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Soil evangelization: Looking beyond international year of soils in Nigeria

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Abstract

Soil evangelization (SE) is an attempt to cue into the discussions of the Global Soil Security targeted to achieve the goals of the dimensions of soil security by 2030 using 2015 as a base year. It was conceived by Dr. Godwin O. Chukwu on 25 June, 2015, at the Michael Okpara University of Agriculture, Umudike, as a national and grass root soil movement in Nigeria, and as a contribution to the celebration of the International Year of Soils 2015. The SE slogan is "Soil Evangelization for Ecosystem Conservation and Food Security". SE is a holistic transdisciplinary approach to raise awareness about the importance of soils and to address soil and land related challenges to sustainable development. It is an agricultural transformation with the potential to impact on Nigerians a positive attitudinal change to soil resources use and management to enhance ecosystem conservation and food security. It involves adding value to soils to attract more youths by incorporating songs and drama into teaching of soil science. The paper introduced soil evangelization as a soils' re-birth, calling for a passionate approach to sustainable use and management of soils, to enhance ecosystem conservation and food security.

Keywords: Soil Evangelization; Soil Slogan; Ecosystem Conservation; Food Security; Nigeria

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1. Introduction

Soil is alive. It is the source of every living thing- man, plants and animals. Soil as a natural resource serves man in many ways whether in a relatively undisturbed state or in a highly altered utilitarian forms in an ecosystem. Okusami (2015) exalted the soil as an indispensable companion for human existence. Soils possess a cultural heritage because they narrate the events which have taken place on a territory or in an ecosystem but because the quantity and quality of information soils preserved differ, their cultural values also differ (Costantini and Giovanni, 2010). The cultural values of soils as a narrator of events that have taken place in a community over a reasonable period of time buttress strong affinity between rural communities and soils as shown by people's cosmovision. Culturally soil is revered as the final resting place for earthly bodies and archeological investigations reveal the evolution of humankind's struggles to live in harmony with the environment. The cultural dimension of soil is an opportunity for the awareness campaign to penetrate rural environments to arouse passion and nostalgia for sustainable use of soils and land management within a pedosite (Costantini, 1999), a geo-referenced soil having cultural heritage, that is, a soilscape where an extraordinary cultural interest, such as a sacred grove, a cemetery, etc has been recognized.

A basic understanding of soil resources ideally includes their characteristics, distribution, classification, their present and potential uses (capability). A strong understanding of how soils are used requires knowledge of the social, political, economic, technological processes, institutional organizations (including rules-in-use) which determine their utilization. Towers et al. (2010) described the activities of the Working Group on Soil Awareness and Education established in 2008 under the banner of the European Soil Bureau Network, sponsored by the Joint Research Centre of the European Commission. They insisted that the onus lies on soil scientists to connect with wider society in portraying their science (soil) as relevant. Probably, in response to this challenge, the World Soil Day celebration which started in 2014 and the International Year of Soils 2015 were launched at global scale. Nigeria joined the international soil community to celebrate the two global soil events. Despite the existence of a soil map of Nigeria produced by the Federal Department of Agricultural Land Resources (FDALR, 1990), there is poor understanding of Nigerian soils. This is buttressed by an alarm raised by Chukwu (2015a) and the laments by the Soil Science Society of Nigeria (SSSN, 2015) on increasing soil resource illiteracy in Nigeria and its adverse consequences. The SSSN lamented about:

i. non - involvement of soil scientists in erosion control and environmental programmes;
ii. lack of use of soil information by farmers;
iii. absence of land use policy;
iv. 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;
v. increase in land and environmental degradation as marginal micro ecologies are over exploited, and
vi. low subscription to the study of agriculture, particularly soil science in Nigerian Universities.

