PROFILE STUDY OF SOILS ALONG THE TOPOSEQUENCE OF KATSINA-ALA RIVER IN BENUE STATE, NIGERIA

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Abstract: A profile study of soils proximal to river Katsina-Ala at two locations along its bank was studied. River Katsina-Ala is an international (transboundary) water body in the northcentral state of Benue and areas of interest were Katsina-Ala and Buruku at 25 km apart. Three mapping units were identified and classified based on physiographic position along the toposequence and associated land-use types in the two study sites. Six profiles were described based on genetic horizons differentiation in-situ. Soil samples were taken for routine physical and chemical analysis for the twenty seven genetic horizons identified. Buruku soils had more horizon than katsina-Ala while more textural diversity was observed in Buruku though both locations had preponderance of sand (katsina-Ala 752.6 g/kg and Buruku 673.3 g/kg), indicative that soil on the lower course of the river tends to have more colluvial and alluvial material sediment. The colour matrix of dark yellowish brown, strong brown and reddish yellow are associated with minerals such as Goethite (FeOOH) and Haematite (Fe_2O_3) redoximorphic features associated with flooding/wetness resulted from alternating periods. Silt separates was generally higher than the values obtained for clay an indication for the presence of reserved weatherable minerals. The pH (H_2O) was within the range that allow for nutrient availability. Fertility indicators (TN, %BS, C/N, Av.P, K) were rated moderate to high while micro-nutrients were rated low to moderate however Cu levels were rated very low (0.43 -1.72 mg/kg). The soil generally was classified in the order of ustalfs in the USDA soil taxonomy and corresponds to arenic luvisol (valley and midslope) and loamic luvisol (crest slope) in the WRB. The soils are capable of supporting profitable production of rice, sorghum, yam and sugarcane provided it is used appropriately.

Keywords: River Katsina-Ala, Toposequence, Soil Characterization and Classification Sustainable Landuse and Top Soil Mining

Introduction

The future of sustainable landuse (LU) lies in the way we plan, protect and enhance soil resilience to degradation. In the face of the increasing anthropogenic activities, options to arable soil conservation are limited. Sustainable soil resources management requires intensive soil survey and landuse development. Akamigbo (2010) sees soils survey not only as inventory of soil properties but also of many land features. Landuse involves land management; management must be planned in order to allocate land to its most suitable use to avoid degradation. Soils along big rivers can become floodplains depending on the amount of precipitation in a given year and the slope characteristics along such water bodies. The land units in watershed demarcated through its properties, physiographic position and usage have their own potentials and limitation (Bandyopadhyay *et al*., 2009). Again soils adjoining rivers have come under intensive cultivation. Farming in watersheds or proximal soils to the river without proper land use planning (LUP) and management practices such as nutrient replenishment using organic matter, erosion control and correct tillage orientation etc. their absence will lead to soil degradation. Understanding soil characteristics are essential for decision making regarding crop productivity and useful in estimating the ability of the soil to resist erosion especially runoff. Soil characterization and classification together are powerful resources for the benefit to mankind especially in the areas of food security and environmental sustainability (Esu, 2004). Soil classification gives the best meaning to sustainable soil resources management.

Relief or topography as a factor of soil formation influences the distribution of materials and energy occurring from climate and parent materials. Relief influences the drainage and depth of soil profile. The formation of soil varies along various segments of the toposequence. Physiographic positions such as crest/ summit, shoulder/ midslope and valley bottom/ toeslope as the result of deposition of materials in various sections of the landform (Osodeke, 2017).

Landuse changes in forest, farmlands and along the river banks are being driven by anthropogenic needs for food, shelter, fiber and water whether for domestic or industrial purposes. These quests by humans have led to human-induced changes to the natural and ultimately land degradation. The floods of 2022 in nearly all the states of Nigeria lend more credence and justification for soil characterization and classification especially in the area of climate change adaptation and climate smart agriculture. Soil organic matter varies spatially with natural soil variability and soil management practices. The amount of organic matter content indicates the soil health and its suitability for agriculture (Bandyopadhyay et al., 2009). Therefore, the aim of this study was undertaken to investigate the in-situ characteristics and classify the soil for sustainable agriculture.

