

TREE CROP DISEASES MANAGEMENT AND DWINDLING FOOD PRODUCTION IN NIGERIA

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Abstract

Tree crop diseases pose severe implication on food production in Nigeria despite the continuous population growth. Hence, the contribution of this study is to examine the impact of tree crop diseases on food production in Nigeria. The study adopted survey research approach and primary data were collected using questionnaires designed and administered by the researchers to hundred farmers. The Cost Benefit Analysis theory was used in the study to drive home the message. The result shows that tree crop diseases have drastically reduced the quantity and quality of food produced. Hence, the study recommended that Nigerian government should urgently provide the necessary insecticide that will help farmers in Nigeria tackle the urgent problem.

Keywords: Tree Crop Diseases Management, Dwindling Food Production, Cost Benefit Analysis, Life time theory, Agro-based Economy

INTRODUCTION

Nigeria is considerably an agro-based economy since majority of her rural dwellers are farmers and depends heavily on agriculture for their sustenance. Her climate variation affects several cash crops and these constitute her exports before 1970s. The growing human population necessitates high demand for staple crops from food companies across the globe. The

increasing demand for food crops generates a ripple effect on the production value-chain for the farmers, food companies and the government at large. Crops are mostly part of this agriculture this study is talking about.

Crop diseases are the impairment of health or a condition of abnormal functioning of crops. They cause nothing but a significant yield and quality constraint for growers of broad acre crops. These include fungal, bacterial, viral or nematodes and can damage crops above or below the ground. While “food production is the process of transforming raw ingredients into prepared food products (What is food production?, 2016)

Crop diseases and their adverse effects on production in Nigeria have become thorns on the flesh of many farmers and all Nigerians who depend so much on crop production. These have totally reduced the quality of crop which the farmers produce and have discouraged many farmers because of the losses they encounter during such diseases outbreak.

According to the annual meeting held by the stakeholders and board of directors at Ada Palm Ltd on 20/12/2011, it was presented that trees do not go in search of nutrients, instead, whatever they need comes to them like sunlight, wind, rainfall as well as predators, diseases and natural disasters. The activities of post harvest disease were reported to be outrageous in the outbreak of oil palm wilt fungus in 2010/ 11 farming season (cf. <http://www.agriculturalsocietyofnigeria.org>).

According to Yayock, Russell and Harkness (1976), the hey days of agriculture could be said to be rewarding until the constant recent outbreak of rosette epidemic that is killing our crops in Nigeria. The symptoms are often sporadic but very disastrous whenever outbreak occurs. Inefficient disease control measures coupled had crippled some communal cocoa plantations in Cross river state. According to the International Cocoa Organization journal (2012), black pod rot has devastated cocoa fields in Nigeria which was estimated as over \$250 million in regional trade. The infestation was spotted in bits, it continued spreading geographically across regions of cocoa producing areas until farmers abandon the fields and thus low productivity sets in.

The imperative of making basic food supply affordable to the masses is the prerequisite of every responsible government. Government pays a sort of agricultural subsidy to farmers and injects fund into the food production value-chain; this is a way of supplementing farmers’ income and maintaining food production in the country.

Having observed that crops are varied, this study therefore, intends to limit itself to addressing the management of diseases affecting the three main tree crops namely, Groundnut, Cocoa and Palm Oil and its contributions to the dwindling food productivity.

STATEMENT OF PROBLEM

At present, agricultural sector accounts for less than 30 percent of Nigeria's GDP (World Bank, 2014 in Oluwafemi, Adedokun, Ogunleye & Oladokun, 2015). It is of no doubt that crop diseases might have contributed to this dwindle. Nigeria, as well-known, stands tall in the World's groundnut production as the fourth largest producer and the highest in Africa with 1.55 million metric tons (United States Department of Agriculture in Agriculture Nigeria, 2011). However, the quality and quantity of these groundnuts have tremendously reduced in recent time due to the following diseases that attack them. They include; rosette, steak, bacteria wilt, fusarium wilt, pod rot etc. This groundnut rosette disease is the most destructive disease of groundnut, and is transmitted by aphids. Although rosette epidemics are sporadic, fields' losses approach 100% whenever the disease occurs in epidemic proportion

