A Reference Manual for Utilising and Managing the Soil Resources of Fiji

NEW ZEALAND
MINISTRY OF FOREIGN AFFAIRS & TRADE
Aid Programme

MPI

SPC
Secretariat
of the Pacific
Community

A Reference Manual for Utilising and Managing the Soil Resources of Fiji

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2. Soil Classifications
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David M. Leslie

Foreword

The Land Resources Division of SPC remains committed to integrated and sustainable agriculture and forestry resource management and development; this is a key objective in the LRD Strategic Plan. Soil resources information is a primary underpinning pillar in support of this objective.

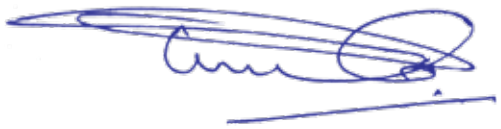
This publication provides a broad framework for understanding and interpreting the soil resources of Fiji in bringing together into one document all the relevant available soil data. It describes these data in a user-friendly format designed for use by farmers, institutional extensionists, researchers, agribusiness managers, and land use planners.

A useful component of the manual is the matching of land qualities with crop requirements, leading to a determination of suitability classes for 78 crops. In separate formats, single-factor maps for each crop have been generated, and enterprise gross margins have been prepared in Excel spreadsheets.

Much of the information was collected by soil scientists from the Soil Bureau of New Zealand's Department of Scientific and Industrial Research, who, in the 1980s, conducted detailed soil surveys of the nine Ministry of Primary Industries (MPI) agricultural research stations in Fiji. This was followed by the national soil survey of Fiji (Seru and Leslie 1986), with supporting information published in the *Fiji Soil Taxonomic Unit Description Handbook* (Leslie and Seru 1998). These soil surveys were indebted to an earlier national soil resources survey (Twyford and Wright, 1965). This most comprehensive bulletin with accompanying soil and land use maps provided the basis for understanding the genesis and pattern of Fiji soils.

The manual will be of value to the MPI, other government departments, the sugar industry institutions, international agencies and non-government organisations in planning future land development assistance programmes and formulating rural sector and land use policies.

LRD is confident this publication will make a significant contribution to sustainable land development in the Republic of Fiji.



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Abbreviations

BS	***base saturation***
BSP	**Benchmark Soils Project**
CEC	***cation exchange capacity***
DSIR	**Department of Scientific and Industrial Research (New Zealand)**
FAO	***Food and Agriculture Organization (United Nations)***
FCSC	**fertility capability soil classification**
GIS	***geographical information systems***
IBSNAT	**International Benchmark Soils Network for Agrotechnology Transfer**
LUC	***land use capability***
MASLR	**Ministry of Agriculture, Sugar and Land Resources (now Minstry of Primary Industries)**
MDS	***minimum data set***
MPI	**Ministry of Primary Industries (Fiji)**
NZAID	***New Zealand Agency for International Development***
SMR	**soil moisture regime**
SMU	***soil map unit***
SPC	**Secretariat of the Pacific Community**
STR	***soil temperature regime***
UNESCO	**United Nations Educational, Scientific and Cultural Organization**
USDA	***United States Department of Agriculture***
USP	**University of the South Pacific**

Glossary

Alluvium	Material, including clay, silt, sand and gravel, deposited in riverbeds, alluvial fans and valley floors by contemporary streams
Base saturation (BS)	May be used as a general measure of soil fertility and leaching. The term *base* refers to those metallic elements that have basic oxides (calcium, magnesium, potassium and sodium). A low BS indicates strong leaching.
Beach strand	A sand-covered plain between the coastal zone and inland landforms (fans, terraces, etc.)
Cation exchange capacity (CEC)	This measures the total number of sites in a soil available for cation exchange, and so is a measure of the ability of the soil to retain added nutrients such as calcium, magnesium and potassium. Nearly all the action exchange sites are on the surfaces of clay particles or organic matter (OM). Soils with large amounts of clay or OM usually have a higher CEC than soils low in clay and OM.
Clayey texture group	Soil material with >35% clay. It is very plastic and moderately or very sticky. Includes silty clay, loamy clay and clay. *Refer to 6 (vii).*
Colluvium	Material that has moved downhill mainly by the force of gravity and has accumulated on lower slopes.
Drainage	Usually four drainage classes are used: well drained, moderately well drained, imperfectly drained and poorly drained. The terms are an indication of how long a soil, or part of a soil, is saturated with water, and how quickly it can rid itself of excessive water. *Refer 6 to (vi).*
Drought risk	The risk of drought in normal years is expressed as the days of soil moisture deficit and the period (months) when deficits occur.
Dune	A low mound or ridge of loose sand piled up by wind
Erosion hazard	The risk of soil erosion occurring under specified conditions, or in a specified area. Erosion hazard is expressed in qualitative terms (severe, moderate, slight, etc.) and type (rill, debris slide, etc.).
Estuaries	Wide tidal mouths of a river where the tide meets the river current; an area where fresh and marine waters mix
Fan	A gently sloping, fan-shaped mass of alluvial material deposited by a stream at a place where a notable decrease in gradient occurs
Field capacity	The moisture content of a soil after it has been saturated and has drained freely

Flooding risk	The risk of flooding is expressed as the frequency or return period for floods depositing sediment (years) and for other floods.
Floodplain	Nearly level land situated on either side of a channel that is subject to overflow flooding
Horizon	A soil layer that has a texture, colour or other property that distinguishes it from other layers in the soil profile
Iron pan	A subsurface continuous horizon containing cemented iron concretions or nodules
Karst	Topography characterised by closed depressions or sink holes in limestone from which surface waters drain by underground routes
Land use capability (LUC)	The LUC classification is a systematic arrangement of different kinds of land according to those properties that determine the capacity for permanent sustained production. The eight LUC classes cover a simple land classification useful for many purposes. Each LUC class includes a specified range in degree of its natural limitations with respect to use. *Refer to Appendix 1*.
Loamy texture group	Soil material containing 9–35% clay and <40% silt. Includes sandy loam, sandy clay loam, clay loam. *Refer to 6 (vii).*
Marine marsh	Coastal lowland subject to diurnal tidal flooding. 'Soft' wet soils with high water tables commonly supporting mangrove.
Matching	The process of comparing crop requirements, land qualities and/or soil characteristics to arrive at a land suitability classification
Matrix	The fine-earth ground mass that in mottled soil materials surrounds the mottles (it need not have the dominant colour)
Minimum rooting depth	Soils — in which shallowness, stones, low moisture-holding capacity, low fertility difficult to correct, or salinity are permanent features — are regarded as having limitations in the rooting zone.
Mottles	Discrete area of fine-earth material surrounded by a matrix of contrasting colour. Mottle colour(s) may be the dominant colour.
Parent material (PM)	The unconsolidated chemically weathered mineral or organic matter from which the solum of soils has developed by pedogenic processes
Permeability	The quality of a soil horizon that enables water to move through it

pH	A measure of the acidity or alkalinity of a soil. The pH of a soil is a measure of the acid groups associated with clay or organic matter. Strong leaching, or the accumulation of large amounts of organic matter (OM) causes the pH to decrease. pH controls the availability of plant nutrients. The optimum pH level for most plants is about 6.0. *Refer to 6 (x).*
Plateau	Comparatively flat extensive and elevated land area above the adjacent country
Relict	Describes a topographic feature that was originally part of a more extensive feature of which most has been removed
Rill	An erosion process in which numerous small channels only several centimetres deep are formed. Occurs mainly on recently cultivated soils.
Rock outcrops and surface boulders	Rock outcrop is the *in situ* bedrock that protrudes through the soil. Boulders are the detached rock masses with diameters >20 cm. The percentage of the ground surface of the site occupied by each is given.
Rotational slip and slump	A slip or slump in which shearing takes place on a well-defined, curved shear surface, concave upward in cross-section, producing backward rotation in the displaced mass
Sandy texture group	Soil material consisting dominantly of sand with 8% or less clay and <40% silt. Includes sand, loamy sand. *Refer to 6 (vii).*
Sheet	Erosion in which thin layers of surface material are gradually removed evenly from an extensive area of sloping land
Silty texture group	Soil material with 40% or more silt and 35% or less clay. Includes silt loam, loamy silt and silt. *Refer to 6 (vii).*
Soil mapping unit	Any unit describing the spatial distribution of soils, which can be mapped
Soil profile (solum)	The vertical section of the soil body and although there are exceptions the majority of soil profiles comprise three master horizons (A – topsoil, B – subsoil, and C – parent material). That part that owes its main characters to the soil-forming processes is referred to as the solum. It includes the A and B horizons or the upper part above the parent material horizon.

Soil moisture regimes	- The **aquic** moisture regime implies a reducing regime that is virtually free of dissolved oxygen because the soil is saturated by ground water. - Soils with a **udic** moisture regime are moist throughout the year due to well distributed rainfalls and the amount of stored water plus rainfall exceeds the amount of evapotranspiration. An extremely wet moisture regime is described as **perudic.** - Soils with an ustic moisture regime have limited moisture, but are moist in the season when the soil is suitable for plant growth. In the isohyperthermic STR soils are dry for >90 cumulative days.
Soil temperature regimes	- **Isothermic**. The mean annual soil temperature is >15 ºC but <22 ºC and the difference between summer and winter mean temperature is <5 ºC. - **Isohyperthermic**. The mean annual soil temperature is >22 ºC and the difference between summer and winter mean temperature <5 ºC.
Terrace	Any relatively flat surface bounded on one edge by a steeper descending slope and along the other by a steeper ascending slope. Rivers are commonly bordered by terraces at different levels.
Translational slide	Downslope displacement of soil-rock material on a surface that is parallel to the general ground surface, in contrast to rotational slips and slumps.
Volcanic rocks	These rocks consist of ash and/or magma that has been blown out of a volcano and has cooled and solidified rapidly
Waterlogging risk	The risk is expressed as the duration (days) of waterlogging, the time it occurs (months) and the position of the water table within the soil profile.
Weathering	The physical and chemical processes in soils that commonly act together. Physical is the breaking of rock into finer and finer particles while the important aspect of chemical weathering is argillisation — the formation of clay. Moisture, temperature, etc. impact the weathering process.

1. INTRODUCTION

Publication of *A Reference Manual for Utilising and Managing the Soil Resources of Fiji* represents an initiative to collate and organise the current knowledge about Fiji's soils and their management. Revisions can be made as more is learnt, particularly about soil fertility, crop options and sustainable farming systems.

The main purpose in compiling the manual is to provide agricultural extensionists and researchers, planners, farmers and others working in the rural development sector with a ready guide to the field identification of soils, soil attributes important for optimal crop growth, information about soil fertility, and an assessment of the suitability of the soils to grow a wide range of fruit and vegetable crops.

The text, tables and overall format of the manual have been designed and written to be user-friendly.

The re-interpreted information in the manual has been derived from the very comprehensive technical report — *The Soil Resources of the Fiji Islands* (Twyford and Wright 1965) — and the revision of Wright's soil map with modern laboratory soil characterisation and soil classification of soil series (Seru and Leslie, 1986; Leslie and Seru, 1998).

The manual has been structured to provide a logical flow of information as follows:

- physiographic soil legends where soil mapping units and soil series are hierarchically organised according to temperature regime, landscape type, composition and degree of weathering of parent material and, finally, drainage class;
- classification of soils series according to soil taxonomy and the FAO/UNESCO system;
- key to the identification of soil series; the flow-diagram format also in a hierarchical order as for the physiographic soil legends;
- Fiji soil mapping units, land use capability classes and the main soil limitations;
- land and soil attributes significant for crop growth are presented in spreadsheet format for each soil mapping unit;
- fertility capability soil classification of soil mapping units;
- matching of soil attributes with crop requirements, expressed in one of four classes of crop suitability. Based on this analysis, GIS-generated single factor crop suitability maps are available separately; and
- important references in support of the foregoing are provided.

2. PHYSIOGRAPHIC LEGEND FOR SOIL MAP UNITS AND SOIL SERIES OF FIJI

2.1 Introduction

In the physiographic legend (below) for the soil map of Fiji, the soil series have been mainly arranged under physiographic headings with the initial subdivision separating soils of the lowlands and foothills from those of the uplands. This separation reflects the change in soil temperature regime at 600 metres altitude, viz. isothermic soil temperature regime (STR) above 600 metres altitude and isohyperthermic STR below.

The second level separation groups soils into major landform categories, e.g., soils of the marine marshes, soils of the fans and outwash surfaces.

At the third category level, soils are further differentiated on the basis of the parent material from which they develop, e.g. river alluvium from acidic soils.

The fourth category subdivides soils on the basis of their internal drainage class, e.g. imperfectly drained, poorly drained. Where appropriate, a final differentiation is made based on the soil moisture regime (SMR) under which they form: aquic, udic, perudic or ustic.

The physiographic legend is that developed to accompany *Soil Map of Fiji*, scale 1:50,000 (Seru and Leslie 1986).

2.2 Soil map of Fiji – physiographic legend

SOILS OF THE LOWLANDS AND FOOTHILLS (<600m altitude, isohyperthermic soil temperature regime)

	Soil Series Symbol
SOILS OF THE MARINE MARSH (Aquic SMR)	
• from marine and estuarine alluvium	
Imperfectly drained	
LABASA SOILS	1
Poorly drained	
TIRI SOILS	2
SOSO SOILS	3
DREKETI SOILS	4
Very poorly drained	
DOGO SOILS	5
SOILS OF THE BEACH STRANDS, DUNES AND ESTUARIES	
• from calcareous sands	
Excessively drained	
Udic / Perudic SMR	
NUKU SOILS	6
Ustic SMR	
YASAWA SOILS	7
Poorly drained	
Udic / Perudic SMR	
TACILEVU SOILS	8
• from sands of high quartz content	
Well drained to excessively drained	
Udic / Perudic SMR	
VUNIBAU SOILS	9
WAIKALOU SOILS	10
Udic SMR	
VOLIVOLI SOILS	11
VUNAVUTU SOILS	12

Very poorly to poorly drained
Aquic SMR
DEUBA SOILS 13

- from sands of low quartz content
  Excessively drained
  Udic / Perudic SMR
  DAWASAMU SOILS 14

- from river alluvium from basic and intermediate rocks over calcareous sands
  Poorly drained
  Aquic SMR
  VUNILAGI SOILS 15

- from mixed calcareous sands and organic materials
  Poorly drained
  Aquic SMR
  RANA SOILS 16

- from organic materials over sands of high quartz content
  Poorly drained
  Aquic SMR
  QARIBUTA SOILS 17

- from estuarine alluvium from basic and intermediate rocks
  Poorly drained
  Aquic SMR
  NAKELO SOILS 18

- from estuarine alluvium from acidic rocks
  Poorly drained
  Aquic SMR
  TOGORU SOILS 19

- from mixed 'black' sands and calcareous sands over coral beach rock
  Well drained
  Udic / Perudic SMR
  NASELESELE SOILS 20

SOILS OF THE MAJOR FLOOD PLAINS

- from river alluvium from basic and intermediate rocks

(a) Levees
Well drained
Udic / Perudic SMR
MUAINASE SOILS 21
REWA SOILS 22
Ustic SMR
LAWAI SOILS 23

(b) 'Relict' river channels
Moderately well drained
Udic / Perudic SMR
TAMANUA SOILS 24
Imperfectly drained
Udic / Perudic SMR
NADURU SOILS 25

(c) Terraces
Well drained
Udic / Perudic SMR
WAINIBUKA SOILS 26
Ustic SMR
SIGATOKA SOILS 27

SOILS OF THE SECONDARY FLOODPLAINS AND DEPRESSIONS

SOILS OF THE FANS AND OUTWASH SURFACES

- from river alluvium from basic and intermediate rocks
  - Well drained
    - Ustic SMR
      - NASOU SOILS 70
      - DRASA SOILS 71
      - MOLAMOLAU SOILS 72
  - Imperfectly drained
    - Ustic SMR
      - LAUTOKA SOILS 73

SOILS OF THE KARST LANDSCAPE

- from marine limestones and elevated calcareous reef rock
  - Well drained
    - Udic / Perudic SMR
      - WAILOTUA SOILS 74
      - LAMI SOILS 75
    - Ustic SMR
      - TAU SOILS 76
      - VATULELE SOILS 77

- from residual materials over raised coralline limestone
  - Well drained
    - Ustic SMR
      - CIKOBIA SOILS 78
      - OGEA SOILS 79
      - TUVUCA SOILS 80
      - NAYAU SOILS 81
      - NAEVUEVU SOILS 82

- from colluvium of mixed limestone and basic rocks
  - Well drained
    - Ustic SMR
      - EKUBU SOILS 83

SOILS OF THE 'YOUNG' VOLCANIC LANDSCAPE (Udic / Perudic SMR)

- from andesite ash
  - Well drained
    - LOMAJE SOILS 84

- from very young 'aa' lava
  - Excessively drained
    - VUNA SOILS 85

- from very young 'pahoehoe' lava
  - Somewhat excessively drained
    - LOSA SOILS 86

- from basaltic ash
  - Somewhat excessively drained
    - WAIQERE SOILS 87
    - WAIOBA SOILS 88
    - ONO SOILS 89
    - DULEVI SOILS 90

- from basaltic ash over scoria
  - Well drained
    - REREE SOILS 91
    - LAUCALA SOILS 92

- from young 'pahoehoe' lava
  - Somewhat excessively drained
    - TAVEUNI SOILS 93
    - KORO SOILS 94
    - URA SOILS 95
    - NACAMAKI SOILS 96
    - RAVILEVU SOILS 97

- from young 'aa' lava
  - Somewhat excessively drained
    - VAKAWAU SOILS 98
    - KIRIKIRI SOILS 99
    - HAFHAFU SOILS 100

- from older 'pahoehoe' lava
  - Well drained
    - NABEKA SOILS 101
    - WAIORU SOILS 102
    - TABAKA SOILS 103
    - QELENI SOILS 104
    - NASAU SOILS 105

- from basaltic scoria cones
  - Well drained
    - NACAUGAI SOILS 106
    - TAVUYAGA SOILS 107
    - MAFUA SOILS 108

- from basaltic tuffaceous cones
  - Well drained
    - ROROA SOILS 109

SOILS OF THE HILL COUNTRY

- from *in situ* calcareous tuffs, sandstones and marls
  - Well drained
    - Udic / Perudic SMR
      - SAMABULA SOILS 110
      - NALOTU SOILS 111
    - Ustic SMR
      - KOROMAVU SOILS 112
      - KEIYASI SOILS 113
      - NADROGA SOILS 114
      - MOMI SOILS 115
      - SABETO SOILS 116
      - NAQALOTU SOILS 117
  - Poorly drained
    - Ustic SMR
      - EMURI SOILS 118

- from colluvium derived from calcareous tuffs, sandstones and marls
  - Moderately well drained
    - Udic / Perudic SMR
      - SUVA SOILS 119
    - Ustic SMR
      - YAKO SOILS 120

- from basic and intermediate sedimentary rocks
  - Well drained
    - Udic / Perudic SMR
      - BURENITU SOILS 121
      - DOBUILEVU SOILS 122
      - MATAWAILEVU SOILS 123
      - LOBAU SOILS 124

VISA SOILS 125
SOTE SOILS 126
WAIMARO SOILS 127
SERUA SOILS 128
WAIDINA SOILS 129
NACULA SOILS 130

Ustic SMR
VASILAULAU SOILS 131

Imperfectly drained
Udic / Perudic SMR
WAISAVA SOILS 132
DARIA SOILS 133

- from quartz rich and acidic tuffs

Well drained
Udic / Perudic SMR
NAMUANA SOILS 134
SAROWAQA SOILS 135
GAIGAI SOILS 136
DRITI SOILS 137
NAMATIU SOILS 138
NAMARA SOILS 139

Ustic SMR
WAINIKORO SOILS 140
NUKUDAMU SOILS 141
NUKUSA SOILS 142
VATUVONU SOILS 143
KURUKURU SOILS 144
KELIKOSO SOILS 145
VEREVERE SOILS 146

Imperfectly drained
Ustic SMR
UAUA SOILS 147

- from *in situ* quartz porphyry and quartzite rocks

Somewhat excessively drained
Udic / Perudic SMR
LUTU SOILS 148

Ustic SMR
MALOLO SOILS 149

- from silicified and indurated tuffs, sandstones, marls and agglomerates

Well drained
Udic / Perudic SMR
VATUBABA SOILS 150
NADAWA SOILS 151
RAURIKO SOILS 152
YAKITA SOILS 153

Ustic SMR
CUKU SOILS 154
NABUONO SOILS 155
DOGOTUKI SOILS 156
KORONIQALA SOILS 157

- from *in situ* acidic rocks (granite, andesite and dacite)

Well drained
Udic / Perudic SMR
NAMOSI SOILS 158
NAULUVATU SOILS 159
NARAYAWA SOILS 160
SAVUDRODRO SOILS 161
VUNATOTO SOILS 162

- from *in situ* mixed acidic and basic tuffs
  Well drained
  Udic / Perudic SMR
  DELAINACAU SOILS 207

- from mixed basic and acidic *in situ* rocks
  Well drained
  Ustic SMR
  LEDRUTUA SOILS 208

SOILS OF THE UPLANDS (>600m altitude, isothermic soil temperature regime)

SOILS OF THE UPLAND SWAMPS

- from organic materials
  - Very poorly drained
    - Aquic SMR
      - KUTA SOILS 209
      - NADRANU SOILS 210

SOILS OF THE FLOODPLAINS AND TERRACES

- from alluvium derived from basic rocks
  - Well drained
    - Udic / Perudic SMR
      - NADALA SOILS 211
      - NAVAI SOILS 212
  - Imperfectly drained
    - Udic / Perudic SMR
      - NADRAU SOILS 213

SOILS OF THE YOUNG VOLCANIC LANDSCAPE (Udic / Perudic SMR)

- from subrecent basaltic 'aa' lavas
  - Somewhat excessively drained
    - NAITATA SOILS 214

- from young basaltic 'pahoehoe' lavas
  - Well drained
    - MANUKA SOILS 215
    - UCUNILAWE SOILS 216

- from basaltic scoria cones
  - Somewhat excessively drained
    - SOQULU SOILS 217

- from *in situ* basaltic ash
  - Somewhat excessively drained
    - MATANA SOILS 218
    - SALIALAILAI SOILS 219

- from colluvium derived from basaltic rocks
  - Well drained
    - TAGIMAUCIA SOILS 220

SOILS OF THE HILL COUNTRY (Udic / Perudic SMR)

- from *in situ* basic and intermediate rocks
  - Well drained
    - LEWA SOILS 221
    - WAIBICI SOILS 222
    - MONASAVU SOILS 223
    - NADARIVATU SOILS 224
    - WAILULU SOILS 225
    - NABUESA SOILS 226

- from alluvium from basic and intermediate rocks (high terraces)
  - Well drained
    - QALINAOLO SOILS 227

2.3 List of soil series (in alphabetical order)

Ba
Batawai
Batiki
Bua
Bucaisau
Bureni
Burenitu
Cikobia
Cuku
Daria
Dawasamu
Delaibo
Delaimatai
Delainacau
Deuba
Dobuilevu
Dogo
Dogotuki
Drasa
Dreketi
Driti
Dulevi
Ekubu
Emuri
Gaigai
Galoa
Gau
Hafhafu
Kavula
Kedra
Keiyasi
Kelikoso
Kirikiri
Koro
Korokadi
Koromavu
Koroniqala
Koronivia
Korotuku
Korovuli
Kubuna
Kurukuru
Kuta
Labasa
Lagilagi
Lakeba
Lami
Lato
Lau
Laucala
Lautoka
Lawai
Ledrutua
Lekutu
Lewa
Lobau
Lodoni
Lomaiviti
Lomaje
Losa
Lovonivia
Lutu
Macuata
Mafua
Makomako
Malolo
Manuka
Mataiwailevu
Matana
Matavelo
Melimeli
Molamolau
Momi
Monasavu
Muainase
Nabeka
Nabiti
Nabuesa
Nabuono
Nacamaki
Nacaugai
Nacokula
Nacula
Nadala
Nadarivatu
Nadawa
Nadi
Nadranu
Nadrau
Nadroga
Nadruka
Naduru
Naevuevu
Nailoca
Nairai
Naitata
Nakavika
Nakelo
Nalotu
Namaka
Namalata
Namara
Namatiu
Namosau
Namosi
Namuana
Nanukuloa
Naqalotu
Naqilai
Narayawa
Narewa
Nasau
Nasegai
Naselesele
Nasou
Nauluvatu
Nausori
Navai
Navava
Navua
Navunikodi
Nawai
Naweni
Nayau
Nika
Nuku
Nukudamu
Nukusa
Ogea
Ono
Qalinaolo
Qaributa
Qeleni
Rana
Rauriko
Ravilevu
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Seatura
Serea
Serua
Sigatoka
Solevu
Soqulu
Soso
Sote
Suva
Tabaka
Tabia
Tabuquto
Tacilevu
Tagimaucia
Tailevu
Talacagi
Tamanua
Tau
Taveuni
Tavua
Tavuyaga
Tiri
Toguru
Tokotoko
Totoya
Tuva
Tuvuca
Uaua
Ucunilawe
Ura
Vaidoko
Vakawau
Varaciva
Vasilaulau
Vatubaba
Vatukoula
Vatulele
Vatuma
Vatuvonu
Veisaru
Verevere
Visa
Vitawa
Volivoli
Vuna
Vunatoto
Vunavutu
Vunibau
Vunicibicibi
Vunilagi
Vurevure
Vuya
Waibici
Waibula
Waidina
Waidradra
Waikalou
Wailotua
Wailulu
Waimaro
Wainibuka
Wainikai
Wainikavou
Wainikoro
Wainivesi
Wainunu
Waioba
Waioru
Waiqere
Waisava
Yakita
Yako
Yaqara
Yasawa
Yavuna

3. CLASSIFICATION OF THE SOIL SERIES OF FIJI IN DIFFERENT SYSTEMS

3.1 Introduction

This report presents the three systems of soil classification most used in Fiji and provides tables that allow correlation of soils of tropical countries with the soil series of Fiji. In these tables Fijian soils are classified according to Twyford and Wright (1965), the FAO/UNesco scheme (1971) and Soil Taxonomy (Soil Survey Staff 1975) and its subsequent keys, i.e. the ninth edition, published in 2003.

Before examining the three classifications it is important, firstly, to understand the five main reasons for soil classification. These are listed below.

1. To **organise** knowledge about soils. Organising our knowledge of soils helps us to think more clearly and efficiently about them.
2. To **understand** relationships between soils, and between soils and the environment in which they have formed. By understanding these relationships it can be seen why certain soils are similar and why others are different.
3. To **remember** the main properties of the soils being classified.
4. To **learn** new relationships between soils within the same class and between soils in different classes.
5. To **use** classification to make interpretations for land use. Soil classification helps establish groups of soils that can be used for practical applied purposes in:
   (a) predicting soil behaviour;
   (b) estimating soil productivity and likely response to management;
   (c) providing a basis for extending or extrapolating results of research or accumulated land use experience. Results of agricultural research conducted on one site should be generally applicable to other sites that have the same soil.

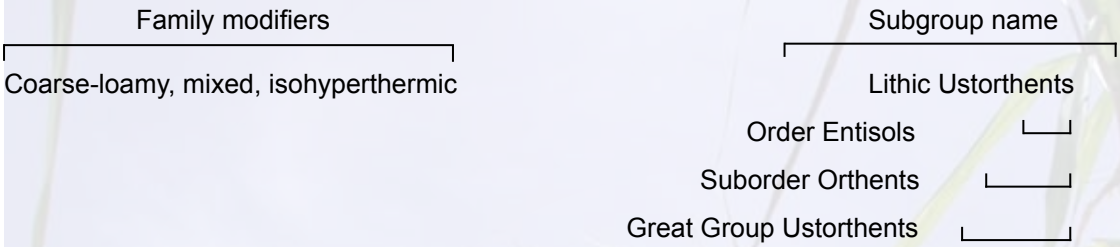
The Twyford and Wright (1965) soil classification developed for Fiji is a hybrid system based on the primary elements of the New Zealand Genetic Soil Classification (Taylor and Pohlen 1970) while incorporating features from the Hawaiian soil classification (Cline 1955). Twyford and Wright's classification is unique to Fiji and different from taxonomic systems used extensively since 1975. The classification has served Fiji well but it places limitations on the ability of Fiji scientists, planners, extension officers, and other users of soil information to fully assimilate and correlate with overseas literature that classify soils primarily to international soil classification systems, i.e. FAO/UNESCO, Soil Taxonomy.

The two systems now widely used in international soil science literature and technical reports related to soil and land resources are the map legend associated with the FAO/UNesco *Soil map of the world* (1971) and *Soil taxonomy* developed by the United States Department of Agriculture (Soil Survey Staff 1975). The FAO/UNESCO classification is a hybrid system incorporating certain aspects of genetic soil systems, but including certain features of key-out schemes. While developed as a soil map legend, it is used extensively as a soil classification system. The FAO/UNESCO system is hierarchal in structure, but as it has only two category levels it has serious limitations in soil mapping at scales of less than 1:100,000.

Soil taxonomy focuses on describing soils as they actually appear at present without undue emphasis on soil genesis. The classification is multi-categoric with few classes in the highest categories and large numbers in the lowest categories. Classes are precisely defined, based on analyses of real soils and measurable properties. The hierarchal structure of soil taxonomy is described below.

The initial category — *Order* — is determined by surface or subsurface diagnostic horizons or features. *Suborders* consider properties affecting current processes, e.g. moisture and temperature. Suborders are then subdivided into *Great Groups* that reflect the dominant properties of the soil. *Subgroups* define the less important properties to show relationships to other soils — typic, intergrade, extragrade. The *family name* identifies all the higher categories of the family, namely, subgroup, great group, suborder and order. For example, the Vatuvonu series is in the *coarse-loamy, mixed, isohyperthermic* family of *Lithic Ustorthents* (Fig. 1).

Figure 1: Construction of a complete family name



The name gives us the following information about the Vatuvonu soil series:

They have no significant pedogenic horizons and only moderate to small amounts of organic matter (from *entisols).*

They are on recent slopes, subject to erosion (from *orthents*).

They are well drained and are dry for >3 months during the growing season (from *ustorthents*).

They have a mean annual soil temperature >22 °C (from *hyperthermic*) and the annual range is <5 °C (from *isohyperthermic*).

The mineralogy is not dominated by any one mineral; it is a mixture of several (from *mixed*).

15% or more of the particles are fine sand or coarser, including fragments up to 7.5 cm in diameter; <18% clay (from coarse loamy).

In 1982, Soil Taxonomy was adopted by the Government of Fiji as the national soil classification system. The primary reason for this was to provide a mechanism through which experiences from the tropics could be applied in order to help the rural economy and to use these new agro-production technologies from similar farming systems to develop Fiji's land resources for increased food production and better nutrition. It also bypasses three key constraints faced by Fiji's lack of trained personnel, lack of investment capital for the rural sector and, above all, lack of time to catch up with Fiji's needs. Poor farmers and marginal cane growers do not have the luxury of waiting decades for the results of slowly developing in-country agricultural technology.

The USAID-funded Benchmark Soils Project (BSP), developed and managed by the University of Hawaii, demonstrated that agro-production technology can be transferred from one tropical region to another on the basis of Soil Taxonomy at the soil family level of the classification.

The implication for food production is significant. First, millions of dollars' worth of research information will be available for immediate tapping. Second, costs of site-specific global trials will be saved, and the waste of human and other resources will be alleviated. Thirdly, the BSP has developed a worldwide network of expertise and a Soil Data Bank to expedite and provide the needed information and communication for rural development. Lastly, agro-technology transfer is all-encompassing: it includes transfer of information on soil management practices and all that goes with it — information on crops and cropping systems, water management practices, erosion control measures, suitability for new crops, economics of crop production, use and problems of irrigation, tikina and national planning and priorities, and so on. The strengths of Soil Taxonomy are: use of quantitative criteria; concepts of diagnostic horizons; emphasis on criteria not readily altered by man; and its logical system of nomenclature.

Table 1: Classification of the soil series of Fiji

Series	Soil Taxonomy	FAO/UNESCO	Twyford and Wright (1965)
Ba	Oxic Dystrustepts fine, kaolinitic, isohyperthermic	Ferralic Cambisols	Ferruginous latosols mod. to str. dry season
Batawai	Oxic Dystrudepts fine, ferruginous, isohyperthermic	Ferralic Cambisols	Humic latosols weak or no dry season
Batiki	Typic Hydraquents fine, kaolinitic, isohyperthermic	Dystric Gleysols	Gley soils v. weak or no dry season
Bua	Typic Kanhaplustalfs very fine, ferruginous, isohyperthermic	Eutric Planosols	Ferruginous latosols str. dry season
Bucaisau	Typic Epiaquolls fine, kaolinitic, isohyperthermic	Mollic Gleyols	Gley related to latosols mod. to str. dry season
Bureni	Typic Kanhaplohumults clayey, ferruginous, isohyperthermic	Humic Nitosols	Humic latosols no dry season
Burenitu	Typic Hapludalfs fine, ferruginous, isohyperthermic	Eutric Nitosols	Humic latosols mod. dry season
Cikobia	Inceptic Eutrustox clayey, gibbsitic, isohyperthermic	Rhodic Ferralsols	Latosolic soils mod. to str. dry season
Cuku	Typic Haplustepts fine-silty, mixed, isohyperthermic	Eutric Cambisols	Steepland related to red yellow podzolic soils str. dry season
Daria	Typic Dystrudepts fine, kaolinitic, isoheperthermic	Humic Cambisols	Humic latosols no dry season
Dawasamu	Typic Quartzipsamments ferritic, isohyperthermic	Arenosols	Recent soils from coastal sands weak to mod. dry season
Delaibo	Typic Entrudepts coarse-loamy, mixed, isohyperthermic	Eutric Cambisols	Steepland related to nigrescent soils weak dry season
Delamatai	Typic Kanhaplustults clayey, ferruginous, isohyperthermic	Dystric Nitosols	Humic latosols str. dry season
Delainacau	Typic Dystrudepts fine, ferruginous, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils weak to mod. dry season
Deuba	Humic Epiaquents sandy, mixed, isohyperthermic	Dystric Gleysols	Gley related to red yellow podzolic soils weak or no dry season
Dobuilevu	Typic Hapludolls fine-loamy, smectitic, isohyperthermic	Haplic Phaeozems	Nigrescent soils weak to mod. dry season
Dogo	Typic Sulfaquents loamy over clayey, mixed, isohyperthermic	Thionic Fluvisols	Saline soils of the marine marsh

Dogotuki	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Humic Cambisols	Red yellow podzolic soils mod. dry season
Drasa	Ultic Haplustalfs fine, ferruginous, isohyperthermic	Eutric Nitosols	Humic latosols str. dry season
Dreketi	Sulfic Endoaquepts clayey, mixed, isohyperthermic	Thionic Fluvisols	Saline soils of the marine marsh
Driti	Inceptic Eutroperox clayey, ferruginous, isohyperthermic	Xanthic Ferralsols	Red yellow podzolic soils no dry season
Dulevi	Hydric Hapludands medial, isohyperthermic	Ochric Andosols	Latosolic soils weak dry season
Ekubu	Lithic Haplustolls fine, smectitic, isohyperthermic	Haplic Kastanozems	Nigrescent soils moderate dry season
Emuri	Udic Haplusterts fine, smectitic, isohyperthermic	Pellic Vertisols	Nigrescent soils str. dry season
Gaigai	Typic Kanhaplohumults clayey, ferruginous, isohyperthermic	Humic Nitosols	Steepland related to red yellow podzolic soils no dry season
Galoa	Typic Rhodudults clayey, ferruginous, isohyperthermic	Dystric Nitosols	Ferruginous latosols weak dry season
Gau	Typic Hapludalfs fine, kaolinitic, isohyperthermic	Eutric Nitosols	Humic latosols weak dry season
Hafhafu	Udic Vitric Hapludands ashy-skeletal, isohyperthermic	Vitric Andosols	Latosolic soils no dry season
Kavula	Typic Dystrustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to humic latosols str. dry season
Kedra	Aeric Epiaquepts fine, kaolinitic, isohyperthermic	Dystric Gleysols	Gley related to red yellow podzolic soils str. to mod. dry season
Keiyasi	Typic Haplustolls fine, smectitic, isohyperthermic	Haplic Kastanozems	Nigrescent soils str. dry season
Kelikoso	Kandic Paleustalfs fine, ferruginous, isohyperthermic	Eutric Planosols	Red yellow podzolic soils str. dry season
Kirikiri	Hydric Hapludands hydrous-skeletal, isohyperthermic	Ochric Andosols	Latosolic soils no dry season
Koro	Typic Eutrudepts fine-silty, halloysitic, isohyperthermic	Eutric Cambisols	Steepland related to latosolic soils weak dry season
Korokadi	Anionic Acrustox clayey, ferruginous, isohyperthermic	Rhodic Ferralsols	Ferruginous latosols str. dry season

Koromavu	Lithic Ustorthents loamy-skeletal, mixed, isohyperthermic	Eutric Regosols	Steepland related to nigrescent soils str. dry season
Koroniqala	Typic Haplustults clayey, kaolinitic, isohyperthermic	Orthic Acrisols	Red yellow podzolic soils mod. dry season
Koronivia	Typic Kandihumults clayey, kaolinitic, isohyperthermic	Humic Nitosols	Red yellow podzolic soils v. weak or no dry season
Korotuku	Typic Argiustoll very-fine, smectitic, isohyperthermic	Luvic Phaeozems	Humic latosols str. dry season
Korovuli	Typic Paleustults clayey, ferruginous, isohyperthermic	Dystric Nitosols	Humic latosols str. dry season
Kubuna	Typic Dystrustepts fine, ferruginous, isohyperthermic	Dystric Cambisols	Ferruginous latosols mod. to str. dry season
Kurukuru	Rhodic Kandiustox clayey, ferruginous, isohyperthermic	Rhodic Ferralsols	Red yellow podzolic soils str. dry season
Kuta	Hydric Tropofibrists dysic, isothermic	Dystric Histosols	Upland organic soils
Labasa	Humic Epiaquepts clayey over sandy, mixed, isohyperthermic	Dystric Gleysols	Saline soils of the marine marsh
Lagilagi	Typic Haplustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Recent soils from alluvium str. to mod. dry season
Lakeba	Typic Dystrustepts very-fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to ferruginous latosols mod. to str. dry season
Lami	Humic Lithic Eutrudepts clayey-skeletal, smectitic, isohyperthermic	Eutric (Lithic) Cambisols	Steepland related to latosolic soils no dry season
Lato	Fluventic Dystrustepts sandy, mixed, isohyperthermic	Dystric Fluvisols	Recent soils from alluvium str. to mod. dry season
Lau	Typic Kandiustox clayey, kaolinitic, isohyperthermic	Rhodic Ferralsols	Ferruginous latosols mod. to str. dry season
Laucala	Vitric Hapludands medial, isohyperthermic	Ochric Andosols	Latosolic soils weak dry season
Lautoka	Udic Argiustoll very-fine, kaolinitic, isohyperthermic	Luvic Phaeozems	Humic latosols mod. to str. dry season
Lawai	Fluventic Haplustepts loamy, mixed, isohyperthermic	Eutric Fluvisols	Recent soils from alluvium mod. to str. dry season
Ledrutua	Typic Haplustolls fine over loamy-skeletal, smectitic, isohyperthermic	Haplic Kastanozems	Nigrescent soils str. dry season

Lekutu	Typic Ustorthents fine-loamy, kaolinitic, isohyperthermic	Dystric Regosols	Ferruginous latosols str. dry season
Lewa	Oxic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Upland ferruginous latosols weak dry season
Lobau	Typic Dystrudepts fine, ferruginous, isohyperthermic	Dystric Cambisols	Steepland related to humic latosols no dry season
Lodoni	Humic Hapludults clayey, ferruginous, isohyperthermic	Orthic Acrisols	Humic latosols weak dry season
Lomaiviti	Typic Eutrudepts fine, ferruginous, isohyperthermic	Eutric Cambisols	Humic latosols v. weak or no dry season
Lomaje	Pachic Vitric Melanudands medial, isohyperthermic	Humic Andosols	Latosolic soils weak dry season
Losa	Lithic Hapludands ashy-skeletal, isohyperthermic	Humic Andosols	Latosolic soils no dry season
Lovonivia	Ultic Haplorthods sandy over clayey, siliceous, isohyperthermic	Orthic Podzols	Red yellow podzolic soils str. dry season
Lutu	Typic Kandihumults fine, kaolinitic, isohyperthermic	Humic Nitosols	Red yellow podzolic soils weak or no dry season
Macuata	Typic Ustorthents fine-loamy, kaolinitic, isohyperthermic	Dystric Cambisols	Ferruginous latosols str. dry season
Mafua	Eutric Fulvudands ashy-skeletal, isohyperthermic	Mollic Andosols	Latosolic soils no dry season
Makomako	Typic Haplustults clayey, kaolinitic, isohyperthermic	Orthic Acrisols	Humic latosols str. dry season
Malolo	Typic Ustipsamments mixed, non-acid, isohyperthermic	Dystric Regosols	Red yellow podzolic soils str. dry season
Manuka	Acrudoxic Hydric Fluvudands medial, isothermic	Humic Andosols	Upland latosolic soils no dry season
Mataiwailevu	Typic Argiudolls very-fine, kaolinitic, isohyperthermic	Orthic Luvisols	Nigrescent soils weak to mod. dry season
Matana	Acrudoxic Hydric Fulvudands thixotropic, isothermic	Humic Andosols	Upland latosolic soils no dry season
Matavelo	Aeric Epiaquepts fine, kaolinitic, isohyperthermic	Dystric Gleysols	Gley related to latosols str. dry season
Melimeli	Hydric Tropofibrists dysic, isohyperthermic	Dystric Histosols	Organic soils
Molamolau	Typic Dystrustepts fine, mixed, isohyperthermic	Dystric Cambisols	Gley related to latosols mod. to str. dry season

Momi	Typic Haplustepts fine, smectitic, isohyperthermic	Eutric Cambisols	Nigrescent soils str. dry season
Monasavu	Oxic Dystrudepts fine, kaolinitic, isothermic	Humic Cambisols	Upland steepland related to humic latosols no dry season
Muainase	Typic Eutrudepts coarse-loamy, mixed, isohyperthermic	Eutric Cambisols	Recent soils from alluvium v. weak or no dry season
Nabeka	Typic Hapludults clayey, halloysitic, isohyperthermic	Dystric Nitosols	Latosolic soils weak dry season
Nabiti	Oxic Dystrustepts very-fine, mixed, isohyperthermic	Dystric Cambisols	Ferruginous latosols str. dry season
Nabuesa	Oxic Dystrudepts fine, kaolinitic, isothermic	Humic Cambisols	Upland humic latosols no dry season
Nabuono	Typic Dystrustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to red yellow podzolic soils str. dry season
Nacamaki	Eutric Thaptic Hapludands medial-skeletal over ashy-skeletal, isohyperthermic	Humic Andosols	Latosolic soils mod. dry season
Nacaugai	Vitric Hapludands medial-skeletal, isohyperthermic	Humic Andosols	Steepland related to latosolic soils weak dry season
Nacokula	Typic Epiaquepts fine, mixed, isohyperthermic	Dystric Gleysols	Gley related to red yellow podzolic soils no dry season
Nacula	Orthoxic Palehumults clayey, kaolinitic, isohyperthermic	Humic Acrisols	Steepland related to humic latosols weak dry season
Nadala	Typic Eutrudepts fine-loamy, mixed, isothermic	Eutric Cambisols	Upland humic latosols no dry season
Nadarivatu	Typic Dystrudepts fine-silty, kaolinitic, isothermic	Dystric Cambisols	Upland steepland related to humic latosols weak to mod. dry season
Nadawa	Typic Eutrudepts fine, kaolinitic, isohyperthermic	Eutric Cambisols	Nigrescent soils weak or no dry season
Nadi	Typic Eutrustox clayey, mixed, isohyperthermic	Orthic Ferralsols	Humic latosols str. dry season
Nadranu	Hemic Tropofibrists dysic, isothermic	Dystric Histosols	Upland organic soils
Nadrau	Oxyaquic Eutrudepts fine, mixed, isothermic	Gleyic Cambisols	Upland gley related to humic latosols no dry season

Nadroga	Udertic Haplustolls fine, mixed, isohyperthermic	Haplic Kastanozems	Nigrescent soils str. dry season
Nadruka	Cumulic Epiaquolls very-fine, kaolinitic, isohyperthermic	Mollic Gleysols	Gley related to latosols mod. to str. dry season
Naduru	Typic Eutrudepts fine, kaolinitic, isohyperthermic	Eutric Fluvisols	Recent soils from alluvium v. weak to no dry season
Naevuevu	Lithic Haplustalfs clayey-skeletal, smectitic, isohyperthermic	Eutric Nitosols	Latosolic soils str. dry season
Nailoca	Typic Dystrudepts fine, ferruginous, isohyperthermic	Humic Cambisols	Steepland related to humic latosols no dry season
Nairai	Typic Kandiustults clayey, kaolinitic, isohyperthermic	Orthic Acrisols	Steepland related to ferruginous latosols mod. to str. dry season
Naitata	Acrudoxic Hapludands medial over medial-skeletal, isothermic	Vitric Andosols	Upland latosolic soils no dry season
Nakavika	Typic Kanhaplohumults clayey, gibbsitic, isohyperthermic	Humic Acrisols	Humic latosols no dry season
Nakelo	Fluvaquentic Eutrudepts fine-loamy, kaolinitic, isohyperthermic	Eutric Gleysols	Gley related to latosols weak or no dry season
Nalotu	Typic Eutrudepts fine, smectitic, isohyperthermic	Eutric Cambisols	Nigrescent soils mod. dry season
Namaka	Typic Paleustults clayey, kaolinitic, isohyperthermic	Ferric Acrisols	Red yellow podzolic soils str. dry season
Namalata	Udic Haplustolls clayey, kaolinitic, isohyperthermic	Haplic Kastanozems	Humic latosols mod. to str. dry season
Namara	Typic Paleudults clayey, kaolinitic, isohyperthermic	Dystric Nitosols	Red yellow podzolic soils weak dry season
Namatiu	Typic Dystrudepts fine-loamy, kaolinitic, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils weak dry season
Namosau	Typic Acrustox clayey, gibbsitic, isohyperthermic	Acric Ferralsols	Ferruginous latosols str. dry season
Namosi	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Humic Cambisols	Humic latosols weak or no dry season
Namuana	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to red yellow podzolic soils mod. dry season
Nanukuloa	Typic Haplustepts fine, mixed, isohyperthermic	Eutric Cambisols	Nigrescent soils mod. to str. dry season

Naqalotu	Typic Haplustepts fine-loamy, kaolinitic, isohyperthermic	Eutric Cambisols	Steepland related to Nigrescent soils mod. dry season
Naqilai	Aeric Epiaquepts fine, mixed, isohyperthermic	Eutric Gleysols	Gley related to red yellow podzolic soils str. to mod. dry season
Narayawa	Typic Dystrudepts sandy, mixed, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils v. weak or no dry season
Narewa	Vertic Epiaquolls fine, smectitic, isohyperthermic	Eutric Gleysols	Gley related to latosols str. dry season
Nasau	Andic Dystrustepts fine-silty, halloysitic, isohyperthermic	Humic Cambisols	Steepland related to latosols mod. dry season
Nasegai	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Humic latosols weak dry season
Naselesele	Typic Udipsamments carbonatic, isohyperthermic	Cambic Arenosols	Recent soils from coastal sands weak dry season
Nasou	Fluventic Dystrustepts fine, mixed, isohyperthermic	Dystric Cambisols	Humic latosols str. dry season
Nauluvatu	Typic Eutrudepts fine-loamy, mixed, isohyperthermic	Eutric Cambisols	Steepland related to humic latosols no dry season
Nausori	Typic Epiaquepts fine, kaolinitic, isohyperthermic	Eutric Gleysols	Gley soils v. weak or no dry season
Navai	Fluventic Hapludolls fine, mixed, isothermic	Eutric Fluvisols	Recent upland soil from alluvium v. weak or no dry season
Navava	Mollic Hapludalfs fine, smectitic, isohyperthermic	Orthic Luvisols	Nigrescent soils v. weak or no dry season
Navua	Fluvaquentic Eutrudepts very-fine, kaolinitic, isohyperthermic	Eutric Cambisols	Gley soils v. weak or no dry season
Navunikodi	Fluventic Dystrudepts fine, mixed, isothermic	Dystric Cambisols	Recent soil from alluvium weak dry season
Nawai	Vertic Haplustepts very-fine, smectitic, isohyperthermic	Vertic Cambisols	Nigrescent soils str. dry season
Naweni	Typic Epiaquepts fine, smectitic, isohyperthermic	Eutric Gleysols	Nigrescent soils v. weak or no dry season
Nayau	Typic Haplustepts fine, ferruginous, isohyperthermic	Ferralic Cambisols	Latosolic soils mod. dry season
Nika	Udic Haplusterts fine, smectitic, isohyperthermic	Pellic Vertisols	Gley related to nigrescent soils str. dry season

Nuku	Typic Udipsamments carbonatic, isohyperthermic	Cambic Arenosols	Recent soils from coastal sands weak dry season
Nukudamu	Typic Dystrustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils str. dry season
Nukusa	Typic Dystrustepts fine-loamy, kaolinitic, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils str. dry season
Ogea	Typic Eutrustox clayey, ferruginous, isohyperthermic	Eutric Ferralsols	Latosolic soils mod. dry season
Ono	Hydric Hapludands hydrous, isohyperthermic	Mollic Andosols	Latosolic soils no dry season
Qalinaolo	Typic Dystrudepts fine, mixed, hypothermic	Humic Cambisols	Upland humic latosols no dry season
Qaributa	Terric Tropofibrists dysic, sandy, isohyperthermic	Dystric Histosols	Organic soil
Qelini	Typic Hapludults clayey, mixed, isohyperthermic	Orthic Acrisols	Latosolic soils weak dry season
Rana	Typic Troposaprists euic, isohyperthermic	Eutric Histosols	Organic soils v. weak or no dry season
Rauriko	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to red yellow podzolic soils mod. dry season
Ravilevu	Andic Dystrudepts loamy, mixed, isohyperthermic	Dystric Cambisols	Steepland related to latosolic soils no dry season
Raviravi	Typic Dystrustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Ferruginous latosols str. dry season
Rawiti	Fluventic Dystrudepts fine, ferruginous, isohyperthermic	Gleyic Cambisols	Recent soils from alluvium str. dry season
Reree	Eutric Fulvudand hydrous over fragmental, isohyperthermic	Mollic Andosols	Latosolic soils no dry season
Rewa	Fluventic Eutrudepts fine-silty, mixed, isohyperthermic	Eutric Cambisols	Recent soils from alluvium v. weak or no dry season
Rewasa	Udic Haplustalfs fine, mixed, isohyperthermic	(Eutric) Luvisols	Nigrescent soils mod. dry season
Roroa	Typic Eutrudepts sandy, mixed, isohyperthermic	Eutric Cambisols	Latosolic soils no dry season
Rukuruku	Ultic Paleustalfs very-fine, mixed, isohyperthermic	Eutric Nitosols	Humic latosols str. dry season

Sabeto	Typic Haplustepts fine, smectitic, isohyperthermic	Eutric Cambisols	Nigrescent soils mod. dry season
Saliadrau	Fluventic Eutrudepts coarse-loamy, mixed, isohyperthermic	Eutric Fluvisols	Recent soils from river alluvium weak dry season
Salialailai	Lithic Fulvudands medial, isothermic	(Lithic) Andosols	Upland steepland related to latosolic soils no dry season
Samabula	Lithic Hapludolls fine, smectitic, isohyperthermic	(Lithic) Phaeozems	Nigrescent soils weak or no dry season
Sarowaqa	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to red yellow podzolic soils mod. dry season
Saunaka	Aquic Dystrustepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Gley related to latosols str. dry season
Savudrodro	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Humic Cambisols	Red yellow podzolic soils weak or no dry season
Sawakasa	Oxyaquic Eutrudepts fine, kaolinitic, isohyperthermic	Gleyic Cambisols	Gley related to latosols weak dry season
Saweni	Typic Epiaquepts fine, smectitic, isohyperthermic	(Vertic) Gleysols	Gley related to nigrescent soils strong dry season
Seatura	Oxic Dystrudepts fine, ferruginous, isohyperthermic	Humic Cambisols	Steepland related to humic latosols no dry season
Serea	Fluventic Eutrudepts coarse-loamy, mixed, isohyperthermic	Eutric Cambisols	Recent soils from river alluvium no dry season
Serua	Typic Kanhaplohumults clayey, ferruginous, isohyperthermic	Humic Acrisols	Steepland related to humic latosols no dry season
Sigatoka	Cumulic Haplustoll fine-silty, mixed, isohyperthermic	Eutric Fluvisols	Recent soil from river alluvium mod. to str. dry season
Solevu	Typic Dystrudepts fine, mixed, isohyperthermic	Dystric Cambisols	Humic latosols weak or no dry season
Soqulu	Hydric Fulvudands medial over ashy-skeletal, isothermic	Humic Andosols	Upland steepland related to latosolic soils no dry season
Soso	Humic Epiaquepts clayey, mixed, isohyperthermic	(Thionic) Gleysols	Saline soils of the marine marsh
Sote	Typic Dystrudepts very-fine, kaolinitic, isohyperthermic	Humic Cambisols	Humic latosols v. weak or no dry season
Suva	Cumulic Hapludolls fine, smectitic, isohyperthermic	Haplic Phaeozems	Nigrescent soils v. weak or no dry season

Tabaka	Andic Dystrudepts fine-silty, halloysitic, isohyperthermic	Humic Cambisols	Latosolic soils no dry season
Tabia	Humic Kandiustox clayey, ferruginous, isohyperthermic	Humic Ferralsols	Humic latosols str. dry season
Tabuquto	Typic Kanhaplustults clayey, kaolinitic, isohyperthermic	Humic Acrisols	Ferruginous latosols str. dry season
Tacilevu	Typic Udipsamments carbonatic, isohyperthermic	Arenosols	Recent soils from coastal sands weak dry season
Tagimaucia	Acrudoxic Hapludands medial, isothermic	Vitric Andosols	Upland latosolic soils no dry season
Tailevu	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Steepland related to humic latosols weak dry season
Talacagi	Aeric Epiaquepts coarse loamy over clayey, siliceous, isohyper-thermic	Dystric Gleysols	Gley related to red yellow podzolic soils str. to mod. dry season
Tamanua	Fluvaquentic Eutrudepts fine, kaolinitic, isohyperthermic	Eutric Fluvisols	Recent soils from alluvium v. weak to no dry season
Tau	Lithic Haplustolls fine, smectitic, isohyperthermic	Haplic Kastanozems	Steepland related to nigrescent soils str. to mod. dry season
Taveuni	Hydric Melanudands hydrous, isohyperthermic	Humic Andosols	Latosolic soils weak dry season
Tavua	Typic Haplustalfs fine, smectitic, isohyperthermic	Eutric Nitosols	Nigrescent soils str. dry season
Tavuyaga	Thaptic Fulvudands ashy, isohyperthermic	Mollic Andosols	Latosolic soils no dry season
Tiri	Typic Sulfaquept clayey over fine loamy, mixed, isohyperthermic	Thionic Fluvisols	Saline soils of the marine marsh
Toguru	Humic Epiaquepts sandy, mixed, isohyperthermic	Dystric Gleysols	Gley related to red yellow podzolic soils weak or no dry season
Tokotoko	Typic Epiaquepts very-fine, kaolinitic, isohyperthermic	Eutric Gleysols	Gley related to latosols v. weak or no dry season
Totoya	Udic Haplustalfs fine, kaolinitic, isohyperthermic	Orthic Luvisols	Ferruginous latosols mod. to str. dry season
Tuva	Typic Kanhaplustults fine, ferruginous, isohyperthermic	Orthic Acrisols	Ferruginous latosols str. dry season
Tuvuca	Cumulic Haplustolls fine-loamy, mixed, isohyperthermic	Haplic Kastanozems	Latosolic soils mod. dry season

Uaua	Kanhaplic Haplustults clayey, ferruginous, isohyperthermic	Orthic Acrisols	Red yellow podzolic soils str. dry season
Ucunilawe	Hydric Fulvudands hydrous, isothermic	Humic Andosols	Upland steepland related to latosolic soils no dry season
Ura	Thaptic Fulvudands ashy, isohyperthermic	Humic Andosols	Latosolic soils no dry season
Vaidoko	Lithic Hapludolls fine, kaolinitic, isohyperthermic	Haplic Phaeozems	Steepland related to nigrescent soils mod. dry season
Vakawau	Hydric Melanudands medial-skeletal, isohyperthermic	Humic Andosols	Latosolic soils no dry season
Varaciva	Typic Kanhaplustult clayey, kaolinitic, isohyperthermic	Orthic Acrisols	Steepland related to ferruginous latosols str. dry season
Vasilaulau	Typic Dystrustepts loamy-skeletal, mixed, isohyperthermic	Dystric Cambisols	Nigrescent soils str. dry season
Vatubaba	Typic Eutrudepts loamy-skeletal, mixed, isohyperthermic	Eutric Cambisols	Steepland related to red yellow podzolic soils mod. dry season
Vatukoula	Udic Rhodustalf fine, mixed, isohyperthermic	Ferric Luvisols	Nigrescent soils str. dry season
Vatulele	Lithic Haplustolls clayey-skeletal, smectitic, isohyperthermic	Haplic Kastanozems	Steepland related to nigrescent soils mod. dry season
Vatuma	Fluventic Haplustolls fine, mixed, isohyperthermic	Haplic Kastanozems	Recent soils from alluvium str. dry season
Vatuvonu	Lithic Ustorthents coarse-loamy, mixed, isohyperthermic	Eutric Regosols	Nigrescent soils str. dry season
Veisaru	Aeric Epiaquepts fine, kaolinitic, isohyperthermic	Dystric Gleysols	Gley related to latosols mod. to str. dry season
Verevere	Typic Haplustepts fine, smectitic, isohyperthermic	Eutric Cambisols	Nigrescent soils str. dry season
Visa	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Humic latosols v. weak or no dry season
Vitawa	Typic Haplustalfs fine, smectitic, isohyperthermic	Orthic Luvisols	Steepland related to red yellow podzolic soils str. dry season
Volivoli	Typic Dystrustepts sandy, siliceous, isohyperthermic	Humic Cambisols	Recent soils from sands of high quartz content str. to mod. dry season
Vuna	Typic Fluvudands medial over medial-skeletal, isohyperthermic	Vitric Andosols	Latosolic soils weak dry season

Vunatoto	Typic Eutrudepts coarse-silty, mixed, isohyperthermic	Eutric Cambisols	Steepland related to red yellow podzolic soils mod. dry season
Vunavutu	Udic Haplustolls loamy, mixed, isohyperthermic	Haplic Kastanozems	Recent soils from coastal sands and alluvium str. dry season
Vunibau	Typic Dystrudepts sandy, siliceous, isohyperthermic	Humic Cambisols	Recent soils from coastal sands weak dry season
Vunicibicibi	Anionic Acrustox clayey, ferruginous, isohyperthermic	Rhodic Ferralsols	Ferruginous latosols str. dry season
Vunilagi	Typic Argiaquolls clayey over loamy-skeletal, mixed, isohyperther-mic	Gleyic Phaeozems	Saline soil of the marine marsh
Vurevure	Humic Epiaquepts fine, mixed, non-acid, isohyperthermic	Eutric Gleysols	Gley related to latosols weak dry season
Vuya	Typic Rhodustults clayey, mixed, isohyperthermic	Dystric Nitosols	Humic latosols mod. to str. dry season
Waibici	Oxic Dystrudepts fine, mixed, isohyperthermic	Dystric Cambisols	Upland humic latosols no dry season
Waibula	Fluventic Hapludolls fine-loamy, mixed, isohyperthermic	Haplic Phaeozems	Recent soils from alluvium weak dry season
Waidina	Typic Eutrudepts fine, kaolinitic, isohyperthermic	Eutric Cambisols	Humic latosols v. weak or no dry season
Waidradra	Fluventic Eutrudepts fine, mixed, isohyperthermic	Gleyic Cambisols	Recent soils from river alluvium v. weak or no dry season
Waikalou	Aeric Epiaquepts sandy, mixed, isohyperthermic	Eutric Gleysols	Gley related to latosols no dry season
Wailotua	Typic Eutrudepts clayey-skeletal, smectitic, isohyperthrmic	Eutric Cambisols	Steepland related to nigrescent soils weak dry season
Wailulu	Oxic Dystrudepts fine, kaolinitic, isothermic	Humic Cambisols	Upland humic latosols weak dry season
Waimaro	Typic Dystrudepts fine, kaolinitic, isohyperthermic	Dystric Cambisols	Humic latosols v. weak or no dry season
Wainibuka	Fluventic Hapludolls fine, smectitic, isohyperthermic	Haplic Phaeozems	Recent soils from river alluvium weak to mod. dry season
Wainikai	(Histic) Hydraquents fine, kaolinitic, non-acid, isohyperthermic	Humic Gleysols	Gley soils v. weak to no dry season
Wainikavou	Epiaquic Tropohumults fine, kaolinitic, isohyperthermic	Humic Acrisols	Red yellow podzolic soils weak or no dry season

Wainikoro	Typic Kandiustults clayey, kaolinitic, isohyperthermic	Orthic Acrisols	Red yellow podzolic soils str. dry season
Wainivesi	Fluventic Eutrudepts fine, kaolinitic, isohyperthermic	Eutric Cambisols	Gley related to latosols no dry season
Wainunu	Oxic Dystrudepts very-fine, ferruginous, isohyperthermic	Humic Cambisols	Humic latosols no dry season
Waioba	Hydric Thaptic Fulvudands hydrous, isohyperthermic	Humic Andosols	Steepland related to latosolic soils weak dry season
Waioru	Humic Pachic Dystrudepts clayey over loamy-skeletal, halloysitic, isohyper-thermic	Humic Cambisols	Steepland related to latosolic soils weak dry season
Waiqere	Acrudoxic Hapludands medial, isohyperthermic	Humic Andosols	Latosolic soils no dry season
Waisava	Fluventic Hapludolls fine, smectitic, isohyperthermic	Haplic Phaeozems	Nigrescent soils weak to mod. dry season
Yakita	Typic Dystrudepts very-fine, kaolinitic, isohyperthermic	Dystric Cambisols	Nigrescent soils mod. dry season
Yako	Entic Haplustolls fine, smectitic, isohyperthermic	Haplic Kastanozems	Nigrescent soils str. dry season
Yaqara	Kanhaplic Haplustalfs fine, kaolinitic, isohyperthermic	Eutric Nitosols	Nigrescent soils str. dry season
Yasawa	Typic Ustipsamments carbonitic, isohyperthermic	Arenosols	Recent soils from coastal sands str. dry season
Yavuna	Typic Haplustepts sandy-skeletal, siliceous, isohyperthermic	Dystric Cambisols	Red yellow podzolic soils str. dry season

4. FLOW-DIAGRAM KEYS FOR THE IDENTIFICATION OF FIJI SOIL SERIES

4.1 Introduction

This chapter seeks to explain, in a flow-diagram format, keys to the Fiji soil series. The keys are intended to permit easier identification of the soil series and are likely to be particularly useful to persons not familiar with the structure of the National Soil Physiographic Legend (Seru and Leslie, 1986) and the associated soil taxonomic unit descriptions (Leslie and Seru, 1998).

