



CURRENT STATUS, TRENDS AND PRIORITIES OF NIGERIA'S NATIONAL SOIL SURVEY PROGRAMME

by

OLATUNJI O. OJUOLA

Deputy Director – Soil Survey Mgt.

Department of Agricultural Land Resources

Federal Ministry of Agriculture and Rural Development

Abuja, Nigeria

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Country Profile

Location: Western Africa, bordering the Gulf of Guinea, between [Benin](#) and [Cameroon](#)

Geographic Coordinates: latitudes 4°N and 14°N and longitudes 2°2'E and 14°30'E ;

Land Mass: 923,768 km² (910,768 km² land and 13,000 km² water)

Agriculture:

- Total Cultivable Area: 71.2million ha
- Area under Cultivation 34 million ha,
- Arable land covered 30.3%
- Grass land area 23%
- Permanent and Forestry crops 16%
- Rivers and Lakes 27%
- **Irrigated Land:** 2,820 sq km (2003)
- **Products:** Ccocoa, peanuts, palm oil, corn, rice, sorghum, millet, cassava (tapioca), yams, tobacco, coffee, rubber; cattle, sheep, goats, pigs; timber; fish
- **Contribution to GDP:** 41 per cent
- **Average annual Growth rate:** 7%





Country Profile

Land Holding: Agricultural

landholdings are generally small and scattered with 0.5 and 5.0 Holdings are classified into:

- The small scale holding (0.1-5.9 ha) are concentrated in the humid region where population density is high;
- Medium farm holding (6-9.9 ha) and
- Large scale (over 10 ha)

Land Use Types: Seven major types have been delineated: These are Urban, Agriculture, Woodland / Shrub / Grassland, Forest, Wetlands, Water, and Bare Surfaces.

About 12% of the northern fringe of Nigeria is threatened by the encroaching Sahara desert.

There are about 60 large dams and 100 small dams (called ADP dams)

Employs about 65% of the total population and provides employment to about 80% of the rural population

Production systems: Traditional production system, and Improved irrigation production system





Country Profile

Poverty

Over 70% of Nigerians

Per capita income is between US \$ 355 and 387

Coastline: 853 km

Climate: Varies; equatorial in south, tropical in center, arid in north

Government

Type: Federal Republic

Administrative Capital: Abuja

Independence Date: 1 October 1960 (from UK)

Administrative Divisions: 36 States and Federal Capital Territory and 774 Local Government Councils;

Legal System: English Common law, Islamic law (in 12 northern states), and traditional law;

Currency: Naira (NGN)

Ecology:

i) The northern Sudan Savanna;

ii) The Guinea Savanna zone or Middle Belt; and

iii) The southern rainforest zone.

Population:

Total Population: 149,229,090

Population Growth Rate: 1.999% (2009 est.)

Life Expectancy at Birth: 47.81 years (2008 est.)

Population Below Poverty Line: 70% (2007 est.)

Languages: Over 250 ethnic tribes with English as official. Major languages include Hausa and Fulani 29%, Yoruba 21%, Igbo (Ibo) 18%, Ijaw 10%, Kanuri 4%, Ibibio 3.5%, Tiv 2.5%

Religion: Muslim 50%, Christian 40%, indigenous beliefs 10%

Population density is 138 inhabitants/km²,

52 percent of the population is rural

Industries: Crude oil, coal, tin, columbite; palm oil, peanuts, cotton, rubber, wood; hides and skins, textiles, cement and other construction materials, food products, footwear, chemicals, fertilizer, printing, ceramics, steel, small commercial ship construction and repair



Country Profile

Natural Resources: Natural gas, petroleum, tin, iron ore, coal, limestone, niobium, lead, zinc, arable land. **Economy**

Crude Oil production: 2.352 million bbl/day (2007 est.). This provides 20% of GDP, 95% of foreign exchange earnings, and about 80% of budgetary revenues.

Natural Gas Production: 34.1 billion cu m (2007 est.)

GDP real growth rate .3% (2008 est.)

GDP - per capita \$2,300 (2008 est.)

GDP by sector

agriculture: 18.1%

industry: 50.8%

services: 31.1% (2008 est.)

Exports: petroleum and petroleum products 95%, cocoa, rubber

Labour Force:

Total Labour Force 51.04 million (2008 est.)

Occupation Labour Force
agriculture: 70%
industry: 10%
services: 20% (1999 est.)

Unemployment rate 4.9% (2007 est.)