It is common and worrisome to observe that in many Nigerian universities, postgraduate theses (masters and doctors of philosophy) in agronomy, soil fertility, soil mineralogy, plant health management, remediation

of polluted soils, etc, do not contain information on soil classification of the project site. This gap in knowledge, definitely limits effective transfer of knowledge gained at the sites of such investigations to another sites of interest. This scenario could be attributed partly to: soil resource illiteracy, lack of passion for soil, ineffective awareness campaign and absence of soil evangelization. Other pragmatic reasons include the scale (1:1,000,000) of reconnaissance soil survey project of Nigeria executed by the Federal Department of Agricultural Land Resources (FDALR) from 1980 – 1985 that gave rise to 39 map sheets with 178 mapping units correlated at a scale of 1: 650, 000 with a total of 8 sheets and 58 soil mapping units (Anande-Kur, 1991). The implication of the tremendous reduction in the number of mapping units is that the legend is highly generalized to adversely affect the details of information which the maps can provide. Similarly, there is a dearth of information about soil maps and interpretive soil maps (land capability maps, land suitability maps and soil fertility classification maps) at states and local government levels where agricultural production and environmental management activities actually take place. These factors explained the widespread soil resource illiteracy, apathy for soil, soil misuse, increased soil degradation, persistent food insecurity, incapacity of the soil to provide other ecosystem services and other laments expressed by SSSN (2015).

1.1. Objectives of the paper

To avert these and increase passion for soil, the paper has the following objectives.

i. To raise awareness about the importance of soils in response to International Year of Soils calls for action by the International Union of Soil Science and the Soil Science Society of Nigeria;
ii. To present soil evangelization as soils re-birth to enhance passion for soils;
iii. To arouse a positive attitudinal change in perception, use and management of soil resources by all stakeholders in Nigeria;
iv. To empower stakeholders (farmers, students and others) and disseminate to them proven soil management technologies, and
v. To attract more youths to study soil science in higher institutions in Nigeria.

2. Developing strategic competencies to raise soil awareness in Nigeria

The present depression in recognition of soil scientists in Nigeria and apathy for soils by the public should stimulate Nigerian soil scientists to adopt new styles of thinking, learning and creativity in order to reverse the current trend. It includes creativity in teaching soil science to make it attractive to the youths, quantitative approaches in soil science research that can be evaluated in terms of cost/benefit analysis, improved soil data interpretation and soil information dissemination to non soil scientists (farmers, politicians, policy makers, etc.) to make soil information appealing to them. The windows of opportunities available should be harnessed to do so. Innovation in soil awareness campaign requires large doses of strategic capital, which we believe, are available but need to be coordinated and galvanized. A creative soil scientist adheres to standards as he or she acquires innovative skills by willingness to pragmatically experiment with new ideas and techniques in the performance of his or her functions. This will increase

opportunities for collaborative research and adaptation and ability to compete with other specialists in the limited labour market.

However, it should be noted that 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. That charter was endorsed by all members of FAO, yet it remains largely ignored (Montanarella, 2015). The author stated that the dramatic rise in food prices during the 2008 global food-commodities crisis led to the creation of the FAO's Global Soil Partnership (GSP) in 2011. The GSP is a voluntary body tasked with finally enacting the soil charter's principles. To address soil challenges globally, the 68th United Nations General Assembly, on 20 December, 2013, recognized December 5th, 2014 as World Soil Day (WSD) and 2015 as the International Year of Soils (IYS) (FAO, 2015a). The official recognition of these events globally emphasized the importance of soils beyond the soil science community. The Food and Agriculture Organization of the United Nations was nominated to implement the IYS 2015, within the framework of the Global Soil Partnership and in collaboration with Governments and the secretariat of the United Nations Convention to Combat Desertification. At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, otherwise known as the Global Goals, to build on the Millennium Development Goals (MDGs). The IYS 2015 aims to increase awareness and understanding of the importance of soil for food security and essential ecosystem functions. The FAO (2015a) outlined the following activities of WSD and IYS.

