Chapter 11
Economics of Soil Fertility Management Practices in Nigeria

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ABSTRACT

The production of cereals, tubers, and vegetables largely depends on the application of organic and inorganic fertilizers to offset their nutrients requirement. In this chapter, the authors identify different soil fertility management practices the maize farmers are using and examine the economic benefits of such practices in maize production. To complete the study, 237 maize farmers across Kogi and Kwara States, Nigeria were investigated. Descriptive statistics, gross margin, and multinomial logit tools were used to analyze the data. The results show that majority of the maize farmers (41.40%) use only inorganic material. Labour employed in the application of fertility materials, distance to the source of fertility materials, the quantity of seed planted, educational attainment, and gender of the maize farmer were the determinants of the use of fertility management practices relative to integrated soil fertility management (ISFM). The analyses of the results show that the use of ISFM for maize production is the most profitable method with a profitability ratio of 2.29.

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INTRODUCTION

Many factors influence the level of output every farmer obtains at the end of the production season. Some of these factors largely depend on soil management practices the farmer adopts. These soil management practices, either good or not, will influence the farmer's level of output. Some of the soil management practices include; use of agrochemicals, tillage system used, soil nutrient mining, removal or loss of vegetative cover, continuous cropping as well as use of soil fertility materials (Mtambanengwe and Kosina, 2007; NOAN, 2012; FAO, 2017). All these practices, when performed excessively may negatively affect the crop production and as a result, level of the crop output decreases. The use of these unfavourable soil management practices are referred as unsustainable.

The overall effect of these unsustainable practices may cause global warming or increasing global temperature as a result of green-house-gases (GHG) emission. Asides the militating impact of climate change on production, the existing and growing population needs their food sustenance to be met by adequate food production. The drive to increase food production in Nigeria for instance has resulted into nutrient mining due to continuous and perhaps mono-culture oriented cropping. A typical example in the Nigerian context is maize production. In the year 2014, a decline of 2.60 percent value in maize crop growth rate has been recorded. Showing that there was depletion in the level of maize output produced when compared to the previous year. Nigeria produces 7.7 percent of the world share of maize (FAOSTAT, 2016). The World Bank in 2013 however pointed that 16 kilograms of fertilizer was used per hectare of arable crop produced in Nigeria. There is need to emphasize the importance of soil fertility management as a means of improving agricultural productivity (USDA, 2014; FAOSTAT, 2016).

Soil Fertility Management in Crop Production

The application of organic and inorganic fertilizers solely or combined are found to have great influence on the vegetative growth and yield of the crop. A study carried out by Ullah, *et al,* (2008), showed the highest yield was obtained from the combined application of organic and inorganic sources of soil nutrients (ISFM). The organic matter content and availability of N, P, K and S in soil were increased by application of both organic materials and inorganic fertilizer application. It was also found that highest vegetative growth was recorded from the use of the ISFM and the lowest vegetative growth was found with the use of only organic fertilizer in form of cow dung used. Also, the application of only inorganic fertilizer was less effective than the combined application.