

## Assessment of Traditional Agricultural Practices in Nigeria for Possible Conversion to Organic Farming Systems

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### Abstract

*Low external input agriculture does not automatically confer on traditional farmers the status of organic farming. This study assessed traditional agricultural practices for compliance with organic practices in Nigeria. Information was obtained from 177 crop farmers in 6 states of 3 agricultural zones in Nigeria, while frequency counts, percentages, mean, and PPMC were used to analyse the data. The result showed that majority were male (69.0%), the mean in years for age (47.7years), formal education (10.5%), farming experience (26.5years), and farm size (5.8ha) with average monthly income of N30,485.76 and most (52.0%) had access to extension service fortnightly. Wood ash, multiple cropping, neem extract and trapping were ranked high as pest management practices while cover crops, uncured poultry manure, crop rotation and mulching were ranked high as soil fertility management practices in use by the respondents. However, most of the practices are used as supplements to synthetic inputs, thus compliance with organic practices is low. The correlation test showed a positive and significant relationship ( $r=0.114$ ,  $p=0.044$ ) between traditional practices in use and the level of possible compliance with organic practices. The study concluded that, possible compliance of traditional agricultural practices with organic practices is low. The study therefore recommend that, leveraging on some of the farmers' practices that align with organic principles and engaging extension service for increased awareness of the standard and benefits of organic agriculture would enhance more rapid conversion to organic farming in Nigeria.*

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### Introduction

Many farmers in Africa practice low external input farming. This claim has made many to think farmers in Africa, practice organic agriculture by default (Walaga, 2005, IFOAM- Organics International, 2013, and Olaito, 2014). The opinion holds because, about 70 percent of the farming population in Africa could not access some of the synthetic inputs such as chemical fertilisers and agrochemicals. Though, these low external inputs can be seen as potentials to leverage on, for promotion of organic agriculture in Africa, conscious recognition of and compliance with organic standards would be required to make efforts truly organic.

In order to remain in business, many farmers in Africa have developed sustainable technologies and practices to produce food for the increasing population in Africa and Nigeria in particular, although some of the technologies and practices are clearly not sustainable and do require improvement. Farmers adopt a wide range of indigenous agricultural practices based on generations of experiences, informal experiments and intimate understanding of their environment. The application of indigenous farming practices for example has reflected in the following: soil preparation and planting materials, controlling pests and diseases, maintaining soil fertility, controlling weeds, harvesting and storage. (Abioye *et al.*, 2011). Many of these indigenous knowledge and approaches to environmental conservation include

technologies and practices such as; shifting cultivation, mixed cropping or intercropping, minimum tillage and agro-forestry and ethnoveterinary. Some of the advantages of these technologies and practices are reduction in susceptibility of the crops to pests and diseases, and better use of the environment (Yekinni, 2002).

Charles Walaga (2005) opined that, the subsidies withdrawal on agrochemicals by most African governments and the misuse of the Green Revolution in Africa, have increased the promotion of viable alternatives for improving food security and sovereignty. In Africa, some of the practices and agro ecological strategies in use, and promoted include; integrated pest management, desertification control, soil fertility management, agricultural biodiversity conservation, agroforestry, rural community development, urban agriculture, participatory ecological land-use management which are incline with some organic agriculture principles and farming techniques.

Organic agriculture (OA) is based upon traditional agricultural practices, farmers' innovations and the results of scientific research (AdeOluwa, 2010; Singh and Grover, 2011, and IFOAM, 2011). Organic farming practices are embedded in local cultures, ethical values and beliefs. It gives them renewed possibilities for maintaining and developing their local sustainable farming systems. Organic agriculture as a production system, distinguished practices by being deliberate in planning, organising, and compliance with standards from seed selection to marketing. Currently, there is Organic Agriculture Standard to enhance; compliance to principles of organic agriculture, adoption of organic practices by farmers, access to local and international market, and stimulate engagement of policy makers in Nigeria.

Majority of the smallholder farmers in Nigeria still use indigenous practices, for them to benefits from the inherent health, economic, and environmental potentials of OA, there is a need to assess their practices for compliance with organic practices.