i. Raise full awareness among civil society and decision makers about the profound importance of soil for human life.
ii. 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.
iii. Support effective policies and actions for the sustainable management and protection of soil resources.
iv. Promote investment in sustainable soil management activities to develop and maintain healthy soils for different land users and population groups;
v. Strengthen initiatives in connection with the SDG process (Sustainable Development Goals) and Post-2015 agenda;

At the flag off ceremony of IYS in Nigeria, the Soil Science Society of Nigeria charged all soil scientists to take good advantage of these two soil events to promote the importance of soil to our health, wellbeing and socio-economic growth (SSSN, 2015). Undoubtedly, the ultimate success of all the global soil initiatives will depend on their effectively trickling down to regional, national and rural levels. This justified the conception of soil evangelization as a national and grass root soil movement in Nigeria.

3. Soil evangelization

Soil evangelism is a paradigm of strategies that involves discipleship in awareness campaign about the importance of soil and sustainable soil resources management. It was conceived by Dr. Godwin O. Chukwu on

25 June, 2015, at the Michael Okpara University of Agriculture, Umudike, as a part of the celebration of IYS 2015 in Nigeria. It is a platform to promote knowledge exchange between soil scientists, policy makers and the society, to increase public and political awareness of the importance of soil. SE is defined from both Nigerian and global perspectives. SE is an agricultural transformation project to impact on Nigerians a positive attitudinal change to sustainable soil resources management, to enhance ecosystem conservation and food security. From the global perspective, (Chukwu, 2015c) defined SE as a holistic transdisciplinary approach to raise awareness about soil security (which refers to the maintenance and improvement of the world's soil to produce food, fibber, freshwater, contribute to energy and climate sustainability, and help to maintain biodiversity and protect ecosystem goods and services) as well as to address soil and land related challenges to sustainable development. 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. SE is a response to the call for action by the World Soil Charter (FAO, 2015b) to individuals, private sector, groups and science community to disseminate information and knowledge on soils, to all individuals using or managing soil resource in order to manage it sustainably and safeguard it for future generations. Another justification is the emphasis by the Global Soil Partnership on communication, outreach, promotion, monitoring and evaluation as the major mechanisms for the adoption of sustainable soil management practices (FAO, 2016).

Soil evangelization believes in ecotheological standpoint that the earth (soil) should be protected, cared for and managed in an orderly and most circumspect manner that depicts the fear of God (Ituma, 2009). Corollary to ecotheology is the Igbo cosmovision that heralds the soil (land or earth) diety as a great mother spirit that controls the society and owns men, dead or alive, the source and custodian of public morality and the dispenser of justice (Aguwom, 2009). It is believed that human conduct affects fertility and productivity so they endeavour to do the right thing in order that the earth may yield good harvest and men may increase. According to Aguwom (2009) the entire gamut of Igbo tradition, customs, and taboos are connected to the earth diety. The traditions, customs and laws guiding the group life are referred to as "omenala" (that which obtains in the land) and the taboos and prohibitions as "nso ala" (what are abominable to the land). The breach of any of these categories is referred to as "arurala" (a breach or pollution of the land) while breach of the taboos is referred to as "aru" (abomination). These require sacrifices or penalties that are directed to appeasing the diety.

As stewards, we are free to utilize soil to satisfy present needs but we are also obliged to conserve it, to avoid jeopardising the prospects of the future generations. Consequently, SE involves awareness campaign about soil misuse, the importance of soil and its sustainable management, introduction of innovative methods of teaching soil science, as well as the dissemination of proven soil management technologies to others with the intension of convincing them to adopt the technologies. According to the Institute for Advanced Sustainable Studies (IASS)(2013), Europe's Global Land Demand for the 27 European Union countries in 2004 imported 370 million ha of virtual land (land on which agricultural products were produced), while exporting only 37 million ha. That net import of over 330 million ha means that 60 % of the

land area needed to cover Europe's demand for food is located outside of Europe. The scenario suggests that planetary boundaries (the safe operating space for humanity) (Steffen et al., 2015) are under serious threat. Steffen et al. (2015) predicted increasing tendency for the planetary boundaries to be exceeded with disastrous consequences for humanity, probably, if the concept of intergenerational equity and soil stewardship for societal well-being is neglected.