The key firstly separates soils on the basis of soil temperature regime (STR), viz. soils occurring above (isothermic STR) and below (isohyperthermic STR) 600 m altitude. The second step groups soils into major landscape types, e.g. soils of the major floodplains, soils of the plateaux, soils of the marine marsh, etc. Further identifiers applied to help arrive at the soil series include: parent material (e.g. weathered colluvium from basaltic rocks); soil moisture regime (aquic, udic/perudic, ustic); internal drainage class, e.g. poorly drained through to excessively drained; slope; and finally to those soil profile properties that define the soil series.

An example for the Yasawa series:

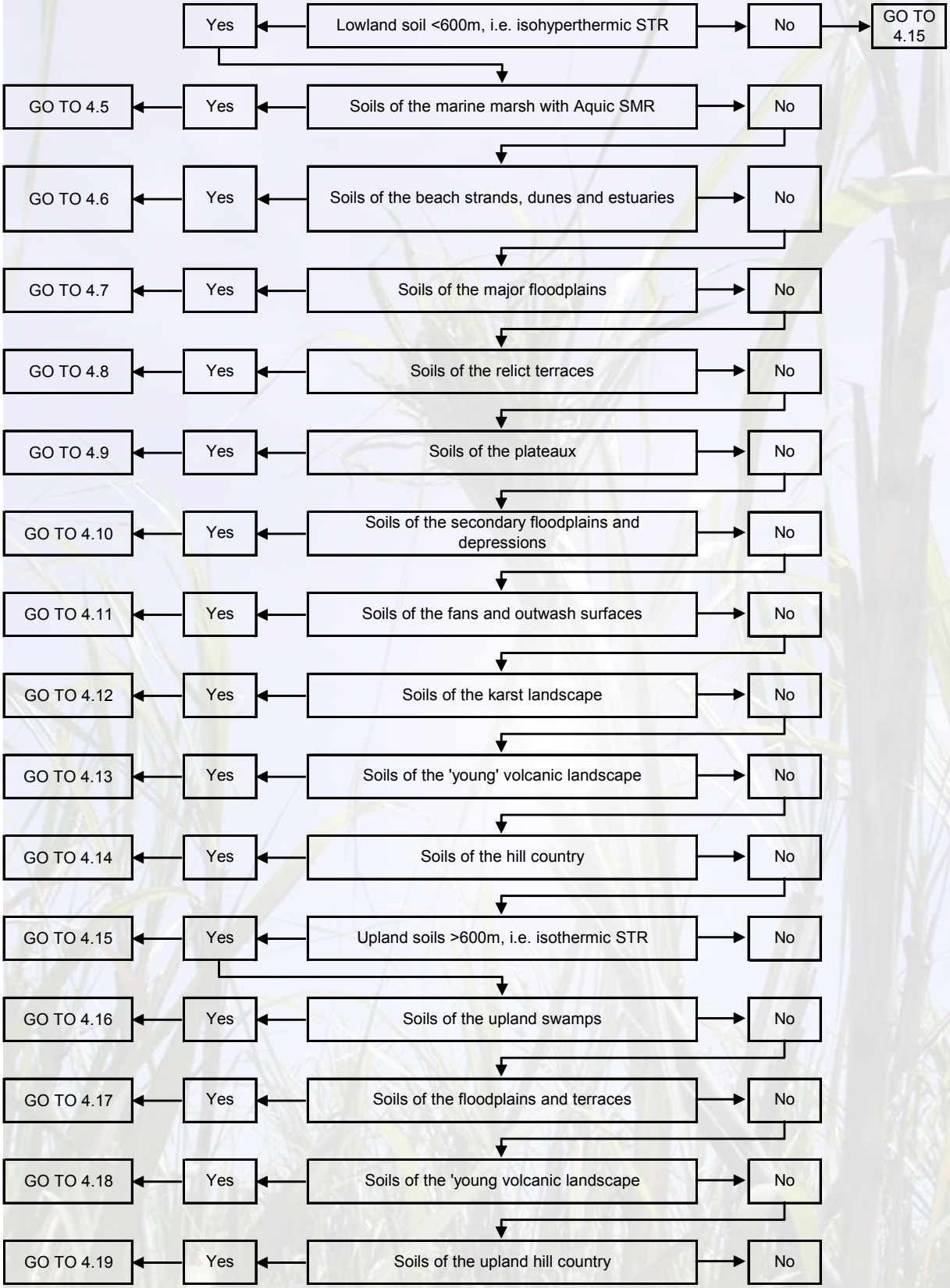
Lowland soil <600 m, i.e. isohyperthermic STR	Yes
Soils of the beach strands, dunes and estuaries	Yes
From calcareous sands	Yes
Excessively drained	Yes
Ustic SMR	Yes
Dark brown sand over white sand	Yes
Yasawa series	Yes

The keying out procedure to follow is to start on page one and then, logically responding to the yes/no questions, progressively eliminate soils related to the hierarchal order of altitude, landscape types, parent materials, etc. until arriving at the soil series for which a match is sought.

4.2 Explanation of the abbreviations

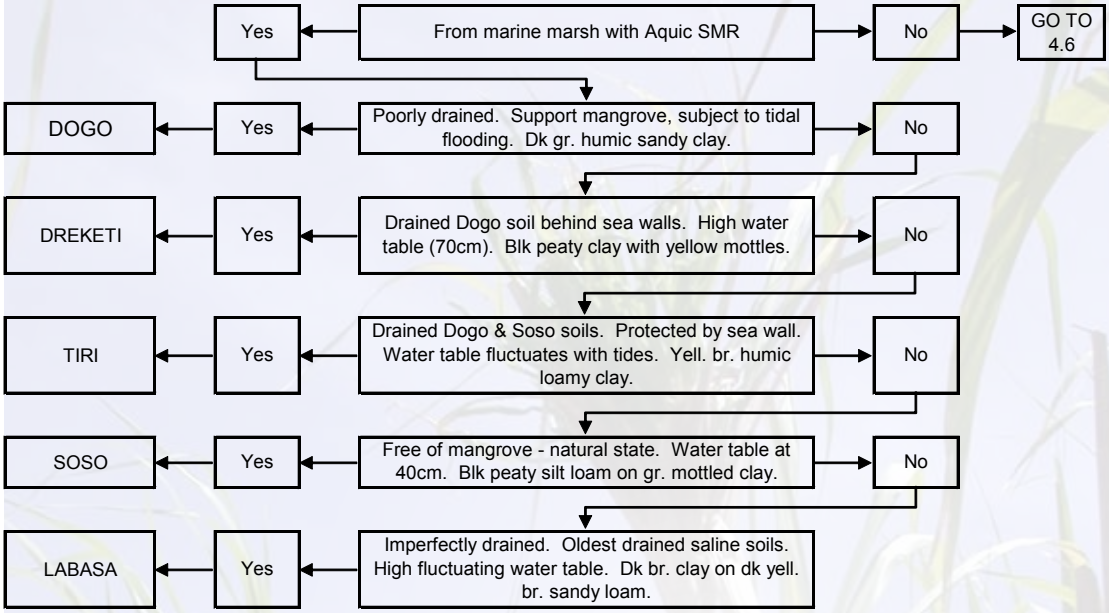
Blk. (blk.)	black
Br. (br.)	brown
co.	coarse
conc.	concretion
Dk. (dk.)	dark
Gr. (gr.)	grey
mod.	moderate
SMR	soil moisture regime
str.	strong
STR	soil temperature regime
v.	very
WT	water table
Yell. (yell.)	yellow

4.3 Keys to the identification of Fiji soil series

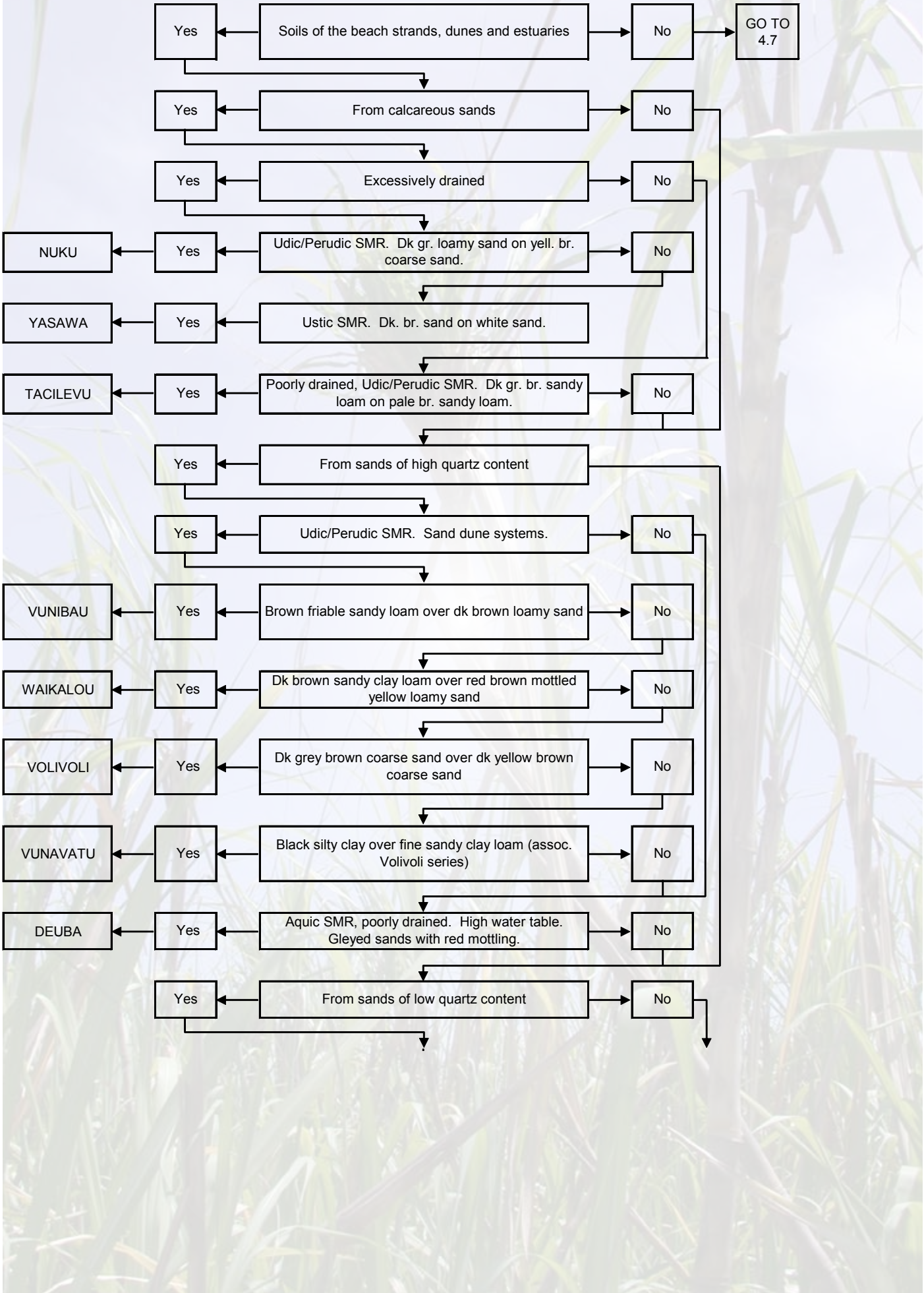


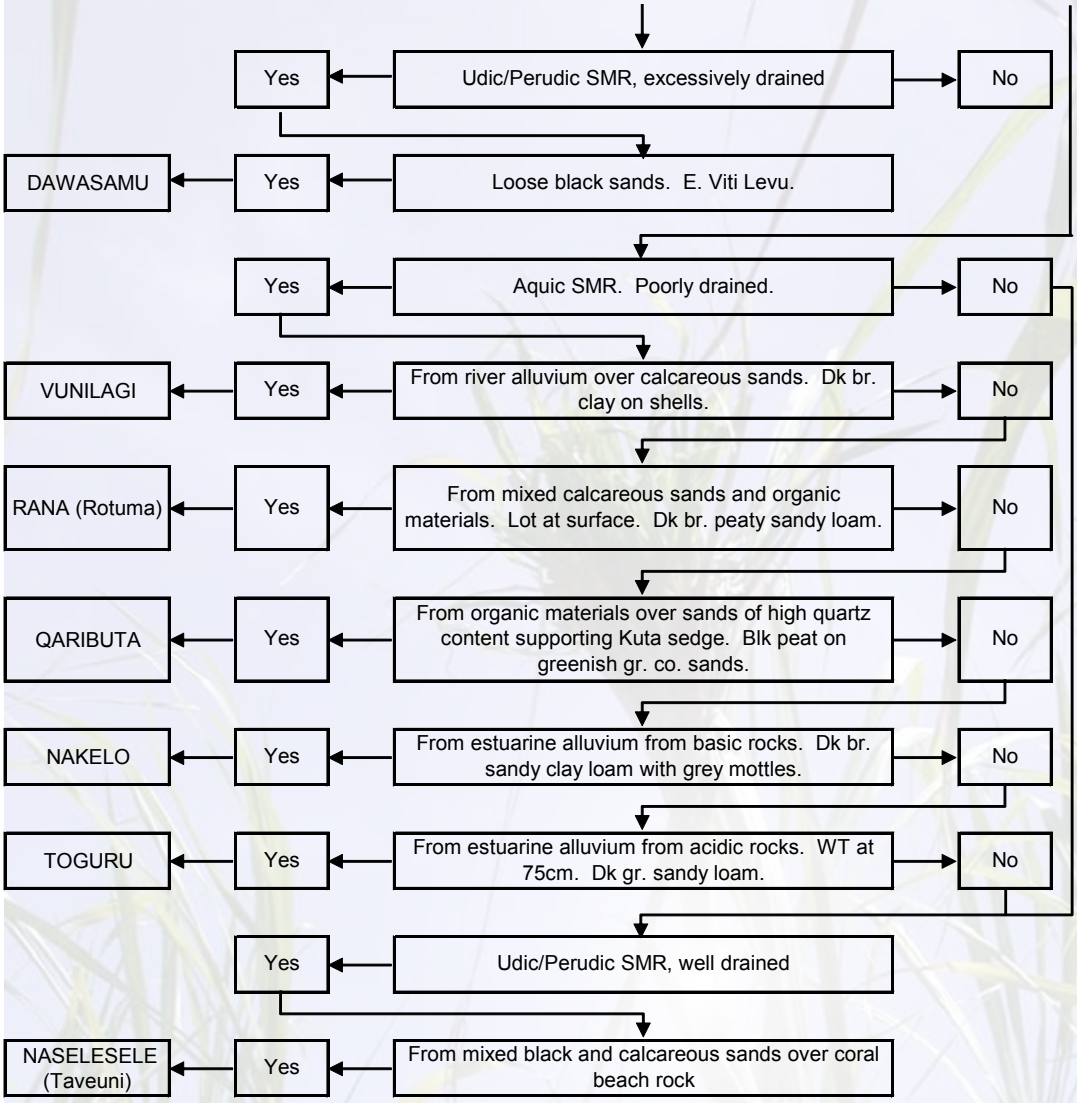
4.4. Lowland soils <600m, i.e. isohyperthermic ST

4.5 Soils of the marine marsh with aquic SMR

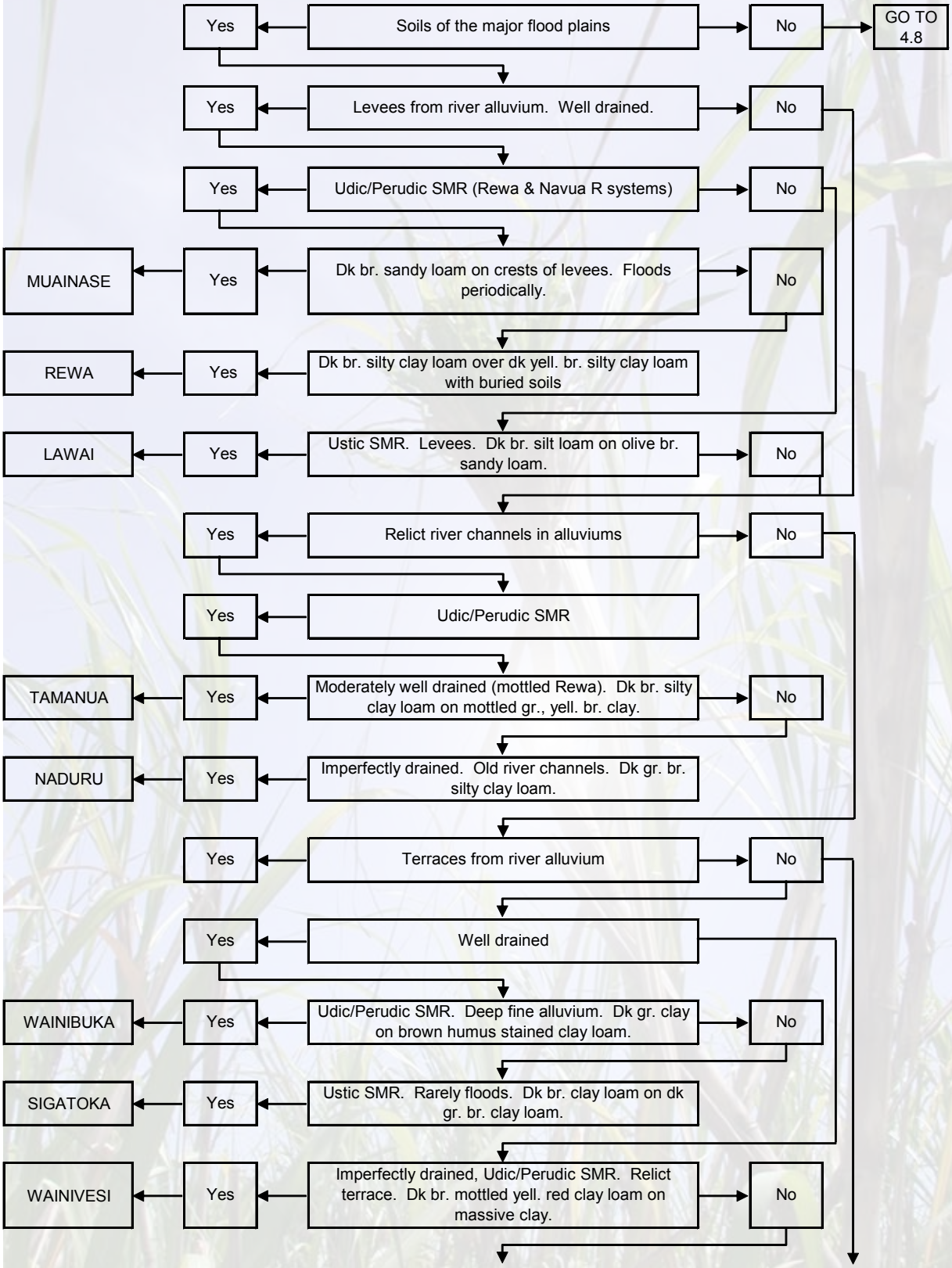


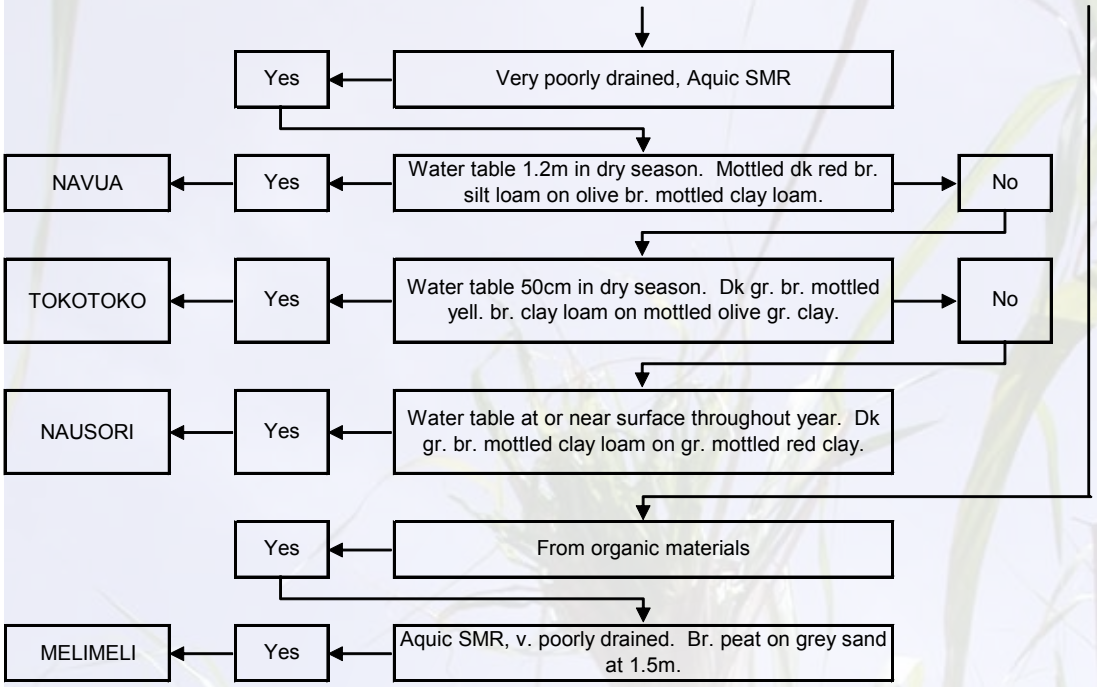
4.6 Soils of the beach strands, dunes and estuaries



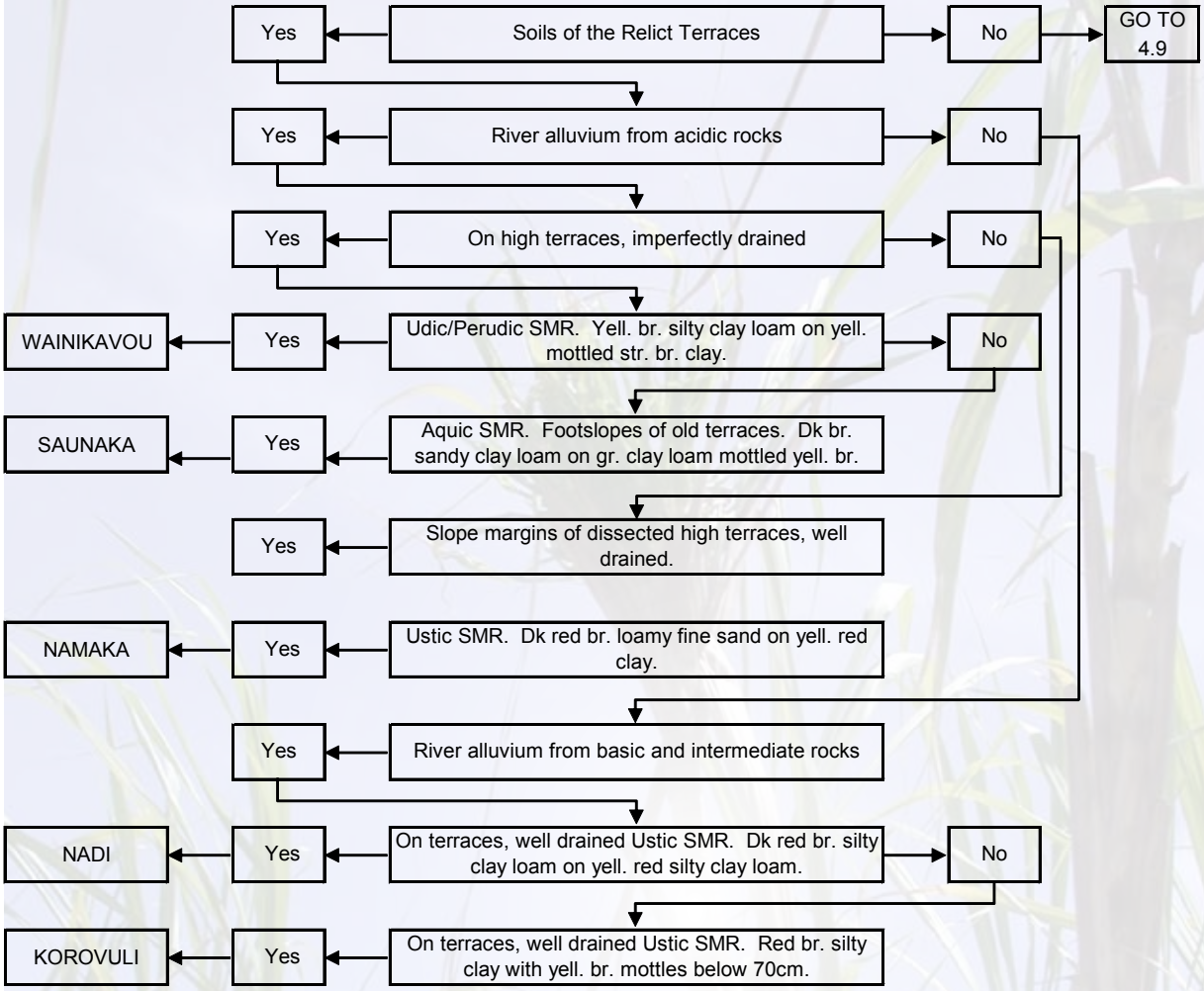

Udic/Perudic SMR, excessively drained
Yes
No
Loose black sands. E. Viti Levu.
DAWASAMU
Yes
Aquic SMR. Poorly drained.
Yes
No
From river alluvium over calcareous sands. Dk br. clay on shells.
VUNILAGI
Yes
No
From mixed calcareous sands and organic materials. Lot at surface. Dk br. peaty sandy loam.
RANA (Rotuma)
Yes
No
From organic materials over sands of high quartz content supporting Kuta sedge. Blk peat on greenish gr. co. sands.
QARIBUTA
Yes
No
From estuarine alluvium from basic rocks. Dk br. sandy clay loam with grey mottles.
NAKELO
Yes
No
From estuarine alluvium from acidic rocks. WT at 75cm. Dk gr. sandy loam.
TOGURU
Yes
No
Udic/Perudic SMR, well drained
Yes
From mixed black and calcareous sands over coral beach rock
NASELESELE (Taveuni)
Yes

4.7 Soils of the major floodplains

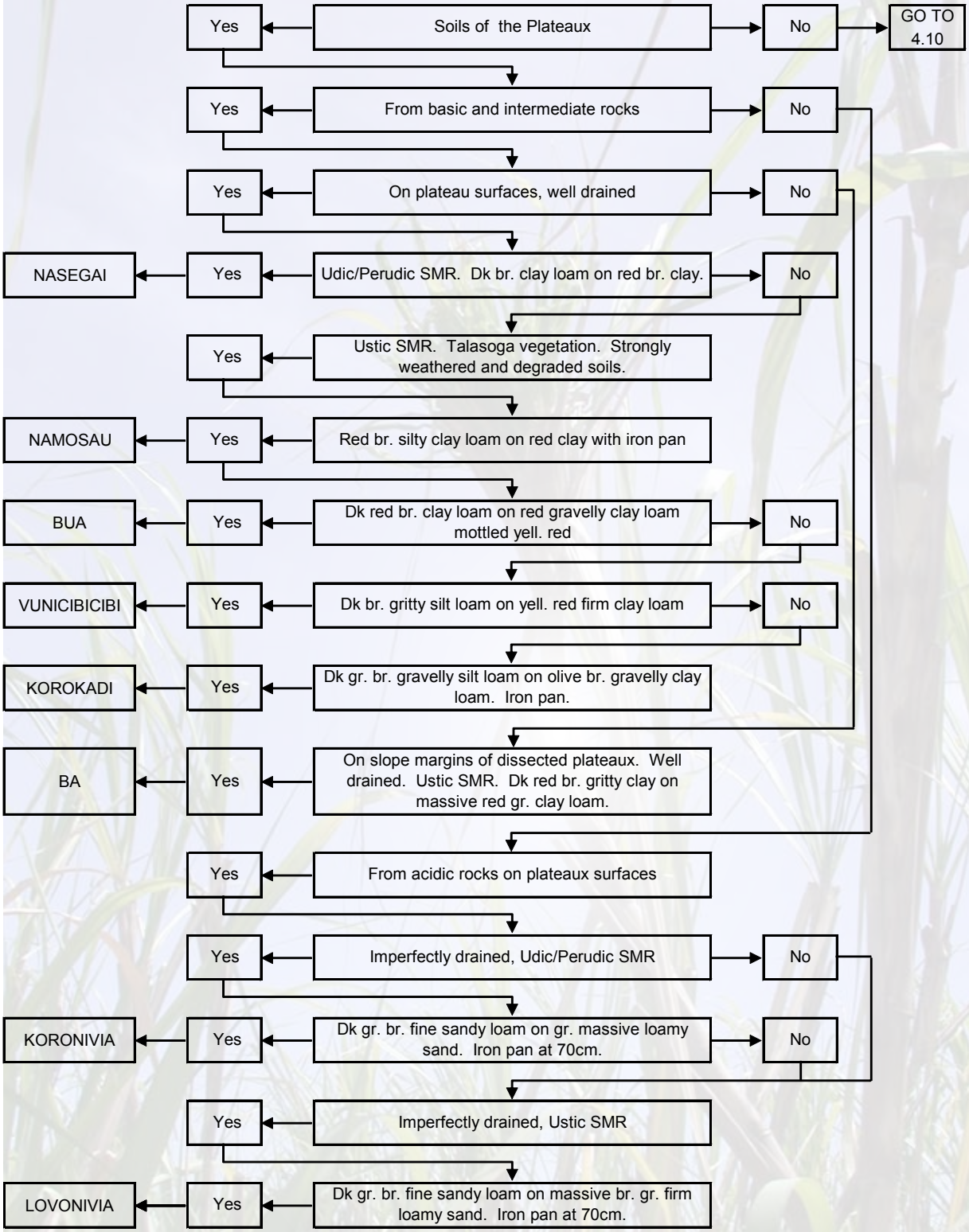



Very poorly drained, Aquic SMR
Yes
Water table 1.2m in dry season. Mottled dk red br. silt loam on olive br. mottled clay loam.
Yes
NAVUA
No
Water table 50cm in dry season. Dk gr. br. mottled yell. br. clay loam on mottled olive gr. clay.
Yes
TOKOTOKO
No
Water table at or near surface throughout year. Dk gr. br. mottled clay loam on gr. mottled red clay.
Yes
NAUSORI
From organic materials
Yes
Aquic SMR, v. poorly drained. Br. peat on grey sand at 1.5m.
Yes
MELIMELI

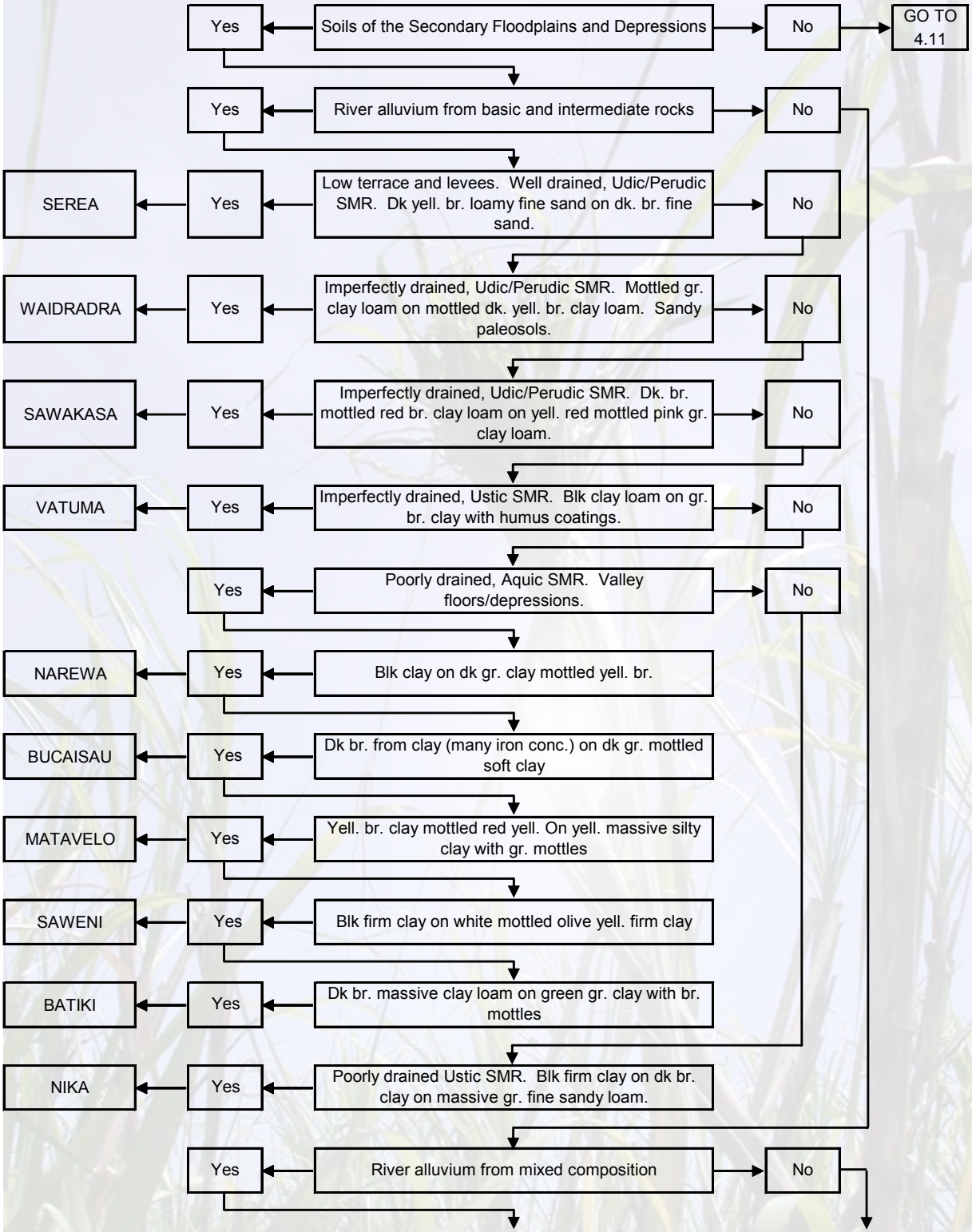
4.8 Soils of the relict terraces

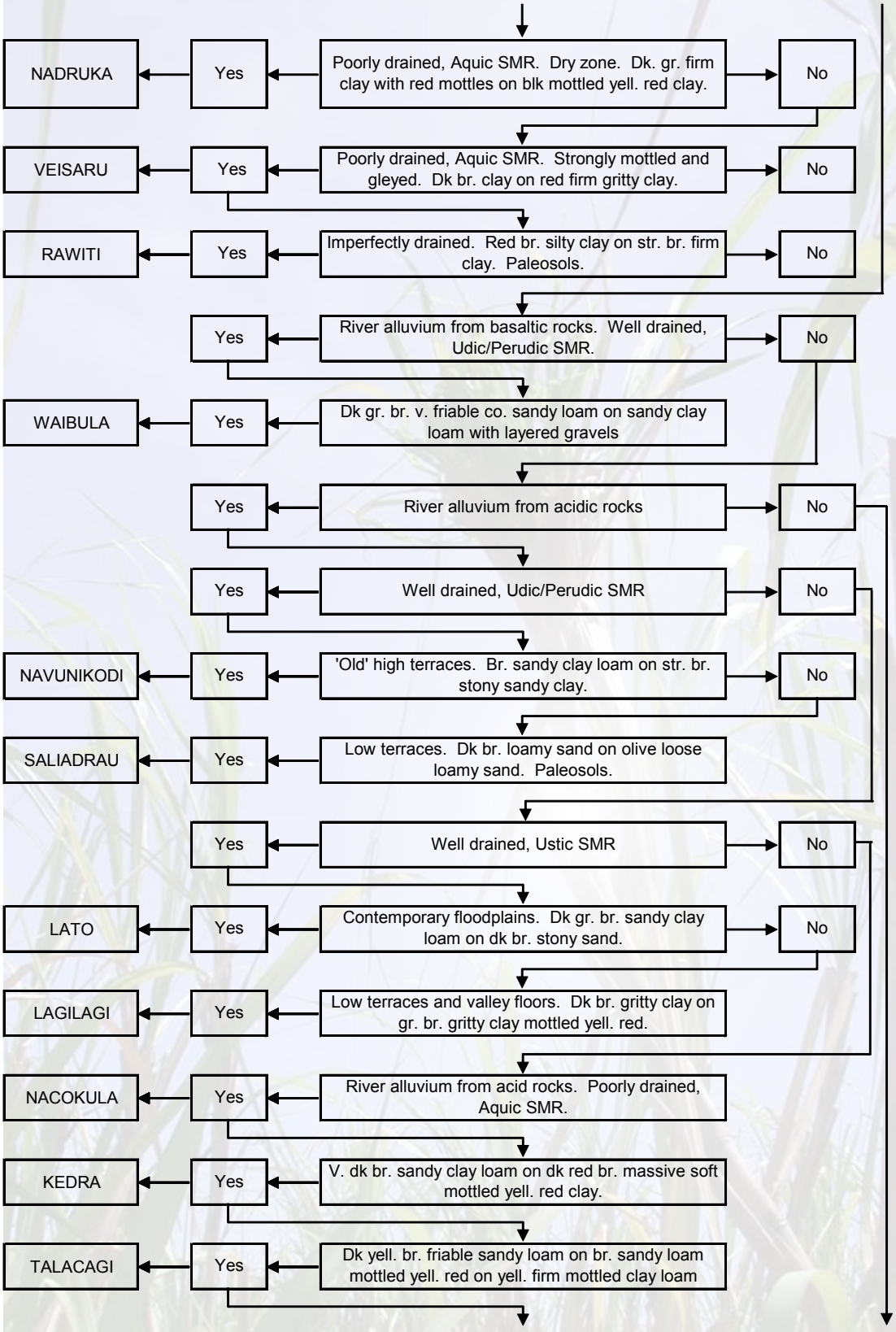


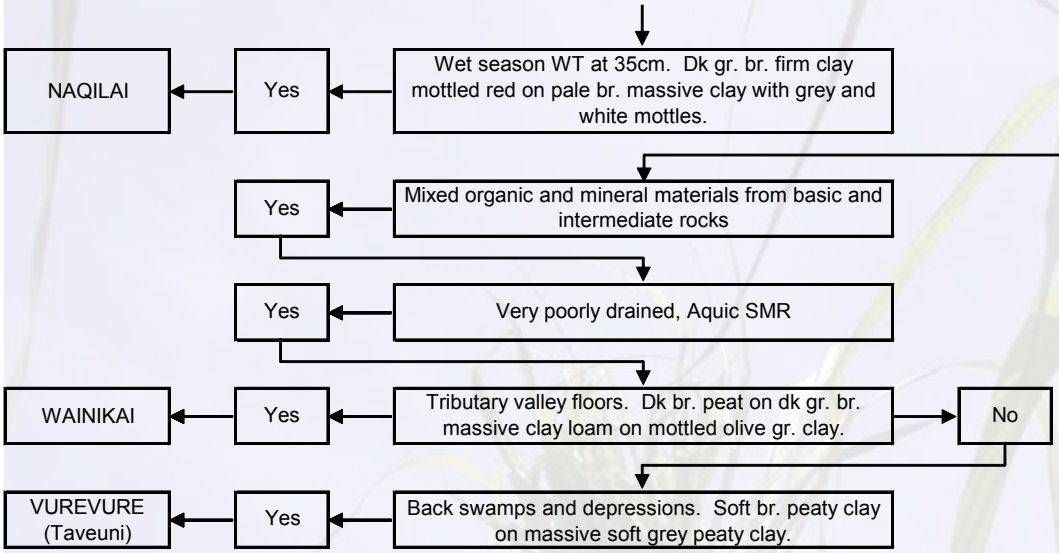
4.9 Soils of the plateaux



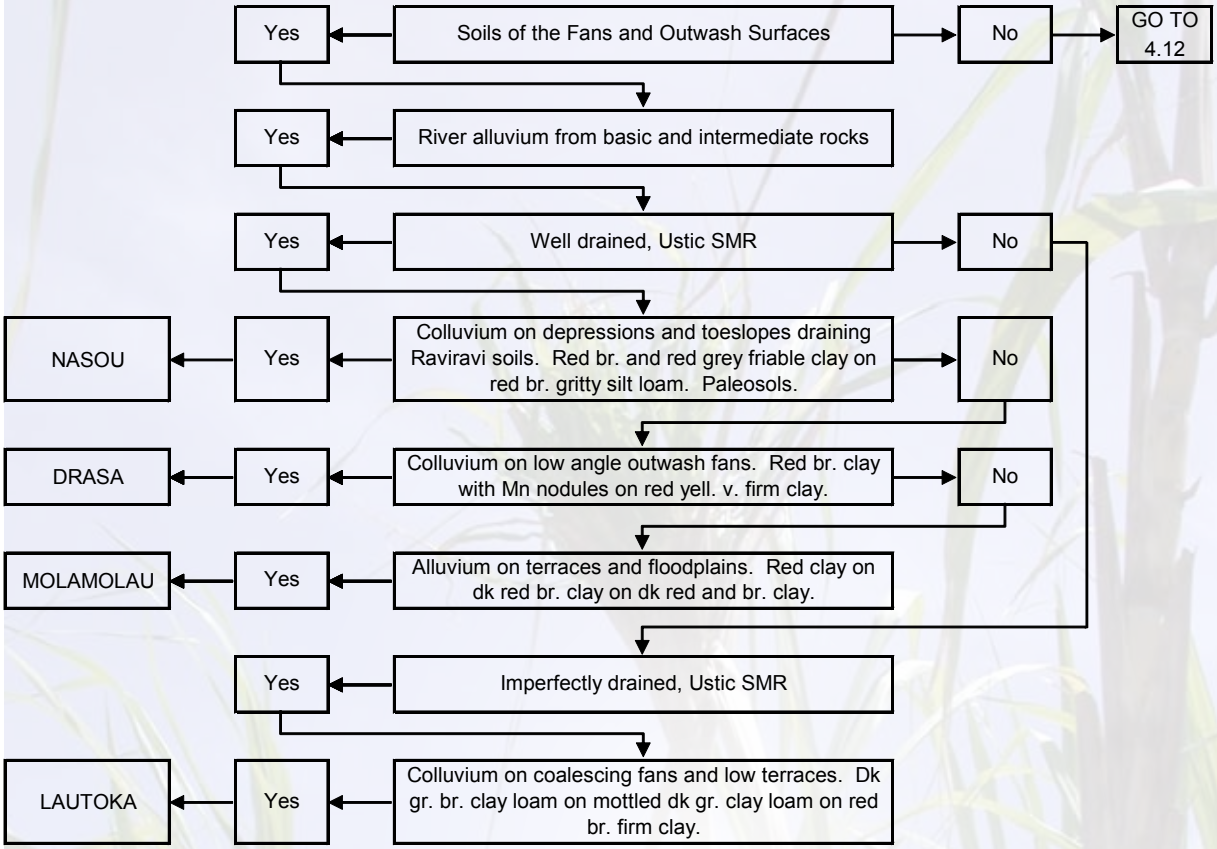
4.10 Soils of the secondary floodplains and depressions



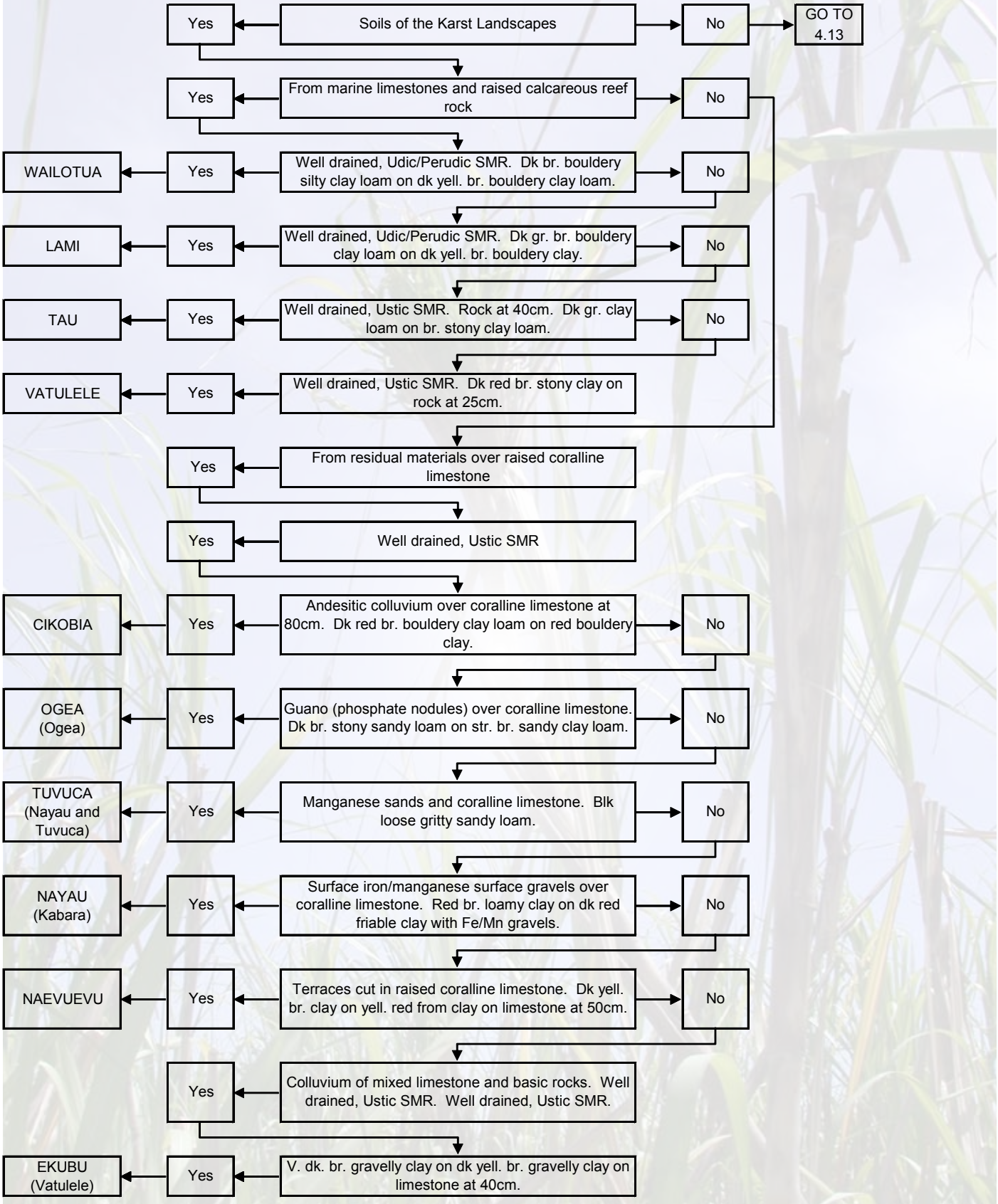

Poorly drained, Aquic SMR. Dry zone. Dk. gr. firm clay with red mottles on blk mottled yell. red clay.
Yes
NADRUKA
No
Poorly drained, Aquic SMR. Strongly mottled and gleyed. Dk br. clay on red firm gritty clay.
Yes
VEISARU
No
Imperfectly drained. Red br. silty clay on str. br. firm clay. Paleosols.
Yes
RAWITI
No
River alluvium from basaltic rocks. Well drained, Udic/Perudic SMR.
Yes
No
Dk gr. br. v. friable co. sandy loam on sandy clay loam with layered gravels
Yes
WAIBULA
River alluvium from acidic rocks
Yes
No
Well drained, Udic/Perudic SMR
Yes
No
'Old' high terraces. Br. sandy clay loam on str. br. stony sandy clay.
Yes
NAVUNIKODI
No
Low terraces. Dk br. loamy sand on olive loose loamy sand. Paleosols.
Yes
SALIADRAU
Well drained, Ustic SMR
Yes
No
Contemporary floodplains. Dk gr. br. sandy clay loam on dk br. stony sand.
Yes
LATO
No
Low terraces and valley floors. Dk br. gritty clay on gr. br. gritty clay mottled yell. red.
Yes
LAGILAGI
River alluvium from acid rocks. Poorly drained, Aquic SMR.
Yes
NACOKULA
V. dk br. sandy clay loam on dk red br. massive soft mottled yell. red clay.
Yes
KEDRA
Dk yell. br. friable sandy loam on br. sandy loam mottled yell. red on yell. firm mottled clay loam
Yes
TALACAGI


Wet season WT at 35cm. Dk gr. br. firm clay mottled red on pale br. massive clay with grey and white mottles.
Yes
NAQILAI
Mixed organic and mineral materials from basic and intermediate rocks
Yes
Very poorly drained, Aquic SMR
Yes
Tributary valley floors. Dk br. peat on dk gr. br. massive clay loam on mottled olive gr. clay.
No
Yes
WAINIKAI
Back swamps and depressions. Soft br. peaty clay on massive soft grey peaty clay.
Yes
VUREVURE (Taveuni)

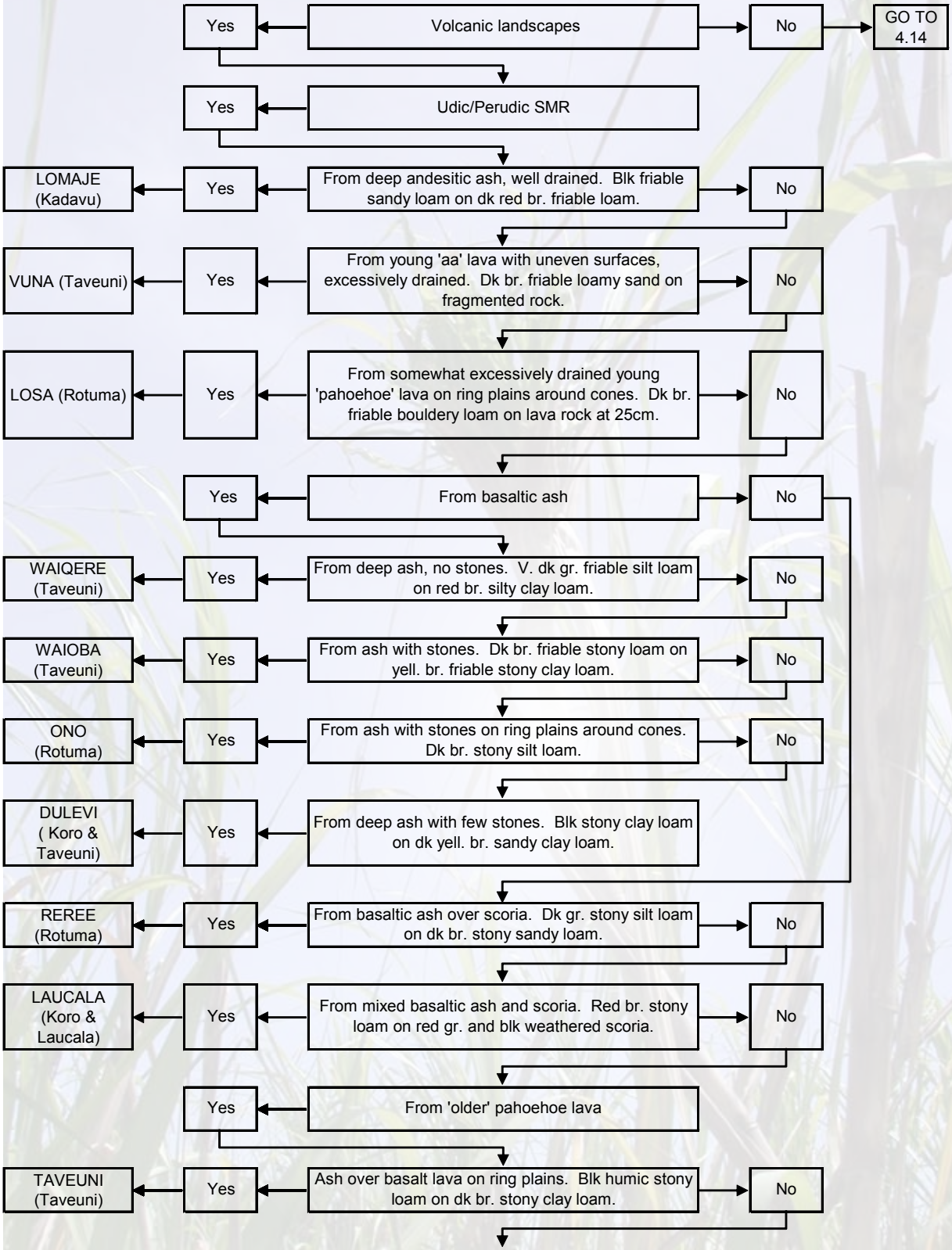
4.11 Soils of the fans and outwash surfaces

