APPENDIX V: MAJOR TROPICAL SOILS AND THEIR SUSCEPTIBILITY TO LAND DEGRADATION

Only those soils that are mentioned in this publication by their FAO classification (1974 *Soil Map of the World* edition) name and/or those that are widespread in tropical environments are described.

FAO-UNESCO Soil name: Soil Unit & Subunit	*US Soil Taxonomy Name*	*Main Properties & Susceptibility to Land Degradation*

Acrisols
- orthic
- ferric
- humic
- plinthic
	Ultisol
	[orthic=Hapludults;
	ferric=Palexerults;
	humic=Humults;
	plinthic=plinthudults]
		Acid, low base status (<50% base saturation) and strongly leached. One of the most inherently infertile soils of the tropics, becoming degraded chemically and organically very quickly when utilised. An orthic Acrisol in Indonesia on a 13% slope under 3000 mm rainfall has been recorded as having over 260 tonnes/ha/yr erosion. All nutrients, except Al, decreased substantially. Acrisols have very low resilience to degradation and moderate sensitivity to yield decline

Andosols - ochric - mollic - humic - vitric	Inceptisols - Andepts [ochric & humic=Dystrandepts mollic=Eutrandepts]	From volcanic ash parent material; high in organic matter. Highly erodible, and limited in phosphorus. Chemical fertility is variable, depending on degree of weathering. Andosols have low resilience, and variable sensitivity.
Arenosols - cambic - luvic - ferralic - albic	Entisols - Psamments	Consists of unconsolidated wind-blown or water-deposited sands. One of the most inherently infertile soils of the tropics and subtropics with very low reserves of nutrients. Yet if chemical inputs provided, they yield well. Arenosols have moderate resilience and low sensitivity

Cambisols
- eutric
- dystric
- humic
- calcic
- chromic
- vertic
- ferralic
	Inceptisols
	[eutric and
	calcic=Eutrochrepts;
	dystric=Dystrochrept;
	humic=Haplumbrepts
	vertic=Vertic Topepts;
	ferralic=Oxic
	Tropepts]
		Tropical 'brown earth' with a higher base status than Luvisols, but otherwise similar limitations. They have relatively good structure and chemical properties, and are not therefore greatly affected by degradation processes until these become large. Because of increasing clay with depth, they tend not to be greatly impacted by degradation. Cambisols have high resilience to degradation, and moderate sensitivity to yield decline

Ferralsols
- orthic
- xanthic
- rhodic
- humic
- acric
- plinthic
	Oxisols
	[orthic, xanthic &
	rhodic =Orthox;
	humic=Humox;
	acric=Acrox;
	plinthic=Plinthaquox]
		Ferralsols are the classic red soils of the tropics, because of high iron. They have low supply of plant nutrients and are not therefore impacted greatly by erosion; they have strong acidity and low levels of available phosphorus. With very few reserves of available minerals and easily lost topsoil organic matter, Ferralsols have low resilience and moderate sensitivity

Fluvisols - eutric - calcaric - dystric - thionic	Inceptisols - Fluvents [thionic=Sulphaquept or acid sulphate]	Formed from unconsolidated water-borne materials. Highly variable, but much prized for intensive agriculture. Under most conditions they have high resilience and low sensitivity. The big tropical exception is acid sulphate soils which have massive chemical degradation impacts when drained for agriculture
Histosols - eutric - dystric	Histosols	Organic or peat soils. When drained, highly prized for agriculture. Land degradation often caused through shrinkage of the organic matter and subsidence.
Luvisols - orthic - chromic - calcic - vertic - ferric - plinthic	Alfisols [orthic=Hapludalfs; chromic=Rhodexeralf calcic=Haplustalf; vertic=Vertic Haploxeralfs]	The tropical soil most used by small farmers because of its ease of cultivation and no great impediments. Base saturation >50%. But they are greatly affected by water erosion and loss in fertility. Nutrients are concentrated in topsoil and they have low levels of organic matter. Luvisols have moderate resilience to degradation and moderate to low sensitivity to yield decline.
Nitosols - eutric - dystric - humic	Alfisols & Ultisols [eutric=Tropudalfs; dystric=Tropudults; humic=Trophumults]	One of the best and most fertile soils of tropics. They can suffer acidity and P-fixation, and when organic carbon decreases, they become very erodible. But erosion has only slight effect on crops. Nitosols have moderate resilience and moderate to low sensitivity.

FAO-UNESCO Soil name: Soil Unit & Subunit	*US Soil Taxonomy Name*	*Main Properties & Susceptibility to Land Degradation*
Phaeozems - haplic - calcaric - luvic	Mollisols [haplic=Hapludolls; calcaric=Vermudolls; luvic=Argiudolls]	They have a good structure and are generally resistant to erosion. But once eroded, the effect on yields is great. They have a high resilience and high sensitivity.
Rendzinas	Mollisols - Rendolls	Characterised by extreme shallowness, and formed on limestone (calcareous) parent material. Degradation serious with severe limitations imposed by depth and high permeability.
Solonchaks - orthic - mollic	Aridisol - Salorthid	Soils having high content of salts, common in arid and semi-arid areas. Badly run irrigation schemes may turn soils into solonchaks.
Solonetz - orthic	Alfisol - Natrustalf	Soils have severe chemical problems associated with salt and sodium on the exchange complex. They degrade very easily, and large gullies typically form.
Vertisols - pellic - chromic	Vertisols [pellic=Pelluderts; chromic=Chromudert]	Soils with 30% or more clay. Clays usually active, cracking when dry and swelling when wet. Extremely difficult to manage (hence easily degraded) but very high natural chemical fertility if physical problems overcome
Xerosols	Aridisols	Soils of the deserts, with low levels of organic matter. Subject to wind erosion and concentration of soluble salts.
Yermosols	Aridisols	Even drier and more problematic than Xerosols