In a similar manner, cocoa serves as a major source of income to this country until recent attacks by varieties of diseases and pest species which include: fungi diseases, insects and rodents; some of which have increased dramatically in geographical range and are sometimes described as invasive species. Invasive species are principal constraints to world cocoa production and on a national scale presents the greatest losses from black pod rot. Black pod rot which we mentioned above is an invasive disease of cocoa which was originally identified in Ecuador in 1917 and it spread rapidly to other countries like Latin America during 1970s (Poonyth, Hassan, Kirsten & Calcaterra, 20010. This black pod produces large quantities of powdery spores, it has a high potential for transmission. Infected plantation of crop may suffer dramatic yield loss, which may lead to the neglect of the particular tree by the farmers and hence result to complete loss of production.

Oil palm is another crop that has been affected by the disease called oil palm wilt fungi. Consequently, this oil palm wilt fungus is a major disease of oil palm which symptoms vary with age of host. The disease can affect seedlings and mature trees. This causes the seedling to exhibit retarded growth, reduced leaf size, chlorosis of older leaves and tip necrosis. The field palm however, may exhibit a bright yellow chlorosis of leaves in mid canopy which starts at the tip of the pinnacle and move towards petioles before affecting adjacent fronds and spreading. The older leaves wilt and dry out and fronds break close to the base of the trunk; new fronds are chlorotic and stunted; the palm shows decline on one side and develop symptoms in the lower canopy; infection spreads rapidly upwards and infects palm through the root system.

Having enumerated all these diseases which affect the three main crops which this paper concentrates on and which have been poorly managed by the Nigerian government; and which have also led to the drastic reduction of the quantity of food produced by Nigerian farmers, it is then of utmost importance to know that if these crop diseases are left to continue

without looking into the way of remedying them, the over growing population in Nigeria will continue to suffer dwindling food production and will not be able to meet up with the rapid development of urban markets and domestic demand for staple crops which is rising daily.

THEORETICAL LITERATURE

To tackle the aforementioned problem head long, this paper has decided to implore the theory of Cost Benefit Analysis. In fact, the lifetime well-being genre of CBA will be considered and adopted as the most appropriate for the study.

Lifetime Well-Being (Cost Benefit Analysis) Theory

This study uses the Life time well-being theory to explain the CBA meant here. It is believed that Cost-benefit analysis can be done using the lifetime well-being theory; a theory about the value of a life which is associated with Broome (2000), as an update that takes care of the shortcomings of the following assumptions: The first assumption is that the goodness of a person's life depends only on how long it continues and on how well it goes at each time it is in progress. A person is born at some time and dies at some time, and at each time in between, her life goes well (or badly) to some degree. The second assumption is that there is no backward causation of temporal wellbeing. One may ask, "Can events that occur in a person's life affect her temporal wellbeing at earlier times?" Just like when one writes a book that later turns out to be influential. "The event of its becoming influential may add value to all the earlier time you spent writing it, by making your work during all those times worthwhile" (Broome, 2000).

It can then be said that the benefit of saving the life of the tree crops is the total temporal wellbeing the Nigerian population goes on to enjoy in the rest of its life after the crops are saved from these diseases.

The term, "temporal wellbeing", in context of discussion refers to how well the life goes at a particular time; and by another term, "life time well being", one refers to the goodness of the life as a whole. Based on the premise, it is now logical to conclude that a person's life time well being depends only on the length of her life and on the temporal well being of her life at all times. The temporal well being meant in the theory, is to be measured on the cardinal scale. The cardinality is a necessary and sufficient because the temporal wellbeing is a discrete issue. The theory also fixes a zero of temporal well being because the zero makes a difference when it comes to comparing life of different lengths. However, by comparing life at different lengths, the scale of well-being automatically becomes more than cardinal; it rather assumes a ratio scale and it is commonsensical at this level.

Life time wellbeing theory, simply put with already noted assumptions, argues that in trying to save a tree crops from the disease, the benefit that results is the well-being that the whole Nigerian population goes on to enjoy in the rest of their life by the abundant food production from the farmers. Saving tree crops life sperm adds well-being to the world in this way, and that is why it is valuable. “But saving a crop life often adds well-being to the entire life of the other crops and also the whole human world in a different way too. If a crop is saved, it may later bear more fruits that would never have existed or germinated had this crop not been saved the deadly disease. The young crops will enjoy well-being during their life sperm; at least their life will be good (or bad) to some degree” (Broome, 2000).

