

## Soil Evangelization Group: Championing Soil Rebirth Initiative in Nigeria

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Received Date: 08-08-2017

Accepted Date: 22-08-2017

Published Date: 29-08-2017

### ABSTRACT

Soil evangelization group (SEG), is a novel, grass root soil movement in Nigeria that started at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria, on 25 June, 2015. The SEG is a soil rebirth awareness campaign group that comprises committed lecturers and students who are passionate to improve soil resource literacy and to impact on Nigerians a positive attitudinal change in soil resources use and management for ecosystem conservation and food security. The group improves soil resources literacy through soil data interpretation, dissemination of innovative soil technologies and capacity building of farmers, students and other stakeholders to be able to work efficiently towards solving current soil management challenges and to prevent new ones that could impact negatively on food security in a given ecosystem. The members add psychological value to soil science by incorporating songs and slogan into teaching, to enhance student – teacher relationships, and attract more youths to the discipline. The paper presents SEG as a grass root and an emerging national soil movement in Nigeria.

**Keywords:** Soil evangelization group, soil rebirth initiative, ecosystem conservation, food security, Nigeria

### INTRODUCTION

As a pedologic term, soil is a living body. Soil genesis passes through the stages of juvenile, maturity and old age. Soil is the source of every living thing (Chukwu, 2016) and it is a common property resource, that serves man in many ways whether in a relatively undisturbed state or in a highly disturbed state. The functions include

- sustaining biological activity, diversity and productivity (habitat and gene pool, food and fibre production);
- filtering, buffering, immobilization, and detoxifying organic and inorganic substances
- storing, and cycling of nutrients and other substances;
- providing support for socioeconomic structures like buildings, roads, etc, and acts as a narrator of events in physical and cultural environment
- source of raw materials;

- acting as carbon pool to mitigate climate change, and
- protection of archaeological and geological treasures associated with human habitation (Karlen et al., 1997; Costantini and Giovanni, 2010).

Soils are revered as the final resting place during rites of passage for earthly bodies. All these are indicative of strong affinity between mundane world and soils, and create opportunities for soil awareness campaign to penetrate rural and urban landscape, to arouse passion and nostalgia for their sustainable use and land management. This will forestall soil and land misuse and concomitant tragedy of the commons (Chukwu and Agugo, 2006).

Consequently, improvement in soil resource literacy is cardinal in this social crusade. A good knowledge of soil resources should include their characteristics, distribution, classification, and capability. Towers *et al* (2000) asserted that the onus lies on soil scientists to connect with wider

society in portraying soil science as relevant. This has been achieved globally through the World Soil Day (WSD) celebration which started in 2014 and the International Year of Soils (IYS) 2015. The FAO (2015) outlined the following activities of WSD and IYS.

- Raise full awareness among civil society and decision makers about the profound importance of soil for human life.
- Educate the public about the crucial role soil plays in food security, climate change adaptation and mitigation, essential ecosystem services, poverty alleviation and sustainable development.
- Support effective policies and actions for the sustainable management and protection of soil resources.
- Promote investment in sustainable soil management activities to develop and maintain healthy soils for different land users and population groups;
- Strengthen initiatives in connection with the sustainable development goals (SDG) process and post-2015 agenda;

### Statement of the Problem

The apathy for soil in Nigerian is worrisome. Scarcely do researchers and post-graduate students in agriculture and allied courses state soil classification of their project sites. This creates a serious gap in knowledge and limits effective transfer of knowledge gained (technology) at the sites of such investigations to other sites of potential interest. The ultimate success of all the global soil initiatives will depend on their effectively trickling down to regional, national and rural levels. There is a dearth of information about any group, governmental or non-governmental organization in Nigeria that has passionately taken up the responsibility of improving soil resources literacy or creating awareness about the importance of soils, to enhance their judicious use and management. This challenge became obvious in the 1980s when Fagbemi (1987) suggested the production of soil fertility capability maps of Local Government Areas (LGAs), as a new dimension towards efficient use of land and fertilizers in Nigeria. In response to this clarion call, Federal Ministry of Agriculture and Natural Resources (FMANR 1990) produced soil fertility maps of North East, North West, South East, South West and Middle Belt agro-ecological zones of Nigeria. Sobulo