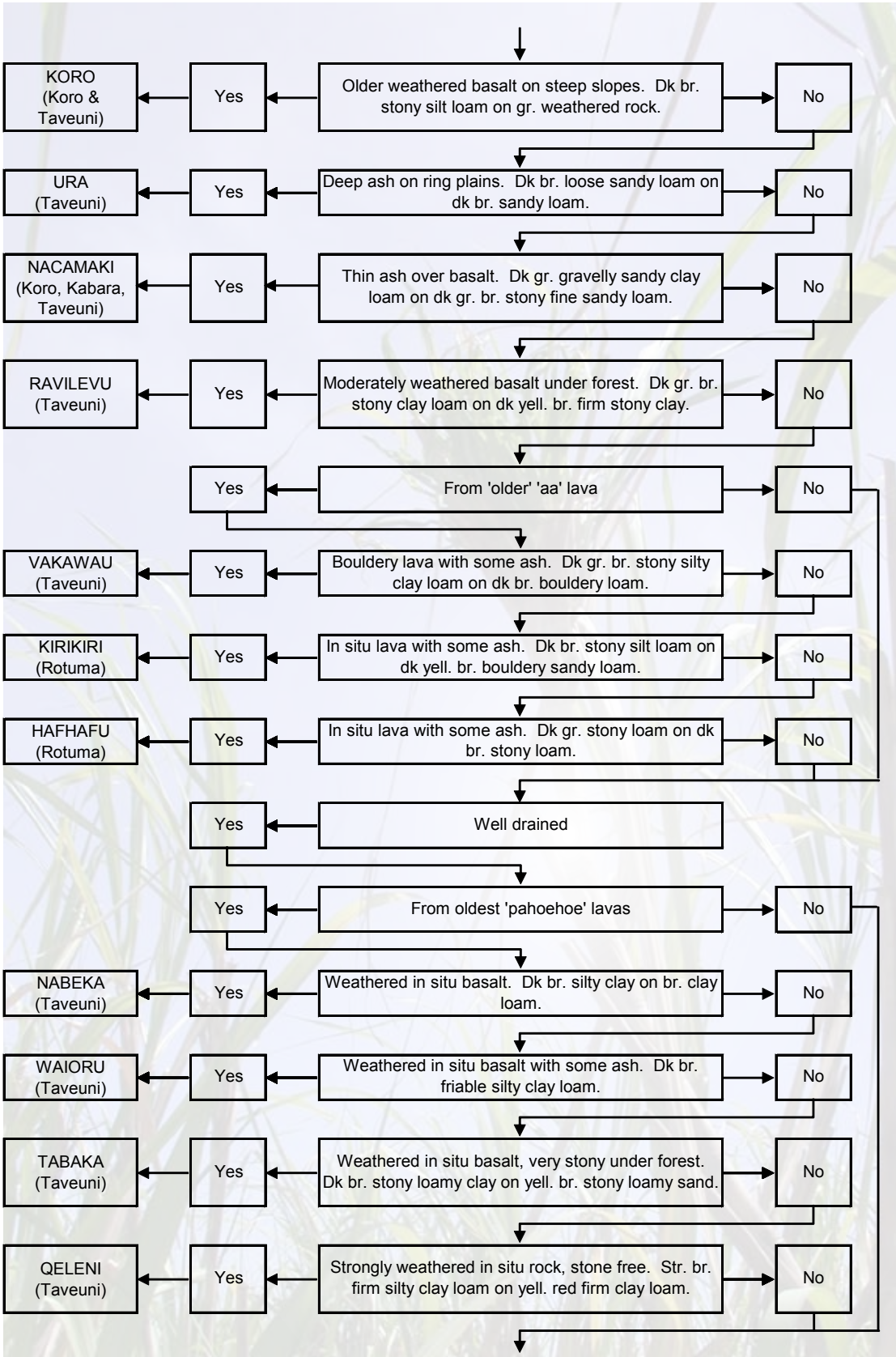


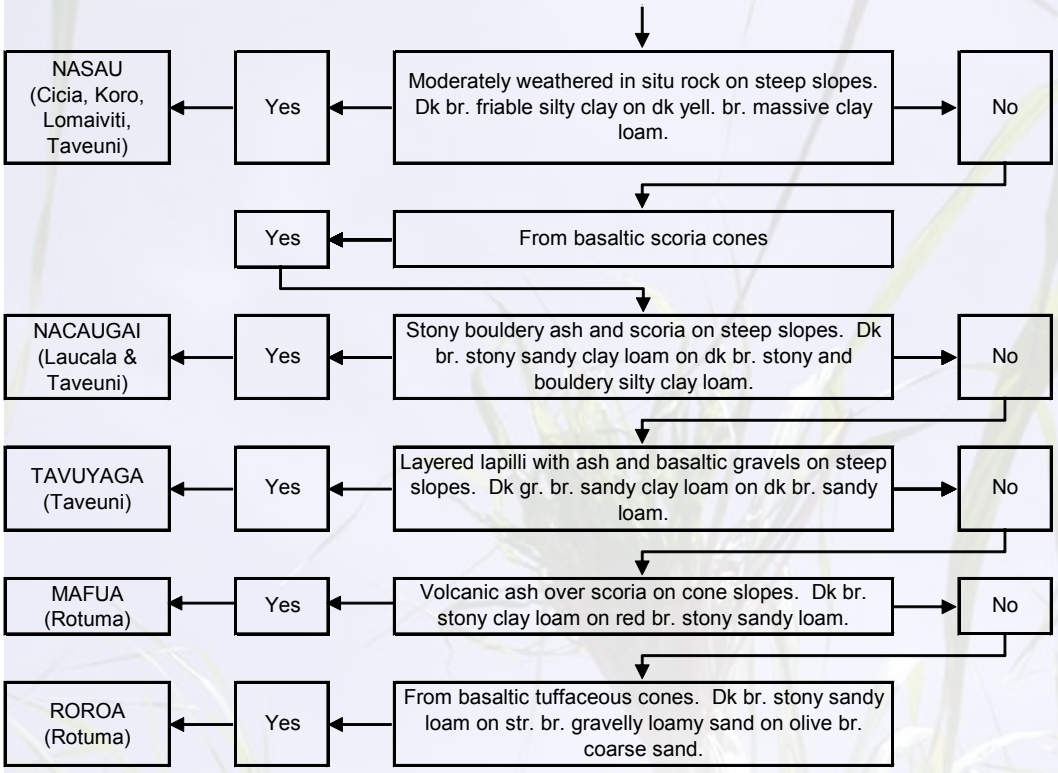
4.12 Soils of the Karst landscapes



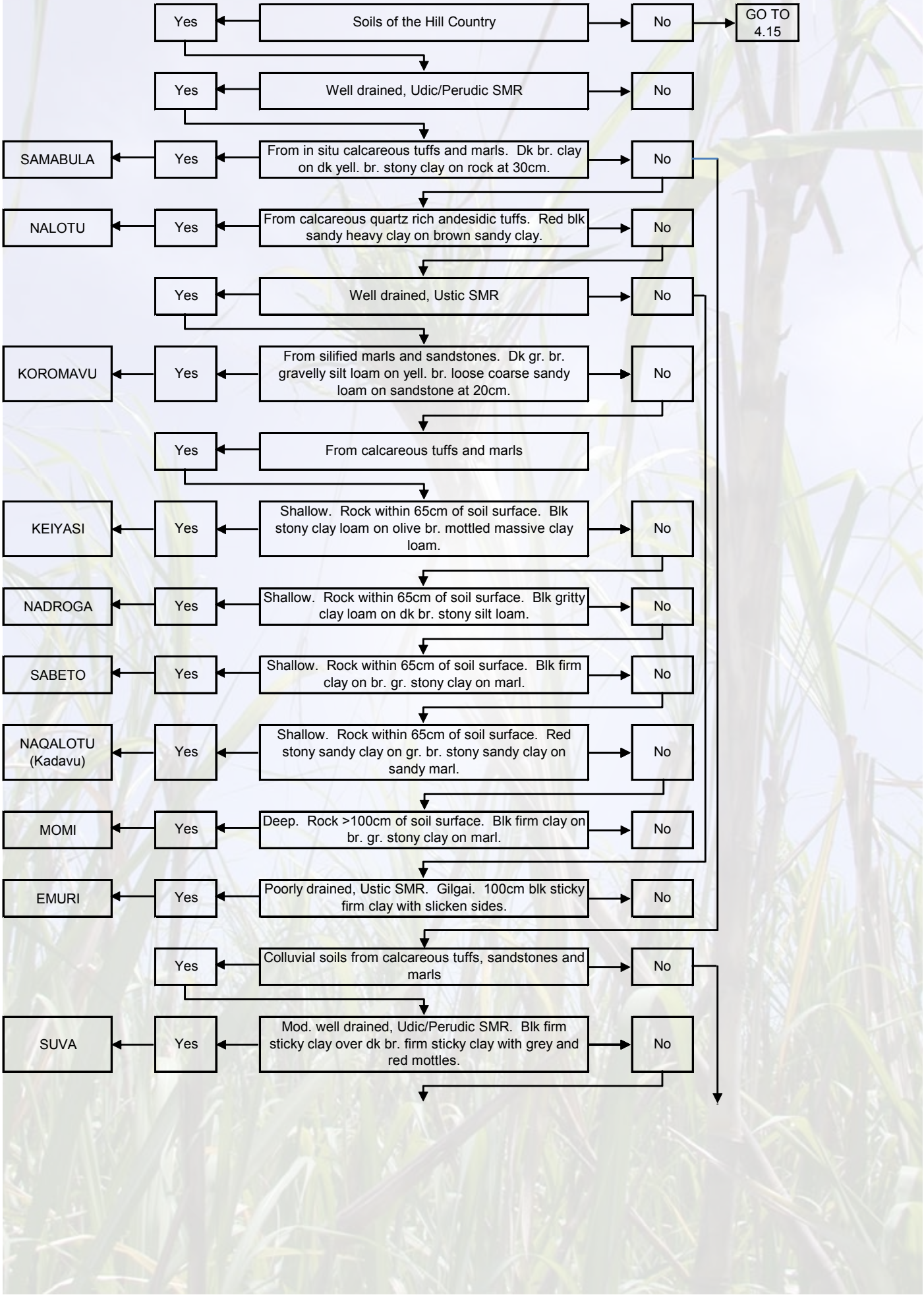
4.13 Soils of the 'young' volcanic landscapes

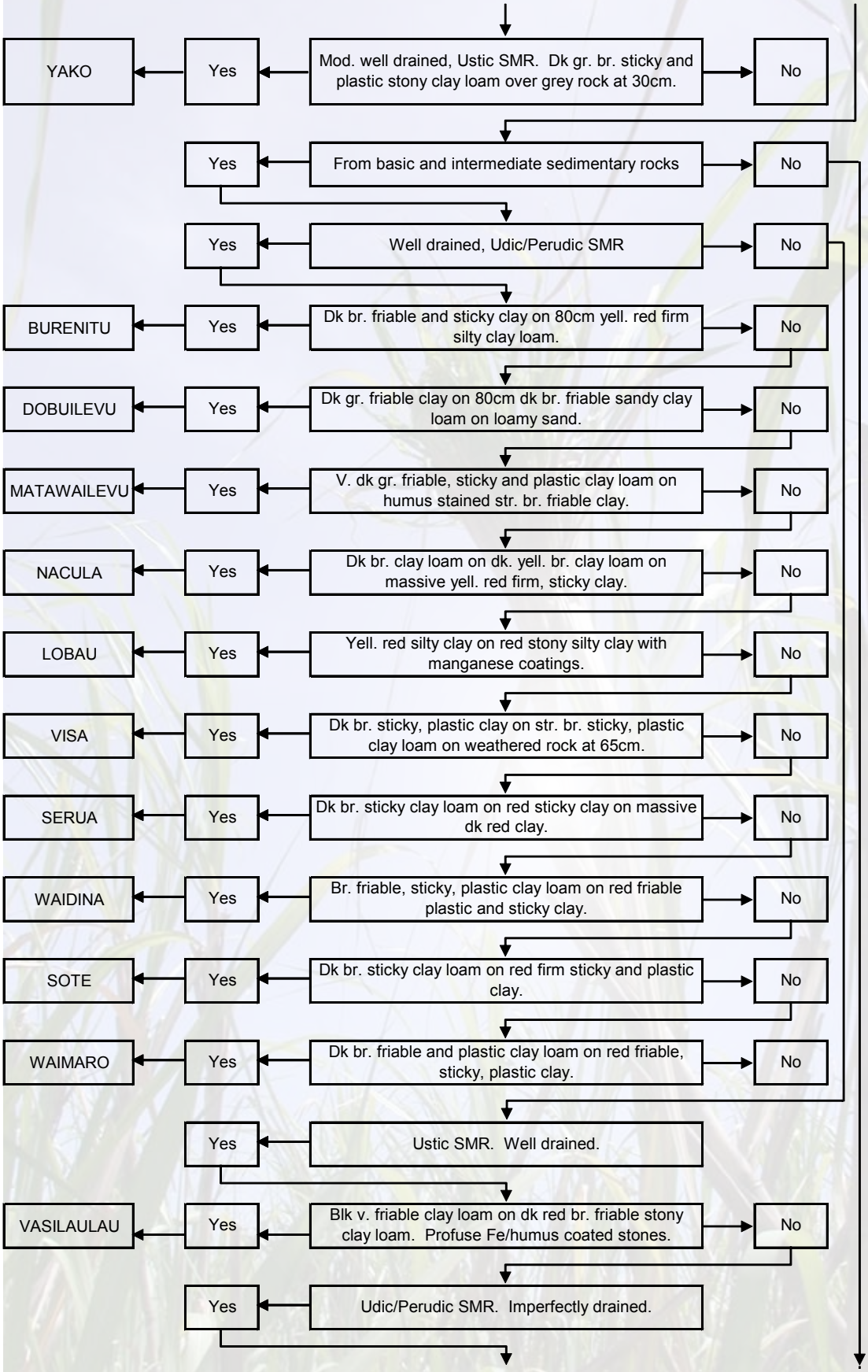


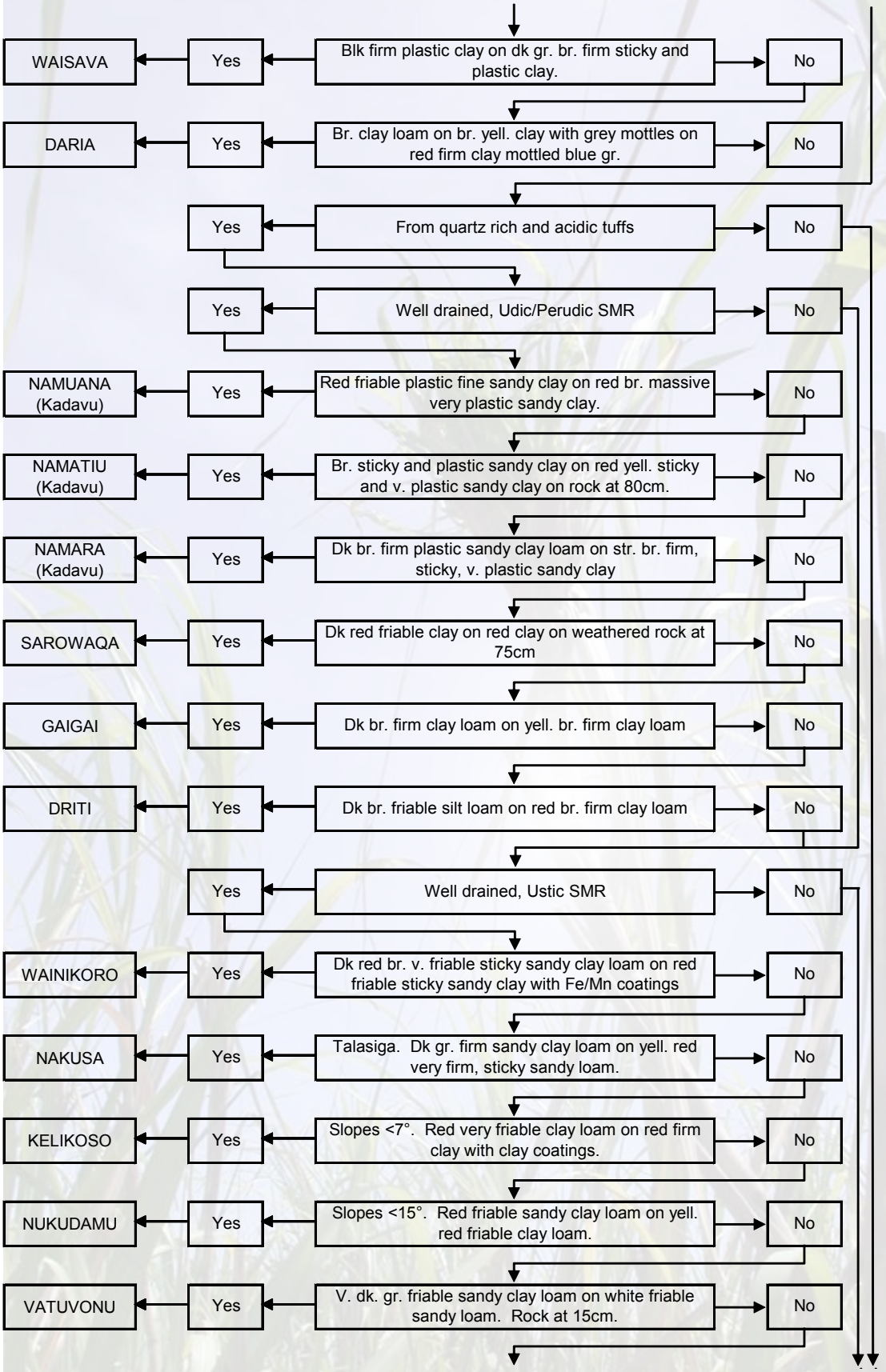

Older weathered basalt on steep slopes. Dk br. stony silt loam on gr. weathered rock.
Yes
KORO (Koro & Taveuni)
No
Deep ash on ring plains. Dk br. loose sandy loam on dk br. sandy loam.
Yes
URA (Taveuni)
No
Thin ash over basalt. Dk gr. gravelly sandy clay loam on dk gr. br. stony fine sandy loam.
Yes
NACAMAKI (Koro, Kabara, Taveuni)
No
Moderately weathered basalt under forest. Dk gr. br. stony clay loam on dk yell. br. firm stony clay.
Yes
RAVILEVU (Taveuni)
No
From 'older' 'aa' lava
Yes
No
Bouldery lava with some ash. Dk gr. br. stony silty clay loam on dk br. bouldery loam.
Yes
VAKAWAU (Taveuni)
No
In situ lava with some ash. Dk br. stony silt loam on dk yell. br. bouldery sandy loam.
Yes
KIRIKIRI (Rotuma)
No
In situ lava with some ash. Dk gr. stony loam on dk br. stony loam.
Yes
HAFHAFU (Rotuma)
No
Well drained
Yes
From oldest 'pahoehoe' lavas
Yes
No
Weathered in situ basalt. Dk br. silty clay on br. clay loam.
Yes
NABEKA (Taveuni)
No
Weathered in situ basalt with some ash. Dk br. friable silty clay loam.
Yes
WAIORU (Taveuni)
No
Weathered in situ basalt, very stony under forest. Dk br. stony loamy clay on yell. br. stony loamy sand.
Yes
TABAKA (Taveuni)
No
Strongly weathered in situ rock, stone free. Str. br. firm silty clay loam on yell. red firm clay loam.
Yes
QELENI (Taveuni)
No

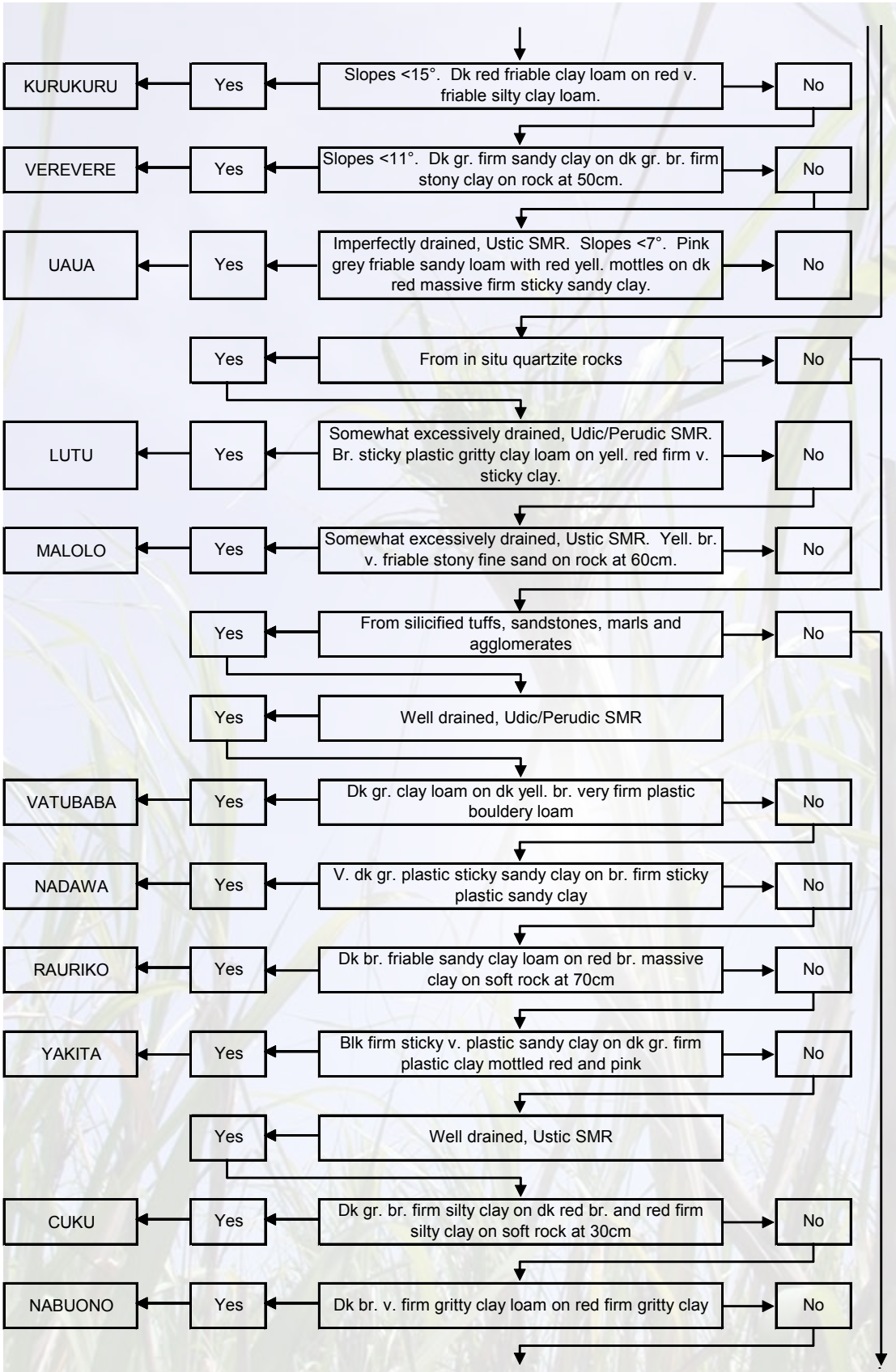

Moderately weathered in situ rock on steep slopes. Dk br. friable silty clay on dk yell. br. massive clay loam.
No
Yes
NASAU (Cicia, Koro, Lomaiviti, Taveuni)
From basaltic scoria cones
Yes
Stony bouldery ash and scoria on steep slopes. Dk br. stony sandy clay loam on dk br. stony and bouldery silty clay loam.
No
Yes
NACAUGAI (Laucala & Taveuni)
Layered lapilli with ash and basaltic gravels on steep slopes. Dk gr. br. sandy clay loam on dk br. sandy loam.
No
Yes
TAVUYAGA (Taveuni)
Volcanic ash over scoria on cone slopes. Dk br. stony clay loam on red br. stony sandy loam.
No
Yes
MAFUA (Rotuma)
From basaltic tuffaceous cones. Dk br. stony sandy loam on str. br. gravelly loamy sand on olive br. coarse sand.
Yes
RoroA (Rotuma)

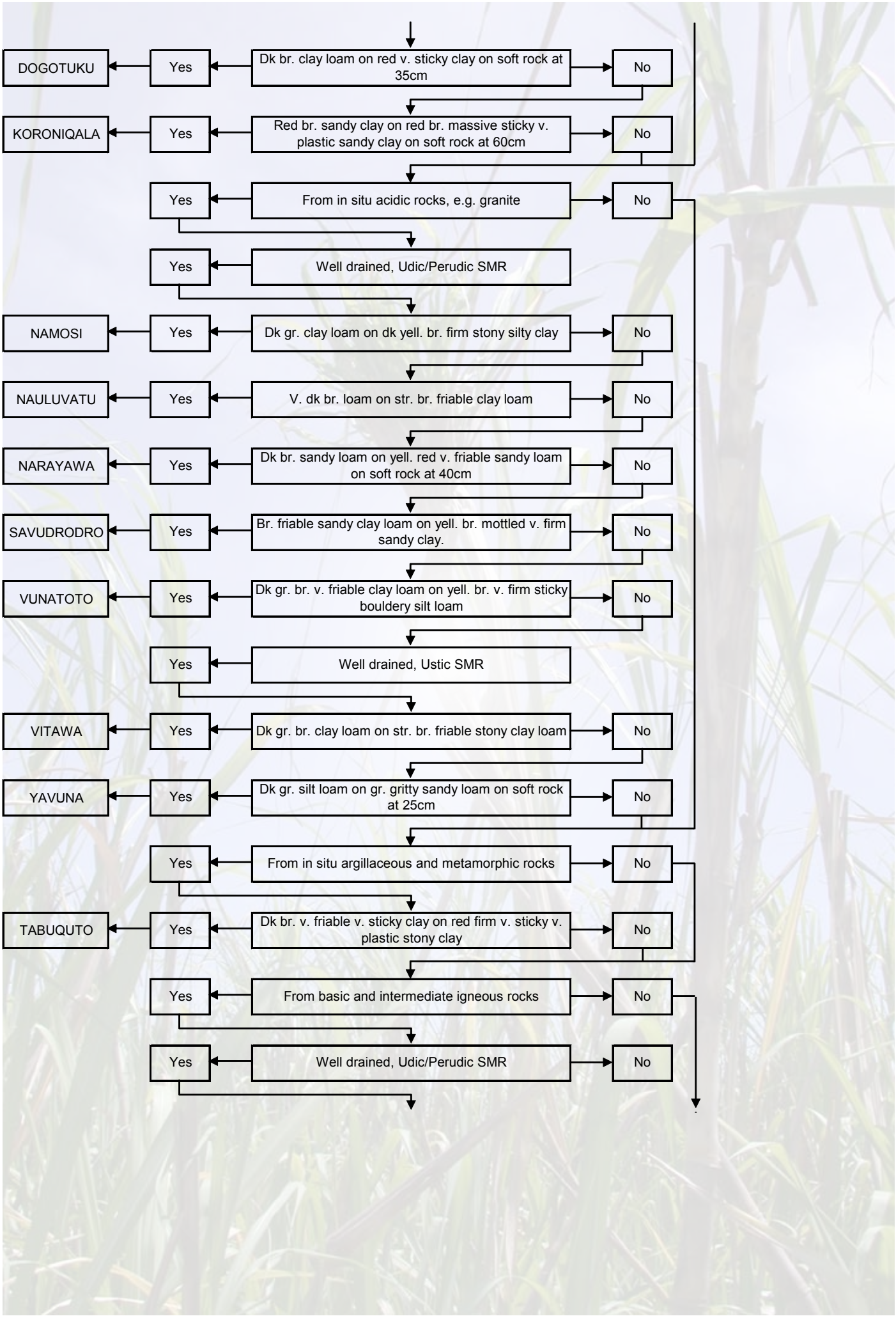
4.14 Soils of the hill country

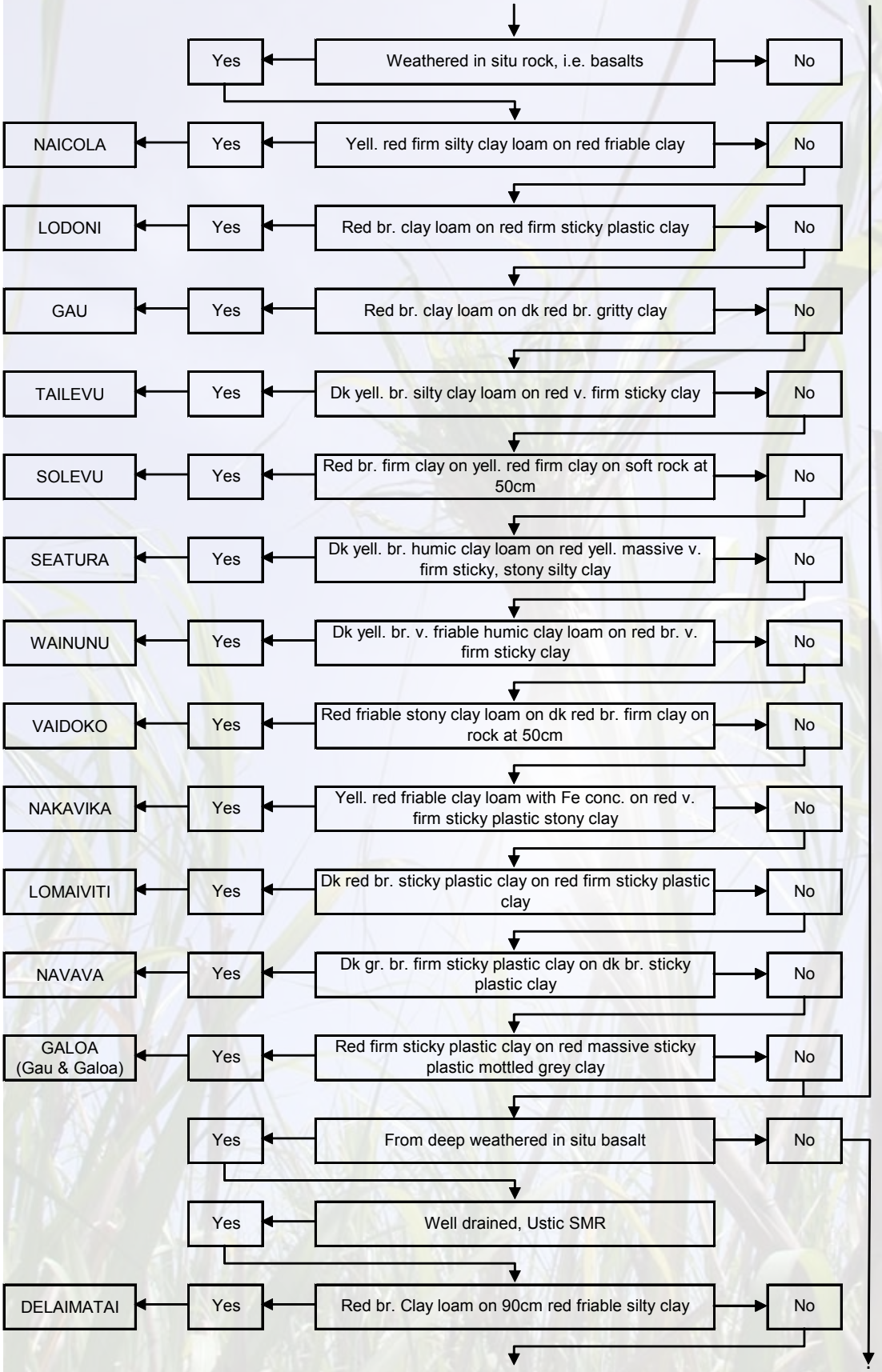


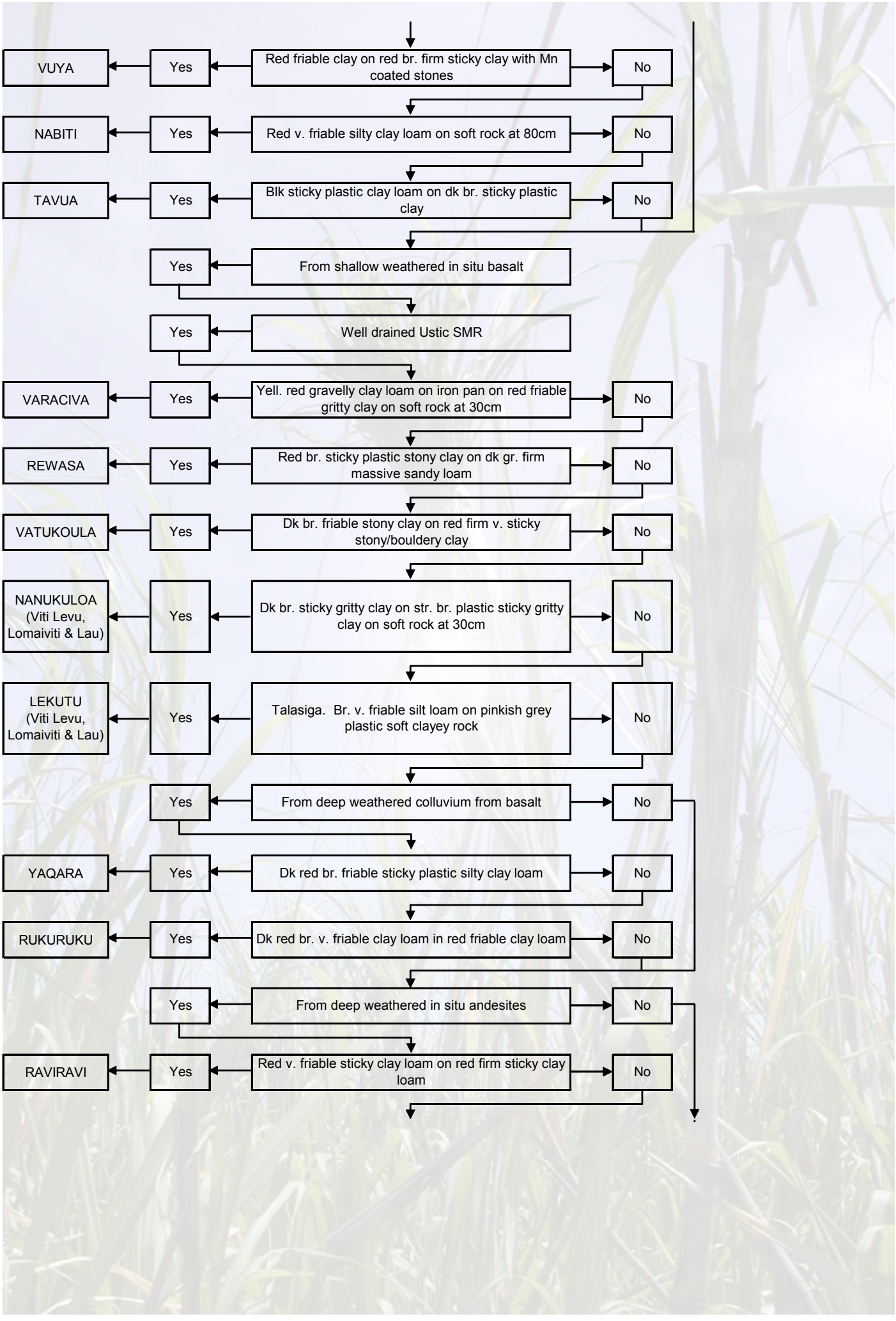

Mod. well drained, Ustic SMR. Dk gr. br. sticky and plastic stony clay loam over grey rock at 30cm.
Yes
YAKO
No
From basic and intermediate sedimentary rocks
Yes
No
Well drained, Udic/Perudic SMR
Yes
No
Dk br. friable and sticky clay on 80cm yell. red firm silty clay loam.
Yes
BURENITU
No
Dk gr. friable clay on 80cm dk br. friable sandy clay loam on loamy sand.
Yes
DOBUILEVU
No
V. dk gr. friable, sticky and plastic clay loam on humus stained str. br. friable clay.
Yes
MATAWAILEVU
No
Dk br. clay loam on dk. yell. br. clay loam on massive yell. red firm, sticky clay.
Yes
NACULA
No
Yell. red silty clay on red stony silty clay with manganese coatings.
Yes
LOBAU
No
Dk br. sticky, plastic clay on str. br. sticky, plastic clay loam on weathered rock at 65cm.
Yes
VISA
No
Dk br. sticky clay loam on red sticky clay on massive dk red clay.
Yes
SERUA
No
Br. friable, sticky, plastic clay loam on red friable plastic and sticky clay.
Yes
WAIDINA
No
Dk br. sticky clay loam on red firm sticky and plastic clay.
Yes
SOTE
No
Dk br. friable and plastic clay loam on red friable, sticky, plastic clay.
Yes
WAIMARO
No
Ustic SMR. Well drained.
Yes
Blk v. friable clay loam on dk red br. friable stony clay loam. Profuse Fe/humus coated stones.
Yes
VASILAULAU
No
Udic/Perudic SMR. Imperfectly drained.
Yes

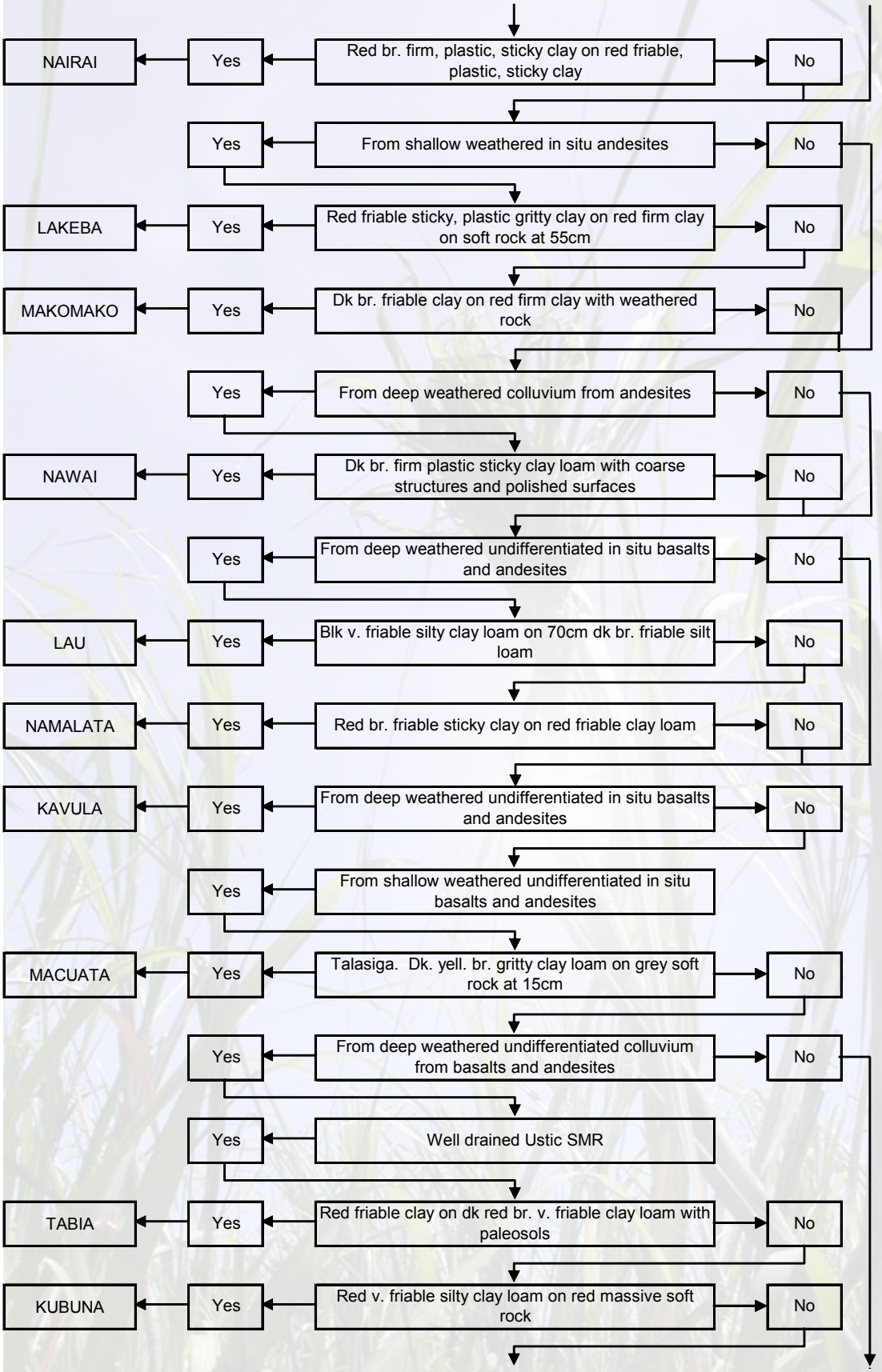

Blk firm plastic clay on dk gr. br. firm sticky and plastic clay.
Yes
WAISAVA
No
Br. clay loam on br. yell. clay with grey mottles on red firm clay mottled blue gr.
Yes
DARIA
No
From quartz rich and acidic tuffs
Yes
No
Well drained, Udic/Perudic SMR
Yes
No
Red friable plastic fine sandy clay on red br. massive very plastic sandy clay.
Yes
NAMUANA (Kadavu)
No
Br. sticky and plastic sandy clay on red yell. sticky and v. plastic sandy clay on rock at 80cm.
Yes
NAMATIU (Kadavu)
No
Dk br. firm plastic sandy clay loam on str. br. firm, sticky, v. plastic sandy clay
Yes
NAMARA (Kadavu)
No
Dk red friable clay on red clay on weathered rock at 75cm
Yes
SAROWAQA
No
Dk br. firm clay loam on yell. br. firm clay loam
Yes
GAIGAI
No
Dk br. friable silt loam on red br. firm clay loam
Yes
DRITI
No
Well drained, Ustic SMR
Yes
No
Dk red br. v. friable sticky sandy clay loam on red friable sticky sandy clay with Fe/Mn coatings
Yes
WAINIKORO
No
Talasiga. Dk gr. firm sandy clay loam on yell. red very firm, sticky sandy loam.
Yes
NAKUSA
No
Slopes <7°. Red very friable clay loam on red firm clay with clay coatings.
Yes
KELIKOSO
No
Slopes <15°. Red friable sandy clay loam on yell. red friable clay loam.
Yes
NUKUDAMU
No
V. dk. gr. friable sandy clay loam on white friable sandy loam. Rock at 15cm.
Yes
VATUVONU
No

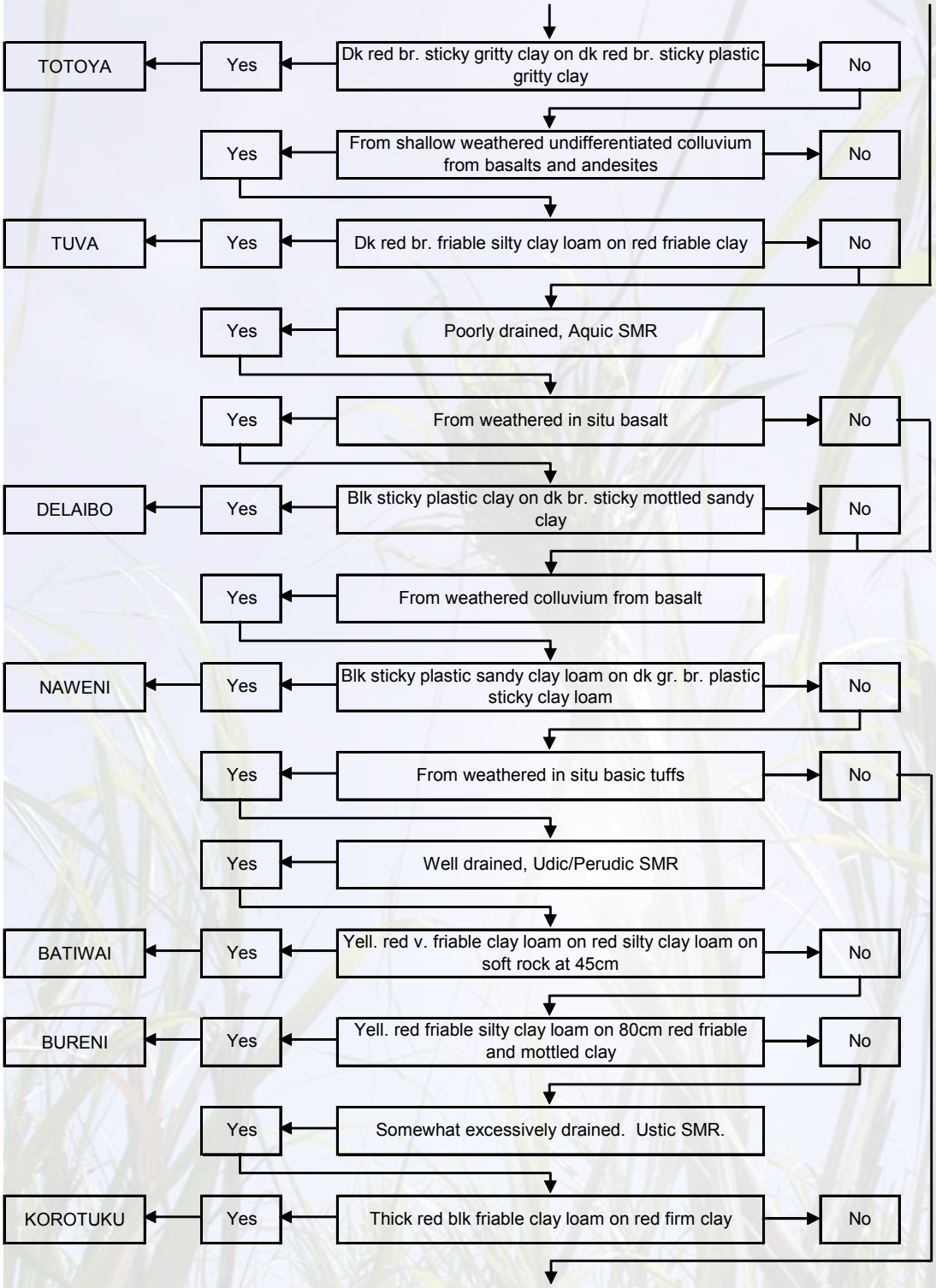

Slopes <15°. Dk red friable clay loam on red v. friable silty clay loam.
No
Yes
KURUKURU
Slopes <11°. Dk gr. firm sandy clay on dk gr. br. firm stony clay on rock at 50cm.
No
Yes
VEREVERE
Imperfectly drained, Ustic SMR. Slopes <7°. Pink grey friable sandy loam with red yell. mottles on dk red massive firm sticky sandy clay.
No
Yes
UAUA
From in situ quartzite rocks
No
Yes
Somewhat excessively drained, Udic/Perudic SMR. Br. sticky plastic gritty clay loam on yell. red firm v. sticky clay.
No
Yes
LUTU
Somewhat excessively drained, Ustic SMR. Yell. br. v. friable stony fine sand on rock at 60cm.
No
Yes
MALOLO
From silicified tuffs, sandstones, marls and agglomerates
No
Yes
Well drained, Udic/Perudic SMR
Yes
Dk gr. clay loam on dk yell. br. very firm plastic bouldery loam
No
Yes
VATUBABA
V. dk gr. plastic sticky sandy clay on br. firm sticky plastic sandy clay
No
Yes
NADAWA
Dk br. friable sandy clay loam on red br. massive clay on soft rock at 70cm
No
Yes
RAURIKO
Blk firm sticky v. plastic sandy clay on dk gr. firm plastic clay mottled red and pink
No
Yes
YAKITA
Well drained, Ustic SMR
Yes
Dk gr. br. firm silty clay on dk red br. and red firm silty clay on soft rock at 30cm
No
Yes
CUKU
Dk br. v. firm gritty clay loam on red firm gritty clay
No
Yes
NABUONO

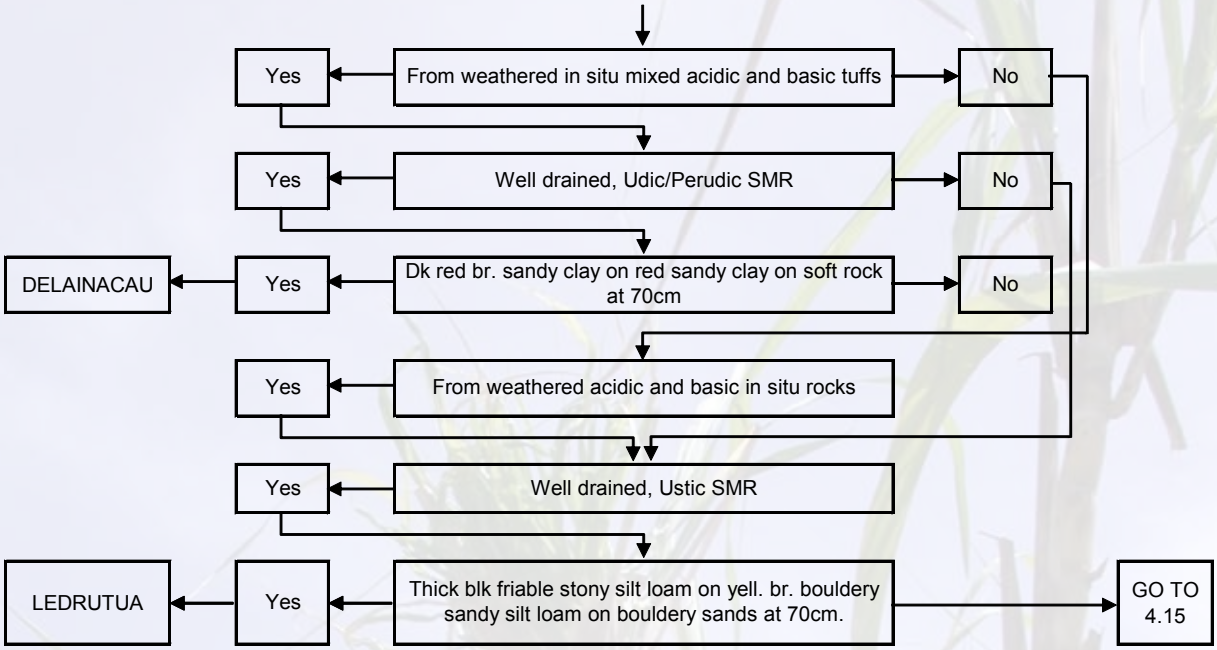

Dk br. clay loam on red v. sticky clay on soft rock at 35cm
Yes
DOGOTUKU
No
Red br. sandy clay on red br. massive sticky v. plastic sandy clay on soft rock at 60cm
Yes
KORONIQALA
No
From in situ acidic rocks, e.g. granite
Yes
No
Well drained, Udic/Perudic SMR
Yes
Dk gr. clay loam on dk yell. br. firm stony silty clay
Yes
NAMOSI
No
V. dk br. loam on str. br. friable clay loam
Yes
NAULUVATU
No
Dk br. sandy loam on yell. red v. friable sandy loam on soft rock at 40cm
Yes
NARAYAWA
No
Br. friable sandy clay loam on yell. br. mottled v. firm sandy clay.
Yes
SAVUDRODRO
No
Dk gr. br. v. friable clay loam on yell. br. v. firm sticky bouldery silt loam
Yes
VUNATOTO
No
Well drained, Ustic SMR
Yes
Dk gr. br. clay loam on str. br. friable stony clay loam
Yes
VITAWA
No
Dk gr. silt loam on gr. gritty sandy loam on soft rock at 25cm
Yes
YAVUNA
No
From in situ argillaceous and metamorphic rocks
Yes
No
Dk br. v. friable v. sticky clay on red firm v. sticky v. plastic stony clay
Yes
TABUQUTO
No
From basic and intermediate igneous rocks
Yes
No
Well drained, Udic/Perudic SMR
Yes
No


Weathered in situ rock, i.e. basalts
Yes
No
Yell. red firm silty clay loam on red friable clay
NAICOLA
Red br. clay loam on red firm sticky plastic clay
LODONI
Red br. clay loam on dk red br. gritty clay
GAU
Dk yell. br. silty clay loam on red v. firm sticky clay
TAILEVU
Red br. firm clay on yell. red firm clay on soft rock at 50cm
SOLEVU
Dk yell. br. humic clay loam on red yell. massive v. firm sticky, stony silty clay
SEATURA
Dk yell. br. v. friable humic clay loam on red br. v. firm sticky clay
WAINUNU
Red friable stony clay loam on dk red br. firm clay on rock at 50cm
VAIDOKO
Yell. red friable clay loam with Fe conc. on red v. firm sticky plastic stony clay
NAKAVIKA
Dk red br. sticky plastic clay on red firm sticky plastic clay
LOMAIVITI
Dk gr. br. firm sticky plastic clay on dk br. sticky plastic clay
NAVAVA
Red firm sticky plastic clay on red massive sticky plastic mottled grey clay
GALOA (Gau & Galoa)
From deep weathered in situ basalt
Well drained, Ustic SMR
Red br. Clay loam on 90cm red friable silty clay
DELAIMATAI


Red friable clay on red br. firm sticky clay with Mn coated stones
Yes
VUYA
No
Red v. friable silty clay loam on soft rock at 80cm
Yes
NABITI
No
Blk sticky plastic clay loam on dk br. sticky plastic clay
Yes
TAVUA
No
From shallow weathered in situ basalt
Yes
Well drained Ustic SMR
Yes
Yell. red gravelly clay loam on iron pan on red friable gritty clay on soft rock at 30cm
Yes
VARACIVA
No
Red br. sticky plastic stony clay on dk gr. firm massive sandy loam
Yes
REWASA
No
Dk br. friable stony clay on red firm v. sticky stony/bouldery clay
Yes
VATUKOULA
No
Dk br. sticky gritty clay on str. br. plastic sticky gritty clay on soft rock at 30cm
Yes
NANUKULOA (Viti Levu, Lomaiviti & Lau)
No
Talasiga. Br. v. friable silt loam on pinkish grey plastic soft clayey rock
Yes
LEKUTU (Viti Levu, Lomaiviti & Lau)
No
From deep weathered colluvium from basalt
Yes
Dk red br. friable sticky plastic silty clay loam
Yes
YAQARA
No
Dk red br. v. friable clay loam in red friable clay loam
Yes
RUKURUKU
No
From deep weathered in situ andesites
Yes
Red v. friable sticky clay loam on red firm sticky clay loam
Yes
RAVIRAVI
No