Materials and Method

Study Area

Two locations along the toposequence of river Katsina-Ala were used for the study location. The areas of interest were Katsina-Ala and Buruku at 25 km apart and both are along the river Katsina-Ala in Benue state. River Katsina-Ala is an international (transboundary) water body in the northcentral state of Benue, it originated from the republic of Cameroon in the Bamenda highlands (northwest) and a major tributary of river Benue. The study area is characterized by tropical climate with two distinct seasons, wet and dry season, the wet season lasts from March to October whereas the dry seasons last from November to February, with mean annual rainfall of 1299 – 1641 mm distribution is bimodal with peaks in August and September. The relative humidity varies as the season (about 40 % in January and 90 % in July) with mean annual temperature of about 29°C and the dry and wet seasons are controlled by the annual migration of the inter-tropical zone of convergence (ITZC). The area lies in the southern guinea savannah with green vegetation and scanty tall trees (Ukpai, 2021). The vegetation is secondary regrowth due to the influence of man, through bush burning, land clearing and land cultivation. The vegetation is woody savannah characterize by mango (*mangifera indica*), wide palm, *Daniella olivera,* Shea tree (*Vitellaria paradoxa*). The hydrology is governed by river Katsina-Ala. The geologic materials were sandstone and basement complex with basaltic intrusion giving rise to sandy loamy soil (figure 1). The major farm produce are Yam (*Dioscora spp*), melon (*Citrullus lanatus*), Soy Bean (*Glycine max*), Maize (*Zea mays*), Cassava (*Manihot spp*), Rice (*Oryza sativa*), Sugarcane others are Amaranths, Eggplant, Tomatoes and Pepper. Other socioeconomic activities are fishing, river sand mining and burn bricks making from top soil mining along the floodplains. Indigenous grasses identified in the fields were *Andropogon gayanus* (Gamba grass), Brachiaria *decumbens* (Signal grass), *Cenchrus ciliaris* (Buffel grass), *Digitaria smutsii* (Finger grass), *Panicum maximum* (Guinea grass), *Hyparrhenia rufa* (Shuchi grass). The abundance of these pasture acts as attractants to cattle herders (Fulani pastoralist).

