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HIV/AIDS and Efficiency of Food Production in the Rainforest Belt of Nigeria

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ABSTRACT
The spread of HIV/AIDS to rural areas in Nigeria poses a lot of concern to policymakers due to their perceived higher vulnerability and relevance for national food security. This study analyzed allocative efficiency of food production by farmers in affected and non-affected households in the rainforest belt of Nigeria. Data from 515 farming households in 5 states were used. Results show that inefficiency significantly increased ($p < 0.10$) with HIV/AIDS infection, market distance, farm days lost, market days lost, while farming experience, use of mulching, years of schooling, and tendency to crop specialization significantly decreased it. The average overall allocative efficiency for the HIV/AIDS affected farmers is 40.66 percent as against the 68.21 percent for non-affected. The study recommends that efforts to address HIV/AIDS must focus on economic empowerment for rural youths while food production will increase by promoting the use of soil conservation practices, development of rural market infrastructure, and educational facilities.

Keywords: Allocative efficiency, food production, HIV/AIDS, Nigeria

INTRODUCTION

One of the major problems facing the world today is the widespread of Human Immuno-Deficiency Virus (HIV) and the courage of living with millions of people already infected by Acquired Immune Deficiency Syndrome (AIDS). The general consensus now is that AIDS is a profound human tragedy, which has gone beyond a mere health problem, but a real threat to economic growth and development (WHO, 1987; Kambou, Devarajan & Over, 1992; Kenneth-Ofosu, 1998).

The impact HIV/AIDS in Africa cuts across all sectors of human development and it poses a serious challenge to the survival of several vulnerable poor people, whose livelihoods depend solely on agriculture. The recent shift from urban to rural areas in the efforts towards addressing the problem of AIDS is worthwhile because the disease is having some tremendous impacts on the agricultural sector of several developing countries. Specifically, up to 80 percent of the people in the most seriously affected countries rely on agriculture for their subsistence (CTA, 2004). FAO estimates that AIDS already killed 7 million agricultural workers, and 16 million more could die by 2020. Specifically, in the 9 most affected African countries, it had been projected that AIDS will reduce the agricultural workforce for the period 1985-2020 by the following proportions: Namibia (26 percent), Botswana (23 percent), Zimbabwe (23 percent), Mozambique (20 percent), South Africa (20 percent), Kenya (17 percent), Malawi (14 percent), Uganda (14 percent), and Tanzania (13 percent) (CTA, 2004). The agricultural sector is also affected in several other ways because the households sometimes sell their production assets in order to pay for medical bills and take care of infected members. This will, no doubt, reduce productivity, diversification of sources of income and outputs, food security, and nutritional status.

It should be noted that the state of health at the household level cumulatively determines the status of health (or well-being) of the community, which in turn reflects the well being of the nation. Agriculture and health have direct impacts on one another, although not many of previous analyses have explored this. However, the recent emergences of health problems, like HIV/AIDS and malaria, have made the examination of the linkage between agriculture, health, and productivity of farm households important (Abamu & Nwanze, 2003).

Mutangadura, Mukurazita & Jackson (1999) found that HIV/AIDS is a major threat to agriculture and food security because it reduces agricultural productivity and diminishes the availability of food through direct loss of family labor, reduction in time allocated to farming, sales of farm assets, cultivation of marginal land, and marginalization of surviving widow from land ownership by customary land tenure system.

UNAIDS (2002) found that in Ethiopia, AIDS-affected households spent between 11.4 - 16.6 hours per week performing agricultural work, compared with a mean of 33.6 hours for non-AIDS affected households. It was also noted that in Burkina Faso, about 20 percent of rural families reduced their agricultural work or even abandoned their farms because of AIDS. It was stated that the loss of skilled farmers and the demand of caring for sick family members forced the surviving relatives to exploit the environment. UNAIDS (2002) also showed that some 20 percent of agricultural households in Burkina Faso have reduced their agricultural work or completely reduced their farms because of AIDS.

This paper has the objective of estimating the allocative efficiency of food production by farming households affected with HIV/AIDS and those not affected. The hypothesis is that farmers are equally efficient in resource use irrespective of their HIV/AIDS status or that of their households. The remaining parts of the paper addressed the methods of data collection, results and discussions, and conclusion and recommendations.

MATERIALS AND METHODS

The data

Primary data collected with structured questionnaires administered to rural households between May and July 2004 were used. The multi-stage sampling procedure was used. At the first stage, 5 out of the 17 states in the southern part were randomly selected. Since we are interested in farm households, more states from the south-west were included considering their low rural HIV/AIDS prevalence rate and relevance in food production. The other 2 zones are also important, but the activities of oil companies somehow undermine their agricultural production potentials. Therefore, from the south-west zone, Oyo, Ogun, and Lagos states were randomly selected, while Cross Rivers and Ebonyi States were randomly selected from the south-south zone and the south-east zone, respectively.