and Adepetu (1987) had produced similar maps for South West agro-ecological zone. Similarly, a national soil survey project executed by the Federal Department of Agricultural Land Resources (FDALR) from 1980 – 1985 at a scale 1:1,000,000 gave rise to 39 map sheets with 178 mapping units. After it was correlated in 1990 as the updated soil map of Nigeria (FDALR, 1990) at a scale of 1: 650, 000, the map sheets and mapping units were reduced to 8 and 58 respectively (Anande-Kur, 1991). The implication of the tremendous reduction in the number of map sheets by 79.5 % and mapping units by 67.4 % is that the legend is highly generalized to adversely affect the details of information which the maps can provide. From the foregoing, soil management decisions at rural levels based on extrapolation from these zonal and national soil maps would lead to faulty results.

An attempt to interpret soil resources data, at rural level, where agricultural production commonly take place, was made by Chukwu et al (2013). The output is land capability map and soil fertility map of Ikwuano Local Government Area of Abia State (5°24' to 5°30' N latitudes and 7°31'N to 7°37' E)(Chukwu et al., 2013). Nevertheless, there is a dearth of information about interpretive soil maps (land capability maps and soil fertility classification maps) at states and local government levels, where agricultural production and environmental management activities commonly take place or are likely to take place. The above scenario, most probably, accounted for widespread soil resource illiteracy in Nigeria, buttressed by Chukwu (2015) and laments by the Soil Science Society of Nigeria (SSSN, 2015). The consequences include:

- non - involvement of soil scientists in erosion control and environmental programmes;
- lack of use of soil information by farmers;
- absence of land use policy;
- decreasing lack of interest in agriculture by the youths as agricultural science is deleted as a compulsory subject in Senior Secondary School Certificate Examination and National Examination Council exams;
- increase in land and environmental degradation as marginal micro ecologies are over exploited, and
- low subscription to the study of agriculture, particularly soil science in Nigerian Universities.

## Soil Evangelization Group: Championing Soil Rebirth Initiative In Nigeria

It is worrisome that apathy for soil (soil resource illiteracy) persists at our ivory towers especially now, soil science has been recognized as a profession in Nigeria by the passage of a bill for the establishment of Nigeria Institute of Soil Science in 2017. The Abia State Fadama Coordinating office chose Michael Okpara University of Agriculture, Umudike (MOUAU) (the cradle of soil evangelization) for the training of Fadama Graduate Youths on Agro Entrepreneur Enterprise. The training titled: Fadama - Graduate Unemployment Youth and Women Support Programme (GUYS) lasted from 10 - 21 July, 2017. The courses included crop production, animal husbandry, aquaculture, etc. Among the 13 resource persons from the university, no soil scientist was involved. It is a pity.

However, soil resource illiteracy and apathy for soil is a global challenge. In 1982, the Food and Agriculture Organization of the United Nations (FAO) adopted a World Soil Charter with 13 recommendations for sustainable soil management. According to Montanarella (2015), it enshrined that the use of soil resources should not cause their degradation or destruction because man's existence depends on their continued productivity. The Global Soil Partnership (GSP) of FAO enacted the soil charter's principles endorsed by all members of FAO, yet, it remains largely ignored (Montanarella, 2015). To address global soil challenges, the 68<sup>th</sup> United Nations General Assembly, on 20 December, 2013, recognized 5 December, 2014 as World Soil Day (WSD) and 2015 as the International Year of Soils (IYS) (FAO, 2015). The official recognition of these events globally emphasized the importance of soils beyond the soil science community.