Population below poverty level 70%

Urbanization:

urban population: 48% of total population (2008)

rate of urbanization: 3.8% annual rate of change (2005-10 est.)



**THERE ARE SIX GEO-POLITICAL ZONES OF
NORTH WEST, NORTH EAST, NORTH
CENTRAL, SOUTH WEST, SOUTH EAST AND
SOUTH SOUTH. THE POPULATION AS AT
2001, IS ABOUT
140 MILLION ALTHOUGH THE
POPULATION PRESENTLY IS ABOUT 160
MILLION WITH AN ANNUAL GROWTH RATE
OF 3 - 4%.**



The country is drained by Rivers Niger and Benue both served by about seven river basins/systems and their tributaries and empty into the Atlantic Ocean via an array of distributaries, deltas and lagoons.



The climate and agro ecological conditions are varied and range from the very humid /per humid Niger Delta area with rainfall up to 2700mm, through the sub-humid Central Niger-Benue trough with about 1,400mm of rainfall, to the extreme semi-arid agro-ecological zone in the North East bordering in Chad Republic where rainfall is less than 500mm.

A distinct dry season in the range of 3 to 8 months occurs from the high rainfall areas in the South to the dry areas in the North.



Vegetation ranges from ever-green rain forest in the wettest south-eastern part through moist guinea-savannah, to the Sudan/Sahelian zone in the North-Eastern part of the country. Geologically the country is made up of basement - complex rocks exposed in about two-thirds of the land and sedimentary rocks and alluvia occupying the rest of the land.



NIGERIA AGRICULTURE

The present population is estimated (2001 Census) to be about 140 million, but with growth rate of about 3.5 - 4%, the population is now estimated to be about 160 million. Agriculture is the main occupation as it presently engages more than 70% of the labour force, with about 90% of small-holders, subsistence farmers cultivating between 0.8 - 1.2 hectares in forest areas and 2 - 4 hectares in the savannah areas where land preparation is easier.

Root and tubers crops dominate forest and forest savannah transitional areas in the south consisting mainly cassava, yams and sweet potatoes. On the other hand, cereals crop like guinea/corn, millet, maize, rice and wheat predominate in the savannah areas. Traditional cash crops such as oil palm, rubber and cocoa predominate in the southern forest areas whereas cotton, groundnut and rice are predominant in the northern savannah axis.



NATIONAL SOIL RESOURCES INVENTORISATION: STATUS CURRENT PRIORITIES AND NEED

STATUS

Nigeria has witnessed a remarkable historical progression in its soil surveys/inventorisation activities over the past sixty years. At national level, Doyne et al (1938) works on soil types and fertility experiments in Nigeria evolved into a provisional soil map in 1944 and was based on the **geology and parent material types**.

An improved soil map was attributed to Vine (1951) provisional soil map of Nigeria, that was based on **degree of leaching, mechanical composition and organic matter content**.



Vine's work metamorphosed into the publication of Smyth and Montgomery (1962), on soils of Central Western Nigeria. The survey was essentially to characterise, demarcate and map areas in Central Western Nigeria for Cocoa production. It was the first commissioned soil survey effort by the Western Nigeria Regional Government. In the East, Obihara et al (1963), did some illuminating soil work published at 1:50,000 on Anambra - Do River Basin and this was closely followed by Jungerius (1964), exploratory soil map of the Old Eastern Nigeria. This was essentially to map areas suitable for Oil Palm production by the defunct Eastern Nigeria Government.



The British Ministry of Overseas Development (1957 – 1974) has done a great deal of soil resources inventory works mostly in the northern part of Nigeria. In between these developments, up to the mid-late 80^s, a lot of soil surveys, albeit for specific purpose especially in the **identifying suitable agricultural lands** for River Basin Irrigation projects, were carried out.

- Most of these soil resources inventories were specifically commissioned to be executed at detailed - or semi-detailed levels and to identify, characterise and map soils for irrigation development. Some of these are for large-scale irrigation schemes of the Sokoto-Rima Basin (North-West Nigeria),
- Kano-River Hadejia - Jamaare. Irrigation Project, Chad Basin Project
- (North-East), Niger Basin (North Central), Benin-Owena/Ogun-Osun Projects (South-West), Anambra - Imo Basin (South-East), Niger Delta/Cross River Basin (South-South) to mention but a few.