Why should we not count the young germinated crops well-being as part of the benefit of saving the existing crops life, if we count the well-being of the crops itself? However, saving a tree crop from diseases adds well-being to the world and increase food productivity that will help feeding the Nigerian growing population, and so does creating new ones.

Broome (2000) suggests that we should value one and the other as well. Given that cost-benefit analysis must rest on a theory of value and the theory must account for population changes. Very many events lead to the existence of new people (new tree crop), and many events prevent the existence of people (tree crops) who otherwise would have existed. If a tree crop is added to the population of other tree, they will have some lifetime well-being; their life will have some value. This value must be the benefit of their existence for the sustenance of the human population, which must be added into our cost-benefit calculations (see Broome 2000).

Finally, the simple form in cost benefit analysis compares only the financial costs and benefits. A typical example of cost benefit analysis is the provision of tree crop insecticides to manage the diseases. The viability of the project will be the benefits derived from the food production minus the cost of buying the insecticide (Nwogwugwu &Uzonwanne, 2015).

EMPIRICAL LITERATURE

Several empirical literatures that center on the impact of tree crop diseases on food production abound. They include the following studies:

Aikpokpodon and Adeogun (2011) studied a diagnostic constraint to achieving yield potentials of cocoa varieties and farm productivity in Nigeria. He found increasing farm productivity is a major breeding objective in crop improvement of any crop species. However, a diagnostic tool of stakeholder analysis and Venn diagram were used within a participatory focus group discussion (FGD) with farmers in the three major cocoa growing states to identify causes of low farm productivity and constraints to cocoa cultivation in Nigeria. Research findings showed that the black pod disease, old age of cocoa tress, poor access to improved planting materials, termite

infestation and chemical residue as the most important factors responsible for low cocoa yield obtained by farmers. The study highlighted the need for development of improved cocoa varieties that are resistant to the black pod disease functional system of seed distribution to facilitate greater access to improved varieties. He therefore suggested that programmes should be designed to increase farmers' access to improved planting materials, inputs and involvement in problem –identification and solution strategies of development.

Tijani (2010) examined factors influencing pesticides use among cocoa farmers in Ondo state. It was found that cocoa production in Nigeria is constrained by insect, pest and diseases. The brown cocoa mired, the swollen shoot virus transmitted by mealy bugs and the black pod disease are the biggest constraints to cocoa production. Pesticides have been abused due to constant diseases, resulting into excess residues in the exported products. Consequently, the EU banned cocoa import from Nigeria unless acceptable chemicals were used and a maximum allowed chemical residue adhered to. In response, the government of Nigeria listed the approved chemicals for use in cocoa production destined for the EU market.

Ajeigbe, Waliyar, Echekwu, Ayuba, Motagi, Eniayeju and Inuwa (2015) studied farmer's guide to profitable groundnut production in Nigeria. The study reveals a decline in groundnut productivity due to a combination of draught, rosette and other diseases. The guide shows that Aphids are carriers of groundnut rosette virus which is a devastating disease. It was found that the devastating effect of the groundnut rosette disease made farmers to abandon growing the crop even with the inception of ADPs and other externally funded projects, adaptive research on groundnut was not given high priority. Constraints to input supply include; a range of high yield varieties of groundnut and improved agronomic practice to optimize their yield potentials are available, but wide scale dissemination is limited by lack of seeds. The seed sector faces many constraints including the limited supply of breeder seeds, poor seed demand, estimation and lack of interest by seed companies resulting to inadequate distribution system. In addition, farmers are poorly linked to credit and input market which are necessary to increase productivity. Hence they recommended that it is however necessary to disseminate the seeds of these varieties with improved crop management packages on cultivation through groundnut transformation value chain.

