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INDIGENOUS DESCRIPTION OF SOILS IN SOME COMMUNITIES IN EMUOHA LOCAL GOVERNMENT AREA OF RIVERS STATE, NIGERIA

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ABSTRACT
Local people and small holder farmers have knowledge of their land based on soil and land characteristics that remain largely unknown to the scientific community. It is therefore important for researchers to understand farmers' knowledge of soil classification and management. A study was carried out using a semi structured questionnaire to elicit indigenous knowledge of soil description from households in three different communities (Rumuche, Isiodu and Eliberada) in Emuoha Local Government Area of Rivers State. It was found that farmers' soil classification was based mainly on top soil colour, texture and other criteria such as erodibility, drainage and crop yield. The fertility rating of the different soil was established from laboratory analysis of the soils.

Keywords: indigenous knowledge, soil description, ethnopedology

INTRODUCTION
Soil as a natural resource is a significant component of land which is cherished by the rural inhabitants (Adesope, 2002). This is because agricultural productivity depends mostly on soils. The soil resource of a nation remains one of the most valuable natural endowments. Holdren *et al.* (1995) observed that accurate assessment and mapping of soils are imperative as many land uses depends on soil and therefore, unavailability of soil data may lead to mismanagement of soil resources and its sustainability. So in management of natural resources of the tropics, involvement of farmers can provide important and consistent information about the land they live on. They can provide information in soil types and their management practices, constraints and opportunities that exist for their sustainable management.

Indigenous knowledge is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture (Rajasekeran, 1993). The rural populace has a better understanding of their environments in which they earn a living from than the well-trained scientists who lack rural/local experience (Lawas, 1997). Indigenous knowledge has therefore, evolved through "unintended experimentation", fortuitous mistakes and natural selection by farmers (Adedipe et al 2004), and arises from the practical judgment and skill needed to survive in a fragile soil system (Aina, 1998; Moss, 1988).

People's soil resource knowledge or ethnopedology has been scientifically evaluated but more investigation is needed to fully understand indigenous approaches to soil perception description and appraisal (Furbee, 1989; Hecht, 1990; Tabor, 1990, Niemejer, 1995). Comparatively more progress has been achieved in ethno botanical research during the last 20 years (Berlin, 1992). Despite, thousands of years of validation of ethnopedology by indigenous people, this has not been historically reflected in soil science research (Buol *et al.*, 1980; Krupenikov, 1993). Based on experience with local soil and land types over several generations, farmers store of practical knowledge can be of tremendous benefit to the soil scientists and other researchers in the formulation of research strategies and interventions. Guarino (1995) stated indigenous knowledge is increasingly being recognized as crucial in

agricultural research, extension and development in general. This is because the farmers who are every day users of soil resource in their localities have information on vernacular names of soils and land types, appearance properties and uses of the soil, the places where they are found and the agricultural and management practices which are associated with these soils. The main objective of this paper is to collate information on the indigenous soil nomenclature of Rumuche, Eliberada and Isiodu villages in Emuoha Local Government Area of Rivers State, Nigeria.

METHODOLOGY

This study was conducted in three villages (Rumuche, Eliberada and Isiodu) which lie between latitudes $5^0$13'N and longitudes $7^0$01'E. The climate is dry and wet season. With dry season ranging from December to January, while rainy season ranges from February to November. The minimum temperature is 22^0C and the maximum is 29^0C.

Indigenous soil nomenclature

Ethnopedological surveys were carried out from August to November 2010. 15 farmers were selected from each of the three communities and were interviewed to gain an understanding of indigenous soil nomenclature. A semi structured questionnaire coupled with participative field transects were used to elicit information on soil types, soil names, soil colour and texture, and land use were collected from farmers in the three communities. The information elicited from the survey was analysed using descriptive statistics. Soil samples were collected from representative soil types identified by the farmers. Plate 1-3 show the interview and transect walk with respondents.

Plate 1: Household interview with farmers

Plate 2: Transect walk with farmer

Plate 3: On-site discussion with farmer

RESULTS AND DISCUSSION

Farmers' indigenous soil description system

Farmers in the study area recognized 3 types of soils which are *Rusa ocha, Rusa oji and Rusa mini* and these are detailed in Table 1.

