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Poverty Determinants in the Rainfed Traditional Farms in Western Sudan: Rural Kordofan State

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Abstract

This paper attempted to assess the extent of poverty situation in rural Sudan. It was conducted in the traditional rainfed farming system (covering rural Kordofan Sate in western Sudan). The study relied on primary data sets collected during agricultural season 2005/2006. The aim of the study are: To establish poverty lines, indicators and profiles in the rural household focusing on the traditional farms and to identify the main causes of poverty of the poor rural tenants in traditional farms. The results show that the incidence of poverty was higher among the rural households. However the southern parts of the traditional farms had more vulnerable than the northern parts. A household depending on farm income alone accounts for a great part of the probability of being poor. The illiterate household-headed are more vulnerable to poverty than the educated ones, and similarly, the female-headed households are poorer than the man-headed households. High incidence of poverty was also linked to poor households not having their own livestock. The poor households suffer from lack access to safe drinking water, poor health, with wide spread of diseases. The risk of poverty was on average higher in households with a large number of individuals and of being households suffering from the ill health increase the likelihood of being in a higher poverty status category. The risk of poverty was on average lower in households with male head and young of the households head. The household of being with extra occupation and of being more working family members in the farms are reduce the likelihood of being in a higher poverty.

Keywords: Poverty Measures, Binary Regression, Rural Sudan

Introduction

Poverty in Sudan is widespread and pervasive, particularly in rural areas owing to the relatively low incomes, inequality in income distribution and in face of continuous rise in the prices of goods and services. According to the United Nations Human Development index, Sudan ranked as the 144th out of 174 poor countries in the world (IFAD, 2004). Poverty in Sudan is a multidimensional problem involving economic, political, social as well as ecological factor (Deng 2004). There are strong regional disparities, where States of Kordofan, Darfur, Blue Nile, and the Red Sea are the poorest. Furthermore, the south as whole is worse than the north in poverty census. The decade of the 1980s signified a period of disappointing macroeconomic performance and the decade of the 1990s witnessed increasing numbers of poor among the rural

people in Sudan, the largest and the richest, in natural resources, among the sub-Saharan countries. The Sudanese economy has had suffered secular regress during the 1980s when judged by all macroeconomic indicators. A steady declining of income and consumption per-capita, persistence deficit in the balance of payment and huge external debt have also characterized the 1980's and most of 1990's.

Sudan economy like other African economies depends mainly on traditional rainfed agricultural, which is characterized by high risk and uncertainty and continued fluctuation in the agricultural output. Thus food insecurity becomes a prominent feature in the traditional rainfed of rural Sudan. Before two decades productivity or yield was high and rural household used to cover all grain and cereal needs from farm production through direct or physical access. Over the years crop production has fluctuated due to many factors such as low and erratic rainfall, pest infestation and low soil fertility, as well as ill perceived macro-policies. As a result rural Sudan has continuously been facing food deficits in many of its regions.

The objectives set of the study are two folds: 1. To establish poverty lines, indicators and profiles in the rural household focusing on the traditional farms. 2. To identify the poverty causes of the poor rural tenants in traditional farms.

Methodology and Techniques

The data used in this study are based on household cross-section survey conducted in the traditional rainfed farms named rural Kordofan State in western Sudan for the agricultural season 2005/6. Households' locations within specific geographic areas constituted two provinces named Sheickan and Bara to represent the Kordofan State. The key information of the rural poverty had been collected. Two approaches are applied to establish the poverty line in the rural areas, these are Food Energy Intakes (FEI) approach and Costs of Basic Needs (CBN) approach. The most widely used class of poverty indices in the literature is the FGT, following Foster, Greer and Thorbecke (1984). The FGT poverty measure is defined as following equation:

$$p^{\alpha} = \frac{1}{n}\sum_{1}^{q}\left[\frac{z-y}{z}\right]^{\alpha} \quad \text{----------(1)}$$

where n is the total number of individuals under consideration, q is the total number of poor, y is the income of the i^{th} poor individual, z is the poverty line, and α is a parameter characterizing the degree of poverty aversion i.e. the parameter α determines the precise measure of poverty to be used. For z, most of the literature uses the national absolute poverty line.

When the parameter α equal zero the headcount ratio (H) is generated, when parameter α equal one the poverty gap ratio (PG) is generated, which is often considered as representing the depth of poverty. And when the parameter α equal two the poverty severity (PS) is obtained.

Many researchers estimated the causes of poverty using different regressions models (Krishna et al., 2006 and Francis, 2006). A binary logistic regression (BLR) analysis was undertaken to determine which factors were significantly associated with poverty movements (Kristjanson et al., 2006). The BLR used to built a model directly estimates the probability of an event occurring. The dependent variable (the status of the household livelihood) is dichotomous (1 extremely poor and 0 for non-poor). The model used to derive estimates of the odds ratios for each factor contributing to the poverty incidence. The independent variables considered in the analysis were: age, occupation, households' size, education level of the household head, disease affected the households' members, water sources, gender, disease affected the households' members, water sources, gender, etc… The binary logistic regression is specified as:

Zi = ăj + βiWhij + εhi---------- (2)

Where: zi is the value of the unobserved explanatory variable for the ith case, it is a binary variable indicating whether a household is below the extreme poverty line or not. Whi is the ith predictor for the hth it is a vector of the rural household's characteristics. βi is the ith coefficient of Whi, ă = a cluster fixed or random effect (constant), εhi = is a random error term assumed uncorrelated with the regressors.