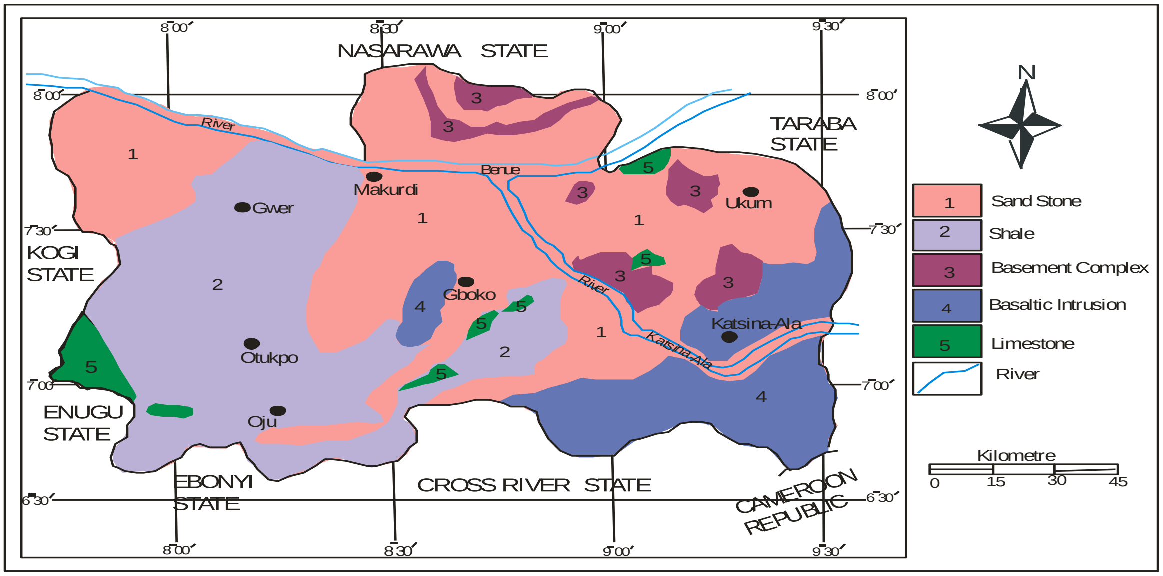

Figure 1: Geology Map of Benue State
Source: Benue State Ministry of Lands, Survey and Solid Minerals, Makurdi

Field Work

Three mapping units were identified and classified based on physiographic position along the toposequence and associated land-use types in the two study sites. A purposive sampling technique was adopted in the study. A transect was used to delineate the slope. Reconnaissance survey was carried out in order to obtain general information about the study area. The toposequence were delineated into mapping units based on their physiographic positions (upper slope, mid-slope and valley bottom) along transect spaced at 200 m across the slope. These slope positions also corresponded to different landuse upon which three profile pits were sunk according to the procedures of Soil Survey Staff, (2006). Sampling was based on genetic horizon differentiation. All profile pits were geo-referenced with hand held GPS receiver (see table 1). The profiles were described based on genetic horizons differentiation in-situ. Soil samples were taken for routine physical and chemical analysis

Laboratory Analysis

The pH was determined by glass electrode pH meter both in 1:2.5 soil/ liquid suspension of water and KCl (Henderson *et al.*, 1993). Particle size analysis was by hydrometer method (Gee and Or, 2002). Organic carbon was determined by wet dichromate method by Udo *et al.*, (2009). Total nitrogen was determined by micro-Kjeldahl digestion method as modified by Udo *et al.*, (2009). Extraction of available phosphorus was done using Bray 1 method. Exchangeable cations (K^+, Ca, Mg^{2+}, and Na^+) were extracted by neutral normal ammonium acetate, K^+ and Na^+ in the extraction were determined by flame photometer (Udo *et al.*,, 2009)while Ca^{2+} and Mg^{2+} were by atomic absorption spectrophotometer. Cation exchange capacity was by summation method. Exchangeable acidity was determined in 1NKCl extracting solution with 0.5N NaOH using phenolphthalein indicator by titration method of Mclean as described by Udo *et al.*, (2009). Bulk density was measured by core method (Grossman and Reinsch, 2002). Total porosity (P_o) was obtained from bulk density (ℓp) values with assumed particle density (ℓs) 2.65 g cm^{-3} as follows, Porosity (Po) =100 – (ℓp/ℓs) ×100/1. The following micro nutrients Fe, Zn, Mn and Cu were analyzed with atomic absorption spectrophotometer after wet digestion with concentrated HCl and HNO_3. The data collected were analyzed using descriptive statistics and coefficient of variability among soil properties were measured using coefficient of variation (CV) and rank according to the procedure of Wilding et al., (1994).