Therefore the objectives of this study was to; i) identify the traditional practices in use for crop production in Nigeria, and ii) determine the extent of compliance of the agricultural practices with organic principles and standard in Nigeria. Hypothesis of the study; there is no significant relationship between traditional practices and compliance with organic principle and standard in Nigeria.

## **Methodology**

This study was conducted in Nigeria. Nigeria has six agricultural zones; Southeast, Northeast, Northwest, Southwest, Southsouth, and North central zones (Agricultural Transformation Agenda, 2011). The study population was crop farmers in three agricultural zone in Nigeria. A multistage sampling procedure was used to select respondents for the study. The primary data were collected using quantitative methods. Quantitative data were collected with validated structured questionnaires. From three agricultural zones, six states (Ebonyi, Anambra, Benue, Niger, Ekiti and Oyo) were randomly selected for this study. From the six states, 15 Local government Areas (LGAs), and two communities were randomly selected from each of the 15 LGAs. And twenty percent of the farming households were selected as respondents for this study using simple random sampling technique. Variable measured in the study were socio-economic characteristics, traditional practices in use, and extent of compliance with organic practices.

## **Results and Discussion**

Table 1 reveals that the farmers had a mean age of 47.7 years. This shows that most of the farmers were still in the active years. These findings are consistent with that of Meludu (2014), who reported a mean age of 49 years for farmers in Oyo State. Distribution of farmers by sex shows that majority (69.0%) of

them were male, while female (31.9%), the average number of years spent for formal education is 10.5 years. This finding is in line with Adeniyi, and Yekinni (2015), who reported that the average formal education of farmers was 9.6 years. This result implies that there is considerable level of literacy among the farmers, which is an important factor that may likely influence application of new ideas and agricultural practice. The average year of farming experience is 26.5 years, implying that these farmers

**Table 1. Distribution of crop farmers by socio-economic characteristics n=117**

| <b>Variables</b>                   | <b>Percentage</b> | <b>Parameter</b>            |
|------------------------------------|-------------------|-----------------------------|
| <b>Age</b>                         |                   |                             |
| 21 – 33                            | 8.70              | Mean = 47.78<br>S.D = 11.32 |
| 34 – 46                            | 39.0              |                             |
| 47 -59                             | 33.9              |                             |
| 60 -72                             | 17.7              |                             |
| 73 – 85                            | 0.7               |                             |
| <b>Sex</b>                         |                   |                             |
| Male                               | 69.0              | Mode = Male                 |
| Female                             | 31.0              |                             |
| <b>Years of formal Education</b>   |                   |                             |
| Primary education                  | 30.96             | Mean = 10.57<br>S.D = 6.12  |
| Secondary education                | 40.32             |                             |
| Tertiary education                 | 21.30             |                             |
| No formal education                | 7.42              |                             |
| <b>Years of farming experience</b> |                   |                             |
| 1 – 10                             | 17.7              | Mean = 26.46<br>S.D = 4.33  |
| 11 – 20                            | 27.4              |                             |
| 21 – 30                            | 21.6              |                             |
| 31 – 40                            | 18.1              |                             |
| 41 – 50                            | 11.0              |                             |
| 51 – 60                            | 4.2               |                             |
| <b>Land Acquisition</b>            |                   |                             |
| Inheritance                        | 61                |                             |
| Lease                              | 12                |                             |
| Rent                               | 22                |                             |
| Purchase                           | 5                 |                             |
| <b>Access to extensive service</b> |                   |                             |
| None                               | 32.7              |                             |
| Once in a year                     | 4.0               |                             |
| Twice in a year                    | 4.0               |                             |
| Quarterly                          | 7.3               |                             |
| Fortnightly                        | 52.0              |                             |
| <b>Monthly income</b>              |                   |                             |
| 1,000 - 20,000                     | 50.24             | 30,485.76 ± 31,834.27       |
| 20,001 - 40,000                    | 27.12             |                             |
| 40,001 - 60,000                    | 11.86             |                             |
| 60,001 - 80,000                    | 4.00              |                             |
| 80,001 - 100,000                   | 2.26              |                             |
| >100,000                           | 4.52              |                             |

**Source:** Field Survey, 2017

are well knowledgeable on farming activities, the predominant mode of land acquisition in the study area is through inheritance (61.0%). The average farm size was 5.8 hectares. This implies that crop farmers in the study area are predominantly smallholder, which has a lot of influence on the type of agricultural practices they use. The Table also shows that above half (52.0%) of the respondents have access to extension service fortnightly and the average monthly income of N30,485.76.

