



**FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**

**EVIDENCE-BASED SUSTAINABLE
AGRICULTURAL DEVELOPMENT IN
NIGERIA THROUGH ECONOMETRIC
MODELLING OF CREDIBLE DATA**

By

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BSc, MSc, PhD (ABU), Dip.

Professor of Agricultural Economics

INAUGURAL LECTURE SERIES 45

14TH JULY, 2016



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Agriculture, Economics, Agricultural Economics

Agriculture is art and science of crop and livestock (including fisheries and micro-livestock) production and processing for the use of man (Nmadu & Amos, 2011) and it is the oldest profession of man dating back to the early post-creation era (Dake, 1991). Marketing, financing, and a host of support services are the integral part of successful agricultural activities (Nmadu & Amos, 2011). Agriculture has been the mainstay of Nigerian economy in spite of the huge oil revenues and indeed is the sector that will bring about sustainable development, poverty eradication, self-sufficiency and food security to Nigeria (Adamu & Idisi, 2014; Chukwunonso, 2014). As a science, agriculture is made up of a number of branches. These branches include the following:

- * Crop Science, Plant Science
 - * Agronomy
 - * Animal Science
 - * Soil Science *and Land Management*
 - * Crop Protection
 - * Fisheries Study
 - * Agricultural Engineering
 - * Agricultural Economics
 - * Agricultural Extension
 - * Agricultural Education etc.
- (Nmadu & Amos, 2011)

Economics which is derived from two Greek words 'oikos' and 'nemein' meaning "household management" is a branch of the Social Sciences which deals with how people choose to use their limited resources (land, labour, capital and entrepreneurship/management¹), which have alternative use, to produce, distribute, exchange and consume goods and services. Production of goods and services is only complete when what is produced gets to the ultimate consumer. Economics is the study of social behavior guiding in the allocation of scarce resources to meet the unlimited needs and desires of the individual members of a given society (O'Sullivan & Sheffrin, 1998).

Economics is a very wide and versatile subject and include the following branches:

- * Microeconomics
 - * Macroeconomics
 - * Monetary economics
 - * Finance and banking
 - * International economics
 - * Applied economics
 - * Agricultural Economics (Socio-economics)
 - Farm management
 - Production Economics
 - Econometrics
 - Agribusiness Management
 - Agricultural marketing
 - Price analysis
 - Resource Development
 - Agricultural policy
 - Agricultural finance
 - International Agriculture
 - * Environmental economics
 - * Resource Economics
 - * Land economics
 - * Development Economics etc.
- (Nmadu & Amos, 2011)

Agricultural economics is a branch of agriculture and economics, which uses basic agricultural and economic principles to ensure optimum agricultural production. Farmers have scarce resources (land, labour, capital and entrepreneurship/management) and these resources have alternative uses. The Agricultural Economist therefore develops models and systems of alternative resource allocation to agricultural production and then advises the farmers appropriately. Agricultural economics also studies the interdependence between agriculture and the general economy as well as foreign economies with a view to establishing superior resource allocation models for sustainable agricultural production. In

a bid to do all these, the agricultural economist tries to answer four basic questions:

- i. What types of agricultural goods or service should be produced for the ultimate consumers,
- ii. How the agricultural goods or service should be produced,
- iii. How much of these agricultural goods or service should be produced, and
- iv. For whom should these agricultural goods or service be produced?

(Nmadu & Amos, 2011; Reddy, Ram, Sastry, & Devi, 2010)

An Agricultural Economist is also referred to as a Socio-Economist because as part of the modelling process, we also relate the economic activity of the farmer to his social and cultural behaviour. For example, we often want to determine how a farmer's marriage status, educational achievement, gender, religious inclination, family status, his farm location, his mode of transportation to his farm etc. affects his farm performance and efficiency. The socio-economist carefully observes the farmer in his farm and settlement patterns and deduces how they could either impede or encourage his agricultural production activities as well as his performance and level of efficiency. (Nmadu & Amos, 2011; Amos & Nmadu, 2004; Nmadu & Marcus, 2013, Ajah & Nmadu, 2012; Nmadu & Nwawulu, 2015; Nmadu, Sallawu, & Omojeso, 2015).