At the second stage, Local Government areas (LGAs) where HIV/AIDS problem had been reported were purposefully selected from each of the States based on preliminary information from the Ministry of Health (MOH), Local Action Committee on AIDS (LACA), and the extension agents in the State Agricultural Development Project (ADP) zones. The population was stratified into two (2) strata based on whether they are HIV/AIDS affected or non-affected. The stratification was done with the assistance of Community Action Committee in AIDS (CACA) and the extension officers working with the farmers. Thereafter, because of relatively fewer numbers, all the HIV/AIDS affected farmers were interviewed and random samples were obtained from the other group. A farmer is considered affected not only because he had been tested positive of HIV/AIDS, but if a member of the households suffers or had suffered from the disease recently. Some ethical issues surrounding HIV/AIDS were suppressed by the involvement of the extension officers and CACA members in the administration of questionnaires.

After questionnaire pre-testing for information consistency, data were collected from 515 farmers. From Cross River State, 75 farmers were interviewed from Obruba LGA (25), Ikom LGA (25), and Yakur LGA (25). In Ogun State, 120 farmers were interviewed from Ijebu Ode LGA (30), Ijebu North (5), Odogbolu LGA (30), and Sagamu LGA (55). Data from Oyo State were from 117 farmers comprising of 62 from Ogo Oluwa LGA, 21 from Saki West LGA, and 34 from Atisbo LGA. Lagos State data were from 88 farmers comprising of 20 from Alimosho LGA, 20 from Ojo LGA, 20 from Agege LGA, and 28 from Apapa LGA. Finally, from Ebonyi State, data were collected from 115 farmers comprising of 34 from Izzi LGA, 41 from Ezza South LGA, 24 from Ngbo East LGA, and 16 from Ohankwu LGA. The sample sizes from the LGAs and States were done proportionately, given the estimated number of farmers and the available cost.

Food Production Efficiency Model

The stochastic FRONTIER 4.1, developed by Coelli (1994 &1996) is one of the available and most widely used statistical packages for efficiency analysis. This package was used to estimate the Maximum Likelihood Estimates (MLE) and coefficients of the socio-economic determinants of inefficiency for the farmers. The general model that was estimated can be stated as:

$$\text{Log } GM_i = \beta_0 + \beta_1 \text{ Log } LA_i + \beta_2 \text{ Log } FLC_i + \beta_3 \text{ Log } HLC_i + \beta_4 \text{ Log } FTC_i + \beta_5 \text{ Log } SDC_i + (v_i - u_i) \quad \ldots \quad 1$$

$Vi \sim N(0,\sigma^2_v)$

Where: Log = logarithm.

GM_i = gross margin of ith farmer

LA_i = land area of ith farmers (hectares)

FLC_i = cost of family labor of ith farmer (₦)

HLC_i = cost of hired labor of ith farmer (₦)

FTC_i = cost of fertilizer of ith farmer (₦)

SDC_i = cost of seed of ith farmer (₦)

v_i = symmetry error

u_i = inefficiency

The inefficiency model can be stated as follows:

$$|u_i| = \phi_0 + \alpha_i \sum_{i=1}^{16} M_i + d_i. \qquad \ldots\ldots\ldots\ldots\ldots \qquad 2$$

where:

$|u_i|$ = inefficiency of ith farmer

M_1 = sex of farmer (male = 1, 0 otherwise)

M_2 = farming experience (years)

M_3 = HIV status (affected =1, 0 otherwise)

M_4 = total sick days in the cropping season

M_5 = total farm days lost due to sickness in the cropping season

M_6 = total market days lost due to sickness in the cropping season

M_7 = intensification index as measured by Ruthenberg (1980) {computed as total season land was cultivated in the past six years divided by number of seasons (12)}

M_8 = use of mulching (yes =1, 0 otherwise)

M_9 = use of crop rotation (yes = 1, 0 otherwise)

M_{10} = use of organic manure (yes =1, 0 otherwise)

M_{11} = use of zero tillage (yes = 1, 0 otherwise)

M_{12} = use of cover crops (yes =1, 0 otherwise)

M_{13} = distance of main agricultural market (km)

M_{14} = diversification index computed from the Herfindal Index, which is computed as $\sum_{i=1}^{n} \left(\frac{C_i}{\sum_{i=1}^{n} C_i} \right)^2 * 100$ with C_i being the total income from the sales of ith crop.