Soil evangelization challenges the Soil Science Society of Nigeria to establish action plans for the development of pragmatic measures to raise awareness of the importance of soil across the 36 states and the Federal Capital Territory. Such action plans will involve policy makers at the federal and state ministries and the local government authorities. Other proposed collaborators are tertiary educational institutions - universities, polytechnics, monotechnics (colleges of agriculture) and colleges of education, secondary and primary schools. Others are industries, non-governmental organizations (including churches), community based organizations and rural communities.

3.1. Soil evangelization group (SEG)

A soil evangelization group (SEG), made up of lecturers "soil evangelists" and students "soil disciples" who volunteered to champion this innovative and social crusade, was formally launched by Professor Hilary Odo Edoga, the Vice Chancellor, Michael Okpara University of Agriculture, Umudike, Abia State, during the seminar on the celebration of IYS in the university on 25 June, 2015. The SEG is likely to expand beyond academic environment to include farmers other stakeholders that are passionate about soil resources use and management. According to Field et al. (2011) soil science education must be broadened because it has a broad holistic role in the society and has to involve scientists from other disciplines, policy experts and users of the soil itself. Smiles et al. (2000) identified the need for soil science education as problem solving, being able to interact with political influence and policy settings, while maintaining its discipline development and innovation. The authors also noted that the future challenge for soil science education is to stimulate curiosity and innovation as well as a good grounding in existing knowledge. From the forgoing, the soil evangelists and disciples therefore seek to adopt new ways of thinking and perceiving soils in order to meet the challenges of the time. Therefore, they assist people to be where they want be in the areas of choosing soil science as a discipline, soil classification and sustainable soil management through advocacy, innovative and creative training and the dissemination of proven soil management technologies. The SEG is committed to add value to soil science through advocacy and awareness campaign, research to develop innovative teaching methods, low-external input and sustainable soil technologies, extension activities and capacity building of farmers. The group is committed to developing interpretive soil maps (Chukwu et al., 2010; 2013; 2015; Chukwu and Okonkwo, 2015) to enhance the implementation of a proposed pedo - extension model: an integration of pedological science and extension education (Chukwu, et al., 2013, 2014) as a paradigm shift from the conventional agricultural extension system. The maps will serve as visual aids and communication channels during training programmes and provide a pragmatic novel approach to strengthen the weakening gap between agricultural research and farmers. This will enhance the dissemination and

adoption of agronomic and environmentally friendly soil-based technologies within a recommendation domain.

3.2. Adding value to soil science

Value addition generally connotes to economically add value to a product by changing its current place, time and form, from one set of characteristics to other characteristics that are more preferred in the marketplace (Boland, 2009). However, Wikipedia Encyclopedia (2014) stated that "value added" refers to extra features of a product, service, person etc. that go beyond standard expectations and provide something more while adding little or nothing to its cost. In soil evangelization, the SEG realizes that it is a challenge for soil scientists to ensure that their knowledge is not just limited to a discussion amongst themselves but that it diffuses into the broader community who are also tackling challenges of sustainable use and management of soil. 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 teaching methods like incorporating songs, to ease tension and build a more cordial student-lecturer relationship during lectures, to make pedology more attractive to the youths.