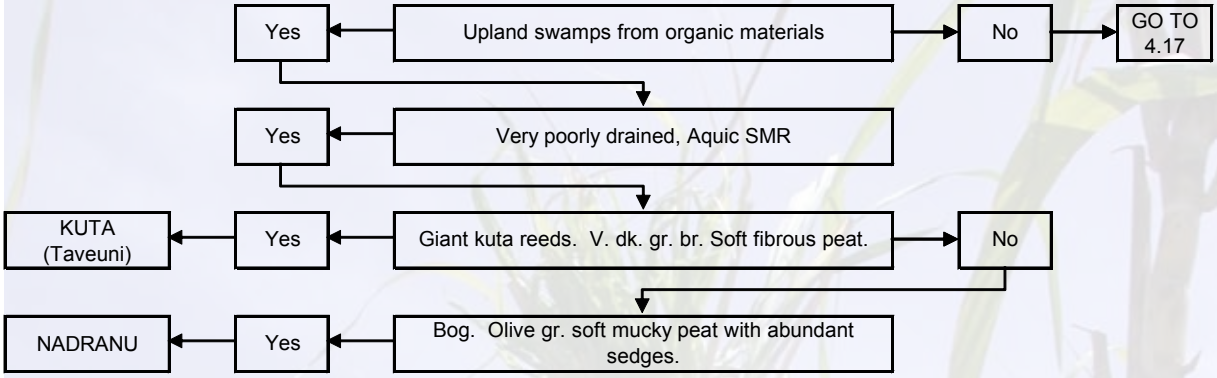

Red br. firm, plastic, sticky clay on red friable, plastic, sticky clay
No
Yes
NAIRAI
From shallow weathered in situ andesites
No
Yes
Red friable sticky, plastic gritty clay on red firm clay on soft rock at 55cm
No
Yes
LAKEBA
Dk br. friable clay on red firm clay with weathered rock
No
Yes
MAKOMAKO
From deep weathered colluvium from andesites
No
Yes
Dk br. firm plastic sticky clay loam with coarse structures and polished surfaces
No
Yes
NAWAI
From deep weathered undifferentiated in situ basalts and andesites
No
Yes
Blk v. friable silty clay loam on 70cm dk br. friable silt loam
No
Yes
LAU
Red br. friable sticky clay on red friable clay loam
No
Yes
NAMALATA
From deep weathered undifferentiated in situ basalts and andesites
No
Yes
KAVULA
From shallow weathered undifferentiated in situ basalts and andesites
Yes
Talasiga. Dk. yell. br. gritty clay loam on grey soft rock at 15cm
No
Yes
MACUATA
From deep weathered undifferentiated colluvium from basalts and andesites
No
Yes
Well drained Ustic SMR
Yes
Red friable clay on dk red br. v. friable clay loam with paleosols
No
Yes
TABIA
Red v. friable silty clay loam on red massive soft rock
No
Yes
KUBUNA


Dk red br. sticky gritty clay on dk red br. sticky plastic gritty clay
Yes
TOTOYA
No
From shallow weathered undifferentiated colluvium from basalts and andesites
Yes
No
Dk red br. friable silty clay loam on red friable clay
Yes
TUVA
No
Poorly drained, Aquic SMR
Yes
From weathered in situ basalt
Yes
No
Blk sticky plastic clay on dk br. sticky mottled sandy clay
Yes
DELAIBO
No
From weathered colluvium from basalt
Yes
Blk sticky plastic sandy clay loam on dk gr. br. plastic sticky clay loam
Yes
NAWENI
No
From weathered in situ basic tuffs
Yes
No
Well drained, Udic/Perudic SMR
Yes
Yell. red v. friable clay loam on red silty clay loam on soft rock at 45cm
Yes
BATIWAI
No
Yell. red friable silty clay loam on 80cm red friable and mottled clay
Yes
BURENI
No
Somewhat excessively drained. Ustic SMR.
Yes
Thick red blk friable clay loam on red firm clay
Yes
KOROTUKU
No

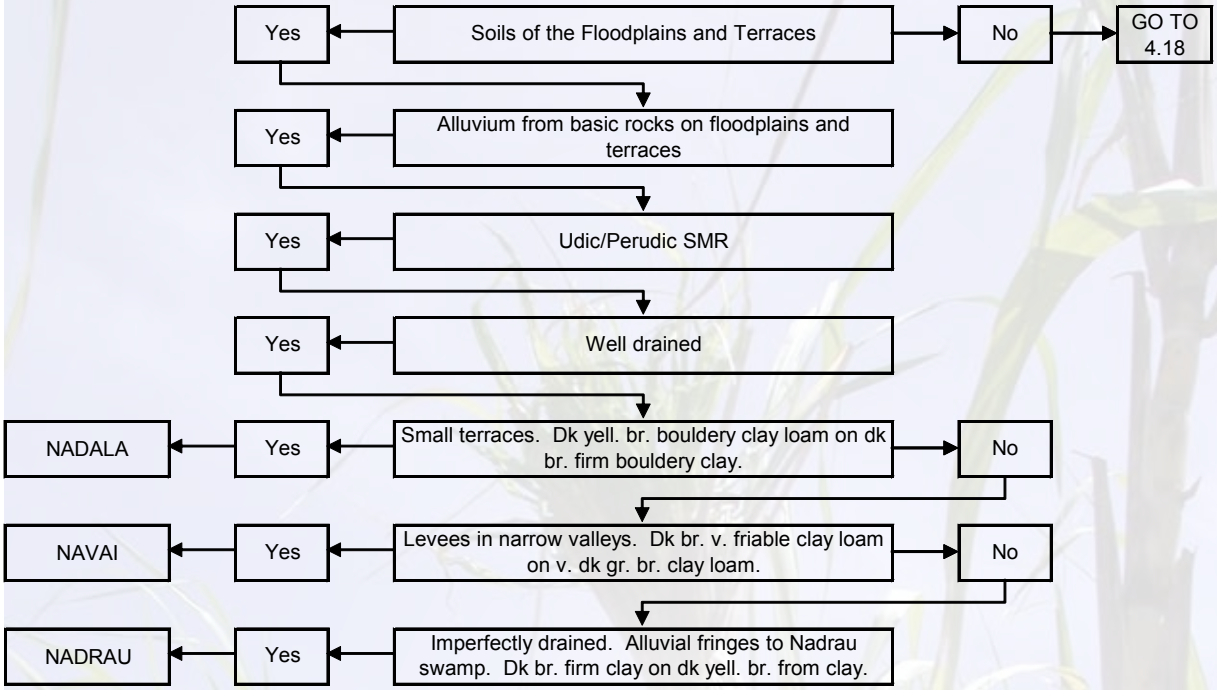

From weathered in situ mixed acidic and basic tuffs
Yes
No
Well drained, Udic/Perudic SMR
Yes
No
Dk red br. sandy clay on red sandy clay on soft rock at 70cm
DELAINACAU
Yes
No
From weathered acidic and basic in situ rocks
Yes
Well drained, Ustic SMR
Yes
Thick blk friable stony silt loam on yell. br. bouldery sandy silt loam on bouldery sands at 70cm.
LEDRUTUA
Yes
GO TO 4.15

4.15 Upland soils >600m, i.e. isothermic STR

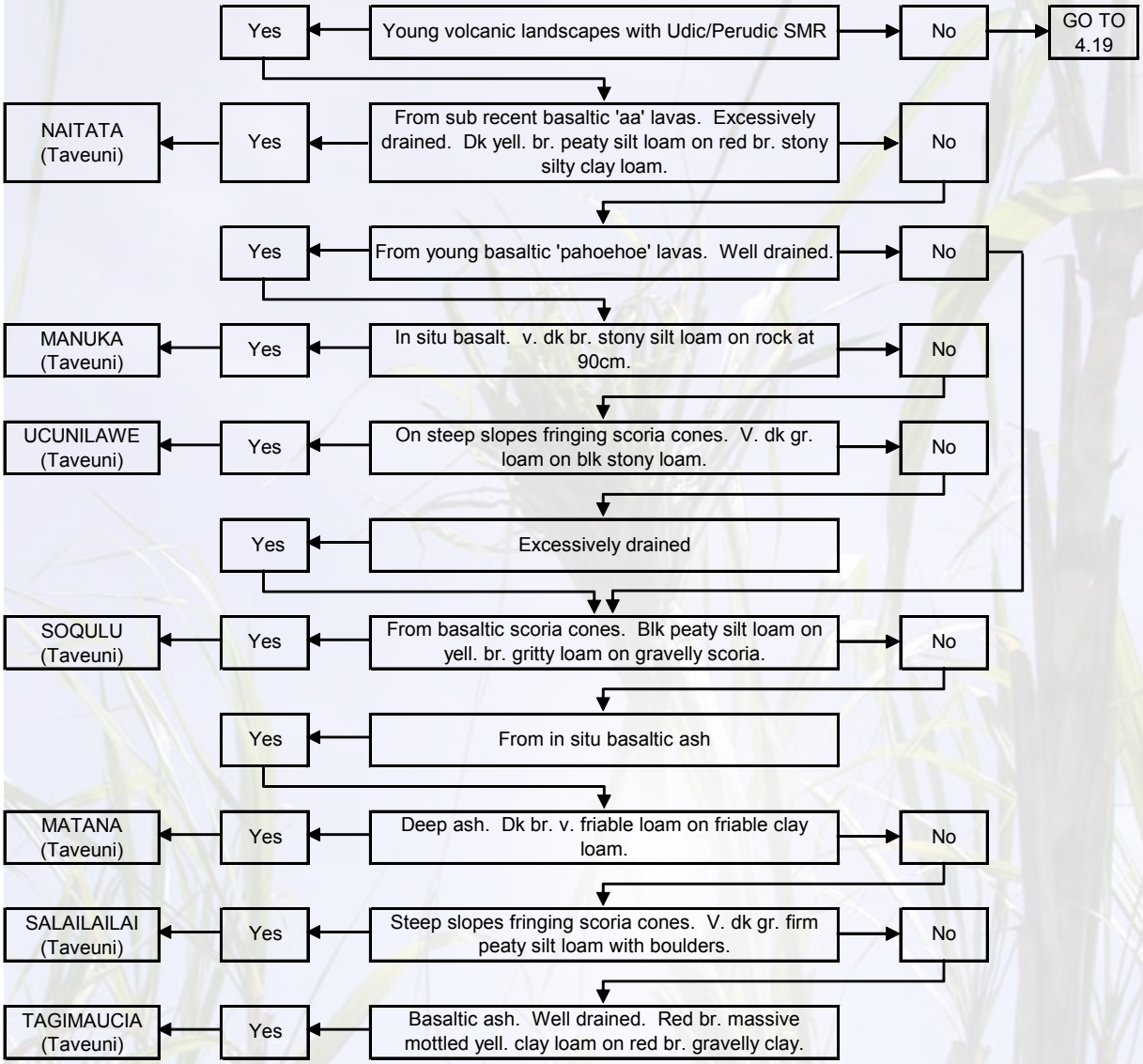
4.16 Soils of the upland swamps



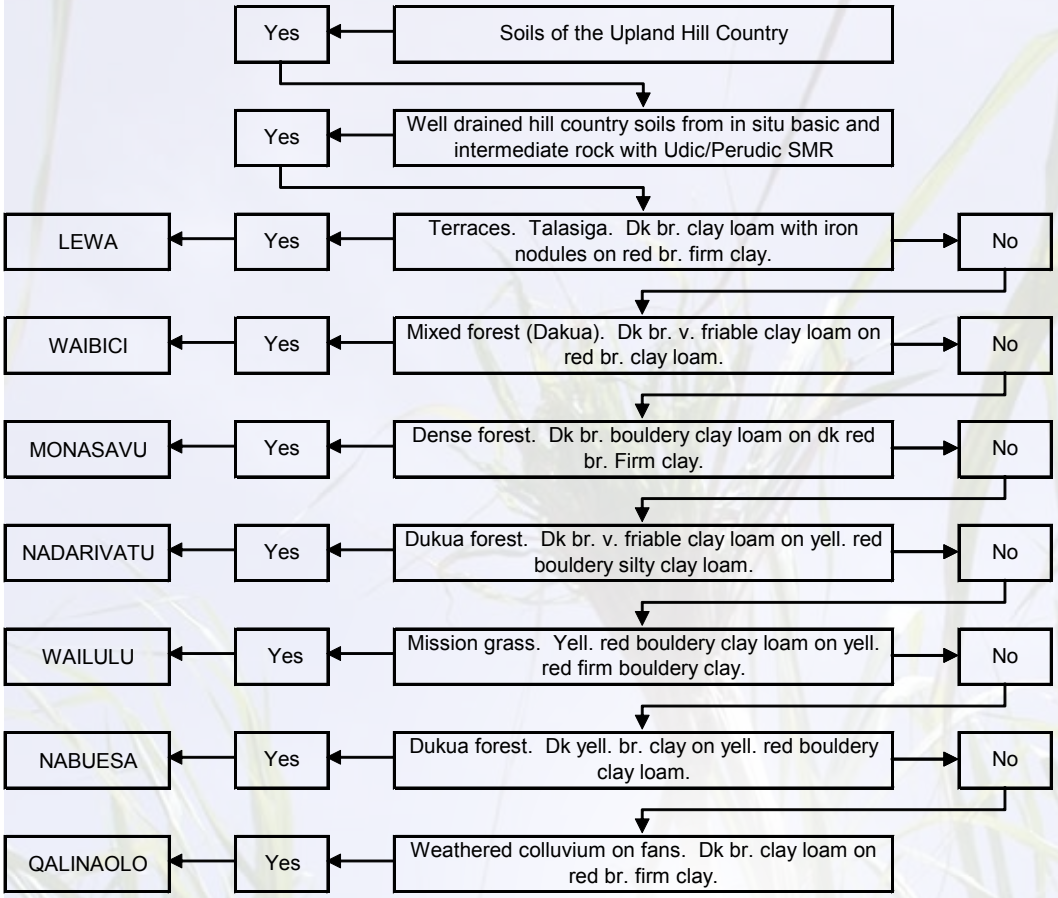
4.17 Soils of the floodplains and terraces



4.18 Soils of the 'young' volcanic landscapes



4.19 Soils of the upland hill country



5. FIJI SOIL MAPPING UNITS, LAND USE CAPABILITY CLASSES AND THE MAIN SOIL LIMITATIONS

5.1 Introduction

Arising out of preliminary trials of classification in Fiji, study of the classification in New Zealand, and advice of visiting New Zealand scientists, the Fiji MPI adopted, with modifications to suit Fiji conditions, the eight-class standard land use capability (LUC) classification as described in New Zealand's *Land use capability survey handbook* (Water and Soil Division 1974).

The NZ classification system is itself a modified version of the United States Department of Agriculture (USDA) LUC system, on which a number of other national classification systems in use today are based.

In its present form, the Fiji LUC classification is soundly based and well placed to meet Fiji's current and future needs for land development planning, land evaluation, soil conservation and promotion of sustainable land use practices. Appendix 1 provides some of the key definitions in the Fiji LUC classification as prepared by F.F. Kafoa and senior staff of the MPI Land Use Section (1977). Table 2 lists the 227 soil series and names their associated soil map unit code as they are shown in *Soil map for Fiji* (Seru and Leslie 1986), land use capability classifications for each soil map unit, and the main soil limitations for each unit.

Detailed soil information for Fiji can be found in *Fiji soil taxonomic unit description handbook* (Leslie and Seru, 1998).

Table 2: Fiji soil map units, land use capability classes and main soil limitations

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
1	Labasa	1	IVs	Nutrient deficiencies, acid
2	Tiri	2	VIIw	High water table (fluctuates daily), salinity
3	Soso	3	VIIw	High water table, salinity
4	Dreketi	4	VIIw	High water table, salinity
5	Dogo	5	VIIIw	Daily flooding, mangrove swamp
6	Nuku	6	IIIs	Alkaline, nutrient deficiencies, soil moisture deficits
7	Yasawa	7	IIIs	Excessively drained, soil moisture deficits, nutrient deficiencies
8	Tacilevu	8	IIIs	Alkaline, nutrient deficiencies, poorly drained
9	Vunibau	9	IIIs	Low water holding capacity, acid, nutrient deficiencies
10	Waikalou	10	IVw	Floods, high water table, nutrient deficiencies
11	Volivoli	11A, 11B	IIIs	Excessively drained, soil moisture deficits, nutrient deficiencies
		11C, 11D	IVe	Wind and sheet erosion, nutrient deficiencies
		11E, 11H	VIIe	Severe erosion, past erosion, moisture deficits
12	Vanavutu	12	Is	High clay content, nitrogen deficiencies
13	Deuba	13	IIIw	Flooding, high water table, acid, nutrient deficiencies
14	Dawasamu	14	IIs	Low water holding capacity, acid, nutrient deficiencies
15	Vunilagi	15	IVw	High water table, poorly drained, salinity
16	Rana	16	IVw	High water table, poorly drained, nutrient deficiencies
17	Qaributa	17	VIw	Floods, high water table, peat swamp, acid
18	Nakelo	18	IVw	Floods, high water table, acid, nutrient deficiencies
19	Toguru	19	IVw	Floods, high water table, nutrient deficiencies
20	Naselesele	20	IIs	Coarse textures, low water holding capacity, alkaline, nutrient deficiencies
21	Muainase	21	Is	Coarse textures, nutrient deficiencies, liable to flood
22	Rewa	22	Is	Some nutrient deficiencies, rare flooding
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
23	Lawai	23A, 23B	Is	Some nutrient deficiencies, low subsoil water holding capacity
24	Tamanua	24	IIw	Slight flood risk, imperfect drainage, wet season subsoil waterlogging
25	Naduru	25	Is	Some nutrient deficiencies, rare flooding
26	Wainibuka	26	Is	Clayey, slow subsoil permeability, rare flooding

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
27	Sigatoka	27	Is	Moderately acid, minor nutrient deficiencies
28	Wainivesi	28	IIIw	Frequent flooding, imperfectly drained, acid, some nutrient deficiencies
29	Navua	29	IIIw	High seasonal water table, imperfectly drained, frequent flooding, clayey
30	Tokotoko	30	IVw	Floods, poor internal drainage, high seasonal water table, acid
31	Nausori	31	VIw	Frequent flooding, permanent high water table, poor internal drainage, acid, nutrient deficiencies
32	Melimeli	32	VIIIw	Peat swamp not feasible to develop
33	Wainikavou	33	IIIw	Surface ponding and subsurface waterlogging in the wet season, imperfect drainage, acid
34	Saunaka	34	IIw	Imperfectly drained, surface flooding in wet season, nutrient deficiencies
35	Namaka	35	IIs	Nutrient deficiencies, severe seasonal moisture deficits, nutrient deficiencies
36	Nadi	36A, 36B	IIs	Seasonal moisture deficits, nutrient deficiencies
		36C, 36D	IIe	Sheet/rill erosion on slopes >8°, seasonal moisture deficits, nutrient deficiencies
37	Korovuli	37	IIs	Clayey, seasonal moisture deficits, nutrient deficiencies
38	Nasegai	38A, 38B	IIs	Acid, nutrient deficiencies
		38C	IIe	Erosion risk, acid, nutrient deficiencies
39	Namosau	39A	IVs	Nutrient deficiencies, acid, limited rooting volume
		39B, 39C	IVe	Severe erosion risk, nutrient deficiencies, acid, limited rooting volume
40	Bua	40A	IVs	Nutrient deficiencies, acid, seasonal moisture deficits
		40B, 40C, 40D	IVe	Severe erosion risk, nutrient deficiencies, acid, seasonal moisture deficits
		40E	Ve	Nutrient deficiencies, acid, seasonal moisture deficits, severe erosion risk
41	Vunicibicibi	41A	IVs	Nutrient deficiencies, acid, seasonal moisture deficits
		41B, 41C, 41D	IVe	Severe erosion risk, nutrient deficiencies, acid, seasonal moisture deficits
42	Korokadi	42A, 42B	IVs	Nutrient deficiencies, acid, seasonal moisture deficits
43	Ba	43B, 43C, 43D	IVe	Severe past and potential erosion risk, nutrient deficiencies, acid
		43E, 43F	VIe	Slope, severe past and potential erosion risk, nutrient deficiencies, acid
44	Koronivia	44A, 44B	IIs	Clayey, acid, nutrient deficiencies, imperfect drainage
		44C	IIIs	Slope, clayey, acid, nutrient deficiencies, imperfect drainage
45	Lovonivia	45A, 45B	IIs	Acid, nutrient deficiencies, seasonal moisture deficits, erosion risk when cultivated
46	Serea	46	IIw	Frequent flooding, rapid permeability, nutrient deficiencies
47	Waidradra	47	IIIw	Frequent flooding, acid, nutrient deficiencies
48	Sawakasa	48	IVw	Frequent flooding, high water table, imperfect drainage

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
49	Vatuma	49A, 49B	IIIw	Frequent flooding, imperfect drainage, nutrient deficiencies
50	Narewa	50	IVw	Frequent flooding, poorly drained, high seasonal water table, gilgai
51	Bucaisau	51	IVw	Frequent flooding, poorly drained, high seasonal water table, acid
52	Matavelo	52	IIIw	Frequent short-duration flooding, poorly drained, high seasonal water table, nutrient deficiencies
53	Saweni	53	IIIw	Frequent short-duration flooding, poorly drained, high seasonal water table, vertic properties
54	Nika	54	IIw	Slight flood risk, poorly drained, wet season waterlogging, gilgai, clayey
55	Batiki	55	IIw	Slight flood risk, very poorly drained, high water table in wet season
56	Nadruka	56	IIw	Slight flood risk, poorly drained, high seasonal water table, clayey
57	Veisaru	57	IIw	Slight flood risk, poorly drained, high seasonal water table
58	Rawiti	58	IIw	Slight flood risk, imperfectly drained, acid, nutrient deficiencies
59	Waibula	59A, 59B	IIs	Nutrient deficiencies, uneven surface with boulders, minor flood risk
60	Navunikodi	60	IIs	Acid, nutrient deficiencies, coarse textures, minor flood risk
61	Saliadrau	61	IIs	Acid, nutrient deficiencies, coarse textures, minor flood risk
62	Lato	62	IIs	Moderate flood risk, coarse textures, seasonal moisture deficits, acid, nutrient deficiencies
63	Lagilagi	63	IIw	Slight flood risk, seasonal moisture deficits
64	Nacokula	64	IIIw	Frequent short-duration flooding, poorly drained, high seasonal water table, acid, nutrient deficiencies
65	Kedra	65	IVw	Frequent flooding, poorly drained, high seasonal water table, slow permeability
66	Talacagi	66	IVw	Frequent flooding, poorly drained, acid, nutrient deficiencies
67	Naqilai	67	IVw	High seasonal water table, very poorly drained, slow permeability, clayey, acid
68	Wainikai	68	IVw	Frequent flooding, very poorly drained, high water table for most of year, soft
69	Vurevure	69	IVw	Frequent flooding, very poorly drained, high water table for most of year
70	Nasou	70A	IIs	Acid, nutrient deficiencies
		70B, 70C	IIIe	Moderate erosion risk, seasonal moisture deficits, acid, nutrient deficiencies
71	Drasa	71A	IIs	Nutrient deficiencies, seasonal moisture deficits
		71B, 71C	IIe	Slight erosion risk, nutrient deficiencies, seasonal moisture deficits
72	Molamolau	72	IIIs	Acid, nutrient deficiencies, severe seasonal moisture deficits, rare flood risk
73	Lautoka	73	IIs	Clayey, seasonal moisture deficits, some nutrient deficiencies, imperfectly drained
74	Wailotua	74D, 74E, 74F, 74G	VIIs	Shallow soils, jagged limestone outcrops, trace element deficiencies
		74H	VIIIs	Very steep slopes, shallow soils, jagged limestone outcrops, trace element deficiencies
75	Lami	75E, 75F, 75G	VIIs	Shallow soils, surface and profile builders, nutrient deficiencies

		75H	VIIIs	Slope, shallow soils, surface and profile builders, nutrient deficiencies
76	Tau	76C	VIs	Shallow soils, very stony, rock outcrops, alkaline
		76D, 76E, 76F, 76G	VIIs	Slope, shallow soils, very stony, rock outcrops, alkaline
		76H	VIIIe	Very steep slopes, erosion risk, shallow soils, very stony, rock outcrops, alkaline
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
77	Vatulele	77H	VIIIs	Very steep slopes, shallow soils, very stony, limestone rock outcrops, alkaline, severe seasonal soil moisture deficits
78	Cikobia	78A, 78B, 78C	IVs	Limestone outcrops, surface and profile boulders, seasonal moisture deficits, nutrient deficiencies, rapid permeability
79	Ogea	79	IIIs	Very stony, nutrient and trace element deficiencies, alkaline, seasonal moisture deficits
80	Tuvuca	80	IIIs	Seasonal moisture deficits, nutrient and trace element deficiencies, alkaline, manganese toxicity
81	Nayau	81	IIIs	Shallow soil, rapid permeability, seasonal moisture deficits, alkaline, nutrient and trace element deficiencies
82	Naevuevu	82A, 82B, 82C	Vs	Rock outcrops, surface boulders, shallow soil, seasonal moisture deficits
		82D, 82E	VIe	Erosion risk, rock outcrops, surface boulders, shallow soil, seasonal moisture deficits
83	Ekubu	83	IIIs	Shallow soil, seasonal moisture deficits
84	Lomaje	84B	IIs	Rapid soil permeability
		84C	IIIe	Slight to moderate erosion risk, rapid soil permeability
		84D, 84E	VIe	Severe erosion risk, slope, rapid soil permeability
85	Vuna	85C, 85D	IVs	Bouldery surface, profile boulders and stones, rapid permeability, nutrient deficiencies
		85E, 85F, 85G	VIIe	Erosion risk, slope, bouldery surface, profile boulders and stones, rapid permeability, nutrient deficiencies
86	Losa	86B, 86C, 86D	IVs	Very shallow soil, very stony, low available water holding capacity, nutrient deficiencies
87	Waiqere	87C, 87D	IVe	Moderate to severe erosion, surface boulders, acid, nutrient deficiencies
		87E	VIe	Slope, moderate to severe erosion, surface boulders, acid, nutrient deficiencies
88	Waioba	88G, 88H	VIIIe	Slope, severe erosion risk, nutrient deficiencies
89	Ono	89A, 89B	IIs	Nutrient deficiencies, few boulders and stones
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
90	Dulevi	90A	IIs	Rapid permeability, nutrient deficiencies
		90B, 90C	IIIe	Slope, moderate erosion risk, rapid permeability, nutrient deficiencies
		90D, 90E	VIe	Slope, severe erosion risk, rapid permeability, nutrient deficiencies
91	Reree	91A, 91B	IIIs	Moderate nutrient deficiencies, stones and boulders
92	Laucala	92B	IIs	Slight nutrient deficiencies, rapid permeability
		92C, 92D	IVe	Severe erosion, slight nutrient deficiencies, rapid permeability
		92E	VIe	Slope, severe erosion, slight nutrient deficiencies, rapid permeability
93	Taveuni	93C, 93D	IIIs	Slight nutrient deficiencies, acid
		93E	VIe	Moderate erosion risk, slope, slight nutrient deficiencies, acid
94	Koro	94G	VIIe	Moderate erosion risk, steep slopes, rapid permeability, nutrient deficiencies
		94H	VIIIe	Severe erosion risk, moderate erosion risk, very steep slopes, rapid permeability, nutrient deficiencies
95	Ura	95D	IVe	Moderate erosion risk, rapid permeability, high phosphorous fixation, slight nutrient deficiencies
		95E, 95F	VIe	Slope, moderate erosion risk, rapid permeability, high phosphorous fixation, slight nutrient deficiencies
96	Nacamaki	96B	IIIs	Surface boulders, profile stoniness, rapid permeability, nutrient deficiencies, high phosphorous fixation
		96C, 96D	IVe	Severe erosion risk, surface boulders, profile stoniness, rapid permeability, nutrient deficiencies, high phosphorous fixation
		96E	VIe	Slope, severe erosion risk, surface boulders, profile stoniness, rapid permeability, nutrient deficiencies, high phosphorous fixation
97	Ravilevu	97G	VIIe	Very severe erosion risk, acid, slight nutrient deficiencies
		97H	VIIIe	Very steep slopes, very severe erosion risk, acid, slight nutrient deficiencies
98	Vakawau	98E, 98F	VIs	Slope, rock outcrops, surface boulders, profile stones and boulders, high phosphorous fixation
99	Kirikiri	99A, 99B	IIs	Stony, low available water holding capacity, slight nutrient deficiencies
100	Hafhafu	100B, 100C, 100D	IIIs	Shallow rooting depth, stony, low available water holding capacity, slight nutrient deficiencies
101	Nabeka	101C, 101D	IVe	Moderate erosion risk, acid, slight to moderate nutrient deficiencies
		101E	VIe	Slope, moderate erosion risk, acid, slight to moderate nutrient deficiencies
102	Waioru	102G	VIIe	Severe erosion risk, acid, moderate nutrient deficiencies
		102H	VIIIe	Very steep slopes, severe erosion risk, acid, moderate nutrient deficiencies

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
103	Tabaka	103C, 103D	IVe	Severe past erosion, very severe erosion risk, surface boulders, acid, slight nutrient deficiencies, very high rainfall
		103E	VIe	Slope, severe past erosion, very severe erosion risk, surface boulders, acid, slight nutrient deficiencies, very high rainfall
104	Qeleni	104C, 104D	IIIs	Clayey, acid, slight nutrient deficiencies, aluminium toxicity
		104E	VIe	Slope, slight to moderate erosion risk, clayey, acid, slight nutrient deficiencies, aluminium toxicity
105	Nasau	105F, 105G	VIIe	Severe past erosion, severe erosion risk, shallow profile, surface boulders, slight nutrient deficiencies
		105H	VIIIe	Very steep slopes, severe past erosion, severe erosion risk, shallow profile, surface boulders, slight nutrient deficiencies
106	Nacaugai	106G	VIIe	Moderate erosion risk, rapid permeability, surface boulders, acid, high phosphorous retention, nutrient deficiencies
		106H	VIIIe	Very steep slopes, moderate erosion risk, rapid permeability, surface boulders, acid, high phosphorous retention, nutrient deficiencies
107	Tavuyaga	107G	VIIe	Moderate to severe erosion risk, rapid permeability, nutrient deficiencies, high phosphorous retention
		107H	VIIIe	Very steep slopes, moderate to severe erosion risk, rapid permeability, nutrient deficiencies, high phosphorous retention
108	Mafua	108D	IVs	Shallow rooting depth, stony, low available water holding capacity, moderate nutrient deficiencies
		108E, 108F, 108G	VIIe	Moderate erosion risk, shallow rooting depth, stony, low available water holding capacity, moderate nutrient deficiencies
		108H	VIIIe	Slope, shallow rooting depth, stony, low available water holding capacity, moderate nutrient deficiencies
109	Roroa	109D	IVs	Shallow rooting depth, low available water holding capacity, moderate nutrient deficiencies
		109E, 109F, 109G	VIIe	Slope, moderate erosion risk, shallow rooting depth, low available water holding capacity, moderate nutrient deficiencies
		109H	VIIIe	Very steep slopes, very severe erosion risk, shallow rooting depth, low available water holding capacity, moderate nutrient deficiencies
110	Samabula	110A	IIIs	Shallow soil, clayey, alkaline
		110B, 110C, 110D	IVe	Moderate erosion risk, shallow soil, clayey, alkaline
		110E, 110F, 110G	VIIe	Slope, moderate to severe erosion risk, shallow soil, clayey, alkaline
		110H	VIIIe	Very steep slopes, severe erosion risk, shallow soil, clayey, alkaline

111	Nalotu	111C, 111D	IVs	Shallow soil, clayey, seasonal moisture deficits, acid, slight nutrient deficiencies
		111E	VIe	Moderate erosion risk, slope, shallow soil, clayey, seasonal moisture deficits, acid, slight nutrient deficiencies
112	Koromavu	112D	IVs	Shallow soil, nutrient deficiencies, severe seasonal moisture deficits
		112E, 112F	VIe	Slope, moderate erosion risk, shallow soil, nutrient deficiencies, severe seasonal moisture deficits
		112G	VIIe	Steep slopes, moderate erosion risk, shallow soil, nutrient deficiencies, severe seasonal moisture deficits
		112H	VIIIe	Very steep slopes, severe erosion risk, shallow soil, nutrient deficiencies, severe seasonal moisture deficits
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
113	Keyasi	113E, 113F	VIe	Slope, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		113E, 113F	VIe	Slope, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		113G	VIIe	Steep slopes, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		113H	VIIIe	Very steep slopes, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
114	Nadroga	114C	IVs	Shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		114D	IVe	Soil erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		114E, 114F	VIe	Slope, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		114G	VIIe	Steep slopes, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies
		114H	VIIIe	Very steep slopes, erosion risk, shallow soil, seasonal moisture deficits, acid, nutrient deficiencies

115	Momi	115B, 115C	IIIs	Clayey, seasonal moisture deficits, nutrient deficiencies
		115D	IVe	Slope, erosion risk, clayey, seasonal moisture deficits, nutrient deficiencies
		115E, 115F	VIe	Slope, erosion risk, clayey, seasonal moisture deficits, nutrient deficiencies
		115G	VIIe	Steep slopes, erosion risk, clayey, seasonal moisture deficits, nutrient deficiencies
		115H	VIIIe	Very steep slopes, erosion risk, clayey, seasonal moisture deficits, nutrient deficiencies
116	Sabeto	116C, 116D	IVe	Erosion risk, severe past erosion, shallow soil, seasonal moisture deficits
		116E, 116F	VIe	Slope, erosion risk, severe past erosion, shallow soil, seasonal moisture deficits
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
117	Naqalotu	117F	VIe	Erosion risk, shallow soil, stony, seasonal moisture deficits
		117G	VIIe	Steep slopes, erosion risk, shallow soil, stony, seasonal moisture deficits
118	Emuri	118A	IIIw	Wet season waterlogging, clayey, vertic properties, nutrient deficiencies
		118B, 118C	IIIs	Clayey, vertic properties, seasonal moisture deficits, nutrient deficiencies
119	Suva	119B, 119C	IIIs	Clayey, nutrient deficiencies
120	Yako	120B	IIIs	Shallow soil, low water holding capacity, season moisture deficits
		120C, 120D	IVe	Severe past and potential erosion risk, shallow soil, low water holding capacity, season moisture deficits
		120E	VIe	Slope, erosion risk, shallow soil, low water holding capacity, season moisture deficits
121	Burenitu	121B, 121C	IIIs	Clayey, nutrient deficiencies
		121D	IVe	Moderate erosion risk, clayey, nutrient deficiencies
		121E, 121F	VIe	Slope, erosion risk, clayey, nutrient deficiencies
		121G	VIIe	Steep slopes, erosion risk, clayey, nutrient deficiencies
122	Dobuilevu	122B, 122C	IIs	Nutrient deficiencies
		122D	IVe	Erosion risk, slope, nutrient deficiencies
		122E, 122F	VIe	Slope, erosion risk
		122G	VIIe	Moderate erosion risk, slope, nutrient deficiencies
		122H	VIIIe	Severe erosion risk, very steep slopes, nutrient deficiencies
123	Matawailevu	123A, 123B	IIs	Clayey, nutrient deficiencies, slow subsoil permeability

124	Lobau	124C	IIIs	Acid, severe nutrient deficiencies
		124D	IVe	Severe erosion risk, acid, severe nutrient deficiencies
		124E, 124F	VIe	Slope, erosion risk, acid, severe nutrient deficiencies
		124G	VIIe	Slope, very severe erosion risk, acid, severe nutrient deficiencies
		124H	VIIIe	Very steep slopes, very severe erosion, acid, severe nutrient deficiencies
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
125	Visa	125B, 125C	IIIs	Acid, nutrient deficiencies
		125D	IVe	Slope, erosion risk, acid, nutrient deficiencies
		125E, 125F	VIe	Slope, moderate erosion risk, acid, nutrient deficiencies
		125G	VIIe	Slope, severe erosion risk, acid, nutrient deficiencies
		125H	VIIIe	Very steep slopes, very severe erosion risk, acid, nutrient deficiencies
126	Sote	126B	IIIs	Acid, nutrient deficiencies
		126C, 126D	IVe	Erosion risk, acid, nutrient deficiencies
		126E, 126F	VIe	Erosion (including land slides), slope, acid, nutrient deficiencies
		126G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies
		126H	VIIIe	Very steep slopes, very severe erosion, acid, nutrient deficiencies
127	Waimaro	127B, 127C	IIIs	Acid, nutrient deficiencies, clayey, limited rooting volume
		127D	IVe	Erosion risk, acid, nutrient deficiencies, clayey, limited rooting volume
		127E, 127F	VIe	Moderate erosion risk, acid, nutrient deficiencies, clayey, limited rooting volume
		127G	VIIe	Slope, severe erosion risk, acid, nutrient deficiencies, clayey, limited rooting volume
		127H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies, clayey, limited rooting volume
128	Serua	128E, 128F	VIe	Moderate erosion risk, strong acid, nutrient deficiencies
		128G	VIIe	Slope, moderate erosion risk, strong acid, nutrient deficiencies
		128H	VIIIe	Very steep slopes, severe erosion risk, moderate erosion risk, strong acid, nutrient deficiencies
129	Waidina	129B, 129C	IIIs	Acid, nutrient deficiencies, slow permeability, pugs
		129D	IVe	Moderate erosion risk, acid, nutrient deficiencies, slow permeability, pugs
		129E, 129F	VIe	Slope, moderate erosion risk, acid, nutrient deficiencies, slow permeability, pugs
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**

130	Nacula	130C, 130D	IVs	Acid, nutrient deficiencies
		130E, 130F	VIe	Moderate erosion risk, acid, nutrient deficiencies
		130G	VIIe	Steep slopes, severe erosion, acid, nutrient deficiencies
		130H	VIIIe	Very steep slopes, very severe erosion, acid, nutrient deficiencies
131	Vasilaulau	131D	IVs	Shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		131E, 131F	VIe	Moderate erosion risk, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		131G	VIIe	Steep slopes, severe erosion risk, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		131H	VIIIe	Very steep slopes, very severe erosion risk, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
132	Waisava	132A, 132B	IIIs	Clayey, slow subsoil permeability, nutrient deficiencies
		132C	IIIe	Moderate erosion risk under cultivation, clayey, slow subsoil permeability, nutrient deficiencies
133	Daria	133A – D	IIIs	Clayey, imperfectly drained, acid, nutrient deficiencies, slight erosion risk on slopes >12° when cultivated
134	Namuana	134C, 134D	IIIs	Acid, nutrient deficiencies, slight erosion risk on slopes >12° when cultivated
		134E, 134F	VIe	Moderate erosion risk, acid, nutrient deficiencies, moderate erosion risk
		134G	VIIe	Steep slopes, severe erosion risk, acid, nutrient deficiencies
		134H	VIIIe	Very steep slopes, very severe erosion, acid, nutrient deficiencies
135	Sarowaqa	135F	VIe	Moderate erosion risk, acid, nutrient deficiencies
		135G	VIIe	Steep slopes, severe erosion risk, acid, nutrient deficiencies
		135H	VIIIe	Very steep slopes, very severe erosion, acid, nutrient deficiencies
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
136	Gaigai	136D	IVs	Acid, nutrient deficiencies, Al. toxicity
		136E, 136F	VIe	Moderate erosion risk, acid, nutrient deficiencies, Al. toxicity
		136G	VIIe	Steep slopes, severe erosion risk, acid, nutrient deficiencies, Al. toxicity
		136H	VIIIe	Very severe erosion, very steep slopes, acid, nutrient deficiencies, Al. toxicity
137	Driti	137B, 137C	IIIs	Shallow soil, acid, nutrient deficiencies, moderately rapid permeability
		137D	IIIe	Moderate erosion, shallow soil, acid, nutrient deficiencies, moderately rapid permeability
		137E	VIe	Severe erosion risk, shallow soil, acid, nutrient deficiencies, moderately rapid permeability

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
138	Namatiu	138B	IIIs	Shallow soil, acid, nutrient deficiencies
		138C, 138D	IIIe	Moderate erosion risk, shallow soil, acid, nutrient deficiencies
		138E	VIe	Severe erosion risk, shallow soil, acid, nutrient deficiencies
139	Namara	139B, 139C	IIIs	Shallow soil, clayey, acid, nutrient deficiencies, Al. toxicity
		139D	IVe	Moderate erosion risk, shallow soil, clayey, acid, nutrient deficiencies, Al. toxicity
		139E	VIe	Severe erosion risk, slope, shallow soil, clayey, acid, nutrient deficiencies, Al. toxicity
140	Wainikoro	140C, 140D	IVs	Low moisture-holding capacity, acid, seasonal moisture deficits, nutrient deficiencies
		140E, 140F	VIe	Past erosion, moderate erosion risk, low moisture-holding capacity, acid, seasonal moisture deficits, nutrient deficiencies
		140G	VIIe	Past erosion, severe erosion risk, low moisture-holding capacity, acid, seasonal moisture deficits, nutrient deficiencies
		140H	VIIIe	Very severe erosion risk, very steep slopes, low moisture-holding capacity, acid, seasonal moisture deficits, nutrient deficiencies
141	Nukudamu	141A	IIIs	Acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits
		141B, 141C, 141D	IVe	Severe erosion risk, past topsoil loss, acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits
142	Nukusa	142A, 142B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		142C, 142D	IVe	Severe erosion risk, severe past erosion, acid, nutrient deficiencies, seasonal moisture deficits
143	Vatuvonu	143B, 143C	IIIs	Shallow soil, acid, low available P, seasonal moisture deficits
		143D	IVe	Moderate erosion risk, shallow soil, acid, low available P, seasonal moisture deficits
		143E, 143F	VIe	Severe erosion risk, slope, shallow soil, acid, low available P, seasonal moisture deficits
144	Kurukuru	144A	IIs	Acid, low P and K, seasonal moisture deficits
		144B, 144C	IIIe	Moderate erosion risk, acid, low P and K, seasonal moisture deficits
		144D	IVe	Severe erosion risk, acid, low P and K, seasonal moisture deficits
145	Kelikoso	145A, 145B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits, slight erosion risk under cultivation
146	Verevere	146A, 146B, 146C	IIIs	Shallow soil, nutrient deficiencies, seasonal moisture deficits
147	Uaua	147A, 147B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
148	Lutu	148C, 148D	IVe	Moderate erosion risk, acid, nutrient deficiencies
		148E, 148F	VIe	Slope, moderate erosion risk, acid, nutrient deficiencies
		148G	VIIe	Severe erosion risk (including debris slides), slope, acid, nutrient deficiencies
		148H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies
149	Malolo	149D	IVs	Shallow soil, sandy, rapid permeability, low water holding capacity, seasonal moisture deficits, acid, nutrient deficiencies
		149E, 149F	VIe	Past erosion, severe erosion risk, shallow soil, sandy, rapid permeability, low water holding capacity, seasonal moisture deficits, acid, nutrient deficiencies
150	Vatubaba	150F	VIe	Moderate erosion risk, acid, nutrient deficiencies
		150G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies
		150H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies
151	Nadawa	151B	IIIs	Shallow soil, nutrient deficiencies, serious past erosion
		151C, 151D	IVe	Moderate-severe erosion risk, shallow soil, nutrient deficiencies, serious past erosion
		151E	VIe	Severe erosion risk, slope, shallow soil, nutrient deficiencies, serious past erosion
152	Rauriko	152F, 152G	VIIe	Slope, past erosion, moderate erosion risk, shallow soil, acid, nutrient deficiencies
		152H	VIIIe	Past erosion, severe erosion risk, very steep slopes, past erosion, moderate erosion risk, shallow soil, acid, nutrient deficiencies
153	Yakita	153B, 153C	IIIs	Clayey, high plasticity, acid, nutrient deficiencies
154	Cuku	154D	IVs	Shallow soil, low water holding capacity, nutrient deficiencies, seasonal moisture deficits, severe past erosion
		154E, 154F	VIe	Moderate erosion risk, shallow soil, low water holding capacity, nutrient deficiencies, seasonal moisture deficits, severe past erosion
		154G	VIIe	Steep slopes, severe erosion risk, shallow soil, low water holding capacity, nutrient deficiencies, seasonal moisture deficits, severe past erosion
		154H	VIIIe	Very severe erosion, very steep slopes, shallow soil, low water holding capacity, nutrient deficiencies, seasonal moisture deficits, severe past erosion

155	Nabuono	155F	VIe	Moderate erosion risk, acid, nutrient deficiencies, shallow soil, seasonal moisture deficits
		155G	VIIe	Severe erosion risk, steep slopes, moderate erosion risk, acid, nutrient deficiencies, shallow soil, seasonal moisture deficits
		155H	VIIIe	Very severe erosion risk, very steep slopes, moderate erosion risk, acid, nutrient deficiencies, shallow soil, seasonal moisture deficits
156	Dogotuki	156B, 156C	IIIs	Acid, nutrient deficiencies
		156D	IIIe	Moderate erosion risk, acid, nutrient deficiencies
		156E, 156F	VIe	Severe erosion risk, slope, acid, nutrient deficiencies
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
157	Koroniqala	157B, 157C	IVs	Acid, nutrient deficiencies, severe past erosion
		157D	IVe	Moderate erosion risk, acid, nutrient deficiencies, severe past erosion
		157E	VIe	Severe erosion risk, slope, acid, nutrient deficiencies, severe past erosion
158	Namosi	158C, 158D	IVs	Surface and profile boulders, rock outcrops, acid, nutrient deficiencies
		158E, 158F	VIe	Moderate erosion risk, surface and profile boulders, rock outcrops, acid, nutrient deficiencies
		158G	VIIe	Severe erosion risk, steep slopes, surface and profile boulders, rock outcrops, acid, nutrient deficiencies
		158H	VIIIe	Very severe erosion, very steep slopes, surface and profile boulders, rock outcrops, acid, nutrient deficiencies
159	Nauluvatu	159D	IVs	Shallow soil, acid, nutrient deficiencies
		159E, 159F	VIe	Moderate erosion risk, shallow soil, acid, nutrient deficiencies
		159G	VIIe	Steep slopes, severe erosion risk, shallow soil, acid, nutrient deficiencies
		159H	VIIIe	Very serious erosion, very steep slopes, shallow soil, acid, nutrient deficiencies

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
160	Narayawa	160C, 160D	IVs	Coarse textures, rapid soil permeability, low moisture-holding capacity, acid, nutrient deficiencies
		160E, 160F	VIe	Moderate erosion risk, coarse textures, rapid soil permeability, low moisture-holding capacity, acid, nutrient deficiencies
		160G	VIIe	Steep slopes, severe erosion risk (including rotational slumping), coarse textures, rapid soil permeability, low moisture-holding capacity, acid, nutrient deficiencies
		160H	VIIIe	Very severe erosion, very steep slopes, coarse textures, rapid soil permeability, low moisture-holding capacity, acid, nutrient deficiencies
161	Savudrodro	161C, 161D	IIIs	Acid, nutrient deficiencies, slight erosion risk
		161E, 161F	VIe	Moderate erosion risk, acid, nutrient deficiencies, slight erosion risk
		161G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies, slight erosion potential
		161H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies, slight erosion potential
162	Vunatoto	162D	IVs	Profile boulders, acid, nutrient deficiencies
		162E, 162F	VIe	Moderate erosion risk, profile boulders, acid, nutrient deficiencies
		162G	VIIe	Severe erosion risk, steep slopes, profile boulders, acid, nutrient deficiencies
		162H	VIIIe	Very severe erosion risk, very steep slopes, profile boulders, acid, nutrient deficiencies
163	Vitawa	163F	VIe	Moderate erosion risk, past erosion, acid, nutrient deficiencies, seasonal moisture deficits
		163G	VIIe	Severe erosion risk, past erosion, steep slopes, acid, nutrient deficiencies, seasonal moisture deficits
		163H	VIIIe	Very severe erosion risk, past erosion, very steep slopes, acid, nutrient deficiencies, seasonal moisture deficits
164	Yavuna	164B	IIIs	Low water holding capacity, seasonal moisture deficits, nutrient deficiencies
		164C, 164D	IVe	Moderate erosion risk, past erosion, low water holding capacity, seasonal moisture deficits, nutrient deficiencies
		164E	VIe	Severe erosion risk, past erosion, low water holding capacity, seasonal moisture deficits, nutrient deficiencies
165	Tabuquto	165A, 165B	IIIs	Clayey, acid, nutrient deficiencies, seasonal moisture deficits
		165C, 165D	IVe	Moderate erosion risk, clayey, acid, nutrient deficiencies, seasonal moisture deficits

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
166	Nailoca	166D	IVs	Acid, nutrient deficiencies, Al. toxicity, surface boulders
		166E, 166F	VIe	Moderate erosion risk, acid, nutrient deficiencies, Al. toxicity, surface boulders
		166G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies, Al. toxicity, surface boulders
		166H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies, Al. toxicity, surface boulders
167	Vaidoko	167B	IIIs	Shallow soil, acid, nutrient deficiencies
		167C, 167D	IVe	Erosion risk if cultivated, shallow soil, acid, nutrient deficiencies
		167E, 167F	VIe	Moderate erosion risk, shallow soil, acid, nutrient deficiencies
		167G	VIIe	Severe erosion risk, steep slopes, shallow soil, acid, nutrient deficiencies
		167H	VIIIe	Very severe erosion, very steep slopes, shallow soil, acid, nutrient deficiencies
168	Lodoni	168B	IIIs	Clayey, acid, nutrient deficiencies
		168C, 168D	IVe	Erosion risk, clayey, acid, nutrient deficiencies
		168E, 168F	VIe	Moderate erosion risk, clayey, acid, nutrient deficiencies
		168G	VIIe	Severe erosion risk, steep slopes, clayey, acid, nutrient deficiencies
		168H	VIIIe	Very severe erosion risk, very steep slopes, clayey, acid, nutrient deficiencies
169	Gau	169A, 169B	IIs	Acid, nutrient deficiencies
		169C, 169D	IIIs	Acid, nutrient deficiencies, slight erosion risk if cultivated
170	Tailevu	170C, 170D	IVs	Surface boulders, acid, nutrient deficiencies
		170E, 170F	VIe	Moderate erosion risk, surface boulders, acid, nutrient deficiencies
		170G	VIIe	Severe erosion risk, steep slopes, surface boulders, acid, nutrient deficiencies
		170H	VIIIe	Very severe erosion risk, very steep slopes, surface boulders, acid, nutrient deficiencies
171	Solevu	171B	IIIs	Shallow soil, acid, nutrient deficiencies
		171C, 171D	IVe	Moderate erosion risk, shallow soil, acid, nutrient deficiencies
		171E, 171F	VIe	Slope, severe erosion, shallow soil, acid, nutrient deficiencies
Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
172	Seatura	172D	IVs	Surface boulders, acid, nutrient deficiencies, stony
		172E, 172F	VIe	Moderate erosion risk, surface boulders, acid, nutrient deficiencies, stony
		172G	VIIe	Severe erosion risk, steep slopes, surface boulders, acid, nutrient deficiencies, stony
		172H	VIIIe	Very severe erosion risk, very steep slopes, surface boulders, acid, nutrient deficiencies, stony
173	Wainunu	173A, 173B	IIIs	Clayey, slow permeability, acid, nutrient deficiencies, P fixation
		173C, 173D	IVe	Moderate erosion if cultivated, clayey, slow permeability, acid, nutrient deficiencies, P fixation
		173E, 173F	VIe	Moderate to severe erosion risk, slope, clayey, slow permeability, acid, nutrient deficiencies, P fixation
174	Nakavika	174A, 174B	IIIs	Clayey, slow permeability, acid, nutrient deficiencies, P fixation
		174C, 174D	IVe	Moderate erosion risk if cultivated, clayey, slow permeability, acid, nutrient deficiencies, P fixation
		174E, 174F	VIe	Severe erosion risk, slope, clayey, slow permeability, acid, nutrient deficiencies, P fixation
175	Galoa	175B	IIIs	Clayey, acid, nutrient deficiencies, Al. toxicity
		175C, 175D	IVe	Moderate erosion risk, clayey, acid, nutrient deficiencies, Al. toxicity
		175E	VIe	Moderate to severe erosion risk, slope, clayey, acid, nutrient deficiencies, Al. toxicity
176	Lomaiviti	176C, 176D	IIIs	Acid, nutrient deficiencies
		176E, 176F	VIe	Moderate erosion risk, acid, nutrient deficiencies
177	Navava	177A, 177B	IIs	Slight nutrient deficiencies
		177C, 177D	IIIe	Moderate erosion risk, slight nutrient deficiencies
		177E, 177F	VIe	Moderate erosion risk (including soil slips), slope, slight nutrient deficiencies
		177G	VIIe	Severe erosion risk, steep slopes, slight nutrient deficiencies
		177H	VIIIe	Very severe erosion risk, very steep slopes, slight nutrient deficiencies

178	Raviravi	178B	IIIs	Rapid permeability, seasonal moisture deficits, acid, nutrient deficiencies, Al. toxicity
		178C, 178D	IVe	Moderate erosion risk, rapid permeability, seasonal moisture deficits, acid, nutrient deficiencies, Al. toxicity
		178E, 178F	VIe	Moderate to severe erosion risk, slope, rapid permeability, seasonal moisture deficits, acid, nutrient deficiencies, Al. toxicity
		178G	VIIe	Severe erosion risk, steep slopes, rapid permeability, seasonal moisture deficits, acid, nutrient deficiencies, Al. toxicity
		178H	VIIIe	Very severe erosion, very steep slopes, rapid permeability, seasonal moisture deficits, acid, nutrient deficiencies, Al. toxicity
179	Nairai	179C, 179D	IVe	Past erosion, severe erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
		179E, 179F, 179G	VIIe	Slope, past erosion, severe erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
		179H	VIIIe	Very severe erosion risk, very steep slopes, past erosion, severe erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
180	Lakeba	180D	IVs	Shallow soil, clayey, acid, nutrient deficiencies, seasonal moisture deficits
		180E, 180F	VIe	Moderate erosion risk, shallow soil, clayey, acid, nutrient deficiencies, seasonal moisture deficits
		180G	VIIe	Severe erosion risk, steep slopes, shallow soil, clayey, acid, nutrient deficiencies, seasonal moisture deficits
		180H	VIIIe	Very severe erosion, very steep slopes, shallow soil, clayey, acid, nutrient deficiencies, seasonal moisture deficits
181	Tuva	181A, 181B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		181C, 181D	IVe	Moderate erosion risk, past erosion, acid, nutrient deficiencies, seasonal moisture deficits
		181E, 181F	Vie	Severe erosion risk, past erosion, slope, acid, nutrient deficiencies, seasonal moisture deficits
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
182	Lau	182B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		182C, 182D	IVe	Moderate erosion risk, past erosion, acid, nutrient deficiencies, seasonal moisture deficits
		182E	VIe	Severe erosion risk, past erosion, slope, acid, nutrient deficiencies, seasonal moisture deficits

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
183	Delaimatai	183C, 183D	IVs	Acid, nutrient deficiencies, seasonal moisture deficits, clayey
		183E, 183F	VIe	Moderate erosion risk, slope, acid, nutrient deficiencies, seasonal moisture deficits, clayey
		183G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies, seasonal moisture deficits, clayey
		183H	VIIIe	Very severe erosion risk, very steep slopes, acid, nutrient deficiencies, seasonal moisture deficits, clayey
184	Namalata	184B	IIIs	Acid, seasonal moisture deficits
		184C, 184D	IVe	Moderate erosion risk when forest cleared, acid, seasonal moisture deficits
		184E	VIe	Severe erosion risk, slope, acid, nutrient deficiencies, seasonal moisture deficits
185	Vuya	185B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		185C, 185D	IVe	Moderate erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
		185E, 185F	VIe	Moderate to severe erosion risk, slope, acid, nutrient deficiencies, seasonal moisture deficits
		185G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies, seasonal moisture deficits
		185H	VIIIe	Very severe erosion risk, very steep slopes, nutrient deficiencies, seasonal moisture deficits
186	Kavula	186E, 186F	VIe	Moderate to severe erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
		186G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies, seasonal moisture deficits
		186H	VIIIe	Very severe erosion risk, very steep slopes, acid, seasonal moisture deficits, nutrient deficiencies
187	Nawai	187B	IIIs	Clayey, vertic properties, nutrient deficiencies, seasonal moisture deficits
		187C, 187D	IVs	Clayey, slope, nutrient deficiencies, seasonal moisture deficits
188	Makomako	188B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		188C, 188D	IVe	Moderate erosion risk, slope, acid, nutrient deficiencies, seasonal moisture deficits
		188E	VIe	Moderate to severe erosion risk, slope, acid, nutrient deficiencies, seasonal moisture deficits
189	Tabia	189A, 189B	IIIs	Acid, nutrient deficiencies, clayey, seasonal moisture deficits
		189C, 189D	IVs	Slight erosion risk, clayey, acid, nutrient deficiencies, seasonal moisture deficits

190	Kubuna	190B	IIIs	Clayey, acid, nutrient deficiencies, seasonal moisture deficits
		190C, 190D	IVe	Moderate to severe erosion risk, clayey, acid, nutrient deficiencies, seasonal moisture deficits
		190E	VIe	Severe erosion risk, slope, clayey, acid, nutrient deficiencies, seasonal moisture deficits
191	Totoya	191B	IIs	Nutrient deficiencies, seasonal moisture deficits
		191C, 191D	IIIe	Moderate to severe erosion risk when cultivated, nutrient deficiencies, seasonal moisture deficits
192	Nanukuloa	192B, 192C, 192D	IVs	Shallow soil, surface rock outcrops and boulders, acid, nutrient deficiencies, seasonal moisture deficits
		192E, 192F	VIe	Moderate erosion risk, shallow soil, surface rock outcrops and boulders, acid, nutrient deficiencies, seasonal moisture deficits
		192G	VIIe	Severe erosion risk, steep slopes, shallow soil, surface rock outcrops and boulders, acid, nutrient deficiencies, seasonal moisture deficits
		192H	VIIIe	Very severe erosion risk, very steep slopes, shallow soil, surface rock outcrops and boulders, acid, nutrient deficiencies, seasonal moisture deficits
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
193	Nabiti	193B	IIIs	Acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits, rapid permeability
		193C, 193D	IVe	Moderate to severe erosion risk, acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits, rapid permeability
		193E	VIe	Severe erosion, slope, acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits, rapid permeability
194	Lekutu	194C, 194D	IVe	Past erosion, severe erosion risk, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		194E, 194F	VIe	Slope, past erosion, severe erosion risk, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
195	Varaciva	195E, 195F, 195G	VIIe	Severe erosion risk, uneven surface due to past erosion, slope, acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits
		195H	VIIIe	Very severe erosion risk, very steep slopes, uneven surface due to past erosion, acid, nutrient deficiencies, Al. toxicity, seasonal moisture deficits
196	Rewasa	196B, 196C, 196D	IVs	Rock outcrops, surface and profile boulders, clayey, acid, nutrient deficiencies, seasonal moisture deficits
		196E	VIe	Moderate erosion risk, rock outcrops, surface and profile boulders, clayey, acid, nutrient deficiencies, seasonal moisture deficits

