

## Chapter 18

# Modeling and Understanding the Interrelationship between Natural Resource Extraction, Poverty and Inequality: The Case of Forestry in Sub-Saharan Nigeria

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### ABSTRACT

*Many rural households in developing countries derived their income partly from forest extraction yet, very little is known about the distributional implications of this income source on poverty and household welfare in general. Applying Gini and poverty decomposable techniques to community level datasets in rural Nigeria for analyzing the distributional implications of forest income on household welfare, the study finds that forest income reduces both income inequality and poverty. 2-step Ordinary Least Square (OLS) analysis of the determinants of forest income indicates that the decision to participate in forest extraction increases with more access to natural forest areas, larger and poorer households; and decreases with membership in forestry management and higher educational attainment. Furthermore, poverty simulations revealed that poverty can be reduced in the short run, through programs that raise the price that households receive for minor forest products. However, in order to synergize forest-led poverty reduction and forest conservation, the study recommends the planting and use of minor forest products outside of the natural forest areas. Other policy options and implications of the study are fully discussed.*

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## INTRODUCTION

Globally, there is a long tradition of concern and apprehension concerning forest dependence, poverty and household welfare (Sunderlin, Dewi, & Puntodewo, 2003; Lopez-Feldman, Mora & Taylor, 2007). The prospect of over 300 million people, most especially the poor, depending substantially on the forest for daily subsistence and survival, cannot be a matter of indifference (Mariara & Gachoki, 2008). Forest dependence can be linked with economic, social and cultural consequences. On the economic front, there are some associated costs and benefits. The costs would include: (1) increase global warming emanating from poor carbon sequestration caused by massive deforestation for farming and human settlement, and (2) destruction of natural habitats for several important ecosystem species. The benefits would include: (1) daily subsistence and survival from forest product gathering, and (2) income redistribution and poverty reduction. Socio-culturally, the benefits may include fresh water, recreational facilities, firewood, timber, medicine and the role of forestry in the local traditions and customs of the people. However, in the absence of quantitative analysis, it is difficult to say which one outweighs the other.

To date, very little empirical evidence exists on the causal relationship between forest extraction and household welfare (i.e., poverty and income redistribution). Most distributional studies are mainly concerned with taxation and migrant remittances with more recent focus on agricultural and non-agricultural activities. Fewer studies have looked at the quantitative relationship between forest extraction, poverty and income inequality (Lopez-Feldman, Mora & Taylor, 2007). Based on existing rich community level survey data from a community forest area in rural Nigeria, the chapter explores the empirical relationships among the key variables mentioned in the title. This is justified because changes in natural resource income, like any other household income sources,

have economic, environmental, health and social consequences on human welfare.

Our work builds on earlier published and unpublished work (Okafor, 1994; Osemeobo & Ujor, 1999; Neumann & Hirsch, 2000; Nweze & Igbokwe, 2000; Bison & Ajake, 2001; Pattanayak & Sills, 2001; Angelson & Wunder, 2003; Cavenish, 1997 & 2003; Campell, Jeffrey, Kozanayi, Luckert, Mutamba, & Zindi., 2002; Fisher, 2004; Vedeld, Angelsen, Sjaastad, & Kobugabe, 2004; Adhikari, 2004 & 2005; Paumgarten, 2007; Shackleton, Shackleton, Buiten, & Bird, 2007; Mariara & Gachoki, 2008; Ajake, 2008; Chukwuone & Okorji, 2008; Fonta, John, Ezeibe, Otu, & Ogujuiba, 2009; Fonta & Ichoku, 2010). Our specific research objectives with an overriding aim of providing policy-relevant evidence in the chapter are: to analyze the distributional and poverty effects of forest extraction income in a community forest area in rural Nigeria, using three variants of the Foster-Greer-Thorbecke (FGT) poverty decomposable indices (Foster, Greer & Thorbecke 1984); to estimate the impacts of forest income on rural income inequality in Nigeria, using the Gini coefficient decomposition technique (Lerman & Yitzhaki, 1985); and to identify the determinants of forest extraction income based on models of sample selection (Strazzera, Genius, Scarpa & Hutchinson, 2003; Fonta & Omoke, 2008).

## Study Context and Justification

A number of studies have shown that several rural households in Nigeria derive their incomes from a variety of sources with forest income accounting for a substantial share of total household income (Okafor, 1994; Osemeobo & Ujor, 1999; Nweze & Igbokwe, 2000; Bison & Ajake, 2001; UN, 2002; Chukwuone & Okorji, 2008). However, despite the importance of this income source for rural farm household in Nigeria, little is still known about its impacts on the distribution of household income, and hence, on poverty in general. While at the global level some studies find an inconclu-

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