Providing value-added can give any business, profession, or subject an edge over competitors and build loyal customers, and increased public (scientists, students, industrialists, politicians, farmers, etc) interest. This was achieved for cocoyam (*Colocasia* and *Xanthosoma* species) in Nigeria through psychological value addition (songs, drama and slogan) under the aegis of cocoyam re-birth initiative (Chukwu, 2010; 2011; Chukwu et al., 2015). Apart from being fun, interesting and entertaining, songs and drama provide people with strong incentives to learn. Crowther (2013) reported that students who learned and sang a topic in chorus scored higher on a test day than students who did not. According to the author, students interviewed said the song facilitated recall of facts, pronunciation of vocabulary words and other aspects of learning. Music is very necessary to calm nerves and to enhance concentration during risky and tedious tasks. We have observed prisoners in Nigeria singing while executing laborious tasks such as cutting of grass. In medical science, Carson (2008) 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), described as the rarest of all twins. Similarly, 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. Barrett (2007) compared the mental health of choral singers in different communities to people who engaged in other social activities such as sports, and people who did not engage in social activities at all in South African. Results suggested that people who engaged in choral singing were of better mental health than others. At the National Root Crops Research Institute (NRCRI), Umudike, Abia State, Nigeria (Chukwu et al., 2015) reported that the Cocoyam Research Programme, that formed a cultural troupe called the giant crop (cocoyam) choir that usually entertained themselves and others with cocoyam slogan and songs, even in the field, was adjudged the best programme by the NRCRI management in 2009, after field monitoring of projects by scientists, technologists and agricultural superintendants. The explanation is

simple. People are happier when they do what they really love, and happier people are generally healthier. People work harder and concentrate on their work when they are happy. These experiences stimulated the thinking that if psychological value is added to soil by incorporating song in teaching of pedology, it could make the course more comprehensible, interesting and attractive to students.

Among the SEG-members, the SE slogan is shouted and chorused at the beginning of lectures, during lectures to recharge students as the need arises, and at the end of their lectures. It is also shouted and chorused at appropriate occasions like seminars, to attract peoples' attention about soil. Interestingly, anytime the slogan is shouted, people joyously chorus it with a resounding ovation. According to Stanley (2003), slogan is one of the easiest and most cost-effective ways a business can market itself. The protagonists of cocoyam re-birth (Chukwu et al., 2015) built in cocoyam slogan to enhance nostalgia and ethnocentrism for the crop because slogan is a marketer's secret weapon to make a campaign stronger, or simply reinforce the brand's value proposition. Stanley (2003) explained three qualities of a good slogan. To be effective, the slogan must be catchy, easy to remember and be thoughtful to evoke an emotion. It should be powerful to impact consumers or stakeholders and needs to highlight the benefits of the product or service with a timeless message. The soil slogan possesses these qualities and it evokes empathy, nostalgia and ethnocentrism among the soil stewards for overall societal well-being. It is obvious that it has a positive stimulating effect on the students as observed from their increased interest in pedology. Consequently, it became encouraging to go a step further, by adding psychological value to pedology through incorporating songs in lectures when possible. An example of a pedology song composed by Dr Godwin Chukwu in 2016 is presented below. The title is "soil is alive"

SOIL IS ALIVE

The chorus

Soil is a living body, soil is life;

Soil is the source of every living thing;

Man, plants and animals, alike;

Soil is the origin of them.

1. Soils can be young, mature or old;

These are the stages of every living thing;

Entisols and Inceptisols, Fluvisols and Leptosols, Cambisols and Regosols;

Some are shallow, others are deep;

These are young and immature soils.

The chorus

2. Alfisols and Luvisols, Ultisols and Acrisols;

They have distinct horizonations;

These are deep and mature soils.

The chorus

3. Oxisols and Ferrasols, are highly degraded and old;

   Lessivage, illuviation and agillic horizon are their identity;

   These are typical of tropical soils.

   The chorus

4. Conclusion and recommendation

Soil evangelization is likely to be the panacea to the challenges of high soil resource illiteracy in Nigeria, widespread unsustainable soil management practices, perennial food insecurity, absence of soil scientists in environmental projects in Nigeria, and low level of enrolment of youths for the study of soil science in Nigerian higher institutions. The Soil Science Society of Nigeria (SSSN) should encourage and support soil evangelization as an emerging national and grass root soil movement, to promote soil science and the activities of SSSN within the Nigerian soil science community.

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