Series ID	Soil Series Name	Soil Map Unit Code	Land Use Capability Class	Main Soil Limitations
197	Tavua	197C, 197D	IVs	Surface boulders, clayey, nutrient deficiencies, seasonal moisture deficits
		197E, 197F	VIe	Moderate to severe erosion risk, surface boulders, clayey, nutrient deficiencies, seasonal moisture deficits
198	Vatukoula	198C, 198D	IVs	Rock outcrops, surface and profile boulders, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		198E, 198F	VIe	Moderate erosion risk, rock outcrops, surface and profile boulders, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
		198G, 198H	VIIIe	Severe erosion risk, very steep slopes, rock outcrops, surface and profile boulders, shallow soil, acid, nutrient deficiencies, seasonal moisture deficits
199	Yaqara	199A, 199B	IIs	Clayey, seasonal moisture deficits
		199C	IIIs	Slope, clayey, seasonal moisture deficits
200	Macuata	200C, 200D	IVs	Slope, nutrient deficiencies, Al, toxicity, seasonal moisture deficits, past erosion (uneven ground surface)
		200E, 200F, 200G	VIIe	Severe erosion risk, slope, nutrient deficiencies, Al, toxicity, seasonal moisture deficits, past erosion (uneven ground surface)
		200H	VIIIe	Very severe erosion, very steep slopes, nutrient deficiencies, Al, toxicity, seasonal moisture deficits, past erosion (uneven ground surface)
201	Rukuruku	201B	IIIs	Acid, nutrient deficiencies, seasonal moisture deficits
		201C, 201D	IVe	Moderate erosion risk, acid, nutrient deficiencies, seasonal moisture deficits
202	Delaibo	202D	IVs	Bouldery and stony soils, limited rooting depth, nutrient deficiencies
		202E, 202F	VIs	Slope, slight erosion risk, bouldery and stony soils, limited rooting depth, nutrient deficiencies
		202G	VIIe	Moderate erosion risk, steep slopes, bouldery and stony soils, limited rooting depth, nutrient deficiencies
		202H	VIIIe	Moderate to severe erosion risk, very steep slopes, bouldery and stony soils, limited rooting depth, nutrient deficiencies
203	Naweni	203A	IIw	Poorly drained, slow permeability, infrequent flooding
		203B, 203C	IIIw	Poorly drained, slow permeability, slope
204	Batiwai	204B	IIs	Clayey, acid, nutrient deficiencies
		204C, 204D	IIIs	Slope, clayey, acid, nutrient deficiencies
		204E, 204F	VIe	Moderate to severe erosion risk where forest cleared, clayey, acid, nutrient deficiencies
		204G	VIIe	Severe erosion risk, steep slopes, clayey, acid, nutrient deficiencies

205	Bureni	205C, 205D	IVs	Clayey, slow permeability, acid, nutrient deficiencies
		205E, 205F	VIe	Moderate erosion risk when forest cleared, slope, clayey, slow permeability, acid, nutrient deficiencies
206	Korotuku	206A, 206B	IIs	Rapid permeability, nutrient deficiencies, P retention
		206C	IIIe	Erosion risk when cultivated, rapid permeability, nutrient deficiencies, P retention
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**
207	Delainacau	207C, 207D	IVs	Acid, nutrient deficiencies, slope, slight to moderate erosion risk if cultivated
		207E, 207F	VIe	Moderate to severe erosion risk, slope, acid, nutrient deficiencies
208	Ledrutua	208C, 208D	IVs	Shallow soil, stony, nutrient deficiencies, seasonal moisture deficits, slight erosion risk
		208E, 208F	VIe	Moderate erosion risk, shallow soil, stony, nutrient deficiencies, seasonal moisture deficits
		208G	VIIe	Severe erosion risk, steep slopes, shallow soil, stony, nutrient deficiencies, seasonal moisture deficits
		208H	VIIIe	Very severe erosion risk, very steep slopes, shallow soil, stony, nutrient deficiencies, seasonal moisture deficits
209	Kuta	209	VIIIw	Permanently flooded, nutrient deficiencies
210	Nadranu	210	IVw	Floods, imperfectly drained
211	Nadala	211	IIs	Acid, nutrient deficiencies
212	Navai	212	IIs	Acid, subsoil boulders, P fixation, infrequent flooding
213	Nadrau	213	IIIw	Poorly drained, infrequent flooding
214	Naitata	214E, 214F	VIs	Slope, rock outcrops, surface and profile boulders, rapid permeability, nutrient deficiencies
		214G	VIIe	Moderate erosion risk, steep slopes, rock outcrops, surface and profile boulders, rapid permeability, nutrient deficiencies
215	Manuka	215D, 215E	IVs	Rock outcrops, surface boulders, rapid permeability, nutrient deficiencies, acid, P fixation
216	Ucunilawe	216G, 216H	VIIIe	Very severe erosion risk, steep slopes, surface boulders, rock outcrops, acid, P fixation, nutrient deficiencies
217	Soqulu	217G, 217H	VIIIe	Severe erosion risk, steep slopes, acid, P fixation, nutrient deficiencies
218	Matana	218D	IVs	Rapid permeability, acid, nutrient deficiencies, P fixation
		218E	VIe	Moderate erosion risk, rapid permeability, acid, nutrient deficiencies, P fixation
219	Salialailai	219G, 219H	VIIIe	Severe erosion risk, surface boulders, steep slopes, rapid permeability, acid, P fixation, nutrient deficiencies
Series ID	**Soil Series Name**	**Soil Map Unit Code**	**Land Use Capability Class**	**Main Soil Limitations**

220	Tagimaucia	220A, 220B	Vc	Constant wetness, acid, P fixation, nutrient deficiencies
221	Lewa	221A, 221B	IIs	Acid, nutrient deficiencies
		221C, 221D	IVe	Moderate erosion risk, acid, nutrient deficiencies
		221E, 221F	VIe	Slope, moderate to severe erosion risk, acid, nutrient deficiencies
		221G	VIIe	Severe erosion risk, steep slopes, acid, nutrient deficiencies
		221H	VIIIe	Very severe erosion, very steep slopes, acid, nutrient deficiencies
222	Waibici	222C, 222D	IIIs	Acid, nutrient deficiencies
		222E, 222F	VIe	Moderate erosion, slope, acid, nutrient deficiencies
		222G	VIIe	Severe erosion, steep slopes, acid, nutrient deficiencies
223	Monasavu	223D	IIIs	Acid, nutrient deficiencies
		223E, 223F	VIe	Moderate erosion risk, slope, acid, nutrient deficiencies
		223G, 223H	VIIIe	Severe erosion risk, acid, nutrient deficiencies
224	Nadarivatu	224C, 224D	IVs	Rock outcrops, surface boulders, acid, nutrient deficiencies
		224E, 224F	VIe	Moderate erosion risk, rock outcrops, surface boulders, acid, nutrient deficiencies
		224G, 224H	VIIIe	Severe erosion risk, steep slopes, rock outcrops, surface boulders, acid, nutrient deficiencies
225	Wailulu	225A, 225B	IIs	Acid, nutrient deficiencies
		225C, 225D	IIIs	Slope, acid, nutrient deficiencies
		225E, 225F	VIe	Moderate erosion risk, acid, nutrient deficiencies
		225G, 225H	VIIIe	Severe erosion risk, acid, nutrient deficiencies
226	Nabuesa	226B	IIs	Acid, nutrient deficiencies
		226C, 226D	IIIs	Slope, acid, nutrient deficiencies
		226E, 226F	VIe	Moderate erosion risk, slope, acid, nutrient deficiencies
		226G, 226H	VIIIe	Severe erosion risk, very steep slopes, acid, nutrient deficiencies
227	Qalinaolo	227A, 227B	IIs	Stony, acid, nutrient deficiencies, P fixation
		227C, 227D	IIIs	Slope, stony, acid, nutrient deficiencies, P fixation
		227E	VIe	Moderate erosion risk, stony, acid, nutrient deficiencies, P fixation

6. LAND AND SOIL ATTRIBUTES SIGNIFICANT FOR CROP GROWTH

6.1 Introduction

The process of interpreting basic soil survey and laboratory characterisation of soils data through the key steps of assessing suitability of soils for crop production, then ultimately gross margins for crops required a compilation of soil attributes significant for crop growth into a user-friendly format. Note the soil technical information is available elsewhere, viz. *Fiji Soil Taxonomic Unit Description Handbook* (Leslie and Seru, 1998).

The extended legend (Table 3) endeavours to present information in a format that can be easily utilised by extension officers, planners, etc. to promote agro-production with farmers and agri-business developers.

To give interpretative background to the columns in the extended legend explanatory notes follow.

(i) Slope microrelief

Slope class and range of slopes are given in terms of slope classes defined by the Land Use Section of Koronivia Research Station (Ministry of Agriculture and Fisheries 1977):

- Flat to gently undulating (0° **to** 3°)
- Undulating (4° to 7°)
- Easy rolling (8° to 11°)
- Rolling (12° to 15°)
- Strongly rolling (16° to 20°)
- Moderately steep (21° to 25°)
- Steep (26° to 35°)
- Very steep (>35°)

Microrelief is used to describe small-scale differences in relief on the macrorelief, and is not to be confused with low relief. The general surface may be nearly uniform or it may be interrupted by steps, minor depressions and mounds that are commonly no more than a few metres across and have significant differences in elevation of 50 cm to 1 m or even less. The small terracettes on hillsides where soil creep is active, and miniature hummocks, are typical examples.

(ii) Susceptibility to flooding

Describes the severity and susceptibility, or otherwise, to flooding experienced by the soil. The frequency (times per year) of flooding, the duration (days) flood waters pond and the period (month) in the year when flooding occurs. The majority of soils never experience flooding.

(iii) Susceptibility to erosion

Gives the severity and type of soil erosion under the major present land uses. It records evidence of accelerated removal or deposition of material as the result of erosion processes and distinguishes between water erosion (sheet, rill, gully), mass movement (debris slides and avalanches, mud flows, rotational slumps), water deposition, wind erosion and wind deposition. The degree or severity of erosion is given in relative terms of nil, slight, moderate, severe and very severe.

(iv) Susceptibility to waterlogging

Describes the severity and susceptibility for soils to waterlog. The position or depth in the soil at which waterlogging occurs in normal years, the duration (days) and period (months) in the year when waterlogging occurs are given. The majority of soils never experience waterlogging.

(v) Susceptibility to drought

Describes the probability in normal years for moisture deficits to be experienced in soils. The duration (days) of soil

moisture deficit and the period (months) in the year when deficits occur are given. Many soils never experience moisture deficits in normal years.

(vi) Overall drainage

Gives the overall drainage classes for the soil based on those given by Taylor and Pohlen (1979). The classes are defined by the frequency and duration of wet periods and the speed at which water is removed from the soil. Profile features such as presence or absence of ferruginous mottles and greyish colours are used in the identification of classes. The soil drainage classes are: very poorly drained; poorly drained; imperfectly or somewhat poorly drained; moderately well drained; well drained; somewhat excessively drained; and excessively drained. The class refers to natural drainage conditions prevailing at sites where the soil occurs.

(vii) Profile textural pattern

Gives any variations in soil texture within the profile to a soil depth of 120 cm. The thickness (cm) and depth (cm) from the soil surface of the different horizons are described. Alluvium or weathered or unweathered *in situ* rock, if encountered within the 120 cm, is also described. The texture classes follow *Soil Taxonomy* (Soil Survey Staff 1975) and are defined as follows:

(a) classes with less than 18% clay:

- sand: 80% or more sand and 8% or less clay
- loamy sand: less than 80% sand, 8% or less clay, and less than 40% silt
- sandy loam: more than 8% clay and less than 40% silt
- loamy silt: between 40% and 82% silt
- silt: more than 82% silt

(b) classes with 18% to 35% clay:

- sandy clay loam: 15% or less silt
- clay loam: more than 15% and less than 40% silt
- silt loam: 40% or more silt

(c) classes with more than 35% clay:

- silty clay: less than 60% clay and 30% or more silt
- loamy clay: less than 60% clay and less than 30% silt
- clay: 60% clay or more

A size qualifier may be used as a prefix in sand, loamy sand, sandy loam and sandy clay loam soil texture classes: coarse, medium, fine.

Estimates of the percentage of organic matter in topsoils are made, based on the feel and colour of the material. Soil material with 17% organic matter or more is recorded as follows:

17-30% slightly peaty silt loam (or other textural class)

30-50% sandy peat (with >50% sand in mineral fraction)

30-50% loamy peat (with <50% sand in mineral fraction)

>50% peat

(viii) Minimum effective rooting depth

Effective rooting depth describes the soil volume available for plant roots to penetrate and take up water, nutrients, etc. and to give stability to the plant.

On compact rock, the volume of soil penetrated by roots is limited by the depth of soil, though a few roots can break out through cracks and fissures. On loose or weathered rocks and alluvium, such as gravels and sands, roots penetrate beyond the soil.

Ease of rooting depends primarily on soil structure, texture and consistency. Iron pans, concretions, very thick clay-rich horizons, high water tables (can be seasonal) or impeded drainage, salinity, etc. can confine roots to only part of the soil. Depths to the impediment are given and the nature of the feature controlling this, such as high water table, aluminium toxicity, low nutrient status, are described.

A soil on which roots penetrate to only 10 cm would be described as very shallow; 10–25 cm, shallow; 25–50 cm, medium; 50–100 cm, deep; and over 100 cm, very deep. The depth to which roots penetrate also depends, obviously, on the type of plant.

(ix) Outcrops and surface stones and boulders

Rock outcrops and surface boulders and stones influence access and workability in the case of mechanisation. In the extended legend, the percentage of the ground surface of the site occupied has been estimated:

(i) rock outcrops: *in situ* bedrock that protrudes through the soil;

(ii) boulders: detached rock masses with diameters of more than 200 mm.

(x) Acidity/Alkalinity

Soil reaction, the intensity of soil acidity or alkalinity, is an indicator of many other soil qualities. It is expressed in units of pH where pH7 is neutral, lower values indicate acidity, and higher values alkalinity. The general terms for describing the range of pH are:

Extremely acid	<4.5	Slightly alkaline	7.1-7.5
Strongly acid	4.5–5.2	Mod. alkaline	7.6–8.3
Mod. acid	5.3–5.9	Strongly alkaline	8.4–9.0
Slightly acid	6.0–6.5	Extremely alkaline	>9.0
Near neutral	6.6–7.0		

Acidity or alkalinity status is given for whole soil profile or, where there is variation, for the individual horizon(s) with soil depths.

(xi) Salinity

Saline soils are of relatively small extent in Fiji. They are restricted to the saline gley (acid sulphate) soils of coastal mangrove marshes. Only a few kinds of plants survive in soils strongly affected by salt. Only five soil series are moderately or strongly affected by salt.

(xii) Known limiting nutrients

An important outcome of the national soil survey and full characterisation of soils is to make as good an estimate as possible of the fertility of the soil series recognised. A fertile soil may be defined as one whose properties enable it to grow good crops over a long period of time, and soil fertility is the attribute of a soil concerned with its capacity to grow useful plants.

- Many of the soils in Fiji do not attain the ideal, and it is the purpose of this report to estimate which soil series fall short in this respect. Based on laboratory analyses designed to fully characterise soils and facilitate soil classifications, those soil attributes of relevance to soil fertility were also derived. The key soil attributes limiting crop production considered were:
- Cation-exchange properties (exchange capacity – CEC;
- base saturation;
- exchangeable bases – calcium, magnesium, potassium and sodium);
- total nitrogen;
- extractable phosphorous and phosphorous retention;
- exchangeable aluminium;
- adsorbed sulphate.

Only those attributes giving limiting values are listed in the extended legend expressed as low or very low values and, if relevant, where in the profile (depth) these limitations occur.

Table 3: Extended legend : land and soil attributes significant for crop growth

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Ba	43B	Undulating (4-7°). Very uneven microrelief due to windthrow and past erosion.	Never floods.	Extreme past sheet and rill erosion. Very severe erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-30cm gritty clay loam. 30-60cm+ clay loam (in situ weathered rock).	<30cm	No surface rock outcrops. Strongly weathered regolith exposed in 10% of area. Surface stones cover 10% of area.	0-63cm strongly acid.	Non saline.	%BS, organic carbon, phosphorus, calcium, potassium and sodium very low. CEC low.
Ba	43C	Easy rolling (8-11°). Very uneven microrelief due to windthrow and past rill erosion.	Never floods.	Extreme past sheet and rill erosion. Very severe erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-23cm gritty clay loam. 23-63cm+ clay loam (in situ weathered rock).	<25cm	No surface outcrops. Strongly weathered regolith exposed in 20% of area. Surface stones and boulders cover 10% of area.	0-60cm strongly acid.	Non saline.	%BS, organic carbon, calcium, potassium, phosphorus and sodium very low. CEC low.
Ba	43D, 43E, 43F	Rolling to moderately steep (12-25°). Very uneven microrelief due to windthrow, deep rilling and slides.	Never floods.	Minor soil slips and debris slides. Extreme past sheet and rill erosion. 50% of area has total soil loss. Very severe erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-23cm gritty clay loam. 20-60cm+ clay loam (in situ weathered rock).	<20cm	No surface rock outcrops. Strongly weathered regolith exposed in 50% of area. Surface stones and boulders cover 20% of area.	0-60cm strongly acid.	Non saline.	%BS, organic carbon, calcium, potassium, phosphorus and sodium very low. CEC low.
Batawai	204B, 204C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	Soil moisture deficits are never experienced in normal years.	Well drained.	0-13cm clay loam. 13-143cm silty clay loam. 143-220cm strongly weathered in situ rock (silt loam).	<140cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-220cm strongly acid.	Non saline.	Very low phosphorus throughout. Very low potassium below 13cm.
Batawai	204D, 204E	Rolling to strongly rolling (12-20°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential. Slight soil slip erosion potential.	Never waterlogs.	Soil moisture deficits are never experienced in normal years.	Well drained.	0-15cm clay loam. 15-125cm silty clay loam. 125-150cm+ strongly weathered in situ rock (silt loam).	<125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-150cm strongly acid.	Non saline.	Very low phosphorus throughout. Very low potassium below 15cm.
Batawai	204F, 204G	Moderately steep to steep (21-35°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Moderate debris slide erosion potential.	Never waterlogs.	Soil moisture deficits are never experienced in normal years.	Well drained.	0-120cm silty clay loam. 120-150cm strongly weathered in situ rock (silt loam).	<125cm. Note low subsoil nutrient status.	No surface rock outcrops except in areas of mass movement. No surface stones or boulders.	0-150cm strongly acid.	Non saline.	Very low phosphorus throughout. Very low potassium below 16cm.
Batiki	55	Flat (0°). Few hummocks (<30cm amplitude).	In normal years frequent (5 times per year) surface flooding with water ponding for up to 10 days may occur sometime in the period November to April.	No erosion risk.	Water table at or near the ground surface during the months November to April and rarely drops below 60cm depth in the remaining months.	Soil moisture deficits are never experienced in normal years.	Very poorly drained.	0-30cm silty clay loam. 30-125cm+ clay. Note 'n' value >0.7.	<60cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Not analysed.
Bua	40A, 40B	Flat to undulating (0-7°). Generally smooth microrelief.	Never floods.	Slight past erosion. Moderate sheet and rill erosion potential on slopes >3°.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-17cm friable silty clay loam. 17-49cm firm gravelly clay loam. 49-109cm friable to firm clay loam. 109-149cm friable clay loam.	>125cm. Note very low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. No surface stones or boulders.	0-149cm strongly acid. Note variable charge.	Non saline.	Very low nitrogen and potassium. Possible aluminium toxicity.
Bua	40C	Easy rolling (8-11°). Generally uneven microrelief.	Never floods.	Experienced severe past erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable silty clay loam. 20-60cm firm gravelly clay loam. 60-120cm friable clay loam.	>125cm. Note very low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. Common lag gravels.	0-120cm strongly acid. Note variable charge.	Non saline.	Very low nitrogen and potassium. Possible aluminium toxicity.
Bua	40D, 40E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Experienced severe past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable gravelly clay loam. 20-62cm firm gravelly clay loam. 62-125cm friable clay loam.	>125cm. Note very low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. Common lag gravels.	0-125cm strongly acid. Note variable charge.	Non saline.	Very low nitrogen and potassium. Also, possible aluminium toxicity.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Bucaisau	51	Level or near level (0-1°).	Floods regularly associated with high intensity storms. High water table and slow runoff.	No erosion risk.	Water table at 50cm during months November to April.	Soil moisture deficits are rarely experienced in normal years.	Very poorly drained.	0-28cm firm sticky clay. 28-50cm soft sticky clay. >50cm soft sticky massive clay.	<50cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-50cm moderately acid.	Non saline.	High %BS. Calcium and magnesium medium. Potassium very low.
Bureni	205C	Flat to gently undulating (0-3°). Easy rolling to rolling (8-15°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential on slopes >2° when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-10cm silty clay loam. 10-100cm clay loam. 100-150cm silty clay loam.	<100cm. Iron pan at 100cm.	No surface rock outcrops. No surface stones or boulders.	0-150cm strongly acid.	Non saline.	Very low phosphorus.
Bureni	205D, 205E, 205F	Strongly rolling to steep (16-35°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-12cm silty clay loam. 12-80cm clay loam. 80-125cm silty clay loam.	<80cm. Firm and weakly iron cemented horizon at 80cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus.
Burenitu	121B, 121C	Undulating to easy rolling (4-11°). Generally smooth microrelief.	Never floods.	Slight sheet and rill erosion potential. Potential soil creep where grazed.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-16cm clay. 16-125cm silty clay loam.	<100cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Very low potassium.
Burenitu	121D, 121E	Rolling to strongly rolling (12-20°). Generally uneven microrelief due to soil creep.	Never floods.	Moderate to severe sheet, rill, soil creep and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 60-90 days are experienced sometime in the period May to October.	Well drained.	0-120cm clay loam.	<100cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Potassium very low.
Burenitu	121F, 121G	Moderately steep to steep (21-35°). Terracettes. Uneven microrelief.	Never floods.	Severe sheet, soil creep, debris slide and slump erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 80-90 days are experienced sometime in the period May to October.	Well drained.	0-100cm clay loam.	<100cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Potassium very low.
Cikobia	78A, 78B, 78C	From flat to easy rolling 0-11°). Generally even microrelief in natural state.	Never floods.	Occurrence only on gently sloping land negates any potential erosion.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-22cm clay loam. 22-95cm clay. On coralline rock.	<75-100cm	Surface rock outcrops cover <10% of area. Surface stones and boulders cover 10% of area.	0-50cm slightly alkaline. 50-95cm moderately alkaline.	Non saline.	Very low potassium throughout. Low calcium and magnesium below 50cm. Very low CEC >50cm depth.
Cuku	154D, 154E, 154F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Significant past erosion. Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-12cm firm silty clay. 12-26cm firm silt loam. 26-50cm+ friable weathered in situ rock.	<25cm. Weathered in situ rock at 25cm.	Surface rock outcrops occupy 8% of the area. No surface stones or boulders.	0-26cm slightly acid. 26-50cm+ near neutral.	Non saline.	Very low phosphorus and potassium.
Cuku	154G, 154H	Steep to very steep (26-40°). Uneven microrelief.	Never floods.	Significant past erosion. Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-10cm firm silty clay loam. 10-24cm firm silt loam. 24-50+ friable weathered in situ rock.	<25cm. Weathered in situ rock at 25cm.	Surface rock outcrops occupy 8% of the area. No surface stones or boulders.	0-24cm slightly acid. 24-50cm+ near neutral.	Non saline.	Very low phosphorus and potassium.
Daria	133A	Flat (0-3°). Generally uneven microrelief.	Never floods.	No erosion risk.	In normal years waterlogging below 50cm may be experienced for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are not experienced.	Imperfectly drained.	0-20cm clay loam. 20-125cm clay.	<100cm. Note seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Low BS% and potassium.
Daria	133B, 133C	Undulating and easy rolling (4-11°). Hummocky microrelief.	Never floods.	No erosion risk.	In normal years waterlogging below 70cm may be experienced for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are not experienced.	Imperfectly drained.	0-18cm clay loam. 18-120cm clay.	<100cm. Note seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-120cm strongly acid. Note variable charge.	Non saline.	Low BS% and potassium.
Daria	133D	Rolling (12-15°). Uneven microrelief with hummocky surface.	Never floods.	Slight sheet and rill erosion potential.	In normal years waterlogging below 70cm may be experienced for up to 40 days sometime in the period November to April.	In normal years soil moisture deficits are not experienced.	Imperfectly drained.	0-15cm clay loam. 15-100cm clay.	<100cm. Note seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-100cm strongly acid.	Non saline.	Low BS% and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Dawasamu	14	Flat to near level (0-2°). Smooth microrelief.	Never floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits of 60-70 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-8cm loose sandy loam. 8-120cm loose sand.	>100cm	No surface rock outcrops. No surface stones or boulders.	0-120cm slightly acid.	Non saline.	Low potassium and phosphorus.
Delaibo	202D	Rolling (12-15°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	In normal years waterlogging below 20cm (due to subsoil lateral flow and impermeable substrate) may be experienced for up to 90 days sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-30cm clay. 30-65cm sandy clay. On in situ weathered rock (coarse sand).	<65cm. Note seasonal subsoil waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-30cm slightly acid. 30-65cm near neutral. 65-100cm slightly alkaline.	Non saline.	Low potassium.
Delaibo	202E, 202F	Strongly rolling to moderately steep (16-25°). Smooth microrelief.	Never floods.	Topsoil losses have been experienced in some areas. Moderate sheet and rill erosion potential.	In normal years waterlogging below 30cm (due to subsoil lateral flow and impermeable substrate) may be experienced for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-20cm clay. 20-55cm sandy clay. On in situ weathered rock (coarse sand).	<55cm. Note seasonal subsoil waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-20cm slightly acid. 20-55cm near neutral. 55-125cm slightly alkaline.	Non saline.	Low potassium.
Delaibo	202G, 202H	Steep to very steep (26->35°). Smooth microrelief.	Never floods.	Soil slides in some areas. Moderate to severe sheet and rill erosion potential and moderate debris slide potential.	In normal years waterlogging below 15cm (due to subsoil lateral flow and impermeable substrate) may be experienced for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits of up to 15 days may be experienced sometime in the period May to October.	Moderately well drained.	0-14cm clay. 14-48cm sandy clay. On in situ weathered rock (coarse sand).	<50cm. Note seasonal subsoil waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-31cm slightly acid. 31-125cm slightly alkaline.	Non saline.	Low potassium.
Delaimatai	183C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >90 days are experienced sometime in the period May to October.	Moderately well drained.	0-25cm clay loam. 25-125cm silty clay.	<100cm	No surface rock outcrops. Rare surface stones and boulders.	0-125cm strongly acid.	Non saline.	Phosphorus and potassium very low below 15cm.
Delaimatai	183D, 183E	Rolling to strongly rolling(12-20°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-6cm clay loam. 6-125cm silty clay.	<100cm	Few surface rock outcrops. Few surface boulders.	0-140cm strongly acid.	Non saline.	Phosphorus and potassium very low below 6cm.
Delaimatai	183F, 183G	Moderately steep to steep (21-35°). Generally even microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-10cm silt loam. 10-40cm clay loam. 40-125cm clay.	<100cm. Firm weathered in situ at about 100cm.	Few surface rock outcrops. Few surface boulders.	0-125cm strongly acid.	Non saline.	Phosphorus and potassium very low.
Delainacau	207C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 45 days are experienced sometime in the period May to October.	Well drained.	0-40cm friable sandy clay. 40-70cm firm sandy clay. On weathered tuff.	<70cm. In situ rock at 70cm.	No surface rock outcrops. No surface stones or boulders.	0-40cm moderately acid. 40-70cm strongly acid.	Non saline.	Low phosphorus and potassium.
Delainacau	207D, 207E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 50 days are experienced sometime in the period May to October.	Well drained.	0-12cm friable slightly sandy clay. 12-32cm friable clay. 32-44cm friable very slightly sandy clay. 44-69cm friable to firm sandy clay. On weathered tuff.	<70cm. In situ rock at 70cm.	No surface rock outcrops. No surface stones or boulders.	0-32cm moderately acid. 32-69cm strongly acid.	Non saline.	Low phosphorus and potassium.
Delainacau	207F	Moderately steep (21-25°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Well drained.	0-12cm friable sandy clay. 12-35cm friable clay. 35-70cm firm sandy clay. On weathered tuff.	<70cm. In situ rock at 70cm.	No surface rock outcrops. No surface stones or boulders.	0-70cm strongly acid.	Non saline.	Low phosphorus and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Deuba	13	Flat to near level (0-1°). Weakly expressed ridge and swale microrelief.	In normal years, and because of high water table and topographical position, flooding can occur for up to 10 days on 3-4 occasions sometime in the period November to April.	No erosion risk.	In normal years the water table fluctuates between 60cm (summer) and 90cm (winter) but can be at the surface for short periods.	Soil moisture deficits are never experienced.	Very poorly drained.	0-18cm fine sandy loam. 18-46cm medium sand. 46-115cm coarse sand.	<90cm. Note high seasonal water table and low subsoil nutrient status.	No surface rock outcrops. No surface stones and boulders.	0-18cm moderately acid. 18-46cm strongly acid. 46-69cm moderately acid. 69-89cm strongly acid. 89-115cm moderately acid.	Non saline.	Very low phosphorus and potassium throughout.
Dobuilevu	122B, 122C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 60 days are experienced sometime in the period May to October.	Well drained.	0-50cm clay loam. 50-90cm sandy clay loam. 90-120cm loamy sand (in situ rock).	<90cm. Paralithic contact at about 90cm.	Few surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Low potassium in subsoils.
Dobuilevu	122D, 122E	Rolling to strongly rolling (12-20°). Small terracettes.	Never floods.	Moderate sheet and soil creep erosion potential. Severe slumping potential.	Never waterlogs.	In normal years soil moisture deficits of 60 days are experienced sometime in the period May to October.	Well drained.	0-46cm clay. 46-103cm sandy clay loam. 103-130cm loamy sand (in situ rock).	<100cm. Paralithic contact at about 100cm.	Few surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Low potassium in subsoils.
Dobuilevu	122F, 122G, 122H	Moderately to very steep (21-40°). Terracettes. Uneven microrelief.	Never floods.	Moderate sheet and soil creep erosion potential. Severe slumping potential.	Never waterlogs.	In normal years soil moisture deficits of 80-90 days are experienced sometime in the period May to October.	Well drained.	0-30cm clay. 30-85cm sandy clay. 85-100cm loamy sand (in situ rock).	<85cm. Paralithic contact at about 85cm.	Few surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Low potassium in subsoils.
Dogo	5	Flat to near level (0-1°). Uneven microrelief due to mangrove roots.	Permanently flooded though fluctuating diurnally with the tides.	No erosion risk.	Permanently waterlogged.	Soil moisture deficits are never experienced.	Very poorly drained.	0-12cm humic sandy clay loam. 12-70cm peaty silty clay. 70-130cm fine sandy clay loam. 130-180cm+ very fine sandy clay loam.	0cm. Due to permanent flooding.	No surface rock outcrops. No surface stones or boulders.	0-12cm slightly alkaline. 12-35cm strongly acid. 35-130cm near neutral. 130-150cm slightly alkaline.	Strongly saline.	Low phosphorus.
Dogotuki	156B, 156C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of up to 70 days are experienced sometime during May to October.	Well drained.	0-8cm friable clay loam. 8-28cm friable clay. 28-33cm friable silty clay. On weathered in situ parent material of heavy clay.	<35cm. Strongly weathered in situ rock at 35cm.	Surface rock outcrops cover 3% of the surface. No surface boulders or stones.	Strongly acid.	Non saline.	Low phosphorus and potassium.
Dogotuki	156D, 156E, 156F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Severe to very severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of up to 70 days are experienced sometime during May to October.	Well drained.	0-25cm friable clay loam. 25-50cm friable clay. On weathered in situ parent material of heavy clay.	<50cm. Strongly weathered in situ rock at 50cm.	Surface rock outcrops cover 5% of the surface. No surface boulders or stones.	Strongly acid.	Non saline.	Low phosphorus and potassium.
Drasa	71A	Flat to gently undulating (0-3°). Smooth microrelief.	In normal years and on slopes <2° flooding for up to 3 days duration may occur on 2 occasions sometime in the period November to April.	Slight sheet erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits of up to 100-120 days may be experienced sometime during May to October.	Well drained.	0-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. Few fine surface stones and gravels.	0-30cm extremely acid. 30-75cm strongly acid. 75-125cm slightly acid.	Non saline.	Low nitrogen, very low potassium, low phosphorus.
Drasa	71B	Undulating (4-7°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days may be experienced sometime during May to October.	Well drained.	0-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. Few fine surface stones and gravels.	0-80cm strongly acid. 80-125cm slightly acid.	Non saline.	Very low potassium, phosphorus, and nitrogen.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Drasa	71C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime during May to October.	Well drained.	0-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones.	0-25cm strongly acid. 25-125cm slightly acid.	Non saline.	Very low nitrogen, potassium, and phosphorus status.
Dreketi	4	Flat to near level (0-1°). Uneven microrelief due to reclamation and drainage works.	Artificially drained. Water table still affected by tidal fluctuations. In normal years would suffer 4-5 floods, each lying for 2-3 days sometime in the period November to April.	No erosion risk.	In normal years and due to drainage water table maintained at about 65-70cm. Can experience short duration waterlogging at the surface during flood and spring tide events.	Soil moisture deficits are never experienced.	Very poorly drained.	0-14cm peaty silty clay. 14-72cm clay. 72-95cm silty clay. 95-141cm silty clay loam.	<60cm. Note high water table fluctuating with tides.	No surface rock outcrops. No surface stones or boulders.	0-14cm strongly acid. 14-32cm extremely acid. 32-95cm strongly acid. 95-120cm slightly acid.	Strongly saline.	Low phosphorus. Very low nitrogen below 14cm.
Driti	137B, 137C	Undulating and easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-8cm friable silt loam. 8-30cm friable silty clay loam. 30-45cm firm clay loam. On weathering tuff.	<50cm. In situ tuff at 50cm.	No surface rock outcrops. No surface stones or boulders.	0-45cm moderately acid.	Non saline.	Low phosphorus and potassium.
Driti	137D, 137E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm friable silty clay loam. 25-50cm firm clay loam. On weathering tuff.	<50cm. In situ tuff at 50cm.	No surface rock outcrops. No surface stones or boulders.	0-50cm moderately acid.	Non saline.	Low phosphorus and potassium.
Dulevi	90A	Flat to gently undulating (0-3°). Uneven microrelief.	Never floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-20cm very friable clay loam. 20-80cm very friable sandy clay. 80-120cm friable to firm gravelly clay loam.	>120cm	No surface rock outcrops. No surface stones or boulders.	0-20cm moderately acid. 20-120cm slightly acid.	Non saline.	Low potassium. High phosphate retention.
Dulevi	90B, 90C	Undulating and easy rolling (4-11°). Microrelief forest dimpled.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-18cm very friable clay loam. 18-42cm very friable very sandy clay loam. 42-108cm very friable sandy clay. 108-120cm gravelly clay loam.	>120cm	No surface rock outcrops. No surface stones or boulders.	0-18cm moderately acid. 18-120cm slightly acid.	Non saline	Low potassium. High phosphate retention.
Dulevi	90D, 90E	Rolling and strongly rolling (12-20°). Microrelief forest dimpled.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 40 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-15cm very friable clay loam. 15-70cm very friable sandy clay loam. 70-120cm friable gravelly clay loam.	>120cm	Surface rock outcrops cover 5% of the surface. No surface stones or boulders.	0-15cm moderately acid. 15-120cm slightly acid.	Non saline.	Low potassium. High phosphate retention.
Ekubu	83	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	No erosion hazard.	Can waterlog in the subsoil for up to 30 days sometime in the period November to April.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Well drained.	0-3cm loose pumice grits. 3-18cm friable gravelly clay. On limestone.	<40cm. In situ limestone at 40cm.	Limestone rock outcrops cover 3% of the surface. Few surface boulders.	0-38cm slightly alkaline.	Non saline.	None identified.
Emuri	118A, 118B	From flat to gently undulating to undulating (0-7°). Surface hummocks (Gilgai).	3-4 floods per year (water only) occur sometime in the period November to April.	No erosion risk.	In normal years waterlogging may occur for up to 60 days on slopes <4° sometime in the period November to April.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Poorly drained.	0-110cm clay.	<60cm. Waterlogging at depth during wet season. Smectitic clays inhibit rooting.	No surface rock outcrops. No surface stones or boulders.	0-20cm moderately acid. 20-60cm slightly acid. 60-110cm slightly alkaline.	Non saline.	Very low potassium below 20cm. Very low phosphorus throughout.
Gaigai	136D, 136E	Rolling to strongly rolling (12-20°). Forest dimpled microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-50cm firm clay loam. 50-86cm friable very fine sandy loam. 86-150cm bouldery very fine sandy loam.	>125cm	No surface rock outcrops. Few surface stones or boulders.	0-150cm strongly acid.	Non saline.	Very low phosphorus.
Gaigai	136F, 136G	Moderately steep to very steep (21-35°). Forest dimpled microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential when forest cleared. Moderate debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 5 days are experienced on 2-3 occasions sometime in the period May to October.	Well drained.	0-55cm firm clay loam. 55-92cm friable fine sandy loam. 92-200cm friable bouldery sandy loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-200cm strongly acid.	Non saline.	Very low phosphorus.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Galoa	175B, 175C	Undulating to easy rolling (4-11°). Even microrelief.	Never floods.	Have experienced past soil erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 20-30 days are experienced sometime in the period May to October.	Well drained.	0-12cm friable to firm clay. 12-42cm firm clay. 42-103cm friable clay.	<100cm	No surface rock outcrops. No surface stones or boulders.	0-103cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Galoa	175D, 175E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Have experienced past soil erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 20-30 days are experienced sometime in the period May to October.	Well drained.	0-8cm friable clay loam. 8-35cm firm clay. 35-90cm friable to firm clay.	<100cm	No surface rock outcrops. No surface stones or boulders.	0-90cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Gau	169A, 169B, 169C	Flat to easy rolling (0-11°). Even microrelief.	Very short duration (24 hours) flooding on slopes <2° during the period November to April.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits of <60 days are experienced sometime in the period May to October.	Well drained.	0-40cm friable clay loam. 40-100cm very friable gritty clay.	<100cm	No surface rock outcrops. No surface stones or boulders.	0-100cm moderately acid.	Non saline.	Low phosphorus and potassium.
Gau	169D	Rolling (12-15°).	Never floods.	Slight sheet erosion risk when forest cleared.	Never waterlogs.	In normal years soil moisture deficits of <90 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable clay loam. 20-80cm very friable gritty clay.	<80cm	No surface rock outcrops. No surface stones or boulders.	0-80cm moderately acid.	Non saline.	Very low phosphorus and potassium.
Hafhafu	100B, 100C	Undulating to easy rolling (4-11°). Very uneven microrelief due to protruding rock outcrops and boulders.	Never floods.	Slight sheet erosion potential when cleared of forest and cultivated.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-58cm stony loam. 58-100cm+ stony loamy sand.	<100cm. Profuse (>75%) boulders below 15cm.	Surface rock outcrops cover 10-15% of the area. Surface boulders and stones cover 12-15% of the area.	0-100cm slightly acid.	Non saline.	Potassium very low below 15cm. Very high P retention.
Hafhafu	100D	Rolling (12-15°). Very uneven microrelief due to protruding rock outcrops and boulders.	Never floods.	Moderate sheet erosion potential following forest clearance.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-52cm stony loam. 52-125cm stony loamy sand.	<100cm. Profuse (>75%) boulders below 12cm.	Surface rock outcrops cover 15% of the area. Surface boulders and stones cover 10-12% of the area.	0-125cm slightly acid.	Non saline.	Potassium very low below 12cm. Very high P retention.
Kavula	186E, 186F, 186G, 186H	Strongly rolling to very steep (16-40°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced in the period May to October.	Well drained.	0-37cm friable clay loam. 37-93cm friable silty clay. 93-111cm firm gravelly silty clay.	<100cm. In situ rock at 100cm.	Surface rock outcrops cover 5% of the surface. Surface stones and boulders cover 5% of the surface.	0-37cm moderately acid. 37-111cm strongly acid.	Non saline.	Low in nitrogen and phosphorus.
Kedra	65	Flat to near level (0-1°). Even microrelief.	1 in 20 year return period for floods depositing alluvium. 2 in 1 year return period for other floods.	No erosion risk.	Waterlogs below 60cm for 4 months in the period November to April.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-23cm friable sandy clay loam. 23-40cm firm to friable sandy clay. 40-90cm soft clay.	<60cm. Water table at 60cm during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-90cm moderately acid	Non saline.	Low phosphorus.
Keiyasi	113C	Easy rolling (8-11°). Commonly smooth microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Slight soil slip erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-110 days are experienced sometime in the period May to October.	Well drained.	0-35cm silty clay loam. 35-68cm clay loam. 68-125cm in situ weathered rock (sandy clay loam).	<65cm. Weathered in situ rock at 65cm.	No surface rock outcrops. No surface stones or boulders.	0-21cm strongly acid. 21-125cm slightly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Keiyasi	113D, 113E, 113F, 113G, 113H	Rolling to very steep (12-38°). Uneven microrelief (terracettes).	Never floods.	Severe sheet and rill erosion potential. Moderate soil slip and debris slide potential.	Never waterlogs.	In normal years soil moisture deficits of >110 days are experienced sometime in the period May to October.	Well drained.	0-37cm silty clay loam. 27-65cm clay loam. 65-125cm in situ weathered rock (sandy clay loam).	<65cm. Weathered in situ rock at 65cm.	Surface rock outcrops cover 5-8%. No surface stones or boulders.	0-20cm strongly acid. 20-125cm slightly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Kelikoso	145A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits of 90-100 days are experienced sometime in the period May to October.	Moderately well drained.	0-18cm clay loam. 18-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid.	Non saline.	Very low potassium below 18cm.
Kelikoso	145B	Undulating (4-7°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Moderately well drained.	0-17cm clay loam. 17-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid.	Non saline.	Very low potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Kirikiri	99A	Flat to gently undulating (0-3°). Uneven microrelief due to surface boulders and protruding outcrops.	Never floods.	Very slight sheet erosion potential when cleared of forest and cultivated.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-22cm stony silt loam. 22-50cm stony loam. 50-122cm+ bouldery sandy loam.	<100cm. Boulders abundant below 50cm.	Surface rock outcrops cover 10% of area. Surface boulders cover 5-10% of the area.	0-22cm slightly acid. 22-122cm near neutral.	Non saline.	Potassium very low below 22cm. Very high P retention.
Kirikiri	99B	Undulating (4-7°). Uneven microrelief due to surface boulders and protruding rock outcrops.	Never floods.	Slight sheet erosion potential when cleared of forest and cultivated.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-60cm stony loam. 60-125cm bouldery sandy loam.	<100cm. Boulders abundant below 50cm.	Surface rock outcrops over 12-15% of the area. Surface boulders cover 8-12% of the area.	0-20cm slightly acid. 20-125cm near neutral.	Non saline.	Potassium very low below 20cm. Very high P retention.
Koro	94G, 94H	Steep and very steep (26-40°). Very uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 50 days may be experienced sometime in the period May to October.	Well drained.	0-13cm very friable silty clay. 13-30cm friable silt loam. On weathered in situ basalt.	<50cm. In situ weathered basalt at 50cm.	Rock outcrops cover 15% of the surface. Boulders occupy 20% of the surface.	0-30cm moderately acid.	Non saline.	Very low potassium and nitrogen. High phosphate fixation properties.
Korokadi	42A	Flat to gently undulating (0-3°). Even microrelief.	In normal years floods up to 3-4 days occur on 4-5 occasions during the wet season.	No erosion hazard.	In normal years may waterlog for up to 10 days on 4-5 occasions in the period November to April.	In normal years soil moisture deficits of 130 days are experienced sometime in the period May to October.	Moderately well drained.	0-27cm friable gravelly silty loam. 27-82cm firm gravelly clay loam. 82-129cm friable clay loam. 129-159cm firm gritty clay loam.	>150cm. Note low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. No surface stones or boulders.	0-159cm strongly acid. Variable charge.	Non saline.	Very low nitrogen and potassium. Aluminium toxicity.
Korokadi	42B	Undulating (4-7°). Even microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 130 days are experienced sometime in the period May to October.	Moderately well drained.	0-30cm very friable gritty silt loam. 30-61cm friable gritty fine sandy clay. 61-134cm friable to firm gravelly silt loam. 134-149cm firm gritty silty clay loam.	>150cm. Note low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. Surface fine stones and gravels (iron nodules) cover 20% of the surface.	0-30cm moderately acid. 30-149cm strongly acid.	Non saline.	Very low nitrogen and potassium. Aluminium toxicity.
Koromavu	112E, 112F, 112G, 112H	Strongly rolling to very steep (16-40°). Uneven microrelief with terracettes and small soil slips.	Never floods.	Severe soil creep, sheet, shallow soil slip and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-10cm silt loam. 10-20cm coarse sandy loam. On in situ fractured rock.	<20cm	Surface rock outcrops cover 10-12% of the area. Few surface stones.	0-20cm slightly acid.	Non saline.	Low organic carbon and potassium.
Koroniqala	157B, 157C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable slightly sandy clay. 10-60cm firm clay. On compact strongly weathered parent material of very plastic clay.	<60cm. Weathered in situ parent material at 60cm.	Surface rock outcrops cover 3% of the surface. No surface boulders or stones.	0-60cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium.
Koroniqala	157D, 157E	Rolling to strongly rolling (12-20°).	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Well drained.	0-8cm friable sandy clay loam. 8-50cm firm clay. On strongly weathered in situ rock.	<50cm. Weathered rock at 50cm.	Surface rock outcrops cover 5% of the surface. No surface stones or boulders.	0-50cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium.
Koronivia	44A	Flat to gently undulating (0-3°). Smooth microrelief. Some pugging where grazed.	Never floods.	No erosion risk.	Due to clayey textures and imperfect drainage water may surface pond for short periods (1-2 days) during the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-41cm silt loam. 41-100cm clay loam. 100-130cm silty clay loam.	>100cm. Weathered in situ rock at 100cm.	No surface rock outcrops. No surface stones or boulders.	0-41cm moderately acid. 41-130cm strongly acid.	Non saline.	Potassium very low throughout. Phosphorus low below 18cm.
Koronivia	44B, 44C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-35cm silt loam. 35-90cm clay loam. 90-125cm silty clay loam.	<90cm. Weathered in situ rock at 90cm.	No surface rock outcrops. No surface stones or boulders.	0-35cm moderately acid. 35-125cm strongly acid.	Non saline.	Potassium very low throughout. Phosphorus low below 17cm.
Korotuku	206A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-40cm friable clay loam. 40-110cm firm clay. 110-125cm firm sandy clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm near neutral.	Non saline.	Low nitrogen and potassium. High phosphate retention.