Table 2 presents the traditional agricultural practices used for pest and soil fertility management. The Table shows that, wood ash rank first, followed by multiple cropping, trapping and neem extract as third and fourth frequently use traditional practices for pest management. The least on the list for pest management practices was marigold. This is an indication that some farmers in the study area still make use of traditional practices to manage both insect and rodent pests. Eze and Echezona (2012), reported that majority of the farmers in African and Asia use some indigenous practices like neem extracts, wild tobacco, wood ash, and chilli to control and repel pest. Moyin-Jesu (2010) also reported that wood ash has insecticide properties. Table 2 also shows that majority of the crop farmers' ranked cover crop first among the traditional practices still in use for soil fertility management, uncured poultry manure and crop rotation were ranked second and third respectively. Cow manure was the least traditional practices used by respondents for soil fertility management.

**Table 2. Distribution of crop farmers' use of traditional practices n = 177**

| <b>Pest management</b>                   |      |                  |
|--|------|------------------|
| Wood ash                                 | 1.00 | 1 <sup>st</sup>  |
| Multiple cropping                        | 0.99 | 2 <sup>nd</sup>  |
| Trap setting                             | 0.86 | 3 <sup>rd</sup>  |
| Neem extract                             | 0.58 | 4 <sup>th</sup>  |
| Neem + kerosene                          | 0.39 | 5 <sup>th</sup>  |
| Lemon grass extract                      | 0.32 | 6 <sup>th</sup>  |
| Tobacco                                  | 0.24 | 7 <sup>th</sup>  |
| Pawpaw                                   | 0.24 | 7 <sup>th</sup>  |
| Alligator pepper and lemon grass extract | 0.21 | 9 <sup>th</sup>  |
| Local black soap                         | 0.21 | 9 <sup>th</sup>  |
| Dried pawpaw leaf                        | 0.21 | 9 <sup>th</sup>  |
| Marigold flower                          | 0.14 | 12 <sup>th</sup> |
| <b>Soil fertility</b>                    |      |                  |
| Cover crop                               | 1.27 | 1 <sup>st</sup>  |
| Uncured poultry manure                   | 1.10 | 2 <sup>nd</sup>  |
| Crop rotation                            | 1.03 | 3 <sup>rd</sup>  |
| Use of wet mulching materials            | 0.79 | 4 <sup>th</sup>  |
| Compost                                  | 0.78 | 5 <sup>th</sup>  |
| Poultry manure (cured)                   | 0.77 | 6 <sup>th</sup>  |
| Pig manure                               | 0.72 | 7 <sup>th</sup>  |
| Sheep and goat                           | 0.58 | 8 <sup>th</sup>  |
| Abattoir manure                          | 0.45 | 9 <sup>th</sup>  |
| Cow manure                               | 0.41 | 10 <sup>th</sup> |

**Source:** Field Survey, 2017

### Extent of closeness of traditional practice with organic standard

The distribution of the results as represented in Table 3 shows compliance of respondents practices under three headings; general organic practices, soil fertility management and pest management. The Table shows that only 12.4% of the respondents complied with no use of mineral fertilizer, also only 11.3% complied with no use of herbicides, while 37.3% complied to use of cured manure before application. Use of battery powder is not allowed in organic practices 58.8% complied with it, while only 21.5% complied with no use of fire for land clearing.