Results and Discussion

The morphological properties of Katina- Ala and Buruku soils are presented in tables 1a and 1b. The soil are moderately deep (≥ 100 cm) and porous, the entire horizon were well drained. The soil structure all physiographic positions in both locations had crumby structure in the top soil to weak sub-angular and granular in the sub soil. The soil had different color metrix range, with yellowish red dominating. The top soil in Katsina-Ala had dark reddish brown (2.5YR3/4) in Ap horizons to dark (7.5YR4/6) or strong brown (7.5YR3/3) while sub soil colour indicates yellowish red to pink (5YR7/3) to dark brown (2.5YR5/8) in the Bt argillic horizons. The structure were generally crumby/granular in top soils while they had weak medium sub angular to angular blocky in the sub soils along the toposequence. Mottle development was regarded as few to nil this may be due to the textural class of the soil where sand fraction dominated giving a sandy loam texture which in turn enhances drainage. In the Buruku profiles where in pedon 1, it was observed that across the horizons the colours ranges from dark reddish brown (2.5 YR 314) at Ap horizon, sub soil had pinkish colouration (5 YR 7/3) in the Bt horizon. Pedon 2, had colour range of Strong brown (7.5 YR 5/6) in the Ap horizon to red (2.5 YR 3/8) in the Bt horizon. pedon 3, recorded a colour range from dark in the Ap horizon to red (2.5 YR 5/8) in the sub soil. There were more distinct and observable pedogenic horizons in the Buruku study area than in Katsina-Ala soils. However, the textual classes of the soil were sandy loam in the AP, loamy sand in the Bt1, silty loam in the Bt2 and Loamy sand in the Bt3 horizons. Pedon 2, showed a textual range of sandy loam (SL) in the Ap and AB horizons, loamy sand (LS) in the Bt1, horizons and Sandy Loam (SL) in the Bt2 and Bt3 horizons. Pedon 3, was observed to have a textual range of Loamy sand (LS) in the AP horizons, Silty loam in AB horizon, Sandy Loam (SL) in the Bt1, horizons and loamy sand (LS) at the Bt2 and Bt3 horizons. It could be observed that there was more textural diversity in Buruku than in Katsina-Ala. This is an indication that soil on the lower course of the river tends to have more colluvial and alluvial material sediments and in agreement with the finding of Tomer and Anderson (1995) who attributed differences in soil texture to the variation in parent materials and topography. However, top soil mining for burn-bricks making is a major land degradation practice common in both locality.

The colour matrix of dark yellowish brown, strong brown and reddish yellow are associated with minerals such as Goethite (FeOOH) and Haematite (Fe_2O_3) and redoximorphic features associated with flooding/wetness resulted from alternating periods of reduction and oxidation of iron and manganese compounds in the soils (Stoops and Eswaran, 1985; Hossain et al., 2011). These are in agreement with Imadojemu et al (2022). The sub angular and angular structures found in the Bt horizons are indicative of illuviation processes (Imadojemu, 2021).

Table 1a: Morphological Properties of the Soils Along the Toposequence of River Katsina- Ala at Katsina-Ala

Horizon	Depth	Colour	Mottles	Str	HB	Text	Consist	Veg	Root Presence
Pedon 1 7°10’25.5’’ N and 9°16’0.85’’E 180 masl									
Ap	0-15	Dark brown 10YR3/3	Nil	Crumby	SC	SL	firm and slightly sticky		Vf-M (common)
AB	15-30	dark reddish brown 2.5YR3/4	Nil	Wmsabk	SC	SL	very sticky and plastic		Vf-M (common)
Bt1	30-55	Very dark brown 7.5YR2.5/3	Nil	Wmsabk	SC	SL	slightly sticky and plastic		Vf-F(few)
Bt2	55-80	pinkish gray 5YR 6/2	Present	Sabk	SC	SL	sticky and plastic	secondary regrowth and tall grasses	vf (very few)
Bt3	80-110	reddish yellow 7.5YR 6/2	Reddish	Abk	SC	SL	very sticky and plastic		Nil
Pedon 2 7°10’24.0’’N and 9° 16’ 15.2’’E 183 masl									
Ap	0-25	reddish gray 5YR 5/2	Nil	Crumby	SC	SL	firm and slightly sticky		Vf-M (common)
AB	25-45	Very pale brown 10YR8/4	Black	Wmsabk	SC	SL	very sticky and plastic		Vf-F(few)
Bt1	45-75	pinkish white 7.5YR 8/2	black and red	Wmsabk	SC	SL	slightly sticky and plastic	secondary regrowth and tall grasses	Vf-F(very few)
Bt2	75-105	pink 7.5 YR8/4	Reddish	Sabk	SC	SL	sticky and plastic		Vf- F (Very few)
Pedon 3 7°10’23.7’’ N and 9°16’ 15.0’’ E 190 masl									
Ap	0-15	Light brownish gray 10YR 6/2	Nil	Crumby	SC	SL	friable and non- sticky		Vf-M (common)
AB	15-35	brown 7.5YR4/4	Nil	Wmsabk	SC	SL	friable and non -sticky		Nil
Bt1	35-75	reddish yellow 10YR8/4	Nil	Wmsabk	DW	SL	friable and non- sticky	secondary regrowth and tall grasses	Nil
Bt2	75-110	reddish yellow 7.5YR 8/6	Nil	Sabk	SC	SL	slightly sticky and plastic		Nil