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Korotuku	206B, 206C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-38cm friable to very friable clay loam. 38-107cm friable to firm clay. 107-137cm firm slightly gritty heavy clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-137cm near neutral.	Non saline.	Low nitrogen and potassium. High phosphate retention.
Korovuli	37	Flat to gently undulating (0-3°). Microrelief has slight alluvial ridge and swale.	Never flooded.	No erosion risk.	Due to heavy clay textures profiles below 80cm may experience some short duration waterlogging sometimes during the months of November to April.	In normal years soil moisture deficits are experienced >100 days sometime within the period May to October.	Well drained.	0-125cm silty clay.	>100cm. Nutrient deficiencies below 50cm.	No surface rock outcrops. No surface stones.	0-125cm moderately acid.	Non saline.	Organic carbon is low in topsoil and very low in subsoils. Low %BS at depth. Potassium very low throughout.
Kubuna	190B	Undulating (4-7°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-14cm clay loam. 14-125cm clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium extremely low. Phosphorus and nitrogen low.
Kubuna	190C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-12cm clay loam. 12-125cm clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium extremely low. Phosphorus and nitrogen low.
Kubuna	190D, 190E	Rolling to strongly rolling (12-20°). Smooth microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits 100-120 days are experienced sometime in the period May to October.	Moderately well drained.	0-10cm clay loam. 10-125cm clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium extremely low. Phosphorus and nitrogen low.
Kurukuru	144A	Flat to gently undulating (0-3°). Smooth microrelief.	Floods rarely sometime in the period November to April. Return period 1 in 15 years.	Accumulating site. No erosion risk.	Never waterlogs.	In normal years soil moisture deficits of 90-100 days are experienced sometime in the period May to October.	Well drained.	0-15cm silty clay loam. 15-45cm fine sandy clay loam. 45-55cm silty clay loam. 55-125cm clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm extremely acid.	Non saline.	Potassium low to very low.
Kurukuru	144B, 144C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-10cm clay loam. 10-50cm fine sandy clay loam. 50-125cm silty clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-10cm extremely acid. 10-50cm strongly acid. 50-125cm extremely acid.	Non saline.	Potassium low to very low.
Kurukuru	144D	Rolling (12-15°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-10cm clay loam. 10-60cm fine sandy clay. 60-68cm silty clay loam. 68-125cm silty clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-60cm strongly acid. 60-125cm extremely acid.	Non saline.	Potassium low to very low.
Kuta	209	Flat. Uneven (hummocky) microrelief.	Permanently flooded.	No erosion risk.	Permanently waterlogged.	Never experiences soil moisture deficits.	Very poorly drained.	0-270cm soft weakly decomposed fibrous peat. 270-280cm peaty loamy fine sand.	0cm	No surface rock outcrops. No surface stones or boulders.	0-280cm strongly acid.	Non saline.	Generally low nutrient status.
Labasa	1	Flat to near level (0-1°). Generally smooth microrelief.	In normal years and due to permanent tidal influenced water table infrequent flooding (4-5 times per year) of medium duration (10-12 days) can occur sometime in the period November to April and coinciding with high spring tides.	No erosion risk.	Water table fluctuates from 20cm (summer months) to 70cm (winter months), but can be at the surface during flood events.	Soil moisture deficits are never experienced.	Poorly drained.	0-40cm silty clay. 40-128cm sandy loam. 128-140cm+ very fine sandy loam.	<40cm. Note high water table and salinity plus poor subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-40cm moderately acid. 40-140cm moderately alkaline.	Moderately saline.	Low phosphorus.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Lagilagi	63	Flat to near level (0-1°). Smooth microrelief.	1 in 10 year return period for major floods.	No erosion hazard.	Waterlogged below 75cm depth for up to 90 days during the period November to April.	In normal years soil moisture deficits of up to 100 days are experienced in the period May to October.	Moderately well drained.	0-17cm very friable gritty clay. 17-86cm friable gritty clay. 86-116cm firm gritty clay.	>75cm. Water table at 75cm depth during the wet season.	No surface rock outcrops. No surface stones or boulders.	Strongly acid.	Non saline.	Not analysed.
Lakeba	180D	Rolling (12-15°). Uneven microrelief.	Never floods.	Significant past erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-27cm slightly gritty clay. 27-52cm clay. On strongly weathered in situ rock.	<60cm. Weathered rock at 60cm.	No surface rock outcrops. No surface stones or boulders.	0-66cm moderately acid.	Non saline.	Very low phosphorus, potassium and organic carbon throughout. Exchangeable calcium very low.
Lakeba	180E, 180F	Strongly rolling to moderately steep (16-25°). Uneven microrelief.	Never floods.	Significant past erosion. Very severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-25cm slightly gritty clay. 25-55cm clay. On strongly weathered in situ rock.	<60cm. Weathered rock at 60cm.	Few surface rock outcrops. Few surface stones.	0-70cm moderately acid.	Non saline.	Very low phosphorus, potassium and organic carbon throughout. Exchangeable calcium very low.
Lakeba	180G, 180H	Steep to very steep (26-40°). Uneven microrelief.	Never floods.	Significant past erosion. Very severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-20cm gritty clay. 20-50cm clay. On strongly weathered in situ rock.	>50cm. Weathered rock at 60cm.	Few surface rock outcrops. Few surface stones.	0-60cm moderately acid.	Non saline.	Very low phosphorus, potassium and organic carbon throughout. Exchangeable calcium very low.
Lami	75E, 75F, 75G, 75H	Strongly rolling to very steep (16-40°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are rarely experienced.	Well drained.	0-6cm firm clay loam. 6-25cm firm clay. On cemented in situ rock.	<50cm. In situ rock at 50cm.	Surface rock outcrops cover 12% of the surface. Surface boulders occupy 10% of the surface.	Near neutral.	Non saline.	Possible trace element deficiencies.
Lato	62	Flat to near level (0-1°).	1 in 5 year return period for floods depositing alluvium. 2 in 1 year return period for other floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Excessively drained.	0-90cm friable stony sand.	<100cm	No surface rock outcrops. Surface stones occupy 2% of the surface.	0-90cm strongly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Lau	182B, 182C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Past topsoil loss. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-30cm silty clay loam. 30-80cm silt loam. 80-125cm fine sandy loam (strongly weathered in situ rock).	<80cm. Low nutrient status and weathered rock below 80cm.	No surface rock outcrops. No surface stones or boulders.	0-30cm moderately acid. 30-125cm strongly acid.	Non saline.	Very low potassium and organic carbon below 10 cm depth.
Lau	182D	Rolling (12-15°). Smooth microrelief.	Never floods.	Significant topsoil loss. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-30cm silty clay loam. 30-86cm silt loam. 86-125cm fine sandy loam (strongly weathered in situ rock).	<85cm. Low nutrient status and weathered rock below 85cm.	No surface rock outcrops. Few surface stones.	0-30cm moderately acid. 30-125cm strongly acid.	Non saline.	Very low potassium and organic carbon below 8cm depth.
Lau	182E	Strongly rolling (16-20°). Uneven microrelief.	Never floods.	Severe past soil loss with rill erosion scars evident. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-27cm silty clay loam. 27-95cm silt loam. 95-110cm fine sandy loam. (Strongly weathered in situ rock).	<95cm	No surface rock outcrops. No surface stones or boulders.	0-27cm moderately acid. 27-110cm strongly acid.	Non saline.	Very low potassium and organic carbon below 8cm depth.
Laucala	92B, 92C	Undulating and easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential on slopes >7.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced during the period May to October.	Well drained.	0-15cm friable stony and gravelly loam. 15-75cm friable gravelly loam. On weathering scoria.	<100cm	No surface rock outcrops. Surface stone and gravels occupy 3% of the surface.	0-75cm slightly acid.	Non saline.	Low nitrogen. High phosphate retention.
Laucala	92D, 92E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Have experienced past erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced during the period May to October.	Well drained.	0-65cm friable stony and gravelly loam. On weathering scoria.	<100cm	No surface rock outcrops. Surface stones and gravels occupy 5% of the surface.	0-65cm slightly acid.	Non saline.	Low nitrogen. High phosphate retention.
Lautoka	73	Flat to gently undulating (0-2°). Smooth microrelief.	Infrequently flooded. Return period 1 in 5 years.	No erosion risk.	Subject to short duration (2-3 days). Water logging during November to April. Water table >100cm at all times.	In normal years soil moisture deficits are experienced for 90 days during the months of May to October.	Moderately well drained.	0-80cm clay loam. 80-125cm+ clay.	>100cm. Low available potassium in subsoils.	No surface rock outcrops. No surface stones.	0-30cm slightly acid. 30-125cm moderately acid.	Non saline.	Organic carbon is low in topsoil and very low in subsoils. Potassium is low in topsoil and very low in subsoils.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Lawai	23A, 23B	Flat to undulating (0-7°). Smooth microrelief.	1 in 5 year return period for major floods contributing sediment. Days under water - 2 to 5 days.	Bank erosion adjacent to rivers. Elsewhere an accumulating soil.	Subject to short duration waterlogging only during major flood events. Water table >125cm from surface at all times.	In normal years soil moisture deficits are experienced for >90 days during the months May to October. Shallow rooting crops go under stress.	Well drained.	0-50cm very fine sandy loam. 50-80cm fine sandy loam. 80-100cm loam. 100-150cm fine sandy loam.	>150cm	No surface rock outcrops. No surface stones.	0-150cm near neutral.	Non saline.	Organic matter values very low. Potassium values very low in subsoil.
Ledrutua	208C	Easy rolling (8-11°).	Never floods.	Slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days may occur sometime in the period May to October.	Well drained.	0-45cm silt loam. 45-60cm bouldery silt loam. 65-200cm+ bouldery fine sand.	<65cm. In situ bouldery and gravelly formation at 65cm.	No surface rock outcrops. Few surface boulders and stones.	0-45cm moderately acid. 45-60cm near neutral.	Non saline.	Very low subsoil potassium and phosphorus.
Ledrutua	208D	Rolling (12-15°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-22cm silt loam. 22-37cm stony silty clay loam. 37-65cm bouldery sandy silt loam. 65-200cm+ bouldery sand.	<65cm. In situ bouldery and gravelly formation at 65cm.	No surface rock outcrops. Few surface stones or boulders.	0-37cm moderately acid. 37-65cm near neutral.	Non saline.	Very low phosphorus throughout and very low potassium below 22cm.
Ledrutua	208E, 208F	Strongly rolling to moderately steep (16-25°). Smooth microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime between May to October.	Well drained.	0-20cm silt loam. 20-38cm stony silty clay loam. 38-68cm bouldery sandy silt loam. 68-200cm+ bouldery sand.	<65cm. In situ bouldery and gravelly formation at 65cm.	No surface rock outcrops. Few surface stones and boulders.	0-38cm moderately acid. 38-68cm near neutral.	Non saline.	Very low phosphorus throughout and very low potassium below 20cm.
Ledrutua	208G, 208H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of 40 days are experienced sometime in the period May to October.	Well drained.	0-15cm very friable clay loam. 15-35cm loose clay loam. 35-75cm friable sandy clay. On weathering parent rock.	<75cm. Weathered in situ parent rock at 75cm.	Surface rock outcrops cover 5% of the surface. Surface boulders occupy 2% of the surface.	Moderately acid to near neutral.	Non saline.	Very low phosphorus and potassium throughout.
Lekutu	194C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Experienced past sheet erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days are experienced sometime in the period May to October.	Well drained.	0-8cm silt loam. 8-100cm+ very fine sandy loam.	<25cm. Fine roots penetrate in situ weathered rock at 10cm.	No surface rock outcrops. Many iron coated surface stones (pavement).	0-100cm strongly acid.	Non saline.	Potassium very low.
Lekutu	194D, 194E	Rolling to strongly rolling (12-20°). Even microrelief with stone pavement in some areas.	Never floods.	Experienced past sheet and rill erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm silty clay loam. 10-100cm+ fine sandy loam.	<25cm. In situ weathered rock at 10cm.	No surface rock outcrops. Common iron coated surface stones.	0-100cm strongly acid.	Non saline.	Potassium very low.
Lekutu	194F	Moderately steep (21-25°). Uneven where eroded (rilling). Stone pavement in some places.	Never floods.	Experienced past sheet and rill erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-9cm silty clay loam. 9-100cm+ very fine sandy loam.	<25cm. In situ weathered rock at 10cm.	No surface rock outcrops. Few surface stones and rare boulders.	0-100cm strongly acid.	Non saline.	Potassium very low.
Lewa	221A	Flat to gently undulating (0-3°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of 30-40 days are experienced sometime in the period May to October.	Well drained.	0-30cm friable clay loam. 30-120cm firm clay.	>120cm	Few surface rock outcrops. Surface boulders occupy 2% of the surface.	0-120cm strongly acid.	Non saline.	Very low nitrogen phosphorus and potassium.
Lewa	221B, 221C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Very severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of 40-50 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable clay loam. 20-120cm firm clay.	>120cm	Surface rock outcrops cover 3% of the surface. Surface boulders occupy 3% of the surface.	0-120cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Lewa	221D, 221E, 221F, 221G, 221H	Rolling to very steep (12-39°).	Never floods.	Very severe erosion potential if cultivated.	Never waterlogs.	In normal years soil moisture deficits of 50-60 days experienced sometime in the period May to October.	Well drained.	0-30cm friable clay loam. 30-65cm firm clay on weathered rock.	>65cm	Surface rock outcrops cover 10% of the surface. Surface boulders occupy 5% of the surface.	Strongly acid.	Non saline.	Very low phosphorus, calcium, magnesium and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Lobau	124C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Severe debris slide and debris flow erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 10 days are experienced sometime in the period May to October.	Well drained.	0-18cm silty clay. 18-50cm clay. 50-110cm stony silty clay. 110-140cm+ in situ weathered rock.	<100cm. In situ weathered rock at 100cm.	No surface rock outcrops except in areas of mass movement erosion. No surface stones or boulders.	0-140cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Lobau	124D, 124E, 124F, 124G, 124H	Rolling to very steep (16-40°). Uneven microrelief.	Never floods.	Very severe sheet and rill erosion potential. Very severe debris slide and debris flow erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 10 days are experienced sometime in the period May to October.	Well drained.	0-16cm silty clay loam. 16-60cm clay loam. 60-100cm silty clay. 100-125cm in situ weathered rock.	<100cm. In situ weathered rock at 100cm.	No surface rock outcrops except in areas of mass movement erosion. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Lodoni	168B, 168C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-16cm friable clay loam. 16-100cm firm to friable clay. On firm silty clay (weathered in situ rock).	<100cm. Weathered in situ rock at 100cm.	No surface rock outcrops. No surface stones or boulders.	0-52cm extremely acid. 52-150cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Lodoni	168D, 168E, 168F, 168G, 168H	Rolling to very steep (16-40°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential when forest cleared. Minor risk of soil slips on slopes >15°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-19cm friable clay loam. 19-100cm friable clay. On firm silty clay (weathered in situ rock).	<100cm. Weathered in situ rock at 100cm.	No surface rock outcrops. No surface stones or boulders.	0-19cm extremely acid. 52-125cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Lomaiviti	176C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-92cm clay. 92-125cm strongly weathered in situ rock (sandy clay loam).	<90cm. Weathered in situ rock at 90cm.	Few surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid.	Non saline.	None identified.
Lomaiviti	176D, 176E, 176F	Smooth rolling to moderately steep (12-25°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-92cm clay. 92-125cm strongly weathered in situ rock (sandy clay loam).	<90cm. Weathered in situ rock at about 90cm.	Few surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid.	Non saline.	None identified.
Lomaje	84B, 84C	Undulating and easy rolling (4-11°). Even microrelief.	Never floods.	Moderate sheet and rill erosion potential on slopes >7°.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Well drained.	0-48cm friable loam. 48-120cm very friable loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-120cm slightly acid.	Non saline.	High phosphate retention.
Lomaje	84D, 84E	Rolling and strongly rolling (12-20°). Even microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Well drained.	0-55cm very friable slightly sandy loam. 55-80cm friable loam. 80-110cm very friable loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-110cm slightly acid.	Non saline.	High phosphate retention.
Losa	86B, 86C	Undulating to easy rolling (4-11°). Very uneven microrelief due to boulders and rock outcrops.	Never floods.	Slight to moderate sheet erosion potential when cleared of forest.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-22cm bouldery loam. On massive in situ rock.	<25cm. Un-weathered rock at 20-25cm.	Surface rock outcrops cover 12-15% of area. Surface boulders cover 10-12% of area.	0-25cm slightly acid.	Non saline.	Potassium low. Very high P retention.
Losa	86D	Rolling (12-15°). Very uneven microrelief due to surface boulders and rock outcrops.	Never floods.	Moderate sheet erosion potential following forest clearance.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-25cm bouldery loam.	<25cm. Massive un-weathered rock at 20-25cm.	Surface rock outcrops cover 12-15% of the area. Surface boulders cover 12-15% of the area.	0-25cm slightly acid.	Non saline.	Very high P retention.
Lovonivia	45A	Flat to gently undulating (0-3°). Even microrelief.	Never floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits of up to 150 days are experienced sometime in the period May to October.	Poorly drained.	0-22cm very friable fine sandy loam. 22-31cm firm loamy fine sand. 31-64cm extremely firm loamy sand. 64-76cm friable loamy very fine sand. 76-92cm firm gritty clay. 92-111cm friable gritty clay. 111-141cm very friable clay.	<30cm. Extremely firm weakly cemented horizon at 30cm.	No surface rock outcrops. No surface stones or boulders.	Strongly acid.	Non saline.	Strong nutrient and trace element deficiencies.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Lovonivia	45B	Undulating (4-7°). Even microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 150 days are experienced sometime in the period May to October.	Poorly drained.	0-22cm very friable fine sandy loam. 22-31cm firm loamy fine sand. 31-64cm extremely firm loamy sand. 64-76cm friable loamy very fine sand. 76-92cm firm gritty clay. 92-111cm friable gritty clay. 111-141cm very friable clay.	<30cm. Extremely firm weakly cemented horizon at 30cm depth.	No surface rock outcrops. No surface stones or boulders.	Strongly acid.	Non saline.	Strong nutrient and trace element deficiencies.
Lutu	148C	Easy rolling to rolling (8-15°). Even microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Also potential for soil slips.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-7cm gritty clay loam. 7-20cm loam. 20-55cm clay. 55-155cm silty clay loam.	>125cm. Note very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-155cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium throughout.
Lutu	148D, 148E, 148F, 148G, 148H	Strongly rolling to very steep (16-40°). Generally uneven microrelief.	Never floods.	Severe sheet and rill erosion potential, and moderate soil slip and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-22cm gritty clay loam. 22-60cm clay. 60-125cm silty clay loam.	>125cm. Note very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium throughout.
Macuata	200C	Easy rolling (8-11°). Very uneven microrelief due to surface boulders and active rill erosion.	Never floods.	Current severe erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-15cm gritty clay loam. 15-125cm gritty fine sandy loam.	<20cm. In situ weathered rock at 20cm.	No surface rock outcrops. Surface laterite stones and boulders cover 20% of area.	0-125cm strongly acid.	Non saline.	Potassium very low below 15cm.
Macuata	200D, 200E, 200F, 200G, 200H	Rolling to very steep (16-40°). Very uneven microrelief due to surface boulders and deeply incised rilling.	Never floods.	Current severe rill erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-12cm gritty clay loam. 12-125cm gritty fine sand loam.	<20cm. In situ weathered rock at 20cm.	Surface rock outcrops cover 20% of area. Surface laterite stones and boulders cover 25% of area.	0-125cm strongly acid.	Non saline.	Potassium very low below 12cm.
Mafua	108D, 108E	Rolling to strongly rolling (12-20°). Generally even microrelief.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm clay loam. 40-80cm stony sandy loam. 80-125cm stony coarse sand.	<100cm. Weakly cemented gravels and stones at 95-105cm.	No surface rock outcrops. Few surface stones and rare boulders.	0-50cm near neutral. 50-125cm near neutral.	Non saline.	Extremely high P retention.
Mafua	108F, 108G, 108H	Moderately steep to very steep (21-40°). Generally even microrelief.	Never floods.	Severe sheet, rill and debris slide erosion potential. Never waterlogs.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-35cm clay loam. 35-70cm stony sandy loam. 70-125cm+ stony very coarse sand.	<100cm. Weakly cemented gravels and stones at 95-110cm.	No surface rock outcrops. Few surface stones and rare boulders.	0-9cm moderately acid. 9-40cm slight acid. 40-125cm near neutral.	Non saline.	Extremely high P retention.
Makomako	188B, 188C	Undulating and easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Well drained.	0-35cm very friable clay. 35-120cm friable to firm clay. 120-150cm friable silty clay.	<125cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Low phosphorus and potassium.
Makomako	188D, 188E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Well drained.	0-14cm friable clay. 14-43cm very friable clay. 43-84cm friable clay. 84-111cm friable to firm clay. 111-150cm friable clay.	<125cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Low phosphorus and potassium.
Malolo	149D	Rolling (12-15°). Very uneven microrelief due to rill erosion.	Never floods.	Never waterlogs.	Actively eroding. Very severe sheet and rill erosion potential.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-11cm stony fine sand. 11-70cm stony loamy fine sand. On in situ rock (gritty coarse sand).	<70cm. In situ rock at about 70cm.	Surface rock outcrops cover 5% of area. Surface stones cover 10% of area.	0-11cm strongly acid. 11-90cm slightly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Malolo	149E, 149F	Strongly rolling and moderately steep (16-25°). Very uneven microrelief due to severe rill erosion.	Never floods.	Serious active erosion. Extremely severe sheet, rill and creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-8cm stony fine sand. 8-60cm stony loamy find sand. On in situ rock (stony coarse sand).	<60cm. In situ rock at about 60cm.	Surface rock outcrops cover 12% of area. Surface stones cover 12% of area.	0-8cm strongly acid. 8-80cm moderately acid.	Non saline.	Very low phosphorus, nitrogen and potassium.
Manuka	215D, 215E	Rolling and strongly rolling (12-20°). Very uneven surface.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	Rarely experiences soil moisture deficits.	Well drained.	0-20cm friable stony silt loam. 20-70cm very firm silt loam. 70-85cm firm medium sandy loam. On weathered basalt.	<85cm	Rock outcrops cover 10% of the surface. Boulders occupy 30% of the surface.	0-20cm strongly acid. 20-95cm moderately acid.	Non saline.	Very low nitrogen and potassium. Very high phosphate fixation properties.
Matana	218D, 218E	Rolling and strongly rolling (12-20°). Gently undulating microrelief.	Never floods.	Moderate sheet and fill erosion potential.	Never waterlogs.	Rarely experiences soil moisture deficits.	Well drained.	0-28cm very friable clay loam. 28-76cm friable silty clay loam. 76-103cm friable clay loam.	>100cm	Surface rock outcrops cover 8% of the surface. Surface boulders occupy 3% of the surface.	0-28cm extremely acid. 28-160cm moderately acid.	Non saline.	Very low potassium and nitrogen. Very high phosphate fixation properties.
Matavelo	52	Flat to near level (0-2°). Smooth microrelief.	In normal years flooding for up to 5 days ponded are experienced on 2-3 occasions sometime in the period November to April.	Accumulating soil. No erosion risk.	In normal years waterlogging below 40cm is experienced for up to 60 days sometime during the period November to April.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-20cm friable clay. 20-35cm firm clay. 35-60cm very firm clay. 60-120cm very firm silty clay.	>100cm. Note seasonal high water table.	No surface rock outcrops. No surface stones or boulders.	0-60cm moderately acid.	Non saline.	Very low phosphorus and potassium.
Matawailevu	123A, 123B	From flat to gently undulating to undulating (0-5°). Smooth microrelief.	Rarely floods. Return period 1 in 15 years.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 60 days are experienced at sometime in the period May to October.	Well drained.	0-22cm clay loam. 22-127cm clay.	>130cm	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	None identified.
Melimeli	32	Flat to near level (0-1°). Smooth microrelief.	Due to permanent high watertables flooding can occur for up to 120 days during the months of November to April. Sedimentation floods have a 1 in 100 year return period.	No erosion risk.	In normal years the water table is at (summer months) or never within 30cm of the ground surface.	Soil moisture deficits are rarely experienced.	Ponded.	0-76cm fibrous peat. 76-99cm mucky fibrous peat. 99-154cm muck. 154-168cm clayey muck.	<30cm. Note seasonal high water table and low nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-99cm extremely acid. 99-168cm strongly acid.	Non saline.	Potassium very low below 30cm.
Molamolau	72	Flat to gently undulating (0-3°). Generally smooth microrelief.	1 in 25 year return period for floods depositing alluvium. 1 in 5 year return period for other floods.	No erosion risk.	Can waterlog in the subsoil for up to 30 days sometime in the period November to April.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Imperfectly drained.	0-8cm friable to firm clay. 8-23cm friable clay. 23-100cm firm clay.	<100cm	No surface rock outcrops. No surface stones or boulders.	0-100cm strongly acid.	Non saline.	Very low phosphorus and nitrogen.
Momi	115B, 115C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-80cm firm clay. On weathered tuff.	<85cm. Weathered in situ rock at 80cm.	No surface rock outcrops. No surface stones or boulders.	0-80cm slightly acid.	Non saline.	Very low phosphorus.
Momi	115D, 115E	Rolling to strongly rolling (12-20°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-20cm very firm clay. 20-100cm firm clay. On weathered tuff.	<85cm. Weathered in situ rock at 80cm.	No surface rock outcrops. No surface stones or boulders.	0-100cm slightly acid.	Non saline.	Very low phosphorus.
Momi	115F, 115G, 115H	Moderately steep to very steep (21-40°). Generally even microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Slight to moderate soil slip erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-90cm firm clay. On weathered tuff.	<85cm. Weathered in situ rock at 80cm.	No surface rock outcrops. No surface stones or boulders.	0-90cm slightly acid.	Non saline.	Very low phosphorus.
Monasavu	223D, 223E, 223F, 223G, 223H	Rolling to very steep (12-40°). Uneven.	Never floods.	Very severe sheet, rill and mass movement erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-25cm very friable clay loam. 25-100cm firm clay.	<100cm	Rock outcrops cover about 8% of the surface. Surface boulders occupy 5% of the surface.	0-100cm strongly acid. 100-120cm moderately acid.	Non saline.	Very low nitrogen and phosphorus.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Muainase	21	Flat (0-1°). Smooth microrelief.	Floods depositing minor amounts of sediment have a 1 in 5 year return period.	No erosion risk. Potential lateral corrasion adjacent to river.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-22cm sandy clay loam. 22-52cm clay loam. 52-100cm+ sandy loam.	>150cm	No surface rock outcrops. No surface stones or boulders.	0-100cm slightly acid. 100-125cm near neutral.	Non saline.	Very low potassium throughout.
Nabeka	101C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 20 days may be experienced sometime during the period May to October.	Well drained.	0-9cm very friable silty clay. 9-20cm friable silty clay. 20-200cm firm clay loam.	>125cm	Few surface rock outcrops. Boulders occupy 2% of the surface.	0-9cm strongly acid. 9-80cm moderately acid. 80-200cm slightly acid.	Non saline.	Very low potassium.
Nabeka	101D, 101E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 20 days may be experienced sometime during the period May to October.	Well drained.	0-18cm friable silty clay. 18-125cm firm clay loam.	>125cm	Few surface rock outcrops. Boulders occupy 3% of the surface.	0-18cm strongly acid. 18-125cm moderately acid.	Non saline.	Very low potassium.
Nabiti	193B, 193C	Undulating and easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days are experienced sometime in the period May to October.	Well drained.	0-31cm silty clay loam. 31-65cm clay loam. 65-81 silty clay loam. On strongly weathered in situ rock.	<80cm. Weathered rock at about 80cm.	No surface rock outcrops. Few surface stones.	0-18cm extremely acid. 18-31cm strongly acid. 31-56cm extremely acid. 56-111cm strongly acid.	Non saline.	Potassium low.
Nabiti	193D, 193E	Rolling to strongly rolling (12-20°). Generally smooth microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days are experienced sometime in the period May to October.	Well drained.	0-35cm silty clay loam. 35-70cm clay loam. 70-78cm silty clay loam. On in situ rock.	<75cm. Weathered rock at about 75-80cm.	No surface rock outcrops. Few surface stone and rare boulders.	0-35cm extremely acid. 35-100cm strongly acid.	Non saline.	Potassium low.
Nabuesa	226B, 226C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-120cm very friable clay loam.	<120cm	Few surface rock outcrops. Surface boulders occupy 2% of the surface.	0-120cm strongly acid.	Non saline.	Very low nitrogen, potassium, and phosphorus.
Nabuesa	226D, 226E, 226F, 226G, 226H	Rolling to very steep (12-40°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-125cm very friable clay loam.	<125cm	Surface rock outcrops cover 3% of the surface. Surface boulders occupy 3% of the surface.	0-125cm strongly acid.	Non saline.	Very low nitrogen, potassium and phosphorus.
Nabuono	155F, 155G, 155H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Evidence of past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-20cm very firm gravelly clay. 20-27cm firm clay. 27-37cm friable clay. On weathering tuff.	<50cm. Weathered in situ rock normally at 50cm.	Surface rock outcrops cover 8% of the area. Surface stones and boulders occupy 4% of the surface.	Strongly acid.	Non saline.	Low phosphorus and potassium.
Nacamaki	96B, 96C	Undulating and easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-30cm very friable gravelly sandy clay loam. 30-90cm very friable fine sandy loam. 90-125cm loose gravelly sand.	<125cm	Rock outcrops cover 5% of the surface. Surface boulders occupy 5% of the surface.	0-30cm near neutral. 30-125cm slightly acid.	Non saline.	Low potassium. High phosphate retention.
Nacamaki	96D, 96E	Rolling and strongly rolling (12-20°). Hummocky microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-29cm very friable gravelly fine sandy clay. 29-49cm very friable fine sandy loam. 49-77cm very friable gravelly fine sandy loam. 77-116cm loose gravelly sand.	<125cm	Rock outcrops cover 8% of the surface. Surface boulders occupy 3% of the surface.	0-29cm near neutral. 29-116cm slightly acid.	Non saline.	Low potassium. High phosphate retention.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Nacaugai	106G, 106H	Steep and very steep (26-40°). Very uneven microrelief.	Never floods.	Moderate to severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm very friable gritty clay loam. 30-130cm very friable very stony and bouldery silty clay. 130-160cm very friable gritty silty clay loam.	>125cm	No surface rock outcrops. Boulders occupy 10% of the surface.	0-30cm moderately acid. 30-150cm slightly acid.	Non saline.	Very low phosphorus, potassium and nitrogen. Very high phosphate fixation properties.
Nacokula	64	Flat to near level (0-2°). Even microrelief.	1 in 25 year return period for floods depositing alluvium. 2 in 1 year return period for other floods.	No erosion risk.	Waterlogs below 75cm for 4 months in the period November to April.	In normal years never experiences soil moisture deficits.	Poorly drained.	0-12cm friable to firm gritty clay. 12-80cm+ firm gritty clay.	<75cm. Water table at 75cm during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-80cm strongly acid.	Non saline.	Low phosphorus and potassium.
Nacula	130D, 130E, 130F, 130G, 130H	Rolling to very steep (12-40°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days may be experienced sometime in the period May to October.	Well drained.	0-30cm very friable clay loam. 30-70cm friable clay loam. 70-120cm firm clay.	<100cm. In situ weathered rock at 100cm.	Surface rock outcrops cover 5% of the area. Surface stones and boulders occupy 2% of the surface.	Strongly acid.	Non saline.	None identified.
Nadala	211	Flat to gently undulating (0-3°). Even microrelief.	Never floods.	No erosion hazard.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-45cm friable clay loam. 45-100cm firm clay.	>125cm	No surface rock outcrops. Rare surface boulders.	0-45cm strongly acid. 45-100cm moderately acid.	Non saline.	Very low nitrogen, potassium and phosphorus.
Nadarivatu	224D, 224E, 224F, 224G, 224H	Rolling to very steep (12-40°). Uneven microrelief.	Never floods.	Severe sheet, rill and mass movement potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days may be experienced sometime in the period May to October.	Well drained.	0-25cm very friable clay loam. 25-100cm firm silty clay.	<100cm	Surface rock outcrops cover 20% of the surface. Surface boulders occupy 8% of the surface.	0-140cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Nadawa	151B, 151C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Experienced past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Well drained.	0-10cm firm to friable sandy clay. 10-25cm firm to very sandy clay. On weathered marl.	<25cm. Weathered in situ pumiceous marl at 25cm.	Few rock outcrops. No surface stones or boulders.	0-25cm slightly acid.	Non saline.	Low phosphorus and nitrogen.
Nadawa	151D, 151E	Rolling to strongly rolling (12-20°). Generally uneven microrelief.	Never floods.	Experienced past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 30 days are experienced sometime in the period May to October.	Well drained.	0-10cm firm sandy clay. 10-22cm firm sandy clay. On weathered marl.	<25cm. Weathered in situ pumiceous marl at 25cm.	Few surface rock outcrops. No surface stones or boulders.	0-22cm slightly acid.	Non saline.	Low phosphorus and nitrogen.
Nadi	36A, 36B, 36C	Flat to easy rolling (0-11°). Smooth microrelief.	Never flooded.	Many areas with a long history of sugar cane cultivation have experienced moderate topsoil losses by sheet erosion. Moderate erosion potential for slopes <2°.	Never waterlogged.	In normal years soil moisture deficits are experienced >120 days during the period May to October.	Well drained.	0-60cm sandy clay loam. 60-100cm sandy loam. 100-150cm+ sandy clay loam.	>150cm. Where machine cultivated a plough pan commonly develops.	No surface rock outcrops. No surface stones. Rare coral gravel (relict fertiliser).	0-30cm moderately acid. 30-150cm near neutral.	Non saline.	Organic carbon % very low throughout. Calcium low, and magnesium and potassium values very low. Very low CEC and high CRC.
Nadi	36D	Rolling (12-15°). Smooth microrelief.	Never flooded.	Many areas with a long history of sugar cane cultivation have experienced severe topsoil losses by sheet and rill erosion. Severe erosion potential for slopes >2°.	Never waterlogged.	In normal years soil moisture deficits are experienced >120 days during the period May to October.	Well drained.	0-70cm sandy clay loam. 70-110cm sandy loam. 110-150cm+ sandy clay loam.	>150cm. Where machine cultivated a plough pan commonly develops.	No surface rock outcrops. No surface stones.	0-40cm moderately acid. 40-150cm near neutral.	Non saline.	Organic carbon % very low throughout. Calcium low, and magnesium and potassium values very low. Very low CEC and high CRC.
Nadranu	210	Flat to near level (0-2°). Hummocky microrelief.	Almost continuously flooded with the water table at or near the surface for most of the year.	No erosion hazard.	Continuously waterlogged.	Never experiences soil moisture deficits.	Very poorly drained.	0-25cm soft mucky peat. 25-75cm very soft peaty muck. 75-300cm soft peat.	<50cm. Water table at 50cm during the dry season.	No surface rock outcrops. No surface stones or boulders.	Very strongly acid.	Non saline.	Low calcium magnesium and potassium. Very low BS%.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Nadrau	213	Flat to gently undulating (0-3°). Generally uneven microrelief.	1 in 20 year return period for floods depositing sediment. 2 in 1 year return period for other floods.	No erosion hazard.	Commonly waterlogs below 75cm for short periods sometime in the months November to April.	In normal years never experiences soil moisture deficits.	Imperfectly drained.	0-10cm firm clay loam. 10-35cm firm clay. 35-65cm very firm clay. 65-120cm very firm silty clay.	>100cm. Note very firm consistence below 50cm depth.	No surface rock outcrops. No surface stones or boulders.	Slightly acid.	Non saline.	None identified.
Nadroga	114C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-11cm gritty clay loam. 11-25cm stony clay loam. 25-35cm stony silt loam. On massive in situ rock.	<35cm. Extremely firm weakly weathered in situ rock at 35cm.	No surface rock outcrops. Few surface stones.	0-11cm strongly acid. 11-35cm moderately acid. 35-55cm slightly acid.	Non saline.	Very low phosphorus.
Nadroga	114D, 114E, 114F	Rolling to moderately steep (16-25°). Generally even microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Slight to moderate soil slip and shallow debris slide potential	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-20cm gritty clay. 20-40cm stony silt loam. On massive in situ rock.	<35cm. Weakly weathered in situ rock at 35cm.	No surface rock outcrops. Few surface stones.	0-10cm strongly acid. 11-40cm moderate acid. 40-60cm slightly acid.	Non saline.	Very low phosphorus.
Nadroga	114G, 114H	Steep to very steep (26-39°). Uneven microrelief (terracettes).	Never floods.	Severe sheet and rill erosion potential. Moderate soil and shallow debris slide potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-23cm gritty clay loam. 23-35cm stony silt loam. On massive in situ rock.	<35cm. Weakly weathered in situ rock at 35cm.	Surface rock outcrops cover 5-8%. Few surface stones.	0-35cm moderately acid. 35-60cm slightly acid.	Non saline.	Very low phosphorus.
Nadruka	56	Flat to gently undulating (0-3°). Commonly smooth microrelief. Shrinkage cracks common in winter months.	Infrequent (2-3 per year) short duration (3-4 days) floods occur in normal years sometime between November and April. Sedimentation floods have a 1 in 3 year return period.	Accumulating soil. No erosion risk.	Water table fluctuates between 20cm depth (summer months) and 100cm depth (winter months).	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-100cm clay.	<100cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	Moderately acid.	Non saline.	Very low potassium.
Naduru	25	Flat to gently undulating (0-3°). Smooth microrelief.	Floods depositing sediment have a 1 in 50 year return period. Floods (water only) have a 1 in 5 years return period.	No erosion risk.	Waterlogging below 125cm occurs in most years sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-30cm silty clay loam. 30-52cm clay loam. 52-125cm silty clay loam.	<125cm. Note, water table at 125cm during part of the wet season.	No surface rock outcrops. No surface stones or boulders.	0-52cm moderately acid. 52-125cm slightly acid.	Non saline.	Very low potassium throughout.
Naevuevu	82A, 82B, 82C	Flat to gently undulating to easy rolling (0-11°). Uneven microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-30cm friable clay. 30-120cm firm clay. On limestone.	<120cm. Limestone at 120cm.	Surface rock outcrops cover 12% of the surface. Surface boulders occupy 2% of the surface.	Near neutral.	Non saline.	Possible trace element deficiencies.
Naevuevu	82D, 82E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable clay. 20-90cm firm clay. On limestone.	<90cm. Limestone at 90cm.	Surface rock outcrops cover 15% of the surface. Surface boulders occupy 5% of the surface.	Near neutral.	Non saline.	Possible trace element deficiencies.
Naicola	166D, 166E, 166F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Moderate soil erosion potential when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm firm silty clay loam. 30-60cm friable clay. 60-140cm friable to firm clay.	<125cm	No surface rock outcrops. Surface boulders cover up to 3% of area.	0-140cm strongly acid.	Non saline.	Very low potassium and phosphorus.
Naicola	166G, 166H	Steep to very steep (26-40°). Uneven microrelief.	Never floods.	Moderate to severe soil erosion potential when forest cleared.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm firm clay loam. 25-55cm friable clay. 55-125cm friable to firm bouldery clay.	<125cm	No surface rock outcrops. Surface boulders cover up to 2% of area.	0-125cm strongly acid.	Non saline.	Very low potassium and phosphorus.
Nairai	179C	Easy rolling (8-11°). Uneven microrelief due to erosion.	Never floods.	Very severe sheet and rill erosion potential. Badly eroded in 25% of the area.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-13cm gritty clay loam. 13-52cm clay loam. 52-140cm clay.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-13cm moderately acid. 13-140cm strongly acid.	Non saline.	Very low phosphorus and potassium. Calcium, magnesium, CEC and %BS values very low below 13cm.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Nairai	179D, 179E, 179F, 179G, 179H	Rolling to very steep (16-38°). Uneven microrelief due to erosion.	Never floods.	Very severe sheet, rill and shallow debris slide erosion potential. Badly eroded in 35% of the area.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-12cm gritty clay loam. 12-30cm clay loam. 30-125cm clay.	>125	No surface rock outcrops. No surface stones or boulders.	0-12cm moderately acid. 12-125cm strongly acid.	Non saline.	Very low phosphorus and potassium. Calcium, magnesium, CEC and %BS values very low below 12cm.
Naitata	214E, 214F, 214G	Strongly rolling to steep (16-35°). Very uneven microrelief. Very bouldery surface.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-10cm firm slightly peaty silt loam. 10-45cm very firm silty clay loam. 45-65cm friable gravelly and gritty loam. On basalt boulders.	>65cm	Rock outcrops cover 20% of the surface. Boulders occupy 30% of the surface.	0-45cm slightly acid. 45-64cm moderately acid.	Non saline.	Very low nitrogen and potassium. Very high phosphate fixation properties.
Nakavika	174A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-10cm very friable clay loam. 10-40cm firm gravelly clay loam. 40-120cm very firm stony clay.	<125cm. Note very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-40cm strongly acid. 40-120cm extremely acid.	Non saline.	Very low phosphorus.
Nakavika	174B, 174C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-12cm very friable clay loam. 12-50cm firm gravelly clay. 50-125cm firm stony clay.	<125cm. Note very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-12cm extremely acid. 12-125cm strongly acid.	Non saline.	Very low phosphorus.
Nakavika	174D, 174E, 174F	Rolling to moderately steep (12-25°). Generally uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-15cm very friable clay loam. 15-125cm firm gravelly clay.	<125cm. Note very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-15cm extremely acid. 15-125cm strongly acid.	Non saline.	Very low phosphorus.
Nakelo	18	Flat to near level (0-1°) Normally smooth microrelief.	In normal years infrequent (4-5 per year) short duration (3-4 days) flooding can occur following high intensity storms sometime in the period November to April.	No erosion risk.	The water table is at the surface after heavy rain but falls to 100cm in dry periods. The water table fluctuates rapidly but can be at 30cm for up to 30 days during the period November to April.	Soil moisture deficits are never experienced.	Poorly drained.	0-46cm sandy clay loam. 46-76cm sandy clay. 76-152cm sandy loam. 152-203cm sand.	<100cm. Note high seasonal water table and low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-46cm moderately acid. 46-112cm strongly acid. 112-152cm extremely acid.	Non saline.	Potassium very low.
Nalotu	111C	Easy rolling (8-11°). Even microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Well drained.	0-45cm firm sandy heavy clay. On weathered tuff.	<50cm. In situ rock at 50cm depth.	No surface rock outcrops. No surface stones or boulders.	0-45cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Nalotu	111D, 111E	Rolling and strongly rolling (12-20°). Even microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Well drained.	0-15cm firm to friable sandy heavy clay. 15-40cm firm sandy heavy clay. On weathered tuff.	<50cm. In situ rock at 50cm.	No surface rock outcrops. No surface stones or boulders.	0-40cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Namaka	35	Flat to undulating (0-3°). Uneven microrelief due to cultivation furrows.	Never floods.	Moderate to severe sheet and rill erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-48cm friable gritty clay. 48-125cm+ firm sandy clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-28cm moderately alkaline. 28-48cm slightly alkaline. 48-125cm near neutral.	Non saline.	Very low potassium and phosphorus.
Namalata	184B, 184C	Undulating to easy rolling phase (4-11°). Even microrelief.	Never floods.	Slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits >90 days are experienced sometime in the period May to October.	Well drained.	0-23cm clay. 23-50cm slightly gritty clay. 50-110cm clay loam. On in situ weathered rock.	<110cm.	No surface rock outcrops. No surface stones or boulders.	0-110cm moderately acid.	Non saline.	Very low organic carbon values.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Namalata	184D	Rolling (12-15°). Even microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >90 days are experienced sometime in the period May to October.	Well drained.	0-45cm gritty clay. 45-100cm clay loam. On weathered in situ rock.	<100cm	No surface rock outcrops. No surface stones or boulders.	0-100cm moderately acid.	Non saline.	Very low organic carbon values.
Namalata	184E	Strongly rolling (16-20°). Even microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-15cm gritty clay. 15-95cm clay loam. On weathered in situ rock.	<95cm	No surface rock outcrops. No surface stones or boulders.	0-95cm moderately acid.	Non saline.	Very low organic carbon values.
Namara	139B, 139C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-12cm firm to friable sandy clay loam. 12-45cm very firm sandy clay. 45-70cm firm clay. On in situ rock.	<65cm. In situ rock at 65cm.	No surface rock outcrops. No surface stones or boulders.	0-70cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Namara	139D, 139E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-10cm friable sandy clay loam. 10-30cm firm sandy clay. 30-60cm firm clay. On in situ rock.	<65cm. In situ rock at 65cm.	Surface rock outcrops cover 5% of the surface. Few surface stones.	0-60cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Namatiu	138B, 138C	Undulating to easy rolling (4-11°).	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-52cm firm sandy clay. 52-80cm very firm stony clay.	<80cm. In situ weakly weathered rock at 80cm.	Few surface rock outcrops. Surface stones occupy 2% of the surface.	0-80cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Namatiu	138D, 138E	Rolling to strongly rolling (12-20°).	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-17cm friable to firm sandy clay. 17-42cm firm sandy clay. 42-82cm very firm heavy stony clay. On hard rock.	<80cm. In situ weakly weathered rock at 80cm.	Surface rock outcrops cover 3% of the surface. Surface boulders occupy 3% of the surface.	0-82cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Namosau	39A, 39B	Flat to undulating (0-7°). Even microrelief.	Never floods.	Moderate sheet and wind erosion potential particularly when in fallow or row crops.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-16cm silty clay loam. 16-64cm clay loam. 64-67cm iron pan. 67-89cm clay loam. 89-92cm iron pan. 92-125cm silty clay loam.	<65cm. Discontinuous iron pan at this depth.	No surface rock outcrops. Rare surface boulder.	0-125cm strongly acid.	Non saline.	Very low nitrogen and potassium. Possible aluminium toxicity.
Namosau	39C	Easy rolling (8-11°). Even microrelief.	Never floods.	Very severe rill, sheet and wind erosion potential particularly when in fallow or row crops.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-30cm silty clay loam. 30-80cm clay loam. 80-83cm iron pan. 83-93cm clay loam. 93-96cm iron pan. 96-125cm silty clay loam.	<80cm. Discontinuous iron pan at this depth.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid. Note variable charge.	Non saline.	Very low nitrogen and potassium. Possible aluminium toxicity.
Namosi	158C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-33cm friable clay. 33-80cm firm silty clay loam. On rock.	<80cm. Hard unweathered in situ rock at 80cm.	Surface rock outcrops cover 8% of the area. Few surface boulders.	0-80cm moderately acid.	Non saline.	Very low phosphorus and potassium.
Namosi	158D, 158E, 158F, 158G, 158H	Rolling to very steep (12-40°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-21cm friable clay loam. 21-40cm friable clay. 40-88cm friable to firm silty clay. 88-110cm firm fine sandy clay. On rock.	<100cm. Hard unweathered in situ rock at 100cm.	Surface rock outcrops cover 20% of the area. No surface stones or boulders.	0-110cm moderately acid.	Non saline.	Very low phosphorus and very low potassium below 21cm.
Namuana	134D, 134E, 134F, 134G	Rolling to steep (12-35°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable to firm fine sandy clay. 10-28cm firm to friable clay. 28-118cm friable slightly sandy clay.	<100cm. Weathered in situ rock at 100cm.	Surface rock outcrops cover 9% of the area. Surface stones and boulders occupy 3% of the surface.	0-118cm moderately acid.	Non saline.	Low nitrogen and phosphorus.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Nanukuloa	107B, 107C	Undulating to easy rolling (4-11°).	Never floods.	Slight to moderate potential of sheet erosion under cultivation.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-15cm friable sticky clay. 15-30cm friable sticky clay on firm gritty clay.	<45cm	Surface rock outcrops cover less than 2% of area. Surface boulders cover 5% of area.	Moderately acid.	Non saline.	Very high %BS, calcium medium, potassium low.
Nanukuloa	107D, 107E, 107F, 107G	Rolling to steep (12-35°).	Never floods.	Severe sheet and rill erosion potential where vegetative cover removed.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable sticky gritty clay. 10-25cm friable sticky gritty clay on strongly weathered rock.	<35cm	Surface rock outcrops cover 5-10% of area. Surface boulders cover 10% of area.	Moderately acid.	Non saline.	Very high %BS, calcium medium, potassium low.
Naqalotu	117F, 117G	Moderately steep and steep (21-35°). Uneven surface.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Well drained.	0-8cm friable stony sandy clay. 8-46cm firm stony sandy clay. On weathered sandy marl.	<50cm. Weathered in situ marl at 50cm.	Rock outcrops cover 15% of the surface. Stones occupy 2% of the surface.	Near neutral.	Non saline.	Low phosphorus and potassium.
Naqilai	67	Flat to near level (0-1°). Smooth microrelief.	1 in 25 year return period for floods depositing alluvium. 1 in 2 year return period for other floods.	No erosion hazard.	Waterlogs below 50cm for up to 6 months during the period November to April.	In normal years soil moisture deficits are never experienced.	Very poorly drained.	0-15cm firm to friable clay. 15-52cm very firm clay. On soft clay.	<50cm. Water table at or about 50cm.	No surface rock outcrops. No surface stones or boulders.	0-52cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Narayawa	160C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-20cm sandy loam. 20-70cm coarse sandy loam. 70-125cm coarse sand.	<70cm. Strongly weathered in situ rock between 70-80cm.	No surface rock outcrops. No surface stones or boulders.	0-10cm moderately acid. 10-125cm strongly acid.	Non saline.	Potassium very low below 20cm.
Narayawa	160D, 160E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm sandy loam. 30-70cm coarse sandy loam. 70-125cm coarse sand.	<70cm. Strongly weathered in situ rock between 70-80cm.	No surface rock outcrops. No surface stones or boulders.	0-10cm moderately acid. 10-125cm strongly acid.	Non saline.	Potassium very low below 30cm.
Narayawa	160F, 160G, 160H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential. Some rotational slumps on slopes >25°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm sandy loam. 25-56cm loamy coarse sand. 56-125cm coarse sand.	<50cm. Strongly weathered rock between 50-70cm.	No surface rock outcrops. No surface stones or boulders.	0-7cm moderately acid. 70-100cm strongly acid.	Non saline.	Potassium very low below 25cm.
Narewa	50	Flat to near level (0-2°). Uneven (gilgai) microrelief).	In normal years infrequent (2-3 per year) surface floods that may pond for up to 5 days are experienced sometime in the period November to April.	Accumulating soil. No erosion risk.	In normal years waterlogging below 50cm depth and for up to 90 days occurs sometime in the period November to April.	In normal years soil moisture deficits of 30-60 days in the upper 75cm are experienced sometime in the period May to October.	Poorly drained.	0-63cm firm clay. 63-95cm soft clay.	50-75cm. Note seasonal high water table.	No surface rock outcrops. No surface stones or boulders.	0-95cm slightly acid.	Non saline.	Very low phosphorus and potassium.
Nasau	105F, 105G, 105H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Have experienced severe past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Well drained.	0-9cm very friable silty clay loam. 9-15cm very friable silty clay. 15-45cm friable silty clay. 45-70cm firm clay loam.	<70cm. In situ basalt rock at 70cm.	Surface rock outcrops cover 8% of the surface. Surface boulders occupy 5% of the surface.	0-45cm moderately acid. 45-70cm slightly acid.	Non saline.	Low phosphorus and potassium. Moderate phosphate retention.
Nasegai	38A, 38B	Flat to undulating (0-7°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm firm clay loam. 25-53cm very firm clay. 53-86cm firm clay loam. 86-125cm+ very firm weathered in situ rock.	<90cm. Weathered in situ rock at about 90cm.	No surface rock outcrops. No surface stones or boulders.	0-86cm extremely acid.	Non saline.	Very low phosphorus and potassium.
Nasegai	38C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-28cm friable to firm clay loam. 28-60cm firm clay. 60-80cm firm clay loam. 80-125cm very firm weathered in situ rock.	<80cm. Weathered rock at about 80cm.	No surface rock outcrops. No surface stones or boulders.	0-80cm extremely acid.	Non saline.	Very low phosphorus and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Naselesele	20	Flat to near level (0-1°). Generally smooth but surface hummocks where windthrow has occurred.	Never floods.	During hurricanes may experience minor scouring. Accretion of new sediment more significant at these times.	Never waterlogs. Water table >150cm depth.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-30cm loose loamy sand. 30-60cm loose coarse sand. 60-100cm+ loose stony and gravelly coarse sand.	>100cm. Note subsoil nutrient deficiencies.	No surface rock outcrops. No surface stones or boulders.	0-100cm slightly alkaline.	Non saline.	Very low nitrogen, phosphorus and potassium.
Nasou	70A	Flat to gently undulating (0-3°). Smooth microrelief.	In normal years and on slopes <2° flooding (water only) for up to 3 days duration may occur on 2 occasions sometime in the period November to April.	Very slight sheet erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days may be experienced sometime in the period May to October.	Well drained.	0-25cm clay loam. 25-50cm gritty silt loam. 50-55cm silt loam. 55-69 gritty silt loam. 90-125cm gritty clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Nitrogen and phosphorus low. Potassium extremely low.
Nasou	70B	Undulating (4-7°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days may be experienced sometime in the period May to October.	Well drained.	0-9cm clay loam. 9-19cm gritty clay. 19-42cm gritty silt loam. 42-45cm silt loam. 45-77cm gritty silt loam. 77-79cm silt loam. 79-125cm gritty clay loam.	<125cm. Note low subsoil nutrient status.	No surface rock outcrops. Few fine surface gravels.	0-125cm strongly acid.	Non saline.	Nitrogen and phosphorus low. Potassium extremely low.
Nasou	70C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days may be experienced sometime in the period May to October.	Well drained.	0-20cm clay loam. 20-40cm gritty silt loam. 40-45cm silt loam. 45-125cm gritty clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. Few fine surface stones and gravels.	0-125cm strongly acid.	Non saline.	Nitrogen and phosphorus low. Potassium extremely low.
Nauluvatu	159D, 159E, 159F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Slight debris slide potential on slopes >20°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-7cm friable loam. 7-79cm friable clay loam. On weakly weathered in situ rock.	<80cm. Hard in situ rock at 80cm.	Rock outcrops cover 30% of area. Few surface stones and boulders.	0-79cm moderately acid.	Non saline.	Low phosphorus and very low potassium below 7cm.
Nauluvatu	159G, 159H	Steep to very steep (26-42°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Moderate debris slide potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-5cm friable silty clay loam. 5-60cm friable clay loam. On weakly weathered in situ rock.	<60cm. Hard in situ rock at 60cm.	Rock outcrops cover 35-40% of area. Few surface stones and boulders.	0-60cm moderately acid.	Non saline.	Low phosphorus and very low potassium below 5cm.
Nausori	31	Flat to near level (0-2°). Commonly smooth microrelief but hummocky when overlying peat at depth.	Due to near permanent high water table throughout the year surface flooding can occur for >200 days. 1 in 25 year return period for floods depositing sediment.	Accumulating soil. No erosion risk.	In normal years the water table fluctuates from at the surface (summer) to 50cm (winter) but where drained to below 100cm in winter.	In normal years soil moisture deficits are never experienced.	Very poorly drained.	0-16cm clay loam. 16-28cm silty clay loam. 28-93cm clay loam. 93-118cm fine sandy clay.	<50cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-28cm strongly acid. 28-93cm moderately acid. 93-110cm strongly acid.	Non saline.	Low potassium.
Navai	212A, 212B	Flat to undulating (0-7°). Smooth microrelief.	1 in 20 year return period for floods depositing sediment. 1 in 2 year return period for other floods.	No erosion hazard.	Never waterlogs.	In normal years never experiences soil moisture deficits.	Well drained.	0-35cm very friable clay loam. 35-95cm friable clay loam. 95-120cm firm clay.	>120cm	No surface rock outcrops. No surface stones or boulders.	Slightly acid.	Non saline.	Low phosphorus.
Navava	177A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Very slight sheet erosion potential on slopes >1°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-60cm clay. 60-100cm fine sandy clay. On weathered in situ rock (coarse sandy loam).	<100cm. Weathered in situ rock at about 100-110cm.	Few surface rock outcrops. No surface stones or boulders.	0-20cm slightly acid. 20-100cm near neutral. 100-125cm slightly alkaline.	Non saline.	Very low potassium below 10cm.
Navava	177B, 177C	Undulating and easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential where vegetative cover removed.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-70cm clay. 70-102cm fine sandy clay. On weathered in situ rock (coarse sandy loam).	<100cm. Weathered in situ rock at about 100cm.	Few surface rock outcrops. No surface stones or boulders.	0-25cm slightly acid. 25-102cm near neutral. 102-129cm slightly alkaline.	Non saline.	Very low potassium below 9cm.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Navava	177D, 177E	Rolling and strongly rolling (12-20°). Generally even microrelief.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-60cm clay. 60-91cm sandy clay. 91-123cm coarse sandy clay loam. On weathered in situ rock (coarse sandy loam).	<120cm. Weathered in situ rock between 120-130cm.	Few surface rock outcrops. Rare surface boulders.	0-31cm slightly acid. 31-60cm near neutral. 60-180cm slightly alkaline.	Non saline.	Very low potassium below 7cm.
Navava	177F, 177G, 177H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Active mass movement in some areas. Very severe sheet, rill and soil creep erosion potential. Moderate debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-10cm clay loam. 10-70cm clay. 70-100cm fine sandy clay loam. On weathered in situ rock (medium sandy loam).	<100cm. Weathered in situ rock at about 100cm.	Few surface rock outcrops. Rare surface boulders.	0-20cm slightly acid. 20-70cm near neutral. 70-110cm slightly alkaline.	Non saline.	Very low potassium below 10cm.
Navua	29	Flat to gently undulating (0-3°). Smooth microrelief.	1 in 2 years return period for floods comprising water only. During such events water could lie for up to 7 days. 1 in 25 year return period for floods depositing sediment.	Accumulating soil. No erosion risk.	In normal years the water table fluctuates between 40cm (summer) and 120cm (winter).	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-20cm silt loam. 20-33cm silty clay loam. 33-49cm silt loam. 49-64cm silty clay loam. 64-143cm clay loam.	<100cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-93cm moderately acid. 93-143cm slightly acid.	Non saline.	Very low potassium throughout.
Navunikodi	60	Flat to near level (0-2°). Smooth microrelief.	1 in 100 year return period for floods depositing sediment. 1 in 5 year return period for other floods.	No erosion hazard.	May waterlog for short periods below 75cm sometime during the wet season.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm friable sandy clay loam. 40-60cm friable stony sandy clay. 60-100cm friable to firm slightly stony sandy clay.	>100cm	No surface rock outcrops. Few surface stones.	0-100cm strongly acid.	Non saline.	Low phosphorus and potassium.
Nawai	187B, 187C	Undulating to easy rolling (4-11°). Surface cracks in the dry season. Minor surface hummocks.	Never floods.	Very slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-60cm clay loam. 60-120cm fine sandy clay loam.	<120cm. Vertic properties severely restrict rooting during the dry season.	No surface rock outcrops. No surface stones or boulders.	0-14cm moderately acid. 14-120cm near neutral.	Non saline.	Potassium low. Organic carbon very low in subsoils.
Nawai	187D	Rolling (12-15°). Even microrelief. Surface cracks in the dry season.	Never floods.	Slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Moderately well drained.	0-70cm clay loam. 70-100cm fine sandy clay loam.	<100cm. Vertic properties severely restrict rooting during the dry season.	No surface rock outcrops. No surface stones or boulders.	0-12cm slightly acid. 12-100cm near neutral.	Non saline.	Potassium low. Organic carbon very low in subsoils.
Naweni	203A	Flat to gently undulating (0-3°). Smooth microrelief.	Infrequent (1-2 times per season) short duration (1-2 days) overflow flooding may be experienced sometime in the period November to April.	Slight sheet and rill erosion potential if vegetative cover removed.	In normal years waterlogging below 25cm (due to subsoil lateral flow and landscape position) may be experienced for up to 90 days sometime in the period November to April.	In normal years soil moisture deficits are not experienced.	Poorly drained.	0-10cm sandy clay loam. 10-54cm clay loam. 54-82cm sandy clay loam. 82-120cm+ clay loam.	<100cm. Note seasonal subsoil waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-10cm near neutral. 10-120cm slightly alkaline. 160-180cm moderately alkaline.	Non saline.	Potassium very low.
Naweni	203B, 203C	Undulating to easy rolling (4-11°). Smooth microrelief.	Infrequent (once per season) short duration (1-2 days) overflow flooding may be experienced sometime in the period November to April.	Moderate sheet and rill erosion potential if vegetative cover removed.	In normal years waterlogging below 50cm (due to subsoil lateral flow and landscape position) may be experienced for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are not experienced.	Poorly drained.	0-60cm clay loam. 60-90cm sandy loam. 90-125cm+ fine sandy clay loam.	<100cm. Note seasonal subsoil waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-12cm near neutral. 12-125cm slightly alkaline.	Non saline.	Potassium very low.
Nayau	81	Flat to gently undulating (0-3°). Smooth.	Never floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Well drained.	0-14cm friable loamy clay. 14-59cm very friable clay. On hard limestone.	<60cm. Hard in situ coralline limestone at 60cm.	Limestone surface rock outcrops cover 3% of the surface. Boulders occupy 3% of the surface.	0-14cm near neutral. 14-59cm slightly alkaline.	Non saline.	Low phosphorus and potassium. Possible trace element imbalance.
Nika	54	Flat to gently undulating (0-3°). Surface hummocks (gilgai).	3-4 flood events each year (water only) occur within the period November to April.	No erosion risk.	In normal years waterlogging can occur for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits of 100 days are experienced sometime in the months May to October.	Poorly drained.	0-80cm clay loam. 80-125cm fine sandy clay loam.	<80cm. Waterlogging at depth in wet season. Smectitic clays inhibit rooting.	No surface rock outcrops. No surface stones.	0-20cm slightly acid. 20-80cm near neutral. 80-125cm slightly alkaline.	Non saline.	Low potassium throughout. Very low organic carbon below 20cm.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Nuku	6	Flat to gently undulating (0-2°). Smooth flat microrelief.	Never flooded. Subject to wave encroachment during severe storm events.	In general no erosion risk. Subject to some wave scouring during severe storm events in places.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-10cm loamy clay. 10-109cm+ coarse sand.	>105cm. Note, low nutrient status below 10cm.	No surface rock outcrops. Few surface coral stones.	0-10cm moderately alkaline. 10-109cm strongly alkaline.	Non saline.	Very low potassium throughout. Available phosphorus, organic carbon and nitrogen very low below 10cm depth.
Nukudamu	141A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Experienced past topsoil loss. Moderate sheet and rill erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-15cm clay loam. 15-82cm sandy clay loam. 82-125cm+ clay loam.	<125cm	No surface rock outcrops. No surface stones and boulders.	0-15cm extremely acid. 15-125cm strongly acid.	Non saline.	Phosphorus very low. Potassium low to very low.
Nukudamu	141B, 141C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Experienced past topsoil loss. Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-13cm clay loam. 13-79cm sandy clay loam. 79-125cm+ clay loam.	<125cm	No surface rock outcrops. No surface stones and boulders.	0-13cm extremely acid. 13-125cm strongly acid.	Non saline.	Phosphorus very low. Potassium low to very low.
Nukudamu	141D	Rolling (12-15°). Smooth microrelief and uneven in areas that have experienced rill erosion.	Never floods.	Experienced sheet and rill erosion in some areas. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-12cm clay loam. 12-65cm sandy clay loam. 65-125cm+ clay loam.	<125cm	No surface rock outcrops. No surface stones and boulders.	0-125cm strongly acid.	Non saline.	Phosphorus very low. Potassium very low.
Nukusa	142B, 142C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-25cm firm sandy clay. 25-80cm friable sandy loam. 80-120cm friable loamy sand.	<120cm	No surface rock outcrops. No surface stones or boulders.	Strongly acid.	Non saline.	Potassium and phosphorus very low.
Nukusa	142D, 142E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Very severe sheet and rill erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm firm sandy clay loam. 10-30cm very firm sandy clay. 30-60cm very friable sandy loam. 60-90cm friable loam. 90-120cm very friable loamy sand.	<120cm	No surface rock outcrops. No surface stones or boulders.	Strongly acid.	Non saline.	Potassium and phosphorus very low.
Ogea	79	Flat to near level (0-2°). Smooth microrelief.	Never floods.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-12cm loose slightly bouldery gritty and sandy loam. 12-17cm very friable stony sandy loam. 17-167cm very friable fine sandy clay loam.	>150cm	Limestone surface rock outcrops occupy 10% of the area. Few surface stones and boulders.	0-17cm slightly alkaline.	Non saline.	Potassium very low.
Ono	89A	Flat to gently undulation (0-3°). Smooth microrelief.	Never floods.	Very slight sheet erosion potential on the 2-3° slopes only.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm heavy silt loam. 25-125cm loam	>125cm	Few surface rock outcrops. Few surface stones.	0-12cm moderately acid. 12-60cm slightly acid. 60-125cm moderately acid.	Non saline.	Potassium very low below 12cm. Nitrogen very low below 25cm. Extremely high P retention.
Ono	89B	Undulating (4-7°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-22cm silt loam. 22-125cm loam.	>125cm	Few surface rock outcrops. Few surface stones and rare boulders.	0-125cm slightly acid.	Non saline.	Potassium very low below 13cm. Nitrogen very low below 22cm. Extremely high P retention.
Qalinaolo	227A, 227B, 227C	Undulating to easy rolling (0-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential on slopes >7°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-18cm very friable clay loam. 18-70cm friable clay. 70-120cm very firm silty clay.	<120cm. Note very firm consistence below 70cm.	No surface rock outcrops. Surface boulders occupy 3% of the surface.	Moderately acid.	Non saline.	Potassium and phosphorus very low.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Qaributa	17	Flat to near level (0-1°). Hummocky microrelief.	As the water table is at or near the ground surface for most of the year surface flooding is experienced for >180 days in normal years.	No erosion risk.	In normal years the water table is at or near the ground surface.	Soil moisture deficits are never experienced.	Very poorly drained.	0-53cm peat. 53-77cm clay loam. 77-100cm sandy loam. 100-122cm medium to coarse sand.	0cm. Due to permanent water table at or near the surface.	No surface rock outcrops. No surface stones or boulders.	0-30cm strongly acid. 30-53cm moderately acid. 53-77cm extremely acid. 77-100cm slightly alkaline. 100-122cm moderately acid.	Non saline.	Very low potassium below 30cm.
Qeleni	104C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-22cm firm silty clay loam. 22-125cm firm clay loam.	>125cm	No surface rock outcrops. Few surface boulders.	0-21cm moderately acid. 22-125cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium. Possible aluminium toxicity.
Qeleni	104D, 104E	Rolling and strongly rolling (12-20°). Teracettes.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-21cm very firm silty clay loam. 21-220cm firm clay loam. 220-450cm friable to firm silt loam.	>125cm	Few surface rock outcrops. Few surface boulders.	0-21cm moderately acid. 21-160cm strongly acid.	Non saline.	Very low phosphorus, nitrogen and potassium. Possible aluminium toxicity.
Rana	16	Flat to gently undulating (0-3°).	Surface floods >50 days due to topographical position and seasonal high water table.	No erosion risk.	In normal years water table is at or near the ground surface.	Soil moisture deficits are never experienced.	Very poorly drained.	0-120cm very friable peaty fine sandy loam. >120cm loose coarse sand.	>160cm	No surface rock outcrops or surface boulders.	Strongly acid.	Non saline.	Nitrogen, potassium and phosphorus levels low.
Rauriko	152F, 152G, 152H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Have suffered past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 60 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable sandy clay loam. 20-44cm friable sandy clay. 44-66cm friable clay. 66-110cm weathered in situ rock.	<70cm. Strongly weathered in situ rock at 70cm.	Surface rock outcrops cover 8% of the surface. Surface boulders occupy 3% of the surface.	0-20cm moderately acid. 20-44cm slightly acid. 44-110cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Ravilevu	97G, 97H	Steep to very steep (26-40°).	Never floods.	Very severe sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-16cm firm clay loam. 16-90cm very firm stony and bouldery clay.	<100cm	Rock outcrops cover 20% of the surface. Boulders occupy 10% of the surface.	0-90cm moderately acid.	Non saline.	Very low potassium.
Raviravi	178B, 178C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Has experienced past erosion. Moderate sheet erosion on slopes >1°.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days occur sometime in the period May to October.	Well drained.	0-13cm silty clay loam. 13-61cm clay loam. 61-125cm silty clay loam.	<125cm	No surface rock outcrops. No surface stones.	0-13cm strongly acid. 13-125cm extremely acid.	Non saline.	Potassium, phosphorus and nitrogen very low.
Raviravi	178D, 178E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Evidence of past sheet erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm silty clay loam. 10-70cm clay. 70-125cm silty clay loam.	<125cm	No surface rock outcrops. No surface boulder, few iron coated surface stones.	0-70cm strongly acid. 70-125cm extremely acid.	Non saline.	Phosphorus, potassium and nitrogen very low.
Raviravi	178F, 178G	Moderately steep to steep (21-35°). Uneven microrelief.	Never floods.	Severe past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-5cm clay loam. 5-60cm clay. 60-100cm silty clay loam. On weathered in situ rock.	<100cm. Weathered in situ rock at 100cm.	No surface rock outcrops. Few surface stones, no surface boulders.	0-60cm strongly acid. 60-100cm extremely acid.	Non saline.	Phosphorus, potassium and nitrogen very low.
Rawiti	58	Flat to gently undulating (0-3°). Slight alluvial ridge and swale microrelief.	Floods (water only) on average twice sometime in the period November to April. Flood sedimentation events have a 1 in 15 year return period.	Some lateral stream bank corrasion. Otherwise no erosion potential. Accumulating soil.	Water table fluctuates from 50cm depth (summer months) to 150cm depth (winter months).	In normal years soil moisture deficits of up to 30-40 days are experienced sometime in the period May to October.	Imperfectly drained.	0-15cm silty clay. 15-21cm clay. 21-29cm silt loam. 29-37cm clay loam. 37-125cm+ clay.	<125cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium very low throughout.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Reree	91A	Flat to gently undulating (0-3°). Even microrelief.	Never floods.	Slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-19cm silt loam. 19-82cm sandy loam. 82-125cm gravelly very coarse sand.	<80cm. Profuse weathered scoria gravels at about 80cm.	Few surface rock outcrops. Few surface stones.	0-42cm near neutral. 42-125cm slightly acid.	Non saline.	Very low nitrogen below 42cm. Potassium very low below 19cm. Extremely high P retention.
Reree	91B	Undulating (4-7°). Even microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-18cm silt loam. 18-70cm sandy loam. 70-125cm gravelly very coarse sand.	<70cm. Profuse (>75%) weathered scoria gravels at 70cm.	Few surface rock outcrops. Few surface stones.	0-40cm near neutral. 40-125cm slightly acid.	Non saline.	Potassium very low below 18cm. Extremely high P retention.
Rewa	22	Flat to gently undulating (0-3°). Smooth microrelief.	Floods depositing sediment have a 1 in 10 year return period. Floods (water only) have a 1 in 2 year return period.	No erosion risk.	Waterlogging below 125cm occurs in most years sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Well drained.	0-106cm silty clay loam. 106-126cm silt loam.	<125cm. Note, water table at 125cm during part of the wet season.	No surface rock outcrops. No surface stones or boulders.	0-28cm moderately acid. 28-126cm slightly acid.	Non saline.	Very low potassium throughout.
Rewasa	196B, 196C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable to firm clay. 20-62cm firm clay. 62-100cm extremely firm weathered in situ rock (sandy loam).	<65cm. Weathered in situ rock at 65cm.	Surface rock outcrops occupy 6% of the area. Common surface boulders.	0-20cm moderately acid. 20-100cm slightly acid.	Non saline.	Phosphorus very low.
Rewasa	196D, 196E	Rolling to strongly rolling (12-20°). Generally uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Well drained.	0-22cm friable clay. 22-65cm firm clay. 65-125cm very firm weathered in situ rock (sandy loam).	<65cm. Weathered in situ rock at 65cm.	Surface rock outcrops occupy 10% of the area. Common surface boulders.	0-22cm moderately acid. 22-125cm slightly acid.	Non saline.	Phosphorus very low.
Roroa	109D, 109E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm fine sandy loam. 30-75cm gravelly coarse loamy sand. On indurated tuff.	<75cm. Cemented tuff between 75-100cm.	No surface rock outcrops. Rare surface stones.	Slightly acid.	Non saline.	Phosphorus and potassium very low.
Roroa	109F, 109G, 109H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Very severe sheet, rill and debris slide erosion potential. Debris slides are recognised.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-16cm gravelly loamy very coarse sand. 23-60cm very coarse sand. On indurated tuff.	<60cm. Cemented tuff between 60-100cm.	No surface rock outcrops. Few surface stones.	Slightly acid.	Non saline.	Phosphorus and potassium very low.
Rukuruku	201B, 201C	Undulating and easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days are experienced sometime in the period May to October.	Well drained.	0-125cm clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Phosphorus very low.
Rukuruku	201D	Rolling (12-15°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 90-120 days are experienced sometime in the period May to October.	Well drained.	0-125cm clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Phosphorus very low.
Sabeto	116C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Have experienced severe past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-20cm friable to firm clay. 20-48cm firm stony clay. On weakly weathered marl.	<50cm. Weathering in situ marl at 50cm.	Rock outcrops cover 12% of the surface. Stones cover 3% of the surface.	0-48cm slightly acid.	Non saline.	Low nitrogen.
Sabeto	116D, 116E, 116F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Have experienced severe past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Well drained.	0-18cm friable to firm clay. 18-43cm firm stony clay. On weakly weathered marl.	<50cm. Weathering in situ marl at 50cm.	Rock outcrops cover 15% of the surface. Stones cover 2% of the surface.	0-43cm slightly acid.	Non saline.	Low nitrogen.
Saliadrau	61	Flat to near level (0-2°). Slightly undulating microrelief.	Floods depositing sediment have a 1 in 10 year return period. Floods (water only) have a 1 in 2 year return period. Water lies for 2-3 days.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-12cm loamy fine sand. 12-30cm silt loam. 30-45cm loam. 45-70cm loamy sand. 70-84cm silt loam. 84-125cm loamy sand.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-30cm strongly acid. 30-125cm moderately acid.	Non saline.	Very low nitrogen and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Salialailai	219G, 219H	Steep and very steep (26-40°). Very uneven microrelief.	Never floods.	Very severe sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-15cm firm slightly peaty silt loam. 15-40cm friable silty clay loam. On basalt flow rock.	<50cm. Weakly weathered in situ rock at 50cm.	Surface rock outcrops cover 15% of the surface. Surface boulders occupy 10% of the surface.	0-15cm strongly acid. 15-40cm moderately acid.	Non saline.	Very low nitrogen and potassium. Very high phosphate fixation properties.
Samabula	110A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	No erosion risk.	In normal years waterlogging for up to 5 days duration may occur on 3-5 occasions sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Well drained.	0-5cm firm clay. 5-20cm friable stony clay. 20-30cm friable bouldery clay. On in situ marl.	<30cm. Weakly weathered in situ rock at 30cm.	No surface rock outcrops. No surface stones or boulders.	0-5cm near neutral. 5-20cm slightly alkaline. 20-30cm moderately alkaline.	Non saline.	None identified.
Samabula	110B, 110C	Undulating to rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-35cm firm clay. 35-45cm friable stony clay. On in situ marl.	<45cm. Weakly weathered in situ rock at 45cm.	No surface rock outcrops. No surface stones or boulders.	0-7cm near neutral. 7-35cm slightly alkaline. 35-45cm moderately alkaline.	Non saline.	None identified.
Samabula	110D, 110E, 110F, 110G	Rolling to steep (12-35°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-10cm firm clay. 10-45cm friable clay. On in situ marl.	<45cm. Weakly weathered in situ rock at 45cm.	Few surface rock outcrops. No surface stones or boulders.	0-10cm near neutral. 10-45cm slightly alkaline.	Non saline.	None identified.
Sarowaqa	135F, 135G, 135H	Moderately steep to very steep (21-40°). Uneven microrelief.	Never floods.	Evidence of past erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable to firm sandy clay. 10-75cm friable clay. On firm clay.	<75cm. Weathered in situ parent rock at 75cm.	Surface rock outcrops cover 8% of the surface. Surface stones and boulders occupy 4% of the surface.	0-10cm moderately acid. 10-75cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Saunaka	34A	Flat to gently undulating (0-3°). Smooth microrelief.	In normal years infrequent (1-2 times per year) short duration (1-2 days) surface flooding and ponding may be experienced sometime in the period November to April.	Moderate sheet and rill erosion potential on slope >1°.	In normal years waterlogging below 30cm may occur for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits of 60 days are experienced sometime in the period May to October.	Imperfectly drained.	0-30cm loamy sand. 30-125cm+ clay.	>125cm. Note low subsoil nutrient status and seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low potassium, phosphorus, and nitrogen.
Saunaka	34B	Undulating (4-7°). Smooth microrelief.	In normal years isolated ponding for up to 1-2 days may occur sometime in the period November to April.	Severe sheet and rill erosion potential.	In normal years waterlogging below 70cm may occur for up to 40 days sometime in the period November to April.	In normal years soil moisture deficits of up to 90 days are experienced sometime in the period May to October.	Imperfectly drained.	0-25cm loamy sand. 25-125cm+ clay.	>125cm. Note low subsoil nutrient status and seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low potassium, phosphorus, and nitrogen.
Savudrodro	161D, 161E, 161F, 161G	Rolling to steep (12-35°). Uneven microrelief.	Never floods.	Very severe sheet, rill and mass movement erosion potential. Have experienced past sheet erosion.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-8cm friable sandy clay loam. 8-40cm very firm sandy clay. 40-120cm firm sandy clay.	<100cm. Weathered in situ rock at 100cm.	Surface rock outcrops cover 5% of the surface. Surface boulders occupy 5% of the surface.	Strongly acid.	Non saline.	Calcium, magnesium and potassium low.
Sawakasa	48	Flat to near level (0-2°). Even microrelief.	1 in 10 year return period for floods depositing small amounts of fresh alluvium. 1 in 2 year return period for other floods.	No erosion hazard.	In normal years may waterlog below 75cm for up to 60 days during the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-30cm friable clay loam. 30-70cm firm clay loam. 70-120cm firm clay.	<100cm	No surface rock outcrops. No surface stones or boulders.	Slightly acid.	Non saline.	Phosphorus low.
Saweni	53	Flat to near level (0-2°). Uneven microrelief due to vertic properties.	In normal years flooding for up to 5 days are experienced on 2-3 occasions sometime in the period November to April.	Accumulating soil. No erosion risk.	In normal years waterlogging below 50cm is experienced for up to 60 days sometime during the period November to April.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-20cm very firm heavy clay. 20-45cm extremely firm clay. 45-120cm extremely firm silty clay.	<120cm. Note seasonal high water table.	No surface rock outcrops. No surface stones or boulders.	0-45cm slightly acid. 45-100cm slightly alkaline.	Non saline.	Very low phosphorus and potassium.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Seatura	172D, 172E	Rolling to strongly rolling (12-20°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential following forest clearance. Slight soil slip and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-15cm friable humic clay loam. 15-70cm firm stony clay. 70-125cm firm stony silty clay.	<120cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-15cm strongly acid. 15-125cm moderately acid.	Non saline.	Very low phosphorus. Very low potassium below 15cm.
Seatura	172F, 172G, 172H	Moderately steep to very steep (21-40°). Hummocky microrelief.	Never floods.	Moderate to severe sheet and roll erosion potential. Moderate soil slip and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-16cm friable humic clay loam. 16-65cm firm stony clay loam. 65-125cm firm stony silt loam.	<120cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-16cm strongly acid. 16-125cm moderately acid.	Non saline.	Very low phosphorus values.
Serea	46	Near flat (0-2°). Smooth microrelief.	Floods depositing sediment have a 1 in 10 year return period. Floods (water only) have a 1 in 2 year return period. Water lies for 2-3 days.	No erosion risk. Potential lateral corrasion adjacent to river.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-6cm loamy fine sand. 6-17cm fine sand. 17-92cm loamy very fine sand. 92-150cm fine sand.	<150cm	No surface rock outcrops. No surface stones or boulders.	0-6cm slightly alkaline. 6-17cm near neutral. 17-250cm slightly acid.	Non saline.	Very low nitrogen throughout.
Serua	128E, 128F	Strongly rolling to moderately steep (16-26°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential. Severe debris slide and soil slip erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm silty clay loam. 40-60cm silty clay. 60-125cm clay.	<125cm. Strongly weathered in situ rock at 125cm.	No surface rock outcrops except in areas of mass movement. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Phosphorus very low. Potassium and nitrogen very low below 10cm.
Serua	128G, 128H	Steep to very steep (27-40°). Hummocky microrelief.	Never floods.	Very severe sheet and rill erosion potential. Very severe debris slide and soil slip erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-8cm clay loam. 8-43cm silty clay loam. 43-65cm silty clay. 65-125cm clay.	<125cm. Strongly weathered in situ rock at 125cm.	No surface rock outcrops except in areas of mass movement. No surface stones or boulders.	0-8cm moderately acid. 8-125cm strongly acid.	Non saline.	Phosphorus very low. Potassium and nitrogen very low below 8cm.
Sigatoka	27	Flat to gently undulating (0-1°). Smooth microrelief.	1 in 10 year return period for major floods contributing minor amounts of sediment. Days under water 4 to 7.	No serious erosion. Slight wind potential where structures have broken down. A slowly accumulating site.	Subject to short duration waterlogging during periods of low frequency major flood events. Water table >125cm from surface at all times.	In normal years soil moisture deficits are experienced for >30 days during the months May to October.	Well drained.	0-25cm clay loam. 25-35cm silt loam. 35-100cm clay loam. >100cm fine sandy clay loam.	>150cm	No surface rock outcrops. No surface stones.	0-150cm slightly acid.	Non saline.	Low organic carbon values. Low potassium values in subsoils.
Solevu	171B, 171C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-50cm firm clay. On weathered in situ basalt.	<50cm. Weathered in situ rock at 50cm.	Few surface rock outcrops. Surface boulders cover 2% of the area.	0-70cm strongly acid.	Non saline.	Potassium low.
Solevu	171D	Rolling (12-15°). Uneven microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-55cm firm clay. On weathered in situ basalt.	<50cm. Weathered in situ rock at 50cm.	Surface rock outcrops cover 10% of the area. Surface boulders cover 2% of the area.	0-65cm strongly acid.	Non saline.	Potassium low.
Solevu	171E, 171F	Strongly rolling to moderately steep (16-25°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-18cm friable clay. 18-60cm firm clay. On weathered in situ basalt.	<60cm. Weathered in situ rock at 60cm.	Surface rocks cover 15% of the area. Few surface boulders.	0-70cm strongly acid.	Non saline.	Potassium low.
Soqulu	217G, 217H	Steep and very steep (26-40°). Very uneven microrelief.	Never floods.	Very severe sheet and debris slide erosion potential.	Never waterlogs.	In normal years never experiences soil moisture deficits.	Somewhat excessively drained.	0-12cm soft peaty silt loam. 12-38cm friable peaty silt loam. 38-57cm firm gravelly and gritty loam. 57-70cm friable loamy fine sandy gravel. 70-150cm weathered in situ scoria.	<75cm. Compact scoria at 75cm.	No surface rock outcrops. Surface boulders occupy 10% of the surface.	0-38cm moderately acid. 38-70cm slightly acid.	Non saline.	Very low nitrogen and potassium. Very high phosphate fixation.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Soso	3	Flat to near level (0-1°). Commonly hummocky microrelief.	Water table permanently high and fluctuates with the tides. Not flooded above 30-50cm during normal high tide. Major flooding relates to spring tides and major storm events.	No erosion risk.	In normal years the soil is waterlogged permanently below about 40cm though the water fluctuates daily with the tides.	In normal years soil moisture deficits are never experienced.	Very poorly drained.	0-8cm peaty silty clay. 8-67cm clay. 67-95cm silty clay. 95-142cm silty clay loam. 142cm+ loamy fine sand.	<40cm. Note high water table and low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-44cm extremely acid. 44-67cm strongly acid. 67-95cm moderately acid. 95-160cm slightly acid.	Moderately saline.	Low phosphorus. Very low nitrogen below 8cm.
Sote	126B, 126C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-22cm clay loam. 22-125cm clay.	<65cm. Strongly weathered in situ rock between 65 and 75cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium very low below 13cm.
Sote	126D, 126E, 126F, 126G	Rolling to steep (12-35°). Uneven microrelief.	Never floods.	Moderate sheet, rill, soil creep and terracette (under grazing regime) erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm clay loam. 40-125cm clay.	<70cm. Strongly weathered in situ rock between 70-75cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium very low below 18cm.
Suva	119B, 119C	Undulating and easy rolling (4-11°). Smooth microrelief.	Never floods.	Very slight sheet erosion potential on slopes >7°.	Never waterlogs.	In normal years soil moisture deficits are not experienced.	Well drained.	0-35cm friable to firm clay. 35-75cm firm clay. On weathering marl.	<75cm. In situ marl (paralithic contact) at 75cm.	No surface rock outcrops. No surface stones or boulders.	0-35cm slightly acid. 35-75cm near neutral.	Non saline.	Low nitrogen, phosphorus and potassium.
Tabaka	103C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Very severe sheet erosion potential.	Due to continuous heavy rainfall can waterlog for short periods.	In normal years soil moisture deficits are never experienced.	Well drained.	0-72cm friable clay. 72-125cm very friable fine sandy loam.	<125cm	Few surface rock outcrops. Boulders occupy 3% of the surface.	0-15cm extremely acid. 15-125cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Tabaka	103D, 103E	Rolling and strongly rolling (12-20°). Uneven microrelief.	Never floods.	Very severe sheet erosion potential.	Due to continuous heavy rainfall can waterlog for short periods.	In normal years soil moisture deficits are never experienced.	Well drained.	0-12cm friable clay. 12-60cm friable loamy clay. 60-90cm loose loamy sand.	<100cm	Surface rock outcrops cover 10% of the surface. Boulders occupy 5% of the surface.	0-12cm extremely acid. 12-90cm strongly acid.	Non saline.	Very low phosphorus and potassium.
Tabia	189A, 189B, 189C	Flat to gently undulating to easy rolling (0-11°). Slightly hummocky microrelief.	Sedimentation has occurred in the past, but infrequent now. Occasional flooding (with water lying 2-3 days) on slopes <2° may occur 2-3 times annually sometime in the period November to April.	Slight sheet erosion potential on slopes >3° when cultivated..	Waterlogging may occur 2-3 times in wet season on slopes <3°.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-28cm clay. 29-43cm clay loam. 43-51cm silt loam. 51-69cm fine sandy clay loam. 69-125cm clay loam.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid.	Non saline.	Potassium very low throughout. Calcium and magnesium very low in subsoils. %BS low to very low.
Tabuquto	165A, 165B	Flat to gently undulating to undulating (0-7°). Smooth microrelief.	Never floods.	Have experienced severe past soil erosion. Have moderate wind, sheet and minor rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-12cm clay loam. 12-60cm clay. 60-75cm sandy clay loam. On fractured in situ rock.	<75cm	No surface rock outcrops. No surface stones.	0-12cm slightly acid. 12-75cm moderately acid.	Non saline.	Calcium and potassium low in topsoil and very low below 12cm.
Tabuquto	165C	Easy rolling (8-11°). Generally even microrelief. Some unevenness in areas of windthrow.	Never floods.	Have experienced severe past soil erosion. Have moderate to severe wind, sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-9cm clay loam. 9-55cm clay. 55-85cm fine sandy clay loam. On fractured in situ rock.	<85 cm	No surface rock outcrops. No surface stones.	0-9cm slightly acid. 9-85cm moderately acid.	Non saline.	Calcium and potassium low in topsoil and very low below 12cm.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Tabuquto	165D	Rolling (12-15°). Terracetted and generally uneven microrelief.	Never floods.	Have experienced severe past erosion and soil losses. Very severe wind, sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-15cm clay loam. 15-65cm clay. 65-95cm sandy clay loam. On in situ fractured rock.	<85cm	Surface rock outcrops cover 5% of area. Surface stones cover 2% of area.	0-15cm slightly acid. 15-95cm moderately acid.	Non saline.	Calcium and potassium low in topsoil and very low below 15cm.
Tacilevu	8	Flat to gently undulating (0-1°). Hummocky microrelief due to windthrow..	Never flooded. Subject to wave encroachment during severe storm events.	Subject to minor scouring by waves in some places during severe storm events.	Perched water table. In normal years waterlogging may occur for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-46cm shelly sandy loam. 46-81cm stony sandy loam. 81-100cm stony coarse sand. On cemented beach rock.	<100cm. Wet season subsoil waterlogging and low nutrient status below 16cm.	No surface rock outcrops. Few surface coral stones.	0-16cm moderately alkaline. 16-100cm strongly alkaline.	Non saline.	Available phosphorus and potassium very low. Organic carbon and nitrogen very low below 16cm.
Tagimaucia	220A, 220B	Flat to undulating (0-7°). Uneven.	Never floods.	No erosion risk.	Commonly waterlogs for part of the year below 50cm depth.	Never experiences soil moisture deficits.	Well drained.	0-2cm friable slightly sandy clay loam. 2-25cm firm clay loam. 25-90cm soft slightly gravelly clay.	<50cm. Normally wet below 50cm.	No surface rock outcrops. No surface boulders and stones.	0-25cm strongly acid. 25-90cm moderately acid.	Non saline.	Very low potassium and nitrogen. Very high phosphate fixation.
Tailevu	170D, 170E	Rolling to strongly rolling (12-20°). Generally uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-15cm friable silty clay loam. 15-90cm very firm clay. 90-140cm in situ coarse angular basalt rubble.	<90cm. In situ rock at 90cm. Note low subsoil nutrient status.	No surface rock outcrops. Few surface boulders.	0-140cm strongly acid.	Non saline.	Very low phosphorus. Very low potassium and nitrogen below 15cm.
Tailevu	170F, 170G	Moderately steep to steep (21-35°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm friable clay loam. 40-90cm firm clay. 90-120cm bouldery clay (in situ weathering rock).	<90cm. In situ rock at 90cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface boulder or stones.	0-120cm strongly acid.	Non saline.	Very low phosphorus. Very low potassium and nitrogen below 17cm.
Talacagi	66	Flat to near level (0-2°). Smooth microrelief.	Floods depositing sediment have a 1 in 20 year return period. Other floods have a 1 in 2 year return period.	Accumulating site. No erosion risk.	In normal years water perches over the compact subsoil for up to 90 days sometime in the period November to April.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Poorly drained.	0-18cm very friable sandy loam. 18-36cm friable to firm sandy loam. 36-102cm compact firm clay loam.	<40cm. Compact firm clayey subsoil at 40cm. Very low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-102cm strongly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Tamanua	24	Flat to gently undulating (0-3°). Smooth microrelief.	Floods depositing sediment have a 1 in 10 year return period. Floods (water only) have a 1 in 2 year return period.	No erosion risk.	Waterlogging below 65cm occurs in most years sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-38cm very fine sandy clay loam. 38-61cm silty clay loam. 61-97cm silty clay.	<65cm. Water table at 65cm during part of the wet season.	No surface rock outcrops. No surface stones or boulders.	0-38cm moderately acid. 38-97cm slightly acid.	Non saline.	Very low potassium throughout.
Tau	76D, 76E, 76F	Rolling to moderately steep (12-25°) Uneven microrelief.	Never floods.	Severe sheet erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of up to 140 days are experienced sometime in the period May to October.	Well drained.	0-18cm friable clay loam. 18-40cm firm stony clay loam. On hard limestone.	<50cm. Hard limestone at 50cm.	Surface rock outcrops cover 15% of the surface. Stones and boulders occupy 10% of the surface.	0-18cm moderately acid. 18-40cm slightly acid.	Non saline.	Very low nitrogen.
Tau	76G, 76H	Steep to very steep (26-40°). Uneven microrelief.	Never floods.	Very severe sheet erosion potential. Have experienced past erosion.	Never waterlogs.	In normal years soil moisture deficits of up to 140 days are experienced sometime in the period May to October.	Well drained.	0-16cm friable clay loam. 16-38cm firm stony clay loam. On hard limestone.	<50cm. Hard limestone at 50cm.	Surface rock outcrops cover 30% of the surface. Stones and boulders occupy 5% of the surface.	0-16cm moderately acid. 16-38cm slightly acid.	Non saline.	Very low nitrogen.
Taveuni	93C	Easy rolling (8-11°). Hummocky microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-11cm very friable humic loam. 11-31cm very friable clay loam. 31-54cm friable loam. 54-75cm friable silty clay loam. 75-114cm friable gravelly loam.	<100cm	Rock outcrops cover 3% of the surface. Boulders occupy 5% of the surface.	0-114cm moderately acid.	Non saline.	Very low potassium. Very high phosphate fixation properties.