Results and Discussions

Our estimated food poverty line and extreme poverty line are equal 0.34 $ and 0.41 $ for person per day; respectively. The poverty incidence, depth and severity in the Sheickan province which is located in the northern part of the State, had a low percentage than Bara province which is located in the southern part of Kordofan State. The educational attainment of the head of the household is found to be among the important factors that are associated with poverty (Elsheikh and Siwar, 2004). The results indicate that more of the poor rural households-headed are illiterate. Occupational categories are affect poverty (Angelsen and Kaimowitz, 1999). Generally, having a job offers protection against poverty, but having only one off-farm income earner in the family unit is often not enough.

In rural economies a stock of household wealth typically consists of agricultural land, human capital and labor endowment (Fuwa, 2006). A small percentage of the rural poor tenants are landless. Nevertheless, owning land under control of the governmental authorities. These results indicate that the poor households owned agricultural land but they lack appropriate technology and removal of subsides from the production inputs. The most of land is not occupied efficiently to satisfy the rural household's needs.

The livestock are one of the major assets that households accumulate as a result of their efforts to climb out poverty. The study result indicates that high incidence of poverty links with poor households who do not own livestock. Furthermore the survey results found that about 90 percent of the poor household suffered from water borne diseases specially Malaria. For the last three decades, many women's advocates have been arguing that women are poorer than men (Regehr 2006). The results show that female-headed households are poorer than male-headed households.

In the traditional farms it denotes that the positive estimate of parameters (β) occurs at variables of marital status, family size, numbers of males and females children in the households and diseases effected the households members (Table 1), i.e. the risk of poverty was on average higher in households with a large number of individuals and of being households suffering from the ill health increase the likelihood of being in a higher poverty status category. While the negative estimate of parameters (β) occurs at the variables: gender, age, education level, secondary occupation and sharing of the households' members in the agricultural activities. Poverty is reducing by the age of the household-headed, i.e. the risk of poverty was on average lower in households with male head and young of the households head. As well the risk of poverty was on average lower in households with head with at least vocational education comparing with households where head had only informal or primary education. Also in the traditional farms the household of being with extra occupation and of being more working family members in the farms are reduce the likelihood of being in a higher poverty.

Table 1: Poverty Causes in the Traditional Farms (Rural Kordofan State)

Variable	Estimated coefficient (β)a	Standard error	Wad	Odds Ratio Exp (β)	95% of C.I. for odds ration	
					Lower	Upper
GENDER	-1.046	1.371	0.582	0.351	0.024	5.158
AGE	-0.005	0.039	0.015	0.995	0.922	1.074
EDUCALEVEL	-0.246	0.426	0.332	0.782	0.339	1.803
MERITALS	1.478	1.004	2.167	4.384	0.613	31.372
SECDOCCU	- 1.660	1.049	2.502	5.258	0.672	41.120
FAMSIZE	1.897	1.405	1.822	1.150	0.010	2.356
NOMALE	2.081	1.445	2.074	8.016	0.472	136.180
NOFEMAL	1.789	1.402	1.629	5.983	0.384	93.331
DIDYOUW	-0.584	0.999	0.342	0.558	0.079	3.950
HAVDISEA	0.79	1.290	0.004	1.924	0.074	11.574
CONSTANT	1.276	4.396	0.084	3.581		
Regression statistics: Number of observation = 240, Likelihood ratio test: X^2 0.05 (10) = 11.407, Adjusted R-squared = 0.270 and 2- Log likelihood = 39.465						

Source: Survey findings and authors' calculations. a * indicates statistical significance at the level α =0.05.

The variables list in Table 1 is defined as follows:

A. Dependant variable:

A binary variable indicates whether a household is below the extreme poverty line or not (1 if extremely poor, zero if not). Poverty is estimated based on consumption per adult equivalent.

B. Explanatory variables:

GENDER: Binary variable indicating whether the household head is female or male (1 if female, zero if male).

AGE: Age of the household head.

EDUCALEVEL: Binary variable indicating whether the household head received education (primary, secondary, higher or professional education) or not (1 if educated, zero otherwise).

MERITALS: Binary variable indicating whether the household head is married or not (1 if married, zero otherwise).

SECDOCCU: Binary variable indicating whether the household head works in a secondary occupation or not (1 have secondary occupation, zero otherwise).

FAMSIZE: Size of the household.

NOMALE: Numbers of males children in the household.

NOFEMAL: Numbers of females children in the households.

DIDYOUW: Performance of the agricultural activities by the households members (1 work in the field by themselves, zero otherwise).

HAVDISEA: Suffering from the diseases last year (1 suffering from the diseases, zero otherwise).

Conclusions

Highly significant proportion of the rural population in the traditional farms are living or lived below the poverty line, without access to sufficient food or income to maintain a healthy and productive life. The incidence of poverty varies considerably according to region. The southern regions of the farms are poorest than the northern regions of the farms. The diverse of poverty incidences is mainly due to uneven distribution of economic growth and severe inequalities in terms of access to education, clean water, natural resources, public services, justices and political protection in the regions. Generally the study concluded that: the poverty existing in the

traditional farms were due to (i) unavailable other off- farm opportunities, (ii) female headed households, (iii) poor housing condition, (iv) deficits in health care (v) lack of own livestock, (vi) civil war and environmental instability, (vii) low yielding farm practices and shortage in modern agricultural inputs and information. All these factors impede access to use new technology in agriculture to produce sufficient food for self-sufficiency and increase income.

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