Structure: Wmsabk=weak medium sub angular blocky, sabk= sub angular blocky, HB=**Horizon Boundary**: cs =clear and smooth, **Root Presence**: vf-m= very fine-fine-medium, vf-c= very fine-fine-medium-coarse, **Texture**: SL= sandy

Table 1b: Morphological Properties of the Soils Along the Toposequence of River Katsina- Ala at Buruku

Horizon	Depth (cm)	Color (moist)	Structure	Mottle	Horizon Boundary	Text.	Consistence	Veg.	Root Presence
				Profile 1 Coordinates: 7°27’24.8’’N and 9°12’41.1’’E 85 MASL					
AP	0.30	2.5YR3/4 Dark reddish brown	Granular/ crummy	No Mottles	CS	Sandy Loam	Loose	Woody Savannah and tall grasses	Vf- F (Very few)
AB	30-40	7.5YR4/6 Strong brown	Granular/ crummy	None	DW	Silty loam	Friable		Vf- F (Very few)
Bt1	40-67	7.5YR5/8 Strong Brown	Wmsabk	Few mottles (7.5YR2.5/3	CS	Loamy sand	Firm		Vf (Very few)
Bt2	67-92	5YR 5/6 Yellowish red	Wmsabk	Common (2.5YR 6/8)	DW	Loamy sand	Very firm		Vf (Very few)
Bt3	92-120	5YR7/3 Pink	Sabk	2.5YR6/8 and 7.5YR2.5/3	DW	Loamy sand	Very firm		No root
				Profile 2 Coordinates: 7°26’34’9’N and 9°13’ 6.6’’E 104masl					
AP	0-10	7.5YR4/6 Strong Brown	Loose	No mottles	CS	Sandy Loam	Coarse friable gritty	Woody Savannah and tall grasses	Vf- C (common)
AB	10-20	7.5YR6/6 Reddish Yellow	Loose	2.5 RY4/1	CS	Sandy Loam	Coarse friable gritty		Vf- M (many)
Bt1	20-70	7.5YR5/6 Strong Brown	Crumby granular	2.5YR4/1	CS	Loamy sand	Firm or moderately		Vf- C (many)
Bt2	70-90	5YR5/6Yellowish Red	Wmsabk	2.5YR4/1	CS	Sandy Loam	Friable		Vf (Very few)
Bt3	90-140	2.5YR5/8 Dark Brown	Wmsabk	2.5YR6/8	CS	Sandy loam	Firm		Vf (Very few)
				Profile 3 Coordinates: 7°26’34.9’N and 9°13’ 6.6’’E 104masl					
AP	0-20	7.5YR3/3 Dark Brown	Loose	No mottles	CS	Loamy Sand	Friable	Woody Savannah and tall grasses	Vf- C (many)
AB	20-48	7.5YR3/6 Strong Brown	Loose	No mottles	CS	Silty loam	Friable		Vf- C (many)
Bt1	48-60	7.5YR6/6 Reddish Brown	Loose	No Mottles	CS	Sandy loam	Friable		Vf - F (many)
Bt2	60-90	5YR5/8 Yellowish Red	Wmsabk	No mottles	CS	Loamy Sand	Firm		Vf (Very few)
Bt3	90-130	2.5YR3/8 Red	Wmsabk	No mottles	CS	Loamy Sand	Firm		Vf (Very few)