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Taveuni	93D, 93E	Rolling to strongly rolling (12-20°). Hummocky microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm very friable humic loam. 25-70cm friable silty clay loam. 70-100cm very friable gravelly loam.	<100cm	Rock outcrops cover 5% of the surface. Boulders occupy 3-4% of the surface.	0-100cm moderately acid.	Non saline.	Very low potassium. Very high phosphate fixation properties.
Tavua	197C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight to moderate potential of sheet erosion under intense cultivation.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-40cm clay loam. 40-90cm clay. On weathered in situ rock.	<90cm	Rock outcrops cover less than 2% of area. Surface boulders cover 5-10% of area.	0-90cm slightly acid.	Non saline.	Low organic carbon % in topsoils and very low below 20cm.
Tavua	197D	Rolling (12-15°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential where vegetative cover bared.	Never waterlogs.	In normal years soil moisture deficits >120 days occur sometime in the period May to October.	Well drained.	0-38cm clay loam. 38-100cm clay. On in situ rock.	<100cm	Rock outcrops cover less than 2% of area. Surface boulders cover 8-10% of area.	0-100cm slightly acid.	Non saline.	Low organic carbon % in topsoils and very low below 15cm.
Tavua	197E, 197F	Strongly rolling to moderately steep (16-25°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential where vegetative cover bared.	Never waterlogs.	In normal years soil moisture deficits >120 days occur sometime in the period May to October.	Well drained.	0-28cm clay loam. 28-80cm clay. On in situ rock.	<80cm	Surface rock outcrops cover 5-10% of area. Surface boulders cover 2-3% of area.	0-80cm slightly acid.	Non saline.	Low organic carbon % in topsoils and very low below 15cm.
Tavuyaga	107G, 107H	Steep and very steep (26-40°). Very uneven microrelief.	Never floods.	Severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are not experienced.	Somewhat excessively drained.	0-16cm friable sandy clay loam. 16-140cm friable sandy loam.	>125cm	No surface rock outcrops. Boulders occupy 10% of the surface.	0-16cm slightly acid. 16-140cm near neutral.	Non saline.	Very low nitrogen, phosphorus and potassium. Very high phosphate fixation properties.
Tiri	2	Flat to near level (0-1°). Uneven microrelief due to reclamation and drainage works.	Artificially drained. Water table still affected by tidal fluctuations. In normal years would suffer 5-6 floods, each lying for 2-3 days sometime in the period November to April.	No erosion risk.	In normal years and due to drainage water table maintained at about 60cm. Can experience short duration waterlogging to the surface during flood and spring tide events.	Soil moisture deficits are never experienced.	Very poorly drained.	0-32cm humic clay loam. 32-108cm peaty silt loam. 108-135cm+ silt loam.	<30cm. Low subsoil nutrient status and high salinity.	No surface rock outcrops. No surface stones or boulders.	0-32cm strongly acid. 32-108cm extremely acid. 108-135cm near neutral.	Strongly saline.	Potassium very low 32-108cm.
Toguru	19	Flat to near level (0-1°). Slight hummocky microrelief.	In normal years and because of high water table and topographic positions flooding can occur for up to 12 days on 2-3 occasions sometime in the period November to April.	No erosion risk. Significant disturbance by crabs and rodents.	In normal years the water table fluctuates between 70cm (summer) and 100cm (winter) but can come to the surface for short periods.	Soil moisture deficits are never experienced.	Very poorly drained.	0-68cm sandy loam. 68-92cm loam.	<100cm. High seasonal water table and low subsoil nutrient status including high aluminium at 46-68cm.	No surface rock outcrops. No surface stones or boulders.	0-46cm moderately acid. 46-68cm extremely acid. 68-92cm slightly acid.	Non saline.	Very low potassium below 23cm. Phosphorus low.
Tokotoko	30	Flat to near level (0-1°). Slight hummocky microrelief.	Due to high water tables in summer months surface flooding may occur on 3-4 occasions lying for up to 15 days during the period November to April. 1 in 25 year return period for floods depositing sediment.	Accumulating soil. No erosion risk.	In normal years the water table fluctuates between 15cm (summer) and 100cm (winter).	In normal years soil moisture deficits are never experienced.	Very poorly drained.	0-17cm silty clay loam. 17-37cm clay loam. 37-134cm clay.	<75cm. Note high seasonal water table.	No surface rock outcrops. No surface stones and boulders.	0-37cm moderately acid. 37-134cm slightly acid.	Non saline.	Very low potassium below 17cm.
Totoya	191B, 191C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced in the period May to October.	Well drained.	0-35cm gritty clay. 35-63cm clay. 63-125cm slightly stony gritty clay.	<125cm	No surface rock outcrops. No surface stones or boulders.	0-63cm slightly acid. 63-125cm near neutral.	Non saline.	Available phosphorus very low. Exchangeable calcium and potassium low. Very low organic carbon below 9cm.
Totoya	191D	Rolling (12-15°). Smooth microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced in the period May to October.	Well drained.	0-40cm gritty clay. 40-72cm clay. 72-125cm gritty clay.	<125cm	No surface rock outcrops. No surface stones or boulders.	0-72cm slightly acid. 72-125cm near neutral.	Non saline.	Available phosphorus very low. Exchangeable calcium and potassium low. Very low organic carbon below 10cm.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Tuva	181A, 181B, 181C	Flat to easy rolling (0-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential on slopes >20.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced in the period May to October.	Moderately well drained.	0-12cm fine sandy clay loam. 12-36cm clay loam. 36-125cm clay loam (in situ weathered rock.)	<40cm. Weathered rock between 40-50cm.	No surface rock outcrops. No surface stones or boulders.	0-12cm moderately acid. 12-150cm strongly acid.	Non saline.	Phosphorus and nitrogen very low.
Tuva	181D	Rolling (12-15°). Smooth microrelief.	Never floods.	Experienced past sheet and rill erosion. Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced in the period May to October.	Moderately well drained.	0-14cm silty clay loam. 14-50cm clay loam. 50-125cm clay loam (in situ weathered rock).	<50cm. Weathered rock between 40-50cm.	No surface rock outcrops. No surface stones or boulders.	0-14cm moderately acid. 14-150cm strongly acid.	Non saline.	Phosphorus and nitrogen very low.
Tuva	181E, 181F	Strongly rolling to moderately steep. (16-25°). Generally smooth microrelief, uneven in areas of rill erosion.	Never floods.	Experienced past sheet and rill erosion. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days are experienced sometime in the period May to October.	Moderately well drained.	0-10cm silty clay loam. 10-46cm clay loam. 46-125cm clay loam (in situ weathered rock).	<50cm. Weathered rock between 40-50cm.	No surface rock outcrops. No surface stones or boulders.	0-10cm moderately acid. 10-50cm strongly acid.	Non saline.	Phosphorus and nitrogen very low.
Tuvuca	80	Flat to near level (0-2°). Smooth microrelief.	Never floods.	No erosion hazard.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-100cm very friable slightly gritty very sandy loam.	>100cm. Note extremely high Mn levels.	Rock outcrops cover 10% of area. No surface stones or boulders.	0-10cm slightly alkaline.	Non saline.	
Uaua	147A	Flat to gently undulating (0-3°). Even microrelief.	Flooding for up to 7 days associated with high intensity storms occur on 3-4 occasions during the wet season.	No erosion hazard.	In normal years waterlogs below 70cm for up to 3 months sometime in the period November to April.	In normal years soil moisture deficits of up to 100 days are experienced sometime in the period May to October.	Imperfectly drained.	0-25cm friable sandy loam. 25-100cm firm sandy clay.	<70cm. Water table at 70cm during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-100cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Uaua	147B	Undulating (4-7°). Even microrelief.	Short duration (2-3 days) flooding associated with high intensity storms occur on 3-4 occasions during the wet season.	Slight sheet and rill erosion potential.	In normal years waterlogs below 100cm for up to 2 months sometime in the period November to April.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Imperfectly drained.	0-10cm very friable gravelly sandy loam. 10-20cm friable heavy sandy loam. 20-45cm friable sandy clay. 45-130cm firm sandy clay.	<100cm. Water table at 100cm during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-45cm strongly acid. 45-130cm moderately acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Ucunilawe	216G, 216H	Steep and very steep (26-40°). Very uneven microrelief. Abundant surface rock outcrops and boulders.	Never floods.	Very severe sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-60cm very friable loam. 60-120cm very friable clay loam.	<100cm. In situ basalt at 100cm.	Rock outcrops cover 30% of the surface. Boulders occupy 30% of the surface.	0-100cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium. Very high phosphate fixation properties.
Ura	95D, 95E, 95F	Rolling to moderately steep (12-25°). Slightly uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Somewhat excessively drained.	0-22cm loose clay. 22-50cm friable sandy loam. 50-90cm friable sandy clay loam. 90-120cm very friable sandy loam.	<125cm	Rock outcrops cover 3% of the surface. Boulders occupy 2% of the surface.	0-22cm moderately acid. 22-50cm slightly acid. 50-90cm near neutral.	Non saline.	Very low potassium. High phosphate fixation properties.
Vaidoko	167B, 167C	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Well drained.	0-25cm clay loam. 25-45cm stony clay. On weakly weathered in situ rock.	<45cm	Surface rock outcrops cover 30% of the area. Surface boulders cover 8-10% of the area.	0-25cm slightly acid. 25-45cm moderately acid.	Non saline.	Very low potassium below 25cm.
Vaidoko	167D, 167E, 167F	Rolling to moderately steep (12-25°). Uneven microrelief (terracettes, boulders).	Never floods.	Moderately severe soil creep, sheet and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Well drained.	0-3cm clay loam. 30-48cm bouldery clay. On weakly weathered in situ rock.	<48cm	Surface rock outcrops cover 20-30% of the area. Surface boulders cover 2-3% of the area.	0-30cm slightly acid. 30-48cm moderately acid.	Non saline.	Very low potassium below 35cm.
Vaidoko	167G, 167H	Steep to very steep (26-38°). Uneven microrelief (terracettes, boulders).	Never floods.	Severe sheet, soil creep and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 are experienced sometime in the period May to October.	Well drained.	0-25cm clay loam. 25-35cm stony clay. On weakly weathered in situ rock.	<35cm	Surface rock outcrops cover 25% of the area. Surface boulders cover 2-3% of the area.	0-25cm slightly acid. 25-35cm moderately acid.	Non saline.	Very low potassium below 25cm.

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Vakawau	98E, 98F	Strongly rolling and moderately steep (16-25°). Very uneven microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-35cm very friable stony silty clay loam. 35-70cm friable bouldery loam. 70-105cm very friable bouldery silt loam.	<50cm. Profuse boulders at 50cm.	Rock outcrops cover 20% of the surface. Boulders occupy 30% of the surface.	0-35cm moderately acid. 35-105cm slightly acid.	Non saline.	Very low potassium. Very low phosphate fixation properties.
Varaciva	195E, 195F, 195G, 195H	Strongly rolling to very steep (16-38°).	Never floods.	Experienced past erosion. Moderate to severe erosion potential.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-6cm very friable gravelly clay loam. 1cm discontinuous hard iron pan. 25cm friable gritty clay on weathered rock.	<30cm	No surface rock outcrops or surface boulders.	Strongly acid.	Non saline.	Nitrogen, BS% phosphorus, potassium levels very low.
Vasilaulau	131D, 131E	Rolling and strongly rolling (12-20°). Generally smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-30cm clay loam. 30-45cm stony clay loam. On in situ rock.	<45cm. Hard in situ rock at 45cm.	Few surface rock outcrops. Few surface stones, no surface boulders.	0-45cm strongly acid. 45-75cm moderately acid.	Non saline.	Very low phosphorus and potassium below 25cm.
Vasilaulau	131F, 131G, 131H	Moderately steep to very steep (21-38°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >120 days are experienced sometime in the period May to October.	Well drained.	0-24cm clay loam. 24-42cm stony clay loam. On in situ rock.	<45cm. Hard in situ rock at 45cm.	Many surface rock outcrops. Few surface stones and no surface boulders.	0-42cm strongly acid. 42-70cm moderately acid.	Non saline.	Very low phosphorus and potassium below 24cm.
Vatubaba	150F, 150G, 150H	Moderately steep to very steep (21-39°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 30 days are experienced sometime in the period May to October.	Well drained.	0-20cm very friable clay loam. 20-30cm friable stony clay loam. 30-40cm very firm stony clay. 40-70cm very firm bouldery loam. 70-120cm very firm bouldery sandy loam.	<70cm. Strongly weathered in situ bouldery parent material at 70cm.	Surface rock outcrops cover 5% of the surface. Surface boulders occupy 5% of the surface.	Strongly acid.	Non saline.	Potassium low.
Vatukoula	198C	Easy rolling (8-11°). Uneven microrelief due to rock outcrops and surface boulders.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100-120 days are experienced sometime in the period May to October.	Well drained.	0-15cm friable clay loam. 15-70cm bouldery clay. 70-100cm bouldery silt loam.	<100cm	Rock outcrops and bluffs cover 30% of the area. Boulders occupy 8% of the surface.	0-100cm moderately acid.	Non saline.	Nitrogen and potassium values low.
Vatukoula	198D, 198E, 198F, 198G	Rolling to steep (12-35°). Very uneven microrelief due to rock outcrops and bluffs.	Never floods.	Very severe sheet and rill erosion potential. Potential scree erosion below bluffs.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-12cm friable clay loam. 12-50cm firm clay. 50-80cm massive bouldery silt loam. On weathered rock.	<80cm. In situ rock at about 80cm.	Rock outcrops and bluffs cover 60% of area. Boulders and scree debris occupy 15% of surface.	0-80cm moderately acid.	Non saline.	Nitrogen and potassium values low.
Vatulele	77H	Very steep (35-40°). Extremely uneven microrelief (roots, boulders, etc.).	Never floods.	Severe sheet erosion potential when forest removed.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-20cm stony clay. On coralline rock.	<20cm	Surface rock outcrops cover 60-80% of area. Surface stones and boulders cover 50% of area.	Near neutral.	Non saline.	None identified. Possible trace element deficiencies.
Vatuma	49A	Flat to gently undulating (0-3°). Smooth microrelief.	In normal years floods (water only) would occur 3-4 times but of short durations (1-2 days). Floods depositing sediment have a 1 in 10 year return period. Floods occur sometime within the period November to April.	Accumulating soil. No erosion risk.	In normal years waterlogging can occur for up to 40 days within 1m of the soil surface.	In normal years soil moisture deficits of 90-100 days are experienced sometime in the period May to October.	Imperfectly drained.	0-25cm clay loam. 25-125cm clay.	<125cm. Note seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.	0-38cm near neutral. 38-125cm moderately alkaline.	Non saline.	Very low potassium throughout. Nitrogen very low.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Vatuma	49B	Undulating (4-7°). Smooth microrelief.	In normal years floods (water only) would occur 3-4 times a year with water running off within 24 hours. Floods depositing sediment have 1 in 15 year return period. Floods occur sometime within the period November to April.	Accumulating soil. No erosion risk.	In normal years waterlogging can occur for up to 10 days within 1m of the soil surface.	In normal years soil moisture deficits of 100-110 days are experienced sometime in the period May to October.	Imperfectly drained.	0-26cm clay loam. 26-130cm clay.	<125cm	No surface rock outcrops. No surface stones or boulders.	0-42cm near neutral. 42-130cm slightly alkaline.	Non saline.	Very low potassium throughout. Nitrogen very low.
Vatuvonu	143B, 143C	Undulating and easy rolling (4-11°). Uneven microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable fine sandy clay. 10-15cm friable sandy loam. On hard pumiceous tuff.	<20cm. Weakly weathered in situ rock at 20cm.	Surface rock outcrops cover 8% of the surface. Surface stones occupy 3% of the surface.	0-10cm strongly acid. 10-15cm moderately acid.	Non saline.	Low phosphorus.
Vatuvonu	143D, 143E, 143F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up 120 days are experienced sometime in the period May to October.	Well drained.	0-10cm friable stony sandy clay loam. 10-25cm friable very stony sandy loam. On weathering pumiceous agglomerate.	<25cm. Weathering in situ rock at 25cm.	Surface rock outcrops cover 12% of the surface. Surface stones occupy 3% of the surface.	0-10cm strongly acid. 10-25cm moderately acid.	Non saline.	Low phosphorus.
Veisaru	57	Flat to gently undulating (0-3°). Even microrelief.	1 in 20 year return period for floods depositing alluvium. 2 in 1 year return period for other floods.	No erosion risk.	Waterlogs below 50cm for 4 months in the period November to April.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-18cm friable clay. 18-71cm firm gritty clay. 71-150cm firm clay loam.	<50cm. Water table at 50cm depth during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-71cm extremely acid. 71-150cm strongly acid.	Non saline.	Low nitrogen and phosphorus.
Verevere	146A, 146B, 146C	Flat to undulating to easy rolling (0-11°).	Never floods.	Slight sheet and rill erosion potential on slopes >3°.	Never waterlogs.	In normal years soil moisture deficits >120 days are experienced sometime in the period May to October.	Well drained.	0-12cm friable sandy clay. 12-50cm friable slightly stony clay on weathered rock.	<50cm	No surface rock outcrops or surface boulders.	Slightly acid.	Non saline.	Low phosphorus values with low subsoil values for potassium.
Visa	125B, 125C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-50cm clay. 50-125cm clay loam.	<90cm. Weathered in situ rock at 90-100cm.	No surface rock outcrops. No surface stones or boulders.	0-50cm strongly acid. 50-125cm moderately acid.	Non saline.	Potassium very low below 15cm.
Visa	125D, 125E	Rolling to strongly rolling (12-20°). Smooth microrelief.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-40cm clay. 40-125cm clay loam.	<75cm. Weathered in situ rock at 75-90cm.	No surface rock outcrops. No surface stones or boulders.	0-40cm strongly acid. 40-125cm moderately acid.	Non saline.	Potassium very low below 13cm.
Visa	125F, 125G	Moderately steep to steep (21-35°). Smooth microrelief.	Never floods.	Odd rotational slumps. Severe sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm clay. 30-100cm clay loam.	<60cm. Weathered in situ rock 60-70cm.	No surface rock outcrops. No surface stones or boulders.	0-30cm strongly acid. 30-100cm moderately acid.	Non saline.	Potassium very low below 11cm.
Vitawa	163F, 163G, 163H	Moderately steep to very steep (21-40°). Generally uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of up to 120 days are experienced sometime in the period May to October.	Moderately well drained.	0-23cm clay loam. 23-43cm stony clay loam. 43-75cm fractured in situ rock (stony silty clay loam).	<45cm. Weathered in situ rock at about 45cm.	Few surface rock outcrops. Common surface stones.	0-23cm strongly acid. 23-43cm moderately acid. 43-100cm slightly acid.	Non saline.	Low phosphorus.
Volivoli	11A, 11B, 11C	Flat to gently undulating to easy rolling (0-11°). Smooth microrelief.	Never floods.	Slight sheet and wind (saltation) erosion at times of cultivated fallow.	Never waterlogs.	In normal years soil moisture deficits of 90 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-15cm very friable coarse sand. 15-76cm loose coarse sand. 76-150cm very friable coarse sand.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-60cm slightly acid.	Non saline.	Very low potassium and organic matter values.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Volivoli	11D, 11E, 11F, 11G	Rolling to steep (12-35°). Smooth microrelief.	Never floods.	Slight to moderate sheet and wind (saltation) erosion at time of cultivated fallow.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Somewhat excessively drained.	0-12cm very friable coarse sand. 12-150cm loose coarse sand.	>125cm	No surface rock outcrops. No surface stones or boulders.	0-50cm slightly acid.	Non saline.	Very low potassium and organic matter values.
Vuna	85C	Easy rolling (8-11°). Very uneven microrelief with rock outcrops and surface boulders.	Never floods.	Very slight sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-27cm very friable stony clay loam. 27-60cm very friable loamy medium sand. On broken basalt lava.	<60cm	Surface rock outcrops cover 10% of the surface. Boulders occupy 5% of the surface.	0-60cm slightly acid.	Non saline.	Low phosphorus and potassium. Very high phosphate fixation properties.
Vuna	85D, 85E	Rolling and strongly rolling (12-20°). Very uneven microrelief with rock outcrops and surface boulders.	Never floods.	Slight to moderate sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-20cm very friable stony silty clay loam. 20-53cm very friable loamy fine sand. On broken bouldery basalt lava.	<55cm	Surface rock outcrops cover 20% of the surface. Boulders occupy 5-10% of the surface.	0-53cm slightly acid.	Non saline.	Low phosphorus and potassium. Very high phosphate fixation properties.
Vuna	85F, 85G	Moderately steep and steep (21-35°). Very uneven microrelief with rock outcrops and surface boulders.	Never floods.	Moderate sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Somewhat excessively drained.	0-15cm very friable stony clay loam. 15-45cm very friable sandy loam. On broken basalt lava.	<45cm	Surface rock outcrops cover 30% of the surface. Boulders occupy 10% of the surface.	0-45cm slightly acid.	Non saline.	Low phosphorus and potassium. Very high phosphate fixation properties.
Vunatoto	162E, 162F, 162G, 162H	Strongly rolling to very steep (16-39°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm very friable clay loam. 30-120cm very firm bouldery clay.	<50cm. Weathered in situ bouldery parent material at 50cm.	Surface rock outcrops cover 5% of the surface. Surface boulders occupy 5% of the surface.	Strongly acid.	Non saline.	Low phosphorus.
Vunavutu	12	Near flat (0-1°).	Floods with wet season high intensity storms. Water may pond for up to 7 days.	No erosion risk.	Waterlogs for a few days 3 times on average during the wet season.	In normal years soil moisture deficits >90 days are experienced sometime in the period May to October.	Well drained.	0-30cm firm silty clay. 30-80cm firm sticky fine sandy clay loam. 80-130cm firm sticky sandy clay.	>100cm	No surface rock outcrops or surface boulders.	0-130cm near neutral.	Non saline.	Low nitrogen values.
Vunibau	9	Flat to gently undulating (0-3°).	Never floods.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-15cm friable sandy loam. 15-50cm very friable loamy sand. 50-160cm loose sand.	>125cm	No surface rock outcrops or surface boulders.	0-125cm moderately acid.	Non saline.	Low nitrogen, potassium and phosphorus values.
Vunicibicibi	41A	Flat to gently undulating (0-3°). Even microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days may be experienced sometime in the period May to October.	Well drained.	0-17cm very friable gritty silt loam. 17-142cm friable to firm clay loam.	>150cm. Note low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. No surface stones and boulders.	0-17cm slightly alkaline. 17-142cm strongly acid.	Non saline.	Very low potassium and nitrogen. Aluminium toxicity.
Vunicibicibi	41B, 41C	Undulating and easy rolling (4-11°). Generally even microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days may be experienced sometime in the period May to October.	Well drained.	0-18cm very friable gritty silt loam. 18-120cm friable to firm gritty clay loam. 120-149cm friable clay loam.	>150cm. Note low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. No surface stones or boulders.	0-147cm strongly acid.	Non saline.	Very low potassium and nitrogen. Aluminium toxicity.
Vunicibicibi	41D	Rolling (12-15°). Uneven microrelief.	Never floods.	Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 120 days may be experienced sometime in the period May to October.	Well drained.	0-20cm friable gravelly clay loam. 20-80cm firm gritty clay loam. 80-152cm friable clay loam.	>150cm. Note low subsoil nutrient status and aluminium toxicity.	No surface rock outcrops. No surface stones or boulders.	0-152cm strongly acid.	Non saline.	Very low potassium and nitrogen. Aluminium toxicity.
Vunilagi	15	Flat to gently undulating (0-2°). Smooth microrelief.	In normal years infrequent (4-5 per year) short duration (3-4 days) flooding from creeks and during high spring tides can occur sometime in the wet season.	No erosion risk.	In normal years the water table fluctuates from 40cm (summer months) to 80 cm (winter months). Note also sea level control on water table.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-69cm clay. 69-100cm+ clay loam (with coral shells and gravels).	<70cm. Note high seasonal water table.	No surface rock outcrops. No surface stones or boulders.	0-16cm slightly alkaline. 16-100cm moderately alkaline.	Non saline.	Phosphorus very low.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Vurevure	69	Flat to gently undulating (0-3°). Hummocky microrelief.	Floods frequently during the period November to April with water ponding for many months.	No erosion risk.	Permanently waterlogged.	Never experiences soil moisture deficits.	Very poorly drained.	0-90cm soft peaty clay.	Water table at or near surface for most of the year.	No surface rock outcrops. No surface stones or boulders.	0-90cm strongly acid.	Non saline.	Not analysed.
Vuya	185B, 185C	Undulating to easy rolling (4-11°). Microrelief - minor surface undulations.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-85cm clay. 85-120cm gritty clay.	<120cm	No surface rock outcrops. Few surface stones.	0-120cm moderately acid.	Non saline.	Low potassium in subsoils. Very low organic carbon and calcium in subsoils.
Vuya	185D, 185E, 185F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-75cm clay. 75-110cm gritty clay.	<110cm	No surface rock outcrops. Few surface stones.	0-110cm moderately acid.	Non saline.	Low potassium in subsoils. Very low organic carbon and calcium in subsoils.
Vuya	185G, 185H	Steep to very steep (26-39°). Uneven microrelief.	Never floods.	Very severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits >100 days are experienced sometime in the period May to October.	Well drained.	0-20cm gritty clay. 20-68cm clay. 68-100cm stony clay.	<100cm	No surface rock outcrops. Few surface stones.	0-100cm moderately acid.	Non saline.	Low potassium in subsoils. Very low organic carbon and calcium in subsoils.
Waibici	222C	Easy rolling (8-11°). Uneven microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-60cm very friable clay loam. 60-120cm very firm clay.	<125cm	Few surface rock outcrops. Surface boulders occupy 2% of the surface.	0-30cm extremely acid. 30-120cm strongly acid.	Non saline.	Very low nitrogen, potassium and phosphorus.
Waibici	222D, 222E, 222F	Rolling to moderately steep (12-25°). Uneven microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	Never experiences soil moisture deficits.	Well drained.	0-25cm very friable clay loam. 25-80cm friable clay loam. 80-125cm firm clay.	<125cm	Surface rock outcrops cover 3% of the surface. Surface boulders occupy 3% of the surface.	0-25cm extremely acid. 25-125cm strongly acid.	Non saline.	Very low nitrogen, potassium and phosphorus.
Waibula	59A, 59B	Flat to gently undulating (0-7°). Uneven microrelief with common surface basalt boulders.	Floods depositing sediment have a 1 in 10 year return period. Other floods have a 1 in 2 year return period.	No erosion risk.	Water table >120cm. Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-27cm very friable coarse sandy loam. 27-30cm very friable coarse sand. 30-110cm very friable sandy clay loam. On basalt boulders.	>100cm	No surface rock outcrops. Basalt boulders occupy 5% of the surface.	0-30cm moderately acid. 30-110cm slightly acid.	Non saline.	Low potassium and nitrogen.
Waidina	129B, 129C	Easy rolling (4-11°). Generally smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-18cm silt loam. 18-105cm silty clay loam. 105-125cm weathered in situ rock (silt loam).	<100cm. Weathered in situ rock at about 100cm.	No surface rock outcrops. No surface stones or boulders.	0-62cm moderately acid. 62-105cm slightly acid. 105-125cm near neutral.	Non saline.	Potassium and magnesium low in subsoil.
Waidina	129D, 129E	Rolling and strongly rolling (12-20°). Uneven microrelief due to forest dimpling and terracettes.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-14cm silt loam. 14-99cm silty clay loam. 99-125cm weathered in situ rock (silt loam).	<100cm. Weathered in situ rock at about 100cm.	No surface rock outcrops. No surface stones or boulders.	0-77cm moderately acid. 77-99cm slightly acid. 99-125cm near neutral.	Non saline.	Potassium and magnesium low in subsoil.
Waidina	129F, 129G	Moderately steep and steep (21-35°). Uneven microrelief due to forest dimpling and terracettes.	Never floods.	Contemporary small areas of mass movement. Severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Moderately well drained.	0-12cm silt loam. 12-80cm silty clay loam. 80-125cm weathered in situ rock (silt loam).	<80cm. Weathered in situ rock at about 80cm.	Few rock outcrops (landslide scars). No surface stones or boulders.	0-80cm slightly acid. 80-125cm near neutral.	Non saline.	Potassium and magnesium low in subsoil.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Waidradra	47	Flat to gently undulating (0-3°). Smooth microrelief.	Floods depositing sediment have a 1 in 10 year return period. Floods (water only) have a 1 in 2 year return period.	No erosion risk.	Waterlogging occurs below 75cm, as a result of raised water table, during some part of the wet season.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-56cm clay loam. 56-61cm sandy loam. 61-100cm clay loam.	<75cm. High water table at 75cm during the wet season.	No surface rock outcrops. No surface stones or boulders.	0-56cm strongly acid. 56-61cm moderately acid. 61-100cm strongly acid. 100-125cm moderately acid.	Non saline.	Potassium very low below 15cm.
Waikalou	10	Flat to gently undulating phase (0-2°). Smooth microrelief.	Short duration (3-6 days) floods 1 or 2 times per year sometime in the period November to April.	No erosion risk.	Waterlogging on flat sites up to 60 days sometime in the period November to April. Water table fluctuates between 70 and 90cm.	In normal years soil moisture deficits are never experienced.	Poorly drained.	0-50cm fine sandy loam. 50-125cm sand.	<75cm. Seasonal waterlogging and low nutrient status of subsoils.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus and potassium throughout.
Wailotua	74D, 74E, 74F, 74G	Rolling to steep (12-35°). Uneven microrelief.	Never floods.	Severe sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-10cm friable bouldery clay loam. 10-100cm friable to firm bouldery clay loam.	<100cm. In situ limestone at 100cm.	Surface rock outcrops cover 15% of the surface. Surface boulders cover 10% of the surface.	Slightly alkaline.	Non saline.	Possible trace element deficiencies.
Wailulu	225A, 225B, 225C	Flat to undulating to easy rolling (0-11°).	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-20cm friable clay. 20-70cm firm clay. 70-100cm friable clay.	<100cm. Many strongly weathered boulders below 70cm.	Surface rock outcrops cover 3% of the surface. Surface boulders occupy 2% of the surface.	0-100cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Wailulu	225D, 225E, 225F, 225G	Rolling to steep (12-35°).	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-25cm friable clay loam. 25-85cm firm clay. 85-120cm friable clay.	<100cm. Many strongly weathered boulders below 50cm.	Surface rock outcrops cover 5% of the surface. Surface boulders occupy 2% of the surface.	0-120cm strongly acid.	Non saline.	Very low nitrogen, phosphorus and potassium.
Waimaro	127B, 127C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight to moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of <10 days may occur sometime in the period May to October.	Well drained.	0-4cm clay loam. 4-62cm clay. 62-125cm stony clay.	<65m. Strongly weathered in situ rock between 65-75cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium, magnesium and calcium very low below 15cm.
Waimaro	127D, 127E	Rolling to strongly rolling (12-20°). Uneven (forest dimpled) microrelief.	Never floods.	Moderate sheet, rill and soil creep erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-20cm clay loam. 20-70cm clay. 70-125cm stony clay.	<65cm. Strongly weathered in situ rock between 65-75cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium, magnesium and calcium very low below 20cm.
Waimaro	127F, 127G, 127H	Moderately steep to very steep (21-38°). Teracettes. Forest dimpled microrelief.	Never floods.	Some rotational slumps occur. Severe sheet, rill, soil creep and slumping erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-30cm clay loam. 30-60cm clay. 60-125cm stony clay.	<60m. Strongly weathered in situ rock between 60-70cm.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Potassium, magnesium and calcium very low below 12cm.
Wainibuka	26	Flat to gently undulating (0-2°). Smooth microrelief.	Floods (1 in 15 years) of short duration (water and sediment) may occur.	No erosion risk.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-68cm clay. 68-83cm clay to clay loam. 83-125cm clay.	>125cm	No surface rock outcrops. No stones or boulders.	Slightly acid.	Non saline.	Potassium low in subsoil.
Wainikai	68	Flat (0°). Even microrelief.	Water table at or near surface for much of the year.	Accumulating soil. No erosion risk.	Due to permanent high water table the soil is continually waterlogged throughout the year.	Soil moisture deficits are never experienced.	Very poorly drained.	0-25cm fibric peat. 25-45cm clay loam. 45-100cm clay. 100-125cm silty clay loam.	0cm. Due to permanent water table at or near the ground surface.	No surface rock outcrops. No surface stones or boulders.	0-45cm strongly acid. 45-125cm moderately acid.	Non saline.	Phosphorus and potassium very low.
Wainikavou	33A, 33B	Flat and near level to undulating (0-5°). Smooth microrelief.	Floods have a 1 in 5 year return period. Water lies up to 5 days.	No erosion risk.	In normal years waterlogging can occur below 30cm for up to 15 days on 2-3 occasions sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-10cm silt loam. 10-23cm silty clay loam. 23-62cm clay loam. 62-125cm clay.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low nitrogen and phosphorus throughout.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Wainikoro	140C	Easy rolling (8-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential on slopes >2°.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Well drained.	0-15cm fine sandy clay loam. 15-85cm fine sandy clay. 85-125cm fine sandy clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Wainikoro	140D, 140E	Rolling to strongly rolling (12-20°). Smooth microrelief.	Never floods.	Have experienced significant sheet erosion where continually cropped. Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Well drained.	0-13cm fine sandy clay loam. 13-73cm fine sandy clay. 73-125+ fine sandy clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Wainikoro	140F, 140G, 140H	Moderately steep to very steep (21-40°). Generally smooth microrelief.	Never floods.	Severe topsoil losses recognised where continually cropped without conservation measures. Very severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of >100 days are experienced sometime in the period May to October.	Well drained.	0-10cm sandy clay loam. 10-80cm fine sandy clay. 80-125cm+ silty clay loam.	>125cm. Note low subsoil nutrient status.	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus, potassium and nitrogen.
Wainivesi	28	Flat to gently undulating (0-3°). Smooth microrelief.	Floods depositing sediment have a 1 in 25 year return period. Other floods have a 1 in 5 year return period.	Accumulating soil. No erosion risk.	In normal years may waterlog below 125cm sometime during the period November to April.	Never experiences soil moisture deficits.	Imperfectly drained.	0-23cm friable clay loam. 23-46cm firm gritty clay loam. 46-76cm very firm gritty clay loam. 76-122cm very firm gritty clay. 122-140cm very firm gritty loam.	<125cm	No surface rock outcrops. No surface stones or boulders.	0-125cm moderately acid. 122-140cm slightly acid.	Non saline.	Very low phosphorus and very low potassium below 23cm.
Wainunu	173A	Flat to gently undulating (0-3°). Smooth microrelief.	Never floods.	Very slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-16cm very friable humic clay loam. 16-30cm firm silty clay. 30-120cm very firm clay.	>120cm	No surface rock outcrops. No surface stones or boulders.	0-16cm extremely acid. 16-120cm strongly acid.	Non saline.	Very low phosphorus.
Wainunu	173B, 173C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-18cm very friable humic clay loam. 18-50cm firm silty clay. 50-125cm firm clay.	>120cm	No surface rock outcrops. No surface stones or boulders.	0-18cm extremely acid. 18-125cm strongly acid.	Non saline.	Very low phosphorus.
Wainunu	173D, 173E, 173F	Smooth to moderately steep (12-25°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-18cm very friable clay loam. 18-52cm firm silty clay loam. 52-125cm firm silty clay.	>120cm	No surface rock outcrops. No surface stones or boulders.	0-125cm strongly acid.	Non saline.	Very low phosphorus.
Waioba	88G, 88H	Steep and very steep (26-40°). Forest dimpled microrelief.	Never floods.	Very severe sheet, rill and debris slide erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-48cm very friable loam. 0-115cm friable clay loam.	>100cm	Few surface rock outcrops. Few surface stone or boulders.	0-88cm slightly acid. 88-115cm moderately acid.	Non saline.	Very low phosphorus and potassium. Very high phosphate fixation properties.
Waioru	102G, 102H	Steep and very steep (26-40°). Forest dimpled microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-43cm friable silty clay loam. 43-97cm firm silty clay loam. 97-110cm firm bouldery silt loam.	<100cm. Profuse boulders below 100cm.	Rock outcrops cover 15% of the surface. Boulders occupy 3% of the surface.	0-110cm moderately acid.	Non saline.	Very low nitrogen, potassium and phosphorus. Very high phosphorus fixation properties.
Waiqere	87C	Easy rolling (8-11°). Undulating microrelief.	Never floods.	Moderate sheet erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-15cm friable silt loam. 15-27cm friable clay loam. 27-45cm friable silt loam. 45-61cm very friable sandy loam. 61-125cm very friable sand.	>100cm	Few surface rock outcrops. Basalt boulders occupy 2% of the surface.	0-7cm strongly acid. 7-125cm moderately acid.	Non saline.	Very low phosphorus and potassium. Very high phosphate fixation.