For soil fertility management 52.5% complied with use of crop rotation, but only 39.5% indicated compliance to planned rotation strategy. Bad odour of compost material before application is not a good practice in organic farming, 48.6% complied with it. Adding some synthetic fertilizers to compost is fraud in organic farming 50.3% complied with this. Pest management practices; only 18.6% practiced the use of neem for pest management. The use of same knapsack sprayer for both plant extracts and synthetic pesticide is not allow in organic farming, only 16.4% complied with it, while not adding chemical and kerosene to plant extracts had 55.9% and 67.8% compliance respectively.

This findings show that majority of the respondents practices are not in compliance with organic practices and standard, therefore, extent of compliance with organic practices is low. This implies that, educating farmers on the organic standard and practices is highly needed across the zones for conversion to organic agriculture.

Table 3. **Distribution of crop farmers by extent of compliance to organic principles**

| Variables   | Complied % | Not Complied % |
|---|------------|----------------|
| General practices   |            |                |
| No use of mineral fertilizer  | 12.4       | 87.6           |
| No use of herbicides to control weed                                      | 11.3       | 88.8           |
| Cure of manure before application   | 37.3       | 62.8           |
| No use battery powder as seed dresser                                     | 58.8       | 41.3           |
| No use of fire for land clearing  | 21.5       | 78.5           |
| Soil fertility management   |            |                |
| Use of crop rotation  | 52.5       | 47.5           |
| Use crop rotation plan  | 39.5       | 60.5           |
| No bad odour of compost before application                                | 48.6       | 51.4           |
| No addition some synthetic fertilizer to compost Pest management          | 50.3       | 49.7           |
| Use of neem extracts  | 18.6       | 81.4           |
| No use of same knapsack sprayer for plant extract and synthetic pesticide | 16.4       | 83.6           |
| No addition of some chemical pesticides to plant extracts                 | 55.9       | 44.1           |
| No addition of kerosene to plant extracts                                 | 67.8       | 32.1           |

Source: Field Survey, 2017

Table 4 shows that crop farmers (51.4%) had low level of compliance with organic practices. This implies that higher proportion of the agriculture practices of the respondents are not in compliance with organic practices, thus they have low compliance with organic standard. This is in line with the findings of Babalola (2012), Issa, (2015), and Oyekale (2016), that Nigeria farmers still have low compliance to agricultural safety precautions.

Table 4. **Distribution of respondents by level of compliance with organic standards n=177**

| Level               | Percentage | Parameter                            |
|---------------------|------------|--------------------------------------|
| <b>Crop farmers</b> |            |                                      |
| Low                 | 51.4       | Min =18.00, Max =61.00, Mean = 39.60 |
| High                | 48.6       |                                      |

Source: Field Survey, 2017

### **Relationship between respondents' use of traditional agricultural practices and the level of compliance with organic standard**

Table 5 shows that there is positive and significant relationship ( $r=0.114$ ,  $p=0.044$ ) between the respondents traditional agricultural practices and level of compliance with organic practices. This findings may be explained by the fact, that some of the respondents are smallholder farmers and have limited access to synthetic input and with relatively low income to purchase synthetic inputs. These could inform the use of available traditional practices to make up for their agricultural production and some of these traditional practices in use are not too far in principle from some organic practices, for instance; crop rotation, use of manure, use of plant extract and multiple cropping. This suggest that some of the practices could be leverage on to promote conversion to organic agriculture practices.

Table 5. **Correlation for test of relationship between use of traditional practices and compliance with organic standard**

| Variable              | r value | p value | Decision    |
|-----------------------|---------|---------|-------------|
| Traditional practices | 0.114   | 0.044   | Significant |

Source: Field Survey, 2017

### **Conclusion**

Many Nigeria farmers use traditional agricultural practices a long side synthetic inputs for their production such as; crop rotation, use of manure, use of plant extract and multiple cropping, but without compliance to safety precaution. The level of compliance with organic practices is low with half of the farmers in this category. Therefore, for rapid adoption of organic practices the need to leverage on the traditional practices that are close to organic principle is imperative as well as engaging agricultural extension service for awareness, advocacy and to promote organic agriculture as adaptable practices for health, economic and environmental benefits.

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