Table 2 presents some physical and chemical properties of the studied soil along the toposequence of River Katsina-Ala. It was observed generally that the contents of sand and silt fractions dominated the soil peds. The preponderance of sandy loam (83%) indicates good drainage and the chemical processes in the soil are oxidized leading to haematite flourishing. The Katsina- ala soil has more sand fraction (752.6 g/kg) than Buruku (673.3 g/kg). The lower values implied that Buruku soils are more loamic. The silt separate were generally higher than the values obtained for clay an indication for the presence of reserved weatherable minerals that could replace plant uptake and other losses that may occur. The highest value for clay (138.4 g/kg) was obtained in Katsina-Ala while Buruku had the highest silt (266.8 g/kg) in its soils. The silt clay ratio (SCR) was highest in Buruku (19.7) while the lowest value was obtained in Katsina-Ala (0.79), Yakubu and Ojanuga (2009) had reported that SCR below 0.15 was indicative of an old soil while >0.15 was indicative of young soil with weatherable reserves. Asemoa (1973) reported that SCR

<0.25 as the value that indicates for soil at advanced stage of weathering. The bulk density values were higher in the Buruku (2 g/cm^3) soils than those obtained in Katsina-Ala though the values are not indicative of plant root restriction however the higher values obtained in Buruku may be due to sediment deposition of colloidal particles. The bulk density (0.87-1.90 g/cm^3) obtained were within the range that do not pose any threat to plant roots as stated by soil survey staff (2006) and Esu (2010). The pH (H_2O) was within the range that allow for nutrient availability. The Katsina-Ala soils were slightly acid (6.29-6.48) while that were more neutral to slightly alkaline (7.07-8.66) this agreed with the rating of Chude et al (2011). The pH was within the optimal pH for the release micro and macro-nutrients. The total nitrogen (TN) mean (2.31 – 5.75 g/kg indicated that the TN can be rate very high according to SPDC (2003) which rated values >3g/kg as very high. The soil organic carbon (4.5- 16.70 g/kg) was rate low to high (SPDC, 2003). The total exchangeable bases were dominated by Ca however; the basic cations were rated low to moderate in the soils. The soils are high in cations notably Ca, Mg and K but are generally ranged from low to high in organic matter. Available Phosphorus was rate moderate (11.11- 5.52 mg/kg). The cation exchange capacity was rated low to moderate (7.57- 6.19 cmol/kg) while the %BS was rated very high; values obtained in Buruku (96.77- 97.91%) were higher than those for Katsina-Ala (85.58 – 68.10%). The micro-nutrients were rated low to moderate (Fe; 16.63 – 80.02 mg/kg, Zn; 1.08 – 2.95 mg/kg and Mn; 1.33 – 2.78 mg/kg) however Cu (0.43-1.78 mg/kg) levels were rated very low in some location compared to critical limits ((Fe; 20,000 mg/kg, Zn; 70 mg/kg, Cu; 65 mg/kg and Mn; 5.50 mg/kg. These findings agrees with those reported by Tanimu et al (2020) and Zaku et al (2011).

Table 2: Some Physical and Chemical Properties of the Soil Along the Toposequence of River Katsina-Ala