The Federal Department of Agricultural Land Resources (FDALR) also commissioned similar soil inventorisations, at State/regional levels as well as for specific single or multipurpose problem-solving assessment of land use/degradation (acidity, salinity, erosional) or soil fertility evaluation activities. The FDALR has commissioned over 140 soil inventorisations/land use planning at different levels and scales in the past three decades and still in progress.



Of greatest land mark to date is the production of a systematic but generalised soil map of the country at scale of 1:650,000. The project was supported by USDA in 1980 and completed in 1985. The programme was limited in its utility, but provided basic information of **group of soils, their extent, distribution and potentials** for agricultural development. Further follow-ups as detailed surveys of areas with high potentials for agricultural development was envisaged.



CONSTRAINTS AND LIMITATIONS OF EXISTING SOIL INVENTORIES

The successful implementation of natural resources inventorisation, be it for agricultural, non-agricultural, and other purposes, have in most developing countries suffered severe constraints and setbacks. Even though over the years there is the need for the intensification of national soil survey as planning tools at farmer's level, this has not been fully actualised principally due to

- (i) Funding and/or budgetary constraints,
- (ii) Depletion and shortage of trained staff,
- (iii) Lack of political will and inconsistency in government policies.

Constraints (i) and (iii) are, however not peculiar to Nigeria.



LIMITATION OF EXISTING SOIL INVENTORIES

Most of the soil inventories do not have **a unified national system of operations**. The coverage of required studies (except for specific projects) and it's diverse taxonomy is a great impediment to applicability in development decision making processes. In addition, most of the existing soil map of Nigeria have highly **generalised legend and mapping units**. **Thematic maps showing basic soil properties are also lacking** in most of the survey work, hence they are of limited use in land evaluation and soil capability classification. These constraints and limitations, are however being addressed presently.



CURRENT NEEDS AND PRIORITIES

Previous national efforts of inventorising the nation's soil resources executed in the 80s at reconnaissance (1:650,000) levels is grossly inadequate for effective land use planning even though it proved to be a good benchmark for the identification of areas of high potential for agricultural development.

The need therefore arises to execute the **National Soil Survey Project at a more detailed level, including soil fertility surveys** and make appropriate crop-based nutrient recommendations as well as sound management practices.



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The execution of the National Soil Survey programme is assigned to focus and support the Agricultural Transformation Agenda (ATA) to enhance the increase in production of crops such as rice, maize, cotton, cocoa, sorghum/millet, soya bean, oil palm and cassava.



In specific terms, current efforts aims at providing soil resources information/data in these crop production belts/zones or clusters at semi-detailed (1:25,000) level in each zone.

The essence therefore, is a paradigm shift in soil resources inventory which focuses in the crop production zones and to provide detailed soil information that will be farmer – user friendly and, in addition, provide the requisite soil extension services to farmers and other stakeholders to enhance agricultural productivity. It also aims to develop area and crop specific fertilizers recommendations targeting the potential agricultural areas.



WAY FORWARD

Under the current dispensation, and in line with the aims of objectives of the Agricultural Transformation Agenda (ATA), the following strategies are being adopted to accelerate the pace of soil resources inventorisation and dissemination at the national level:

- (i) Adopting soil information system and wireless technology (including GIS/RS) to enhance effective mapping and classification of activities;
- (ii) Adopting Digital Soil Mapping (DSM) procedures including the collecting/digitising all legacy data (pre-existing, geo-referenced field or laboratory measurements);
- (iii) Develop evidence – based soil management (including soil health and conservation) recommendations that are crop and site-specific;

(iv) Develop and strengthen the National Soil Information System (NISIS) to key into the African Soil Information System (AFSIS), for which approval has been given for Nigeria to participate under AFSIS – 2 along with Ghana, Ethiopia and Kenya;

(v) Scaling up the current small-scale 1:650,000 to **more farmer – friendly\useful detailed 1:25,000** soil survey to cater for variance in soil series and provide better soil information to farmers;

(vi) Capacity – building and training a new generation of soil scientists with a focus on utilisation of modern methods and approach to soil resources inventorisation (including **DIGITAL SOIL MAPPING PROCEDURES, dissemination and soil extension/technology** transfer to end-users, – farmers;

(vii) Adopting appropriate soil resources inventorisation that recognises the importance of Climate change and adaptation processes that will enhance agriculture in the country.

(viii) Technical and financial support to on-going National Soil Information System (NSIS) by the FAO, development partners – USDA, GIZ, etc and other regional bodies and countries towards the development of Digital Soil Mapping System in Nigeria.

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THANK YOU!!!