Table 1: Criteria used by farmers in describing soil types in selected communities in Emuoha Local Government Area of Rivers State, Nigeria.

Local name			
Distinguishing Criteria	*Rusa Ocha*	*Rusa Oji*	*Rusa Mini*
Colour	Red	Dark-brown	Light coloured
Texture	Heavy	Medium	Light
Stickiness	Very sticky and slippery	Slightly Sticky	None sticky and loose when dry
Hardness	Hard	Soft	Very hard
Drainage	Poorly drained	Well drained	Well drained
Erodibility	Less erodible than Rusa Oji and Rusa mini	Easily eroded	High
Cracking	Severe	Slight	None
Position on catena	Upper slope	Mid slope	Lower slope

According to Table 1, soil types and their characteristics are thus explained as follows:

***Rusa ocha* (Red Soil):** They are reddish in colour and thus known as Rusa ocha (meaning reddish soil). Generally, these are deep soils and are found in upper slope position on the landscape. They become sticky when wet and hard when dry and thus pose some limitations to farming operations. Tillage by farmers is only possible after the onset of the rains since the soil moisture at this time is just enough to soften the soil. Due to their position on the catena, these soils are well drained and have good water retention capacity.

***Rusa oji*:** The farmers classify this as black soils and are mostly found on the mid slope position. Farming operations are only possible under moderate moisture conditions. Because of their physiographic position (found on mid slope) on the catena and some perceived characteristics such as colour and the luxuriant growth of weeds, which they consider as indicators of high fertility., the farmers consider them to be more fertile than the red soils.
***Rusa mini* (light coloured, sandy soil):** Sandy soils are locally known as *Rusa mini*. This soil is lightly coloured than the other two earlier described. The soil is mainly located at the lower slope position on the landscape. These soils are found mostly near the streams and rivers. They are sandy in texture (by feel) and it is prone to flooding during the rainy season. Due to its hydrological characteristics especially high water regime in the dry season vegetables are grown on it as an off season crop.

It was observed that the farmers are concerned mainly with the topsoil characteristics and they used these as basis for their description of the soil. Over 90% of the farmers interviewed described the soils based on a combination of some or all of the following: colour, texture (by feel), structure, stickiness, hardness, fertility (indicated by the presence or absence of certain weeds), difficulty in ploughing the soil, and position of the soil on the landscape. The results obtained from the survey showed that the nomenclature given to the soils in the study area was not influenced by age or gender showing that the indigenous knowledge about soil is easily passed on from one generation to the other.

Table 2: Some Physical and Chemical properties of Soils in the Study Area

Local Soil Type	pH(H_2O)	Ca	Mg	K	Na	CEC	%OC	Av.P mg/kg	Sand g/kg	Silt g/kg	Clay g/kg
		←			cmol / kg		→				
Rusa Mini	5.9	0.90	0.80	0.10	1.52	3.32	0.55	3.6	926	62	12
Rusa Ocha	5.1	2.80	0.40	0.36	3.04	6.60	0.25	6.4	954	26	10
Rusa Oji	5.1	3.70	1.20	0.76	3.04	8.70	1.95	5.0	943	53	4

Table 2 shows some physical and chemical properties of the soils in the study area. Based on particle size analysis, the soils are generally sandy with over 900g/kg sand content. The soils have pH values ranging between 5.1 – 5.9, thus making the soils to be acidic. Available phosphorus content in the soils ranged between 3.6 – 6.4mg/kg soil. The cation exchange capacity is low with values generally <9.00 Cmol / kg in the three soil types. The overall picture of the soils is that of low nutrient status.

CONCLUSION AND RECOMMENDATIONS

The results of this study showed that farmers have knowledge of their soils though based mainly on topsoil observable characteristics and landscape positions. The results derived from the laboratory analysis of the soils can be a guide in advising farmers appropriately. With the acidic nature of the soil, the soil fertility can be improved and maintained through the addition of crop residues, manure and compost. Mulching practices will also help to reduce soil erosion and ultimately increase the soil fertility. The local or indigenous

knowledge can therefore be a tool in ethnopedology especially as it concerns site –specific information, use and management of soils in the study area. This knowledge and the soil analysis result can aid agricultural extension services or agencies in communicating with the farmers. Efforts should be made to correlate the soil description systems of the farmers with contemporary soil classification

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