### Objectives of the Presentation

The objectives of the presentation are

- To create awareness about the existence of soil evangelization group (SEG) in Nigeria, especially at Michael Okpara University of Agriculture, Umudike, Nigeria
- To present SEG as a novel grass root soil movement that champions soil awareness campaign to increase the importance of soil in our ecosystem, and
- To highlight the activities of SEG in soil and land resources management.

### SOIL EVANGELIZATION GROUP: A TIMELY INTERVENTION

Soil evangelization (SE) is a neologism credited to Dr. Godwin O. Chukwu of the Michael

Okpara University of Agriculture, Umudike, Nigeria, in response to International Year of Soils 2015 calls for action by the International Union of Soil Science and the Soil Science Society of Nigeria. Dr. Chukwu presented a seminar titled "soil evangelization" to mark the event in the university on 16 June, 2015 and coined soil slogan: "Soil Evangelization for Ecosystem Conservation and Food Security!!"(Chukwu, 2015). Highlights of the seminar include a formal launching of the SEG by the then Vice Chancellor, Professor Hilary Odo Edoga. Since then, the group has been active in soil evangelization (Figure 1).



**Fig1.** Soil Evangelization Group during World Soil Day celebration in 2016.

Chukwu (2015) defined SE as a holistic transdisciplinary approach to raise awareness about soil security as well as to address soil and land related challenges to sustainable development. It is championed by SEG (Fig2). The philosophy of SE is to empower citizenry that is knowledgeable about the importance of soil resources in land management and its associated challenges and has passion (attitudes), motivations, knowledge, commitment and skills to work individually and collectively towards solving current challenges in a given ecosystem and prevent new ones that impact negatively on food security.



**Fig2.** The SEG with the Vice Chancellor, Prof. Francis O. Otunta.



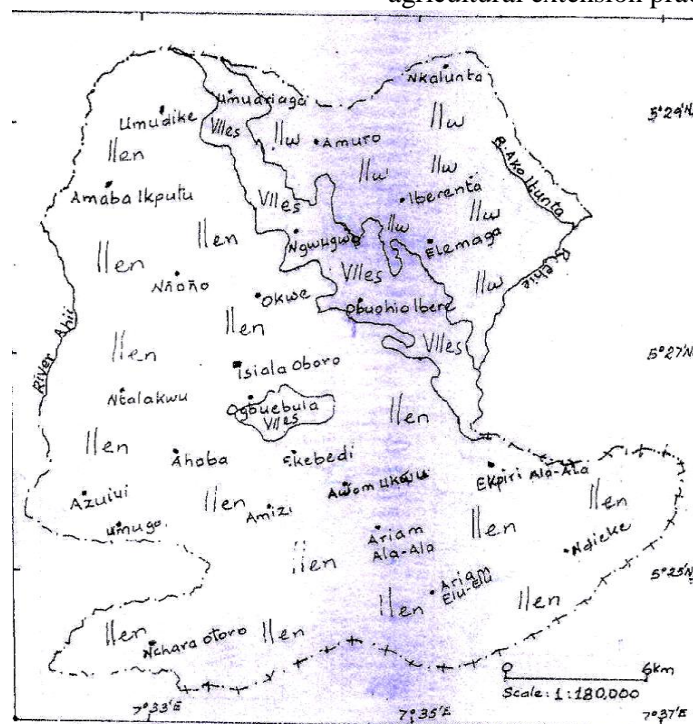
**Objectives of Soil Evangelization Include to**

- Present soil evangelization as soils re-birth to continue soil awareness campaign in Nigeria beyond IYS 2015;
- Arouse a positive attitudinal change and passion in perception, use and management of soil resources by all stakeholders in Nigeria;
- Empower stakeholders (farmers, students and others) through capacity building and dissemination of proven soil management technologies, and
- Attract more youths to study soil science in higher institutions in Nigeria.

**Functions of SEG**

From the forgoing, members of SEG seek to adopt new ways of thinking and perceiving soils in order to meet the challenges of the time. Mentoring young academics and students to be where they want to be in choosing soil science as a discipline is given serious consideration.