Soil Series	Soil Map Unit	Slope Microrelief	Susceptibility to Flooding	Susceptibility to Erosion	Susceptibility to Waterlogging	Susceptibility to Drought	Overall Drainage	Profile Textural Pattern	Min. Effect. Rooting Depth	Outcrops & Surface Stones and Boulders	Acidity/ Alkalinity	Salinity	Known Limiting Nutrients
Waiqere	87D, 87E	Rolling and strongly rolling (12-20°). Undulating microrelief.	Never floods.	Severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Well drained.	0-55cm friable silt loam. 55-70cm very friable sandy loam. 70-100cm very friable medium sand.	>100cm	Few surface rock outcrops. Basalt boulders occupy 4-5% of the surface.	0-10cm strongly acid. 10-100cm moderately acid.	Non saline.	Very low phosphorus and potassium. Very high phosphate fixation.
Waisava	132A	Gently undulating (1-3°). Uneven microrelief (commonly due to pugging).	Never floods.	No erosion risk.	In normal years waterlogging occurs for up to 60 days sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-90cm clay. 90-110cm sandy clay loam.	<130cm	No surface rock outcrops. No surface stones or boulders.		Non saline.	
Waisava	132B	Undulating to easy rolling (4-11°). Uneven microrelief.	Never floods.	Slight sheet erosion potential.	In normal years waterlogging occurs for up to 30 days sometime in the period November to April.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-31cm clay. 31-45cm clay loam. 45-105 clay. 105-113cm sandy clay loam.	<100cm. Note, seasonal waterlogging.	No surface rock outcrops. No surface stones or boulders.		Non saline	Potassium very low throughout.
Yakita	153B, 153C	Undulating and easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential on slopes >7°.	Never waterlogs.	In normal years soil moisture deficits are never experienced.	Imperfectly drained.	0-18cm firm sandy heavy clay. 18-30cm firm to friable very heavy clay. 30-100cm firm clay.	<100cm. Compact clay at 70cm.	No surface rock outcrops. No surface stones or boulders.	0-60cm strongly acid.	Non saline.	Low nitrogen, phosphorus and potassium.
Yako	120B, 120C	Undulating to easy rolling (4-11°). Smooth microrelief.	Never floods.	Slight sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Well drained.	0-30cm very friable stony clay loam. On in situ rock.	<30cm. Fractured in situ rock at 30cm depth.	No surface rock outcrops. No surface boulders but a few surface stones.	0-30cm moderately alkaline.	Non saline.	Low nitrogen.
Yako	120D	Rolling (12-15°). Smooth microrelief.	Never floods.	Moderate sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Well drained.	0-26cm very friable stony clay loam. On in situ rock.	<30cm. Fractured in situ rock at 30cm.	No surface rock outcrops. No surface boulders but a few surface stones.	0-26cm moderately alkaline.	Non saline.	Low nitrogen.
Yako	120E	Strongly rolling (16-20°).	Never floods.	Moderate to severe sheet and rill erosion potential. Moderate soil slip erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Well drained.	0-28cm very friable stony clay loam.	<30cm. Fractured in situ rock at 30cm.	No surface rock outcrops. No surface boulders but a few surface stones.	0-28cm moderately alkaline.	Non saline.	Low nitrogen.
Yaqara	199A, 199B, 199C	Flat to undulating to easy rolling (0-11°).	Never floods.	None observed.	Never waterlogs.	In normal years soil moisture deficits are experienced >100 days during the months of May to October.	Well drained.	0-10cm very friable silty clay loam. 10-100 on silty clay.	>125cm.	No surface rock outcrops. No surface stones.	Moderately acid.	Non saline.	Potassium low.
Yasawa	7A	Flat to undulating (0-2°). Generally smooth but surface hummocks where wind throw has occurred.	Never flooded.	During hurricanes and high tide storm events may experience minor scouring. Accretion of new sediment at these times more significant.	Never waterlogged. Water table >125cm from surface. Water table fluctuates at depth with the tides.	In most years soil moisture deficits are experienced for 100 days during the months of May to October.	Excessively drained.	60cm medium sand. Medium sand. 60-125cm stony medium sand.	>125cm. Low nutrient supply below 10-15cm.	No surface rock outcrops. Common coral surface stone.	Moderately alkaline 0-125cm.	Non saline. Saline water table >125cm near to coastline.	Phosphorus and potassium values very low. Low organic matter status.
Yavuna	164B, 164C	Undulating and easy rolling (4-11°). Generally smooth microrelief.	Never floods.	Moderate to severe sheet and rill erosion potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Well drained.	0-9cm silt loam. 9-30cm sandy loam. On weathered in situ rock.	<30cm. In situ rock normally encountered by 30cm.	Few surface rock outcrops. Few surface stones.	0-9cm strongly acid. 9-30cm near neutral. 30-50cm+ slightly acid.	Non saline.	Very low potassium and nitrogen. Low phosphorus.
Yavuna	164D, 164E	Rolling and strongly rolling (12-20°). Uneven (terracettes) microrelief.	Never floods.	Contemporary debris sliding. Severe sheet and rill erosion potential. Moderate debris slide potential.	Never waterlogs.	In normal years soil moisture deficits of 100 days are experienced sometime in the period May to October.	Well drained.	9-7cm silt loam. 7-24cm gritty sandy loam. On weathered in situ rock.	<25cm. In situ rock at 25cm.	Surface rock outcrops cover 5-8% of the area. Common surface stones.	0-7cm slightly acid. 7-24cm near neutral. 24-50cm+ slightly acid.	Non saline.	Very low potassium and nitrogen. Low phosphorus.

7. APPLICATION OF THE FERTILITY CAPABILITY SOIL CLASSIFICATION

7.1 The system

Soil classification systems commonly emphasise subsurface soil properties rather than those of the topsoil, because of their permanent nature. However, most soil management practices are largely concerned with the plow layer or top 20 cm. In describing a soil surface, soil properties are also simpler, and more easily identified and differentiated, than in horizons below the surface. Information on the characteristics and properties of the topsoil are also readily available.

The Fertility Capability Soil Classification (FCSC) System was developed as an attempt to bridge the gap between the sub-disciplines of soil classification and soil fertility.

FCSC is a technical system for grouping soils according to the kinds of problems they present for agronomic management of their chemical and physical properties. It emphasises quantifiable topsoil parameters, as well as subsoil parameters directly relevant to plant growth. FCSC classes indicate the main fertility-related soil constraints, which can be interpreted in relation to specific farming systems.
For the FCSC, three categorical levels have been proposed, namely, type (texture of surface soil layer), substrata type (subsoil texture), and modifiers.

7.2 Type

Type, the highest category, is determined by the texture of the plow layer, or upper 20 cm of the soil, whichever is shallower. Five textural types are defined. Code letters indicative of type are capitalised. They are:

G = Gravelly topsoils : They are more than 20% by volume of gravels, stones, rock fragments. This is considered a major limiting factor for land preparation and crop production;

S = Sandy topsoils : Loamy sands and sands;

L = Loamy topsoils : They have <35% clay, but are not loamy sand or sand;

C = Clay topsoils : They have >35% clay;

O = Organic soils : They have >30% organic matter content to a depth of 50 cm or more.

7.3 Substrata type

Used if textural change or a hard root restricting layer is encountered within 50 cm.

S = Sandy subsoil : Texture as in type

L = Loamy subsoil : Texture as in type

C = Clayey subsoil : Texture as in type

R = Rock or other hard root restricting layer

7.4 Condition modifiers

They refer to chemical and physical properties of the plow layer or top 20 cm, whichever is shallower. The modifiers indicate specific fertility limitations with different possible interpretations.

Letter-coding of the condition modifiers is given in lower case letters, which have been selected to provide easy association with the conditions described.

The criterion listed first is the most important one. The condition modifiers are:

g = (gley)

Mottles ≤ 2 chroma within 60 cm of surface and below all A horizons or saturated with water for >60 days in most years

d = (dry)

Ustic environment; dry >90 consecutive days per year within 20–60 cm depth

e = (Low CEC)

Low cation exchange capacity (CEC)

a = (Al toxic)

Aluminium toxicity. pH value <5.0 within 50 cm, except in organic soils where pH values must be <4.7.

h = (Acid)

pH values between 5.0 and 6.0, i.e., strongly to moderately acid

i = (Fe-P fixation)

High phosphorus fixation by iron. Hues redder than 5YR and with a granular structure

v = (Vertisol)

Very sticky plastic clay >35% and >50% of 2:1 expanding clays; Severe topsoil shrinking and swelling

x = (X-ray amorphous)

Positive to field NaF test indicative of allophane dominance in clay fraction

p = (Low available P)

Low available phosphorus within 50 cm of the soil surface

k = (K deficient)

Exchangeable potassium <0.20%/100 gm. Low K reserves

b = (Basic reaction)

Free $CaCO_3$ within 50 cm (effervescence with HCL) or pH values >7.3

c = (Cat clay)

pH <3.5 with jarosite mottles with hues 2.Y or yellower and chromas 6 or more within 60 cm

n = (Natric)

>15% Na saturation of CEC within 50 cm

The assessment of Fiji soils according to FCSC criteria is given below in Table 4.

Table 4: Fertility capability soil classification applied to Fiji soils

Soil Series	Map Symbols	FCSC Unit
Ba	43B – 43F	Cdeapk
Batiki	55A	Cgh
Batiwai	204B – 204G	Chipk
Bua	40A – 40E	Cdeaik
Bucaisau	51A	Cghk
Bureni	205C – 205F	Chip
Burenitu	121B – 121G	Ck
Cikobia	78A – 78C	Cdikb
Cuku	154D – 154H	CRdpk
Daria	133B – 133E	Cehk
Dawasamu	14A	Spk
Delaibo	202D – 202H	CRk
Delaimatai	183C – 183H	Cdaipk
Delainacau	207C – 207F	Chipk
Deuba	13A	Sgpk
Dobuilevu	122B – 122H	Ck
Dogo	5A	Cgpn
Dogotuki	156B – 156F	Chpk
Drasa	71A – 71C	Cdipk
Dreketi	4A	Cgpc
Driti	137B – 137E	CRapk
Dulevi	90A – 90E	Cehxk
Ekubu	83A	CRdb
Emuri	118A – 118C	Cdhvpk
Gaigai	136D – 136H	CSeap
Galoa	175B – 175E	Cipk
Gau	169A – 169D	Chpk
Hafhafu	100B – 100D	Lxk
Kavula	186E – 186H	Cdhp
Kedra	65A	LCghp
Keiyasi	113C – 113H	Cdhpk
Kelikoso	145A – 145B	Cdhk
Kirikiri	99A – 99B	Lxp
Koro	94G – 94H	LRhp
Korokadi	42A – 42B	LCdeap
Koromavu	112D – 112H	SRdp
Koroniqala	157B – 157E	Cdehipk
Koronivia	44A – 44C	LCehpk
Korotuku	206A – 206C	Cdik
Korovuli	37A	Cdhik
Kubuna	190B – 190E	Cdeaik
Kurukuru	144A – 144D	LCdaik
Kuta	209A	Oh
Labasa	1A	CSghcp
Lagilagi	63A	Cd
Lakeba	180D – 180H	Cdhipk
Lami	75E – 75H	CRb
Lato	62A	Sdpk
Lau	182B – 182E	CLdap
Laucala	92B – 92E	Lx
Lautoka	73A	Cdk
Lawai	23A – 23B	SLdk
Ledrutua	208C – 208H	Ldhpk
Lekutu	194C – 194F	LRdhk
Lewa	221A – 221H	Ceapk
Lobau	124C – 124H	Chipk
Lodoni	168B – 168H	Chipk
Lomaiviti	176C – 176F	Chi
Lomaje	84B – 84E	Sx
Losa	86B – 86D	LRxk

Lovonivia	45A – 45B	Sdehi
Lutu	148C – 148H	LChpk
Macuata	200C – 200H	CSda
Mafua	108D – 108H	CSx
Makomako	188B – 188E	Cdehpk
Malolo	149D – 149F	Sdehpk
Manuka	215D – 215E	Lhxk
Mataiwailevu	132A – 132B	C
Matana	218D – 218E	Chxk
Matavelo	52A	Cghpk
Melimeli	32A	Oghk
Molamolau	72A	Cdehp
Momi	115B – 115H	Cdp
Monasavu	223D – 223H	Chp
Muainase	21A	LCk
Nabeka	101C – 101E	Chk
Nabiti	193B – 193E	Cdaik
Nabuesa	226B – 226H	Chpk
Nabuono	155F – 155H	Cdhipk
Nacamaki	96B – 96E	LSxk
Nacaugai	106G – 106H	Cxpk
Nacokula	64A	Cgehpk
Nacula	130D – 130H	Ch
Nadala	211A	Chpk
Nadarivatu	224D – 224H	Chpk
Nadawa	151B – 151E	CRp
Nadi	36A – 36D	Ldehk
Nadranu	210A	Ogehk
Nadrau	213A	C
Nadroga	114C – 114H	CLdhp
Nadruka	56A	Cghk
Naduru	25A	Chk
Naevuevu	82A – 82E	CRd
Nailoca	166D – 166H	Chipk
Nairai	179C – 179H	Cdhipk
Naitata	214E – 214G	CLxk
Nakavika	174A – 174F	Ceap
Nakelo	18A	Lghk
Nalotu	111C – 111E	CRhpk
Namaka	35A	SCdehpk
Namalata	184B – 184E	Cdhi
Namara	139B – 139E	LCehpk
Namatiu	138B – 138E	Chpk
Namosau	39A – 39C	Cdeaik
Namosi	158C – 158H	Chpk
Namuana	134D – 134G	Chip
Nanukuloa	192B – 192G	Cdhk
Naqalotu	117F – 117G	Cdpk
Naqilai	67A	Cgpk
Narayawa	160C – 160H	Shk
Narewa	50A	Cgvpk
Nasau	105F – 105H	Cdhpk
Nasegai	38A – 38C	Chpk
Naselesele	20A	Spk
Nasou	70A – 70C	CLdhpk
Nauluvatu	159D – 159H	Chpk
Nausori	31A	Cghk
Navai	212A – 212B	Cp
Navava	177A – 177H	Ck
Navua	29A	Lghk
Navunikodi	60A	LChpk
Nawai	187B – 187D	Cdk
Naweni	203A – 203C	Ck
Nayau	81A	CRdipk

Nika	54A	Cdhvk
Nuku	6A	Spk
Nukudamu	141A – 141D	Ldhipk
Nukusa	142B – 142D	LSdehpk
Ogea	79A	Sdkb
Ono	89A – 89B	Lhxk
Qalinaolo	227A – 227C	Chpk
Qaributa	17A	Oghk
Qeleni	104C – 104E	Chpk
Rana	16A	Spk
Rauriko	152F – 152H	Chpk
Ravilevu	97G – 97H	Chk
Raviravi	178B – 178G	Cdaipk
Rawiti	58A	Cehik
Reree	91A – 91B	LSxk
Rewa	22A	Ck
Rewasa	196B – 196E	Cdhp
Roroa	109D – 109H	Spk
Rukuruku	201B – 201D	Cdhip
Sabeto	116C – 116F	CRd
Saliadrau	61A	SLhk
Salialailai	219G – 219H	LRhxk
Samabula	110A – 110G	CR
Sarowaqa	135F – 135H	Chipk
Saunaka	34A – 34B	Chpk
Savudrodro	161C – 161G	Chk
Sawakasa	48A	Cp
Saweni	53A	Cgpk
Seatura	172D – 172H	Cahpk
Serea	46A	S
Serua	128G – 128H	Cahipk
Sigatoka	27A	Cdk
Solevu	171B – 171F	Chk
Soqulu	217G – 217H	Lhxk
Soso	3A	Cgpc
Sote	126B – 126G	Chik
Suva	119B – 119C	Cpk
Tabaka	103C – 103E	Chpk
Tabia	189A – 189D	CLdaik
Tabuquto	165A – 165D	Cdeaik
Tacilevu	8A	Spk
Tagimaucia	220A – 220B	Chxk
Tailevu	170D – 170H	Chipk
Talacagi	66A	SCehpk
Tamanua	24A	Chk
Tau	76D – 76H	CRdb
Taveuni	93C – 93E	Lhxk
Tavua	197C – 197F	Cd
Tavuyaga	107G	CSxpk
Tiri	2A	CLgkc
Toguru	19A	Sghpk
Tokotoko	30A	Cghk
Totoya	191B – 191D	Cdpk
Tuva	181A – 181F	Cdehip
Tuvuca	80A	Sdi
Uaua	147A – 147B	SCdaipk
Ucunilawe	216G – 216H	Lhxpk
Ura	95D – 95F	CShxk
Vaidoko	167B – 167H	Chik
Vakawau	98E – 98F	CLhxk
Varaciva	195E – 195H	Cdeapk
Vasilaulau	131D – 131H	CRdhpk
Vatubaba	150F – 150H	CLehk
Vatukoula	198C – 198H	Cdhik

Vatulele	77H	CRdb
Vatuma	49A – 49B	Cdk
Vatuvonu	143B – 143F	SRdp
Veisaru	57A	Cghp
Verevere	146A – 146C	CRdpk
Visa	125B – 125H	Chk
Vitawa	163F – 163H	Cdhp
Volivoli	11A – 11F	Sde
Vuna	85C – 85G	CSxpk
Vunatoto	162E – 162H	CLp
Vunavutu	12A	Cd
Vunibau	9A	Shpk
Vunicibicibi	41A – 41D	LCdeak
Vunilagi	15A	Cgp
Vurevure	69A	Cgh
Vuya	185B – 185H	Cdhik
Waibici	222C – 222G	Chpk
Waibula	59A – 59B	SChk
Waidina	129B – 129F	Chk
Waidradra	47A	Chk
Waikalou	10A	CSghpk
Wailotua	74D – 74H	Cb
Wailulu	225A – 225H	Chipk
Waimaro	127B – 127H	Ck
Wainibuka	26A	Ck
Wainikai	68A	OCghpk
Wainikavou	33A – 33B	Chp
Wainikoro	140C – 140H	Cdehipk
Wainivesi	28A	Chpk
Wainunu	173A – 173F	Cehp
Waioba	88G – 88H	Lxpk
Waioru	102G – 102H	Chpk
Waiqere	87C – 87E	LShxpk
Waisava	132A – 132C	Ck
Yakita	153B – 153C	Chpk
Yako	120B – 120E	CRd
Yaqara	199A – 199C	Cdhik
Yasawa	7A	Sdpk
Yavuna	164B – 164E	SRdpk

7.5 Interpretation of modifiers

When only one modifier is included in the FCSC unit, the following designated limitations or management requirements apply to the soil; however, interpretations may differ when two or more modifiers are present simultaneously or when textural types are different.

g: Denitrification frequently occurs in anaerobic subsoil. Tillage operations and certain crops may be adversely affected by excess rain unless drainage is improved through tillage or other drainage procedures.

d: Moisture is a limitation during the dry season unless soil is irrigated. Planting date should take into account the flush of N at onset of rains.

e: Low ability to retain nutrients against leaching, mainly K, Ca and Mg. Applications of these nutrients and of N fertilisers should be split.

a: Plants sensitive to Al toxicity will be affected unless lime is applied; extraction of soil water below depth of lime incorporation will be restricted. Lime requirements are high unless an 'e' modifier is also indicated. This modifier is desirable for rapid dissolution of phosphate rocks.

h: Low to medium soil acidity; requires liming for Al-sensitive crops.

i: High P fixation capacity, required high levels of P fertiliser or special P management practices. Sources and method of P fertiliser application should be considered carefully. With C texture, these soils have granular soil structure.

x: High P fixation capacity; amount and most convenient source of P to be determined. Low organic N mineralisation rates.

v: Clayey textured topsoil with shrink and swell properties. Tillage is difficult when too dry or too moist but soils can be highly productive; P-deficiency common.

p: Low available P; P fertiliser is required for plant growth.

k: Low ability to supply K. Availability of K should be monitored, and K fertilisers may be required frequently; potential K-Mg-Ca imbalance.

b: Calcareous soils. Potential deficiency of certain micronutrients, principally Fe and Zn: High levels of Na. Requires special soil management practices for alkaline soils, including use of gypsum amendments and drainage.

c: Potential acid sulphate soil. Drainage is not recommended without special practices; should be managed with plants tolerant to high water table level.

By using the individual guides for each type, substrata type, and modifiers, it is possible to prepare composite interpretation guidelines for all of the possible FCSC units. More comprehensive interpretative statements are possible when interactions of two or more soil conditions are considered.
FCSC units can be applied to specific crops or farming systems.

7.6 Interpretations of FCSC nomenclature

LCgh — Good water-holding capacity (L), medium infiltration capacity (L); erosion will expose undesirable clay-textured subsoil (C); limitations in drainage so that tillage operations and some crops may be adversely affected by water in the lower root zone (g). Drainage needs to be improved. Strong to medium acid soil; liming required for some crops (h).

Gehx — Gravelly throughout the profile (G), very susceptible to erosion (e), cultivation difficult (G), low ability to retain plant nutrients, especially K, Ca and Mg (e). Applications of these nutrients should be split. Strongly acid and requiring liming for some crops (h); allophane dominated mineralogy sees high P -fixing capacity and low rate of N mineralisation of such soils (x).

7.7 Analysis of Fijian FCSC units

FCSC units are grouped according to type, substrata type and modifier, and are given in Table 5. Low ability to supply potassium and phosphorus, acidity, strong dry season and high iron/phosphorus fixation are considered major problems, which are difficult to improve under field conditions for subsistence farmers.

Table 5: Analysis of type, substrata type, and modifier for Fijian FCSC units

Type	Substrata Type	Modifier
C = 161	R = 23	k = 168
L = 29	C = 14	p = 122
S = 28	S = 12	h = 122
O = 5	L = 11	d = 80
		i = 45
		e = 32
		g = 28
		x = 26
		a = 22
		b = 7
		v = 3
		c = 3
		n = 1

8. MATCHING OF SOIL ATTRIBUTES WITH CROP REQUIREMENTS; SOIL SUITABILITY ASSESSMENTS

8.1 Introduction

The interactions between elements of the soil-plant-atmosphere system which form the basis to crop production and management are complex.

Matching is the process of comparing the requirements of a particular crop with the diagnostic soil attributes of a particular soil map unit.

The process initially involves concisely characterising soils in terms of a selected number of attributes deemed to be important for crop production and management.

Values of the soil characteristics for the soil map units (>1200) were derived from the data compiled for the 1:50,000 scale national soil survey of Fiji (Seru and Leslie 1986) and described in the *Fiji Soil Taxonomic Unit Description Handbook* (Leslie and Seru 1998). The key soil and climate attributes used in the crop suitability analysis are given in Figure 2.

Crop simulation models such as those developed by the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) project (IBSNAT 1984, 1989) were considered too sophisticated and the minimum data sets required to run the IBSNAT crop models are incomplete for Fiji.

It was decided to adopt a manual approach for calculating the performance of crops — a semi-quantitative description of plant/agro-ecological relationships and their use for estimating crop performance. This manual approach produced robust results and provided credible estimates for the crop suitability for 78 crops matched with soil attributes for the soil map units (>1200).

Figure 2: Key soil and climate attributes used in the crop suitability analysis

(i)	temperature	-	mean max. temperature
		-	mean min. temperature
(ii)	erosion	-	slope
		-	soil erodibility
(iii)	moisture conditions	-	mean annual rainfall
		-	rainfall seasonality
		-	profile textures
		-	landform
(iv)	nutrient availability	-	pH
		-	mineral reserve
		-	CEC, BS%
		-	Phosphorous, P retention
		-	Exch. Aluminium
(v)	potential for mechanisation	-	stoniness/rockiness
		-	slope
		-	texture topsoil
(vi)	rooting conditions	-	effective rooting depth
		-	water holding capacity
		-	profile texture
		-	stoniness
(vii)	oxygen available to roots	-	soil drainage class
(wetness)		-	porosity and aeration
(viii)	soil toxicities	-	acid sulphate
		-	calcium carbonate
(ix)	excess of salts	-	salinity

8.2 Process for determining crop suitability ratings

The first step in the process was to select the crops (78) and then determine the climatic requirements of each crop, e.g. soil temperature, which governed growth and potential yield. This documented the range (min. to max.) under optimal and absolute conditions. These depend largely on how well the crop growth cycle fits within the period during which water is available, noting that the actual yield attainable is also influenced by variations in rainfall, soil factors, susceptibility to drought and other agro-ecological factors.

As with climate data, the edaphic requirements of crops are essentially those generated in any detailed soil inventory and characterisation. Those edaphic attributes that affect crops are both internal and external. The principal internal attributes include soil temperature, properties affecting water (principally permeability, capacity to store and release water and drainage characteristics), aeration, natural fertility (particularly the capacity to supply plant nutrients), effective rooting depth, texture and stoniness, absence of salinity, extreme acidity or alkalinity, toxic substances and tilth.

The external attributes include: landform features, probability of flooding, trafficability, and accessibility (rock outcrops, surface boulders, etc.).

These edaphic factors provide the minimum data set for matching with each crop's requirements. They were tabulated on individual crop worksheets (not published) to determine the primary crop needs before matching with the climatic data and the soil attributes for the national soil map units. (SMUs).

After the matching step, ratings for potential crop growth were determined, placing the crop for each SMU into one of four categories of potential yield, i.e. high, moderate, low and very low.

Giving consideration to the limitations and production input needs and costs, the final soil suitability class for each crop can be made.

To determine the suitability class of a soil map unit, the soil and climatic attributes (Table 6) are matched with requirements of the individual crops.

Definitions for suitability classes are given in Figure 3.

Table 6 provides the results of the analysis of matching the soil map units with the 78 crops.

These data have also been spatially expressed through GIS-generated crop-specific maps. The maps are on e-archive with the Fiji Ministry of Primary Industries (MPI) and a print-on-demand service is available.

A future next step available to MPI is to calculate the actual yield range for each soil suitability class for each crop assessed.

Figure 3: Suitability classes

Class	Definition
S1 Highly suitable	Soils that are expected to be highly productive for the defined crop. No significant limitations.
S2 Moderately suitable	Soils that are expected to be moderately productive for the defined crop. Limitations reduce crop yields by 15–40% and/or increase recurrent costs for production and conservation.
S3 Marginally suitable	Soils that are expected to have a low productivity for the defined crop. Limitations reduce crop yields by 40–70% and/or considerably increase recurrent costs for production and conservation.
N Not suitable	Soils with very severe limitations, which cannot be corrected economically.

Table 6: Soil suitability classification for 78 crops

| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
|---|---|---

| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
|---|---|---

| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
|---|---|---

Soil Series	Map Code	226D	226E	226F	226G	226H	155F	155G	155H	96B	96C	96D	96E	106G	106H	64A	130D	130E	130F	130G	130H	211A	224D	224E	224F	224G	224H	151B	151C	151D	151E	36A	36B	36C	36D	210A	213A	114C	114D	114E	114F	114G	114H	56A	25A	82A	82B	82C	82D	82E	166D	166E	166F	166G	166H	179C	179D	179E	179F	179G	179H	214E	214F	214G	174A	174B	174C	174D	174E
Nabuesa	Avocado	N	N							2	N	N				N						N	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Banana	N	N							2	N	N				N						2	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Breadfruit	2	N							2	N	N				N						2	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	B. Beans	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Capsicum	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cardamom	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Carrot	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cashew	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cassava	2	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Chillies	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Ch. Cabbage	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cinnamon	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cloves	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cocoa	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Coconut	2	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Coffee A.	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Coffee R.	2	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cowpea	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Cucumber	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Dalo	2	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Daruka	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Durian	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Eggplant	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Eng. Cabbage	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Ginger	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Gourd	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Grapefruit	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Guava	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Horseradish	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Jackfruit	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Jatropha	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Lime	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Long Beans	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Lychee	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Macadamia	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Maize	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Mandarin	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Mango	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Manila Hemp	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Mung Bean	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Noni (Kura)	2	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Nutmeg	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Oil Palm	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Okra	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Onion	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Orange	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Papaya	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Peanut	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Pepper	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Pigeon Pea	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Pimento	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Pineapple	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Potato	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Pumpkin	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Rice Upland	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Rice Irrig.	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Rubber	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sago	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sisal	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sorghum	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Soursop	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Soya Bean	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Spinach	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Squash	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sugar	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sunflower	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Sweet Potato	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Tea	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Tomato	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Tung Oil	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Turmeric	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Urd	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Vanilla	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Water Melon	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Winged Bean	N	N							2	N	N				N						2	N					N	N			3	3	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Yagona	1	N							1	N	N				N						1	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Yam	2	N							2	N	N				N						2	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nabuesa	Zucchini	2	N							2	N	N				N						2	N					N	N			2	2	2									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Dalka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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| Soil Series | Map Code | Avocado | Banana | Breadfruit | B. Beans | Capsicum | Cardamom | Carrot | Cashew | Cassava | Chillies | Ch. Cabbage | Cinnamon | Cloves | Cocoa | Coconut | Coffee A. | Coffee R. | Cowpea | Cucumber | Dalo | Daruka | Durian | Eggplant | Eng. Cabbage | Ginger | Gourd | Grapefruit | Guava | Horseradish | Jackfruit | Jatropha | Lime | Long Beans | Lychee | Macadamia | Maize | Mandarin | Mango | Manila Hemp | Mung Bean | Noni (Kura) | Nutmeg | Oil Palm | Okra | Onion | Orange | Papaya | Peanut | Pepper | Pigeon Pea | Pimento | Pineapple | Potato | Pumpkin | Rice Upland | Rice Irrig. | Rubber | Sago | Sisal | Sorghum | Soursop | Soya Bean | Spinach | Squash | Sugar | Sunflower | Sweet Potato | Tea | Tomato | Tung Oil | Turmeric | Urd | Vanilla | Water Melon | Winged Bean | Yagona | Yam | Zucchini |
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Soil Series	Yavuna	Yavuna	Yavuna	Yavuna	Yasawa	Yaqara	Yaqara	Yaqara	Yako	Yako	Yako	Yako	Yakita	Yakita	Waisava	Waisava	Waisava	Waiqere	Waiqere	Waiqere	Waioru	Waioru	Waioba	Waioba	Wainunu	Wainunu	Wainunu	Wainunu	Wainunu	Wainunu	Wainivesi	Wainikoro	Wainikoro	Wainikoro	Wainikoro	Wainikoro	Wainikoro	Wainikavou	Wainikavou	Wainikai	Wainibuka	Waimaro	Waimaro	Waimaro	Waimaro	Waimaro	Waimaro	Waimaro	Wailulu
Map Code	164E	164D	164C	164B	7A	199C	199B	199A	120E	120D	120C	120B	153C	153B	132C	132B	132A	87E	87D	87C	102H	102G	88H	88G	173F	173E	173D	173C	173B	173A	28A	140H	140G	140F	140E	140D	140C	33B	33A	68A	26A	127H	127G	127F	127E	127D	127C	127B	225H
Avocado		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Banana		N	N	N	3	N	N	N		N	N	N	2	2	N	N	N		N	2							N	N	N	N	2					3	3	2	2	N	2					N	2	2	
Breadfruit		N	N	N	N	2	2	2		N	N	N	2	2	2	2	2		2	2							2	2	2	2	2					2	2	N	N	N	2					2	2	2	
B. Beans		N	N	N	3	2	2	2		N	N	N	2	2	2	2	2		N	N							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Capsicum		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	
Cardamom		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Carrot		N	N	N	3	2	2	2		N	N	N	2	2	2	2	2		N	2							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Cashew		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Cassava		N	N	N	2	2	2	2		2	2	2	2	2	2	2	2		1	1							1	1	1	1	2					2	2	2	2	N	2					N	2	2	
Chillies		N	N	N	3	2	2	2		N	N	N	2	2	2	2	2		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	
Ch. Cabbage		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	2							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Cinnamon		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Cloves		N	N	N	N	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	N					N	2	N	N	N	N					N	N	N	
Cocoa		N	N	N	N	N	N	N		N	N	N	2	2	2	2	2		N	N							3	2	2	2	2					N	N	N	N	N	2					N	2	2	
Coconut		3	3	3	1	2	2	2		N	N	N	2	2	2	2	2		2	2							3	2	2	2	2					2	2	2	2	N	2					N	2	2	
Coffee A.		N	N	N	N	N	N	N		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	N	N	N	N	N					N	N	N	
Coffee R.		N	N	N	N	N	N	N		N	N	N	N	N	2	2	2		2	2							3	2	2	2	2					N	N	N	N	N	2					N	N	N	
Cowpea		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Cucumber		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	2							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Dalo		N	N	N	N	2	2	2		N	N	N	2	2	1	1	1		1	1							1	1	1	1	2					N	N	N	N	N	2					N	2	2	
Daruka		N	N	N	N	N	N	N		N	N	N	2	2	2	2	2		N	N							N	2	2	2	N					N	N	2	2	N	N					N	2	2	
Durian		N	N	N	N	2	2	2		N	N	N	2	2	N	N	N		2	2							N	N	N	N	N					2	2	N	N	N	N					N	2	2	
Eggplant		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	2							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Eng. Cabbage		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	2							N	2	2	2	2					N	2	2	2	N	2					N	2	2	
Ginger		N	N	N	N	N	N	N		N	N	N	2	2	1	1	1		N	N							2	2	2	2	2					N	N	N	N	N	2					N	2	2	
Gourd		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Grapefruit		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Guava		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Horseradish		N	N	N	N	N	N	N		N	N	N	N	N	N	N	N		N	N							N	N	N	N	2					N	N	N	N	N	2					N	N	N	
Jackfruit		N	N	N	N	2	2	2		N	N	N	2	2	2	2	2		N	N							3	2	2	2	N					2	2	N	N	N	N					3	2	2	
Jatropha		2	2	2	1	1	1	1		2	2	2	3	3	3	3	3		3	3							3	3	3	3	3					1	1	N	N	N	3					N	N	N	
Lime		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Long Beans		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	
Lychee		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Macadamia		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Maize		N	2	2	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Mandarin		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Mango		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Manila Hemp		N	N	N	N	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					3	2	2	
Mung Bean		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Noni (Kura)		N	N	N	N	2	2	2		N	N	N	2	2	2	2	2		2	2							2	2	2	2	2					2	2	N	N	N	2					2	2	2	
Nutmeg		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					3	3	N	N	N	N					N	N	N	
Oil Palm		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Okra		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	2	2	
Onion		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	2	2	
Orange		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Papaya		N	N	N	3	2	2	2		N	N	N	2	2	N	N	N		N	N							N	N	N	N	2					2	2	2	2	N	2					N	N	N	
Peanut		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Pepper		N	N	N	N	N	N	N		N	N	N	N	N	2	2	2		N	N							3	2	2	2	2					N	N	N	N	N	2					N	2	2	
Pigeon Pea		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Pimento		N	N	N	N	N	N	N		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	3	N	N	N	N					N	N	N	
Pineapple		N	N	N	N	1	1	1		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	1	2	2	N	N					N	N	N	
Potato		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	N	N	N	N					N	N	N	
Pumpkin		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Rice Upland		N	N	N	N	N	N	N		N	N	N	N	N	2	2	2		N	N							N	N	2	2	2					N	N	2	2	2	2					N	N	2	
Rice Irrig.		N	N	N	N	N	N	N		N	N	N	N	2	N	N	2		N	N							N	N	N	2	2					N	N	N	2	2	2					N	N	N	
Rubber		N	N	N	N	N	N	N		N	N	N	N	N	2	2	2		N	N							3	2	2	2	2					N	N	N	N	N	2					3	2	2	
Sago		N	N	N	N	N	N	N		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	N	N	N	2	N					N	N	N	
Sisal		N	N	N	2	2	2	2		2	2	2	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Sorghum		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Soursop		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Soya Bean		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	2	2	N	N					N	N	N	
Spinach		N	2	2	3	2	2	2		N	N	N	N	2	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	
Squash		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Sugar		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Sunflower		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Sweet Potato		N	2	2	3	2	2	2		N	N	N	N	2	N	N	N		N	N							N	N	N	N	2					N	2	N	N	N	2					N	2	2	
Tea		N	N	N	N	N	N	N		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	N	N	N	N	N					N	N	N	
Tomato		N	2	2	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	N	N	
Tung Oil		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					2	2	N	N	N	N					N	N	N	
Turmeric		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	N	N	N	N					N	N	N	
Urd		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Vanilla		N	N	N	N	N	N	N		N	N	N	2	2	2	2	2		N	N							3	2	2	2	2					N	N	N	N	N	2					N	2	2	
Water Melon		N	N	N	3	2	2	2		N	N	N	N	2	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	
Winged Bean		N	N	N	N	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	N					N	2	2	2	N	N					N	N	N	
Yagona		N	N	N	N	N	N	N		N	N	N	2	2	2	2	2		1	1							2	2	2	2	2					N	N	N	N	N	2					2	2	2	
Yam		N	N	N	N	N	N	N		N	N	N	2	2	2	2	2		1	1							3	2	2	2	2					H	N	N	N	N	2					3	2	2	
Zucchini		N	N	N	3	2	2	2		N	N	N	N	N	N	N	N		N	N							N	N	N	N	2					N	2	2	2	N	2					N	2	2	

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APPENDIX 1: LAND USE CAPABILITY CLASSIFICATION [LAND USE SECTION, MPI, 1977]

1. Basis of the classification

Land use capability classification is a systematic arrangement of different kinds of land according to those properties that determine its capacity for permanent sustained production. The word "capability" is used in the sense of "suitability for productive use" after taking into account the physical limitations the land may have.

This capacity depends largely on the physical qualities of the soil and the environment. These are frequently far from ideal, and the difference between the ideal and the actual is regarded as limitations imposed by these physical qualities of the soil, and by the environment.

The limitations affect the productivity, the number and complexity of corrective practices needed, and the intensity and type of land use. The degree of limitations can be assessed from the susceptibility to erosion, steepness of slope, susceptibility to flooding, wetness, drought, salinity, depth of soil, soil texture, stoniness, structure, nutrient supply and climate.

As a basis for this assessment an *inventory* is made of the facts about the land, and the information is recorded on the *Land inventory map* on which are delineated many distinct *land inventory units.* The information contained on this map is combined with other information on geology, climate, land use, results of research, and farming and forestry experience to assess the capacity of the land for permanent sustained production.

2. Categories of land use classification

The capability classification provides for three categories of groupings of the inventory units, all of which are decided objectively but which are based on the physical qualities of a soil and its particular site as an entity without reference to surrounding land. The three categories are: major class; subclass; and capability unit.

2.1 Land use capability

The first grouping is into eight major classes. Classes I–IV comprise land suitable for arable cultivation; land in classes V–VII is not suitable for arable cultivation but is suitable for pastoral or forestry use; and class VIII is land suitable only for protective purposes.

The four arable and four non-arable classes are arranged in order of increasing degree of limitation or hazard, from class I to class VIII. Correspondingly, the range of uses to which the land may be put (i.e. its versatility) decreases from class I to class VIII.

The capability class gives information about the general limitations of the land only, i.e. total degree of limitation. It does not give, for instance, productivity ratings for specific crops, but shows the location, amount and general suitability of the land for agricultural, pastoral or forestry use.

Each major class may include many different kinds of land units or soils, and many of the units within a class may require different management treatments. Thus it is difficult to make valid generalisations at the class level about suitable kinds of crops or other management needs.

2.2 Description of land use capability subclass

The second category, the *capability subclass*, are subdivisions of land use capability classes that show the kind of physical limitations or hazards, and there are four, in the following order of precedence: (e) erodibility; (w) wetness;

(s) soil limitations in the rooting zone; and (c) climate.

These are the subclasses and they may be used in two ways — either as broad divisions of the land use capability classes at a more general level of classification for land use, or as groupings of the units for detailed classifications.

The four broad kinds of limitations which are recognised in the subclasses are:

Erodibility, where erosion susceptibility, past erosion damage, or steepness of slope are the major factors *subclass e*. This subclass is present in all LUC classes except class I, which comprises flat land with soils of good structural stability and fertility.

Wetness, where the land units have soils with poor drainage or a high water table, or where there is frequent flooding from rivers or coastal waters, or areas of deep peat, or mangrove swamps — *subclass w.* The subclass applies in all major classes except class V.The subclass will be rare in VII and VIII, common in classes I, II, III, IV and VI and very frequent in class V.

Soil limitations where limitations within the rooting zone exists such as shallowness, stoniness, rock outcrops, low fertility which is difficult to correct, salinity, toxicity, low moisture-holding capacity, or unfavourable soil texture and structure physical properties — *subclass s.* This subclass is the only one that occurs in all the LUC classes.

Climatic limitations, where the climate is the only major hazard or limitation in the use of the land *subclass c*. The subclass is used only where climate is the only limitation to the use of the land, or where a climatic factor (e.g. excessive rain or drought, or extreme temperature) is the dominant limitation to land use. This subclass is present only in LUC classes I–VI.

2.3 Explanatory notes

Certain conventions are observed in determining the correct subclass for any particular land unit and only in rare cases is more than one subclass used. The dominant kind of limitation determines which of the four subclasses should be used. Where two kinds of limitations are essentially equal, the subclasses are given the following priority: *e*, *w*, *s*, *c*. That is, *e* is given precedence over *w*, *s* and *c*, and *w* is given precedence over *s* and *c*, etc.

2.4 Description of land use capability units

At the most detailed or lowest level of classification, the capability unit is used as a grouping of those land inventory units that respond similarly to the same management, are adapted to the same kinds of crops, pasture or forest species, have about the same potential yield, and require the application of the same conservation measures.

Thus the capability unit comprises land within a subclass, with similar soil characteristics, slope, erodibility, potential productivity, and management requirements.

The capability unit groups together similar land inventory units and helps to simplify what may be a very complex inventory pattern. When shown together with the major class and subclass, the capability unit provides the additional information about management practices necessary for the best use of the land.

The symbol used for the capability unit is a small Arabic numeral placed after the subclass symbol, e.g. IIIe1; IIIe2.

At this stage it is not possible to say how many capability units there will be in each subclass of the eight LUC classes. This is because it is currently impracticable to standardise definitions of units on a national level. However, the ultimate objective is to work towards standardisation of the capability unit, first on a catchment basis, then on a national basis.

3. The classification

(a) Capability division: The eight LUC classes can be divided into four capability divisions as shown below.

Capability division			Major class
1. **Arable:**	(a)	Suitable for ploughing and intensive cropping	I–III
	(b)	Unsuitable for ploughing but suitable for less intensive cropping under traditional cultivation methods	IV
2. **Non-Arable:**	(a)	Unsuitable for arable cropping but suitable for pastoral or forestry use	V–VII
	(b)	Unsuitable for productive vegetation; suitable only for protective purposes	VIII

(b) Description of individual LUC classes:

LUC class I: Represents good multiple use of land. Flat (0**–**3°) with deep, easily worked, fertile soils; no risk of erosion, well drained but not seriously affected by drought, and the climate is favourable for the growth of a wide range of crops, as well as for pasture and forestry.

Class I land is confined almost entirely to well drained, recent alluvial areas above frequent flood levels.

Subclasses that may occur in LUC class I are:

Iw **–** 1. Very slight initial wetness (soil condition or high water table)
2. Very slight risk of damaging overflows from rivers and streams (very occasional flooding)

Is **–** 1. Very slight stoniness (presence of river gravels)
2. Very slight salinity (easily removable by permanent work)

Ic **–** 1. Where climate limitations dominate (rainfall, altitude, and temperature)

Subclass *c* should be the best of all subclasses in major class I.

LUC class II: Arable land with only slight limitations, which make it more difficult to manage than class I. Management and conservation practices to overcome those limitations are easy to apply.

The land may be flat to gently undulating (0**°–**7°), well drained to moderately drained, deep to slightly shallow, and fertile to moderately fertile.

Class II land is confined mainly to alluvial areas which are either slightly poorly drained or subject to regular flooding. The land can be used for arable cultivation, pasture or forestry. Subclasses that may occur in LUC class II are:

IIe **–** 1. Slopes (4**°–**7°)
2. Slight susceptibility to erosion

IIw **–** 1. Slight to moderate wetness after drainage
2. Slight to moderate risk of damaging flooding

IIs **–** 1. Slight stoniness (fine gravels)
2. Slight infertility, easy to correct

3. Unfavourable texture and structure — difficult to cultivate to a tilth
4. Slight salinity
5. Slight shallowness (soils of moderate depth)

IIc – 1. Class I land with rainfall >4000 mm — too much rain; and in dry zone — too little rain in growing season
2. Class I land on medium and high altitude areas (>600 m above sea level) — cloudiness, less sunshine
3. Class I land in areas of low winter temperature (<20 **°C)**

LUC class III: Arable land with moderate limitations that restrict the choice of crops grown, or make special conservation practices necessary, or limit land use in both of these ways.

The land may be flat or gently sloping (0°–11°), slightly unstable, of moderate to severe wetness, subject to frequent damaging flooding, of shallow, moderately stony, and/or infertile soils.

Class III land occurs mainly in areas of gley soils, lower river terraces, sandy coastal flats, inceptisols of moderate slopes, and in areas of better alfisols and ultisols.

The land may be used for arable cultivation, pasture or forestry. Subclasses that may occur in LUC class III are:

IIIe – 1. Moderate slopes (8°–11°)
2. Moderate susceptibility to erosion
3. Severe effects of past erosion

IIIw – 1. Moderate to severe wetness
2. Frequent damaging flooding

IIIs – 1. Moderately stony (gravels and stones — can be collected to enable ploughing)
2. Low fertility not easy to correct
3. Low moisture-holding capacity
4. Moderate salinity
5. Shallow soils
6. Areas of shallow peat — easy to develop for cropping

IIIc – 1. Classes I and II land with rainfall 1500–2000 mm — too little rain
2. Classes I & II land in high altitude areas (>600 m above sea level)
3. Class II land in areas of low winter temperatures

LUC class IV: Marginal arable land with severe limitations that restrict the choice of crops grown, or necessitate intensive conservation treatment and very careful management, or that may affect land use in both of these ways.

Class IV land may be flat to rolling (0°–15°) and may comprise one or more of the following: poor to very poorly drained; stony or bouldery, or both; very shallow soils; infertile soils; coarse textured soils very low in moisture-holding capacity; or mangrove or peat swamps that are not too difficult to reclaim for cropping.

Common soil types of class IV land are: strongly gleyed soils, some alfisols, some ultisols; or colluvium derived from oxisols.

Because of these limitations, and in the case of rolling land, the difficulty of installing and maintaining conservation work, this land class is used mainly for pasture, coconut plantations, or subsistence cultivation under traditional cultivation methods.

The upper slope limit for this land class is 12°–15°C; this is too steep for ploughing either by machinery or by draught animals. Accordingly, cropping in the *e* subclass will be restricted to subsistence cultivation using traditional methods, including shifting.

Subclasses that may occur in LUC class IV are:

IVe – 1. Rolling slopes (12°–15°)
2. High susceptibility to erosion. Very unstable under arable cropping.
3. Very severe effects of past erosion

IVw – 1. Very severe wetness (very poorly drained areas — mineral soils)
2. High risk of damaging flooding (very frequent flooding)

IVs – 1. Severe stoniness — cannot be ploughed but suitable for traditional cultivation methods
1. Infertile soils (e.g. alfisols and ultisols) difficult to correct with the use of fertilisers
2. Coarse textured soils very low in moisture-holding capacity, liable to severe drought
3. High salinity — areas of mangrove swamps not too difficult to reclaim for cropping
4. Very shallow soils
5. Areas of moderately shallow peat that can be developed for cropping

IVc – 1. Classes I, II and III in high rainfall zones
2. Some class III land in higher altitude zones
3. Class III land in areas of low winter temperatures

LUC class V: This land class is unsuitable for arable cropping but suitable for pastoral or forestry use.

Steepness (slopes 16°–20°) or stoniness are the main limitations that render it non-arable and restrict it to pastoral use or productive forestry.

The erosion risk on slopes under pastoral or forestry use is only very slight, but on such a slope this hazard would be too great if put under arable cultivation. Where the slope is less than 15° the land may be too stony or bouldery for the use of machinery in arable cultivation.

Thus Class V, in effect, now becomes the best non-arable class, confirming to the progression from I to VIII.

Subclasses that may occur in LUC class V are:

Ve – 1. Strongly rolling slopes (16°–20°)
2. Slight susceptibility to erosion

Vs – 1. Stoniness — unsuitable for cropping

Vc – 1. Some class IV land in low to moderate rainfall zones
2. Class IV and in areas of low winter temperature
3. Class III and IV land in higher altitude groups

LUC class VI: Marginal pastoral land with moderate to severe limitations. It comprises land that is rather too steep for pastoral use (slopes 21° to 25°C); or that has evidence of severe effects of past erosion; or that is highly susceptible to erosion. Class VI may also comprise one or more of the following land types: lower river terraces subject to very frequent flooding; peat and mangrove swamps that would be too difficult to develop for cropping; areas that are very stony to very bouldery, or shallow to very shallow soils; soils that are very low to extremely low in moisture-holding capacity, or low to very low in fertility, or very saline to extremely saline.

Production or commercial forestry may be the best form of land use where erosion or low fertility are the dominant limitations. On all other land types in this class pasture should be suitable but its management will require special attention.

Subclasses that may occur in LUC class VI are:

VIe – 1. Steep slopes (21°–25°)
2. Severe effects of past erosion (class 3)
3. Moderate to severe susceptibility to erosion (class 4)

VIw – 1. Very frequent damaging flooding
2. Peat land
3. Mangrove swamp. This can also be a soil limitation.

VIs – 1. Very shallow soils
2. Very stony to very bouldery
3. Infertile to very infertile soils
4. Very low to extremely low in moisture-holding capacity
5. Very saline to extremely saline soils. This can also be a wetness limitation.

VIc 1. Classes IV and V land in high rainfall zones and class IV land in low to moderate rainfall zones. This may not exist.
2. Class IV land in very high altitude group

LUC class VII: Land in class VII is generally unsuitable for pastoral use, but its suitability for forestry may be fair to marginal.

The class comprises land that is either very steep (26°–35°); or that is very highly susceptible to erosion, or showing very severe damage from past or present erosion; or land that is very shallow, very bouldery, or very low in fertility.

In areas where the major (dominant) hazard is erosion or low fertility, commercial forestry may be the best form of land use. Where steepness, shallowness or stoniness are the dominant hazards, protection forestry may be practised, or otherwise the land is best left untouched in its natural state.

Subclasses that may occur in this LUC class are:

VIIe – 1. Very steep slopes
2. Severe damage from present erosion
3. High susceptibility to erosion

VIIs – 1. Extreme shallowness
2. Very stony and bouldery
3. Very infertile to extremely infertile

Major class VII has no subclasses on either wetness or climatic limitations.

LUC class VIII: Land in LUC class VIII is generally unsuitable for productive use in both agriculture and forestry. This is predominantly very steep mountain land, mostly above an altitude of 2500 feet.

This also includes low land areas in unfavourable situations, such as extreme erosion or susceptibility to erosion (e.g. areas highly susceptible to slumping or earth flow), or extreme stoniness, shallowness, or infertility; and also extremely steep slopes in high to very high rainfall areas (slope G in A and B rainfall zones). Also included in major class VIII are peat and mangrove swamps whose development is not likely to be economically feasible.

Class VIII land is therefore best protected and/or reserved for watershed and wild life protection purposes, or left in its natural state untouched.

Subclasses that may occur in this major class are:

VIIIe – 1. Extreme steepness
2. Extreme damage from erosion, or instability

VIIIw – 1. Peat swamp not feasible to develop
2. Mangrove swamp not feasible to develop

VIIIs – 1. Extreme shallowness
2. Extreme stoniness
3. Extreme infertility