M_{15} = household size

M_{16} = years of education

d_i = error term

RESULTS AND DISCUSSIONS

Socio-economic characteristics of HIV affected and non-affected farmers

Our survey shows that many of the farmers have not gone for HIV/AIDS testing in the past five (5) years. Most times, the need to do the test arises when frequent sickness results and HIV/AIDS suspected. Our samples show that 59 fathers, 45 mothers, and 43 children have been tested positive. These form 4.65 percent of total household members.

Table 1: Socio-Economic Characteristics of HIV Affected (HIV+) and Non-Affected (HIV-) Farmers in the Rainforest Belt of Nigeria

State	Ogun (OGS)		Lagos (LAS)		Oyo (OYS)		Cross Rivers (CRS)		Ebonyi State (EBS)		All States (CAS)	
HIV Status and No. of Respondents	Not-Affected (74)	Affected (46)	Not-Affected (53)	Affected (35)	Not - Affected (112)	Affected (5)	Not-Affected (62)	Affected (13)	Not-Affected (82)	Affected (36)	Not-Affected (380)	Affected (135)
Age (years)	38.61	38.57	34.40	33.90	51.21	58.00	48.69**	42.77**	47.87	47.64	46.22*	41.17*
Farming Experience (years)	14.16	15.04	15.60	13.60	28.88	34.20	23.00	21.07	13.80	16.81	20.35*	16.74*
No. of children	5.11	5.37	3.23	4.87	6.18	6.60	7.92*	4.85*	5.90	6.58	5.94	5.58
Household size	5.38	5.70	3.53	4.20	7.49	6.40	8.05*	5.00*	6.67*	4.33*	6.64*	4.95*
Number < 14 years	1.41	1.85	1.83	2.40	1.83	2.40	3.18***	2.07***	3.04	3.47	2.48	2.48
Number financing home	1.86	1.74	1.60	1.86	2.27	1.80	1.89**	1.31**	2.48	2.19	2.13***	1.85***
Years of education	10.68	10.85	10.83	9.90	5.20	8.60	8.39**	11.00**	9.45	8.42	8.25*	9.88*
Number of time sick	7.39**	9.67**	12.77**	17.60**	5.00***	9.80***	15.94	18.54	13.76	16.83	9.45*	12.47*
Farm days lost	1.24**	2.91**	5.57***	6.83***	5.26**	12.60**	9.19*	21.15*	17.69	25.79***	6.09*	12.02*
Market days lost	17.08	2.17	4.80	5.47	0.60***	2.60***	1.47*	6.00*	5.56***	15.13***	5.69	6.83
Farm size (hectares)	3.01	4.55	0.70	0.82	3.10	2.88	3.91*	2.35*	5.92*	2.63*	6.32*	2.55*
Family labour (man day)	29.14	27.22	33.97	42.23	16.75	17.42	3.81	5.54	3.81	3.92	60.75*	27.62*
Hired labour (man day)	13.72*	19.17*	7.73	7.20	31.21	64.40	8.20	8.92	9.85	8.18	17.46**	13.03**

Note * - z-statistics of mean difference statistically significant at 1 percent level, ** - z-statistics of mean difference statistically significant at 5 percent level, *** - z-statistics of mean difference statistically significant at 10 percent level.

Source: Field Survey, 2004.

Table 1 shows the distribution of HIV positive members across the households and states. It reveals that 17.33 percent, 38.33 percent, 4.27 percent, 40.91 percent, 26.96 percent, and 25.44 percent of the sampled farming households in CRS, OGS, OYS, LAS, EBS, and the combination of all the 5 states (CAS), respectively, have at least one member already tested positive of HIV. Using the z-statistics, no statistical significance exists between the differences of house head mean ages for all the states, except for CRS, which is statistically different ($p<0.05$). Also, the CAS mean age difference shows statistical ($p<0.01$). The results clearly show that it is in OYS, alone, where the average house head age of the infected members is higher than those not infected. In all other states, affected farmers are younger. This could result from the fact that HIV/AIDS has been perceived to be mostly a problem of youth (Shapouri and Rosen, 2001; CTA, 2004).

Average farming experience of farmers whose members were affected in CAS is lower and shows significant difference ($p<0.01$). The average numbers of house members financing the homes are also lower in most of the states when members are infected with HIV/AIDS. As expected, HIV/AIDS affected farmers have higher number of sick times and this shows statistical significant difference ($p<0.05$) in almost all the states, except CRS and EBS. Average farm day loss due to illness is also significantly higher ($p<0.10$) for all the states. The average farm size of HIV affected farmers in the CAS is significantly lower ($p<0.01$). However, this was not the observation for OGS and LAS. The use of family and hired labor by the HIV affected farming households is also statistical significantly lower ($p<0.01$) in the CAS. This finding goes in line with that of Mutangadura et al, (1999).