Members of SEG continue with advocacy, and moral suasion to educate colleagues in sister disciplines (agronomy, plant health management, environmental management, engineering, etc) on the need for soil classification of their experimental sites. This will facilitate transfer of technology or knowledge gained from the project site to another site of interest and enhances international communication of scientific results. We embark on capacity building of students, farmers and other stakeholders in soil resources and land management and disseminate proven soil management technologies to the end users. The SEG is committed to add value to soil science through development of innovative teaching methods and applied soil research. The group develops interpretive soil maps (Chukwu *et al*, 2013; 2015; Chukwu and Okonkwo, 2015) (Figure 2) to enhance the implementation of pedo - extension model: an integration of pedological science and extension education, proposed by Chukwu, *et al.*, (2013, 2014) as a paradigm shift from the conventional agricultural extension practice.



**Fig3.** Land capability classification map of Ikwuano LGA, Abia State.

Where: *Iluw* represents 4, 650 ha of nearly level, poorly drained clay loam to clayey arable soils with moderate fertility, *VIIes* represents 3, 100 ha. The soils are well drained, coarse textured, low fertility, non-arable soils prone to gully erosion and landslide, and *IIen* represents well-drained coarse loam to loamy sand soils with low nutrient retention capacity in undulating to concave and/or nearly level arable land. The extent is 23, 250 ha.

**Source:** Modified from Chukwu *et al.*, (2013).

The maps will serve as visual aids and communication channels during training programmes and strengthen the weak link

between agricultural research and farmers. Ultimately, there would be improvement in choice of site for agronomic on-farm

experiments, enhanced dissemination, adoption and diffusion of innovative agronomic and environmentally friendly soil-based technologies within a recommendation domain. As much as possible, members of SEG add physical and psychological value to soil science research and teaching of soil science through applied soil research and incorporating songs and drama into lectures (Chukwu, 2016), whenever possible.

### STRATEGIC COMPETENCIES FOR SOIL REBIRTH INITIATIVE IN NIGERIA

The apathy for soils exhibited by the general public, especially by the academia in Nigerian calls for development and adoption of new styles of thinking, learning and creativity in teaching soil science and in soil science research. It will include creativity in teaching soil science to make it attractive to the youths and quantitative approaches in soil science research that can be economically evaluated in terms of cost/benefit analysis. Other strategies include applied soil research and soil data interpretation to enable prospective land users to predict information about any part of the land (site) without going there to see. This will make soil information appealing to non soil scientists (farmers, politicians, policy makers, etc.) and make them appreciate the usefulness of soil-based research. Developing strategic competencies will also increase opportunities for collaborative research and ability of soil scientists to compete with other specialists in the limited labour market.

### ADDING PSYCHOLOGICAL VALUE TO SOIL SCIENCE

The SEG challenges soil scientists to ensure that their knowledge is not just limited to a discussion amongst themselves but that it diffuses into the broader community. This is crucial because non soil scientists are also tackling challenges of sustainable use and management of soils. In Nigeria, the present situation demands a pragmatic approach to sensitize the public on the roles of soil scientists and importance of soil in agriculture and environmental management. It also demands innovative pragmatic teaching methods like incorporating songs, soil slogan and drama into teaching, to create a more cordial friendly student – lecturer relationship, and make lectures more attractive and comprehensible by students and thereby attract more youths to the discipline.