Pedons with their weighted mean values								
Soil properties	Units	K1	B1	K2	B2	K3	B3	CV (%)
Sand	g/kg	751.8	606.6	752.6	675.6	748.8	673.3	LV
Silt	g/kg	109.8	374.4	117.3	261.8	113	266.8	MV
Clay	g/kg	138.4	19	130.1	62.6	138.2	39.6	HV
SCR		0.79	19.71	0.91	4.18	0.82	6.74	HV
TC		SL	SL	SL	SL	SL	LS	
BD	g/cm^3	1.02	1.9	0.87	2	0.94	2	LV
Po	%	61.8	63	67.4	65	67.4	61	LV
pH	H_2O	6.48	8.66	6.29	7.29	6.35	7.07	MV
TOC	g/kg	14.3	4.5	13.57	9.3	16.7	13	HV
TN	g/kg	5.3	3.2	5.13	3.5	5.75	2.31	HV
C/N		2.69	1.41	2.65	2.66	2.91	5.63	HV
av.P	mg/kg	5.52	11.06	5.53	11.11	5.8	10.4	MV
Ca	cmol/kg	3.06	4.66	3.18	4.62	3.33	4.72	LV
Mg	cmol/kg	2.82	0.81	3.05	0.82	2.9	0.82	LV
K	cmol/kg	0.29	0.28	0.28	0.23	0.28	0.3	MV
Na	cmol/kg	0.3	0.33	0.23	0.34	0.26	0.34	LV
TEB	cmol/kg	6.42	6.08	6.77	6.06	6.52	6.15	MV
TEA	cmol/kg	1.08	0.2	1.04	0.14	1.05	0.12	HV
CEC	cmol/kg	7.5	6.29	7.82	6.19	7.57	6.28	MV
%BS	%	85.58	96.77	86.75	97.74	68.1	97.91	LV
Fe	mg/kg	16.74	17.86	16.47	80.02	16.74	16.63	HV
Zn	mg/kg	1.62	2.95	1.08	1.54	1.08	1.62	HV
Cu	mg/kg	0.12	0.68	1.72	0.68	1.08	0.43	HV
Mn	mg/kg	1.53	1.33	2.78	1.84	2.15	2.35	HV

Pedon K1,B1 are Katsina-Ala and Buruku toe slope respectively

Pedon K2,B2 are Katsina-Ala and Buruku mid slope respectively

Pedon K3,B3 are Katsina-Ala and Buruku top slope respectively
SL: sandy loam, LS: loamy sand
TC: textural class, BD: bulk density. Po: porosity
SOC: soil organic carbon, TN: total Nitrogen, av.P: available Phosphorus,
HV= high variation, MV= medium variation, LV= low variation (Wilding, et al., 1994).

Soil Classification

These the nature of the epipedon, the types of diagnostic master horizon, the cation exchange capacity of the soil, the clay content, the organic matter content, the percentage base saturation estimated on the basis of the effective effective cation exchangeable capacity (ECEC), the absence of concretion (Plinthites, Duripan), the soil moisture and temperature regimes and the colour of the soils. The valley bottom order level was alfisols, suborder level was ustalfs and great group level is psammemtic endo-ustalfs this corresponds to arenic luvisol in the WRB. Mid slope was classified in order level as alfisols, suborder level was ustalfs and great group level was psammemtic -ustalfs this corresponds to arenic luvisol in the WRB while crestslope order level was alfisols, suborder level was ustalfs and great group level was psammemtic haplustalfs this corresponds to loamic luvisol in the WRB

Conclusion

The result of the physiochemical properties of the soils varied with both depth and physiographic position. The preponderance of sandy loam (83%) indicates good drainage and the chemical processes in the soil are oxidized leading to haematite flourishing. The Katsina- Ala soil has more sand fraction (752.6 g/kg) than Buruku (673.3 g/kg). The lower values implied that Buruku soils are more loamic. The silt separate were generally higher than the values obtained for clay an indication for the presence of reserved weatherable mineral that could replace plant uptake and other losses that may occur. The pH in water was moderately acidic in all the pedons. Percentage base saturation varied from moderate to very high in all pedons which indicate that the soils have dominance of basic cations. Organic carbon and organic matter was very low in all pedons. Total nitrogen was recorded very low in all the pedon. Available phosphorus was recorded moderately low in pedons. Magnesium and potassium were also low in all the pedons. Effective cation exchange capacity was rated high while the findings of this profile study indicated that bulk density was well within the moderate levels. Generally, micronutrients concentrations in the soils followed decreasing order of Fe > Mn > Zn > Cu. For optimum soil productivity, micronutrient fertilizer and organic matter application should be adopted. The micro-nutrients were rated low to moderate however Cu levels were rated very low. The soils generally were classified in the order of alfisols in the USDA soil taxonomy and corresponds to arenic luvisol (valley and midslope) and loamic luvisol (crest slope) in the WRB The soils are capable of supporting profitable production of rice, sorghum, yam, sugarcane provided it is used appropriately.

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