Most people are often confused where to draw the dividing line between an Agricultural Economist and an Agricultural Extensionist. First, the two are not option of each other but are parallel lines of specialisation. Second, the Extensionist is mainly concerned about dissemination of research and other agricultural information to the farmers during which he undertakes to know farmers reaction and his ability and speed of accepting new ideas. Therefore, even though the two were always traditionally housed within a department, their line of specialisation is very much unique of each other (Kudi, Bako, & Atala, 2008; Amos & Nmadu, 2004; Nmadu & Marcus, 2013; Onemolease & Alakpa, 2009; Agwu & Akinnagbe, 2008; Genius, Koundouri, Nauges, & Tzouvelekas, 2013).

Development, sustainable development, development economics, development planning

Development (Kates, Parris, & Leiserowitz, 2005; Todaro & Smith, 2011) can be defined as the systematic use of scientific and technical knowledge to meet specific objectives or requirements. More specifically, it is the application or improvement of techniques and or technology to the production of new goods or services. Development takes quite a different meaning in different disciplines and has numerous synonyms. For example: improvement progress, advancement, broadening elaboration, evolution, deepening, growth, alteration, change, modification, maturing, expansion, enlargement just to mention a few.

Sustainable development (Kates *et al.*, 2005) on the other hand is the development that meets the needs of the present generation without compromising the ability of the future generations to meet their own needs. Sustainable development has three pillars: economic, social, environmental interacting symbiotically such that the systems continue to function optimally without loss of value as depicted in Fig. 1 (Hayati, Ranjbar, & Karami, 2010; Balasubramanian, 1971; Todaro & Smith, 2011).

Development planning is a multidimensional process which involves establishing nation's means of achieving the stated visions, missions, policies and programmes covering social, human, political, environmental, technological and other factors. It is sometimes used interchangeable with sustainable development (Ikeanyibe, 2009).

Development economics is a branch of economics which deals with economic aspects of the development process in low-income countries focusing on how to promote economic growth in such countries by improving factors like health, education, working conditions, domestic and international policies and market conditions. It examines both macroeconomic and microeconomic factors relating to the structure of a developing economy and how that economy can create effective domestic and international growth. Development economics seeks to

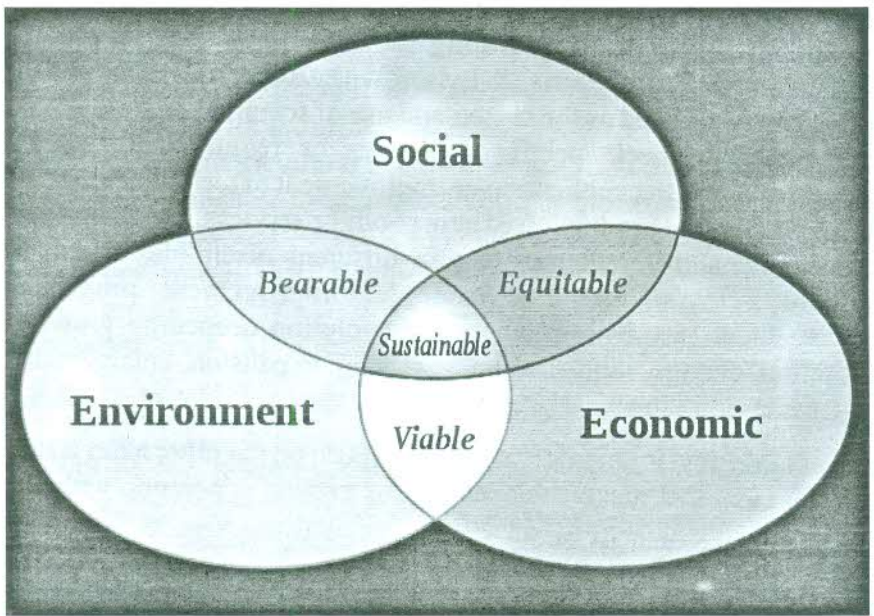


Fig. 1 Interactions between the dimensions of sustainability

determine how poor countries can be transformed into prosperous ones. Strategies for transforming a developing economy tend to be unique, because the social and political background of countries can vary dramatically (Balasubramanian, 1971; van Ittersum *et al.*, 2008; Chikwama, 2010; Dillon, Sharma, & Zhang, 2011; Karodia, 2014; Matunhu, 2013; Nelson, Lamboll, & Arendse, 2008; Oboh & Ekpebu, 2011; Subair, 2009; Tack & Aker, 2014).

From the foregoing, it can be seen clearly that Agricultural Economics and Development Economics are interwoven since the latter is about the development of agriculture from the current subsistence, low technology level to commercial, modern technology level that will bring about food security and remunerative prices thus higher income to farmers, which ultimately means the development of the economy.

