Chapter 22
An Empirical Investigation of Environmental Kuznets Curve in Nigeria

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ABSTRACT
The possibility of the existence of environmental Kuznet curve (EKC) has been debated extensively in the literature. The reality of EKC is that, by pursuing growth in income, environmental objectives can be simultaneously accomplished without initiating extra intervention tools. Various studies have been conducted on the existence of EKC without any consensus. Therefore, in this paper, the author analyzes whether or not EKC exists and its shape. In this study, the author uses an explanatory variable to in the model, which is population density, showing the level of resilience of the environment to pollution. However, this research found that at the lower stage of income, environmental degradation declined with income growth, rises as income grew further, then declined. However, income did not contribute significantly toward the explanation of environmental degradation like population density. This research found no synergies between addressing poverty and environmental problems in Nigeria. Therefore, complementary environmental policies must be put in place when addressing poverty. Lastly, there are different shapes of the relationship between income growth and various measures of pollution and environmental degradation, and developing countries must recognize that no one size fits all in this relationship.

INTRODUCTION
Simon Kuznets (1955) hypothesized an inverted ‘U’ relationship between income and inequality. Later, economists found this hypothesis to be relevant or analogous to the income-pollution relationship and were coined as the Environmental Kuznet Curve (EKC). The postulate of environmental Kuznet’s curve (EKC) is that environmental degradation may rise or worsen at the initial course of development before environmental quality improves as income rises. The explanation for this phenomenon is that increasing size of population, changes in consumption and production patterns
at an aggregate level may contribute to the decline of environmental degradation as income rises. Income levels and urbanization grows with economic development and trigger demographic transition (people ‘migrate’ from lower income lifestyles to a higher income lifestyles and from rural lifestyle to an urban lifestyles). Another explanation for EKC was given that a country has to go through a period of rising pollution as they are industrializing and then reduces environmental impact as they reach a higher level of industrialization.

Another explanation for the possible existence of EKC is that in a developing economy, little weight is given to environment concerns, thereby raising environmental pollution. After attaining certain living standard due to industrial expansion which makes environmental pollution to be at its greatest level, then, focus changes from self-interest to social interest. This interest (social interest) accords greater weight to a cleaner environment and the environmental pollution trend due to industrialization is abated or reduced.

The question that comes to mind is, why study EKC? Since environmentally improvement is at the centre stage of sustainable development worldwide, and more importantly, in developing countries. Various strategies of accomplishing this have been devised. If there is a trade off between environmental quality and income growth therefore, developing countries must tread cautiously on their path to sustainable development. In other words, if EKC exist, sustainable development therefore calls for a viable policy in which income growth is the main target. That means, by pursuing growth in income, environmental objectives will be simultaneously accomplished as income grows without initiating any other extra intervention tools.

This study therefore examined if there is any synergies between addressing poverty and environmental problems in a developing country. Specifically, the general objective of this study is to estimate the relationship between income growth and environmental degradation (using CO₂ emission) in Nigeria from 1970 to 2007.

**LITERATURE REVIEW**

Panayotou (2003) gave three reasons why pollution is inverted as income rises. The first is that pollution rises at early stage of industrialization due to reliance on rudimentary, inefficient and pollution induced technologies. When industrialization has advanced, service industries will gain eminence. This will further reduce pollution. Secondly, the decline in pollution as income rises is due to the fact that more affluent people and communities placing more value on cleaner environment by instituting measures to ensure cleaner environment. Thirdly, at the onset of industrialization, the scale effect will escalate pollution. Further along the trajectory, Firms will switch to less polluting industries/technology (composition effect). Lastly, mature companies continue to invest in pollution abatement equipment and technology thereby reducing pollution (technique effect). Panayotou (2003) implies that pollution will increase at the early stage of industrialization due to scale effect. It will reach the turning point due to the composition effect, then decline due to the technique effect.

Grossman and Krueger (1993) were the first to point out the semblance between Kuznets curve and EKC, and literature on EKC is broken down into three main categories. The first is the case of environmental quality rising as income rises. The second is the case of continual degradation of the environment as income rises (Kolstad, 2000). Issues covered in the literature include, what the critical turning point is, what institutional reforms to hasten environmental improvement, should economic growth be encouraged to bring about environmental improvement? Most studies have concentrated on whether or not EKC exists and what shape is the EKC, we shall review some of these studies.

Shafik (1994) examined the relationship between income and an indicator of environmental quality (access to clean drinking water) using 86 observations from different countries around the world.
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