Psychological value-addition is novel in agricultural research as opposed to physical addition through processing into different food forms (bread, starch, high quality flour, etc and provision of raw material for industries. Chukwu, (2010; 2011) and Chukwu *et al.*, (2015) successfully added psychological value to cocoyam (*Colocasia* and *Xanthosoma* species) under the aegis of cocoyam rebirth at the National Root Crops Research Institute, Umudike. The authors formed a cultural troupe called giant crop (cocoyam) choir. In many scientific and social fora, the choir thrilled and sensitized the audience with cocoyam songs that recapitulate the importance of cocoyam as food, source of income, and in clinical and environmental health management. This, to a large extent, saved cocoyam from extinction in Nigeria. Crowther (2013) reported the advantage of learning a song by students. The author observed that students who learned and sang a topic in chorus scored higher on a test day than students who did not because the song facilitated recall of facts, pronunciation of vocabulary words and other aspects of learning. Music has been found to enhance productivity calm nerves and enhance concentration during risky and tedious tasks (Adodo, 2000; Carson, 2008). Adodo (2000) reported that American companies that customary played a cool and gentle music throughout working hours on some working days had better concentration and higher productivity on music days than on days no music was played. Carson (2008) corroborated the above view and narrated that a soft strains of classical music ebbed and flowed through the operating room where he led a team of neurosurgeons that successfully operated and separated a 29 year's old craniopagus twins (twins attached at the head).

Taking a clue from the foregoing, Chukwu (2015) coined soil evangelization and a soil slogan. The slogan is shouted and chorused at the beginning, during and at the end of lectures, as well as at appropriate occasions like seminars, to attract peoples' attention about soil. It is worthy of note that anytime the slogan is shouted, people joyously chorus it with a resounding ovation. Consequently, it encouraged the SEG to transform lectures into songs as much as possible. An example of a pedology song composed by Dr Godwin Chukwu, the progenitor of soil evangelization, in 2017, is presented below. The title is "Soil Morphology"

## SOIL MORPHOLOGY

### The Chorus

Soil morphology, comprises attributes of a soil,

People can see and feel.

The attributes are horizon, soil depth and soil colour.

Others are soil structure, soil separates,

Soil consistency and void

In the master horizons.

1. To study, soil morphology, in the field,

Involves, digging a soil profile.

Anatomy of the soil body,

Exposing genetic horizonations,

Is called, a soil profile.

To study, soil morphology, in the class,

Involves, using a soil monolith.

Samples of soil, from, genetic horizons,

Preserved, in a frame,

Is called, a soil monolith.

### Chorus

2. Characterizing soil morphology,

Involves master horizonations.

Designated, with uppercase letters,

O, A, E, B, C, R and W, are, master horizons.

Master horizons, are called genetic horizons.

They are manifestations of factors of pedogenesis.

### Chorus

3. Master horizons, include transition horizons.

Merging of properties of master horizons.

Is called a transition horizon.

A twin horizon, is typical of transition horizon.

Some, of the, transition horizons, include,

AE, EB, AB, BC, A/B and B/C transition horizons

### Chorus

4. Characterizing soil morphology involves suffix symbols;

These are, lowercase letters, to qualify, master horizonations;

Examples include: "b" for buried horizon, "g" for mottling or redoximorphic features;

P for tillage, ploughed layer or, pedoturbation, and

"t" for accumulation of clay or clay illuviation.

### Chorus

## CONCLUSION AND RECOMMENDATION

Soil evangelization group (SEG), is a novel, grass root and an emerging national soil movement in Nigeria committed to sensitize the public on importance of soil. The group advocates passionate approach to sustainable soil management through improvement in soil resource literacy. SEG adds psychological value to soil (pedology) by transforming lectures into songs to ease understanding by students, and to attract more youths into the discipline.

## ACKNOWLEDGEMENT

We express our profound gratitude to 400 level students who undertake the practical course titled: CCS 413 (Farm Design, Survey and Land Use Planning), undergraduate and postgraduate students of the Department of Soil Science and Meteorology, MOUA, Umudike for their enthusiasm and cooperation to learn the pedology songs.

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**Citation:** O. Godwin, E. Adesemuyi, U. Kingsley, O. Paul C, A. Damion O, E. Michael and O. Nwaoba, "Soil Evangelization Group: Championing Soil Rebirth Initiative in Nigeria", *International Journal of Research in Agriculture and Forestry*, vol. 4, no. 5, pp. 22-28, 2017.

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