Turner (1981) in (Renard & Quilec, 1984) studied the impact of Furasium wilt on palm production. Furasium wilt was found to be the most important disease of oil palm in western and central Africa. Losses of up to fifty per cent have been recorded for palms under ten years old in some plantations. Based on the rampant increase of this disease, Food and Agricultural Organization (FAO) and a group of international experts have agreed on the framework for a global programme on Furasium wilt. On December 2004, FAO and its partners call for a global

response on this deadly oil palm disease, which poses a severe threat to economic welfare and food security in developing countries.

RESEARCH METHOD

The study is descriptive in nature and employed survey research method. Data were obtained from secondary and primary sources. The primary data were collected through the administration of the questionnaires to selected farmers. Random sampling method was adopted for the study both in the rural and urban areas. The questionnaire was self-designed. A total of 250 participants were selected randomly for the questionnaire. This is made up of low, medium and large scale farmers. The selected farmers were issued questionnaire for the purpose of arriving at a dependable solution. The questionnaire was structured to enable them select the option for each of the questions which they considered most appropriate. From the 250 questionnaires distributed, 240 questionnaires were returned. Descriptive statistics was used in analyzing the data collected through the questionnaires.

ANALYSIS

Table 1: Sex Distribution of Participants

Variables	Frequency	Percentage
Male	150	62.5%
Female	90	37.5%
Total	240	100

The data collected on gender shows that 62.5% male responded to the questionnaire while the females that responded were 37.5%. The data showed that men are more interested in farming than women. This implies that majority of our participants were men who perhaps have tasted poverty and are eager to move away from it. Hence, farming will help to reduce their rate of poverty.

Table 2: Age Distribution of Participants

Variables	Frequency	Percentage
35-40	30	12.5%
41-46	75	31.25%
47-51	60	25%

52-56	45	18.75%
57 –Above	30	12.5%
Total	240	100

Table 2...

As shown in the table above, the greatest number of participants in our survey were within the age bracket of 41-45 (31.25%) and the least was within 35-40 with 30 (12.5%) and 57 above with 30 (12.5%). While 47-51 years were 60 taking 25%, followed by 52-56, were 45, taking 18.75%.

It is interesting to note that the greatest number of participants in the survey fell within that active working age while the least number were the aged above active working age and the younger ones who go about looking for white man collar job. This indicates that age is an important predictor in farming in Nigeria. The active working age saw the benefits of farming at this time Nigeria is going through a very tough time of recession and hence wish to make good use of farming to sustain themselves and their families unlike the older people who now depend mostly on their children.

Table 3: Farming Experience

Variables	Frequency	Percentage
Below 5 years	75	31.25%
5-10 years	90	37.5%
11-15 years	30	12.5%
16-20 years	30	12.5%
21-25 years	10	4.16%
Above 25 years	5	2.09%
Total	240	100

The table above shows that our highest participants with farming experience fall within the years of 5-10years with total number of 90 (37.5%), followed by those below 5 years of experience with 75 (31.25%), while 15-15 years and 16-20 years are 30 in number with (12.5%) each and finally only 5 (2.09%) participants falls within the years of 25 above. This indicates that majority of the farmers in Nigeria do not last in the work perhaps due to diseases which might have affected most of their tree crops.

Table 4: Participants' responses on the causes of low crop production in Nigeria

Variable	Frequency	Percentage
Use of obsolete farm tools	70	29.2
Low level of agronomic education	10	4.2
Inadequate investment policy on food crops	25	10.4
Low access to agro inputs	15	6.3
Diseases outbreak in crops	120	50
Total	240	100

The table above shows that diseases outbreak in crops have 120 (50%), followed by use of obsolete farm tools with 70 (29.2%), inadequate investment policy on food crops had 25 (10.4%), low access to agro inputs has 15 with (6.3%), and low level of agronomic education is 10 with (4.2%).

Table 5: Participants' responses on the impact of tree crop disease on food production in Nigeria

Variable	Frequency	Percentage
Reduces productivity	140	58.3
Increases hunger	80	33.3
Leads to deforestation	5	2.1
Reduces revenue for farmers	15	6.3
Total	240	100

Among all the data collected on the impact of tree crop diseases on food production in Nigeria, it shows that low productivity has the greatest impact with 140 (58.3%), followed by hunger increase of 80 (33.3%), reduction of revenue goes with 15 (6.3%) and deforestation has 5 with (2.1%).

Table 6: Participants' responses on the solution to tree crop diseases and dwindling food production

Variable	Frequency	Percentage
Using Insecticide, pesticide, fungicide etc, to reduce effect of this disease.	98	40.83
Removing the old one and planting the new ones	42	17.51
Fertilization of the tree crop	56	23.33
Imploring proper use of the land nutrient (topography of the land)	44	18.33
Total	240	100

The table above shows the participants' response rate on the solution to tree crop diseases and dwindling food production. 98 participants representing 40.83% are of the opinion that using insecticide, pesticide, fungicide, among others, to reduce the effect of these diseases will be more effective, while 42 participants representing 17.51% are of the opinion that removing the old ones and planting new ones will solve the problem. 56 participants representing 23.33% are of the opinion of fertilizing the tree crop, while 44 participants representing 18.33% are of the opinion that imploring proper use of the land nutrient (topography of the land) will go a long way to help manage the crop diseases which causes the dwindling of food production.

SUMMARY OF FINDINGS

Having conducted a thorough study, it was noted that lack of tree crop diseases management is responsible for the dwindling of production in Nigeria. The lack of tree crop diseases management entails, among others and as found in the study, the use of *obsolete farm tools*. Technology, as well-known, is the mainspring of economic growth and the capacity to develop this technology is most relevant in determining the growth of food productivity in Nigeria. Secondly, *low level of education* is another. Education is power. Without proper education on the use of farm tools and insecticide will create more harm than good. Thirdly, *inadequate investment policy on food crops, low access to agro inputs and diseases outbreak on the crops*.

More of the participants are of the opinion that the lack of tree crop diseases management *reduces productivity* for the farmers. This has necessitated that domestic production has been growing at the rate of 1 percent per annum. This growth rate is rather sluggish and has necessitated massive importation of crops and livestock products needed to maintain a reasonable nutritional standard for Nigerians.

It has *increased hunger* in the country since many of the citizens cannot find food. Depending on the degree of deviation (i.e. intensity), hunger can be manifested by starvation, low life expectancy resulting from widespread famine, susceptibility to diseases as well as physical and psychological discomfort resulting into physical disability. In addition, there is correlation between poor nutrient and mental deficiencies which poses a further constraint to increasing productivity.

It has *reduced revenue* for farmers. Many Nigerians are losing interest in farming system as a result of this and younger ones never wish to associate themselves with farming because no one wants to put their income where no interest comes in.

Finally, it has led to *deforestation*. It destroys the lands for farming and exposes the soil to danger such as erosion which leads to vegetation growth problem.

RECOMMENDATIONS

But from the foregoing, it has been observed that the lack of management of agricultural sector has led to a lot of problems which we have already mentioned above. Hence this study makes the following recommendations:

1. The government is advised to conveniently conceal the economic policy mistakes that account for failures in modernizing agriculture by blaming its poor performance on the inanimate adversity of nature when these natural factors are to be integrated as part of normal expectations with respect to agricultural production since it has been seen that the influence of nature is among the factors accounting for the poor performance of food productivity.
2. The government should ensure adequate investment policy on food crops in order to reduce diseases outbreak on the crops.
3. Technology is the main spring of economic growth and the capacity to develop this technology consistent with environmental and economic condition is most relevant in determining the reduction of crop diseases and the dwindling of food productivity, which will eventually lead to the growth of agricultural productivity in the nation.
4. Education is said to be key to power, hence, proper education of the farmers on the proper use of the farm tools, insecticides, among others are extremely important because when the tools are properly managed to elicit positive responses from the farmers who are the ultimate users of farm technology, so that the real culprit causing the poor performance of food production can be reduced.

CONCLUSION

From the foregoing, one must have observed that this study limited itself to addressing the management of diseases affecting the three main tree crops namely, Groundnut, Cocoa and Palm Oil and its contributions to the dwindling food productivity. The reason for this is that the aforementioned crops have economic values which need to be exploited for the ever growing Nigerian population. There is an increased demand for these staple crops for food. The increasing demand for these food crops generates a ripple effect on the production value-chain for the farmers, food companies and the government at large. If the diseases affecting these food crops are ineffectively managed, the increasing demand of the growing population will not be matched with supply.

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