HIV/AIDS and Food Production Efficiency

Table 2: Maximum Likelihood Estimates (MLE) and Determinants of Economic Inefficiency

	Affected Farmers (n = 135)		Non-Affected Farmers (n = 380)		All Farmers (CAF) (n = 515)	
	Coeffi-cient	T-statistics	Coefficient	T-statistics	Coefficient	T-statistics
Constant	5.698*	5.014	3.497*	12.640	3.616*	14.332
Land area	0.308**	2.422	0.227*	3.058	0.216*	3.334
Family labor	-0.068	-0.395	0.220*	3.933	0.207*	3.962
Hired labor	-0.027	-0.331	0.183*	5.446	0.146*	5.055
Fertilizer	-0.0049	-0.049	-0.052	-1.426	-0.031	-0.912
Seeds	0.261*	3.137	0.165*	3.943	0.198*	5.657
Inefficiency Model						
Constant	1.794*	3.099	0.820**	2.138	0.888**	2.19
Sex of head	-0.0518	-0.542	0.025	0.138	-0.111	-0.806
Farming experience	-0.0045	-0.8855	-0.0092**	-2.430	-0.007**	-2.160
House size	0.0125	0.711	0.0009	0.038	-0.003	-0.126
Years of schooling	0.015	1.231	-0.010***	-1.666	-0.001	0.068
Total sick days	-0.0043	-0.897	-0.0114	-1.078	-0.008	-1.039
HIV status	-	-	-	-	0.036**	2.256
Farm days lost	0.0083**	2.176	-0.0018	-0.747	-0.0004	-0.209
Market days lost	0.0067**	2.031	-0.0096	-0.621	0.007***	1.811
Intensification	-0.0019	-0.838	0.0015	0.512	0.001	0.424
Mulching	-0.310**	2.121	-0.158	-0.912	-0.199**	-2.310
Crop rotation	0.271**	2.156	-0.303***	-1.730	-0.221**	-2.082
Organic manure	0.028	0.178	0.139	0.682	0.345**	2.321
Zero tillage	-0.058	-0.457	-0.569**	-2.137	-0.506*	-2.695
Cover crop	0.038	0.292	-0.256	-1.373	-0.065	-0.489
Market distance	0.322*	2.797	0.0002***	1.739	0.0001***	1.736
Diversification	-0.910*	-3.744	-0.411***	-1.846	-0.498**	-1.962
Diagnostic statistics						
Sigma squared	0.198*	5.778	0.408*	5.652	0.407*	5.541
Gamma $\gamma=\sigma_u^2/(\sigma_u^2+\sigma_v^2)$,	0.782**	2.464	0.751*	13.663	0.760*	16.36
$\gamma^* = \gamma/[\gamma+(1-\gamma)\pi/(\pi-2)]$	0.5659		.5229		0.5351	
Log likelihood function	-75.675		-337.253		-236.376	
Likelihood ratio test	47.542*		52.923*		44.413*	

Note * = statistical significance at 1 percent, ** = statistical significance at 5 percent, *** = statistical significance at 10 percent

Table 2 shows the Maximum Likelihood Estimates (MLE) of the production function. The diagnostic statistics reveal that the efficiency effects, jointly estimated with the production frontier function, are not simply random errors. The gamma is the ratio of the errors in equation 1. If $\gamma = 0$ inefficiency is not present and if $\gamma = 1$, there is no random noise (Battese & Coelli, 1995). The estimated values of gamma are 0.782, 0.751, and 0.760 for the HIV affected, non-affected and combination of all the farmers (CAF), respectively. The statistical significance of these values ($p<0.05$) shows that all the farmers, irrespective of their HIV status, are grossly inefficient. The parameter of gamma is not the same as the ratio of the variance of the efficiency effects to the total residual variance because the variance of u_i is equal to $[(\pi-2)/\pi]\sigma^2$ not σ^2 (Coelli, Prasida & Battese (1998). The relative contribution of the inefficiency effect to the total variance term is measured by γ^*. Therefore, the corresponding variance-ratio parameter γ^* implies that 56.59 percent, 52.29 percent, and 53.51 percent of the differences between observed and the maximum frontier output for the HIV positive, HIV negative and CAF, respectively, are due to the existing differences in efficiency levels among them. Also, the generalized likelihood ratio tests are statistically significant ($p<0.01$). This suggests the presence of the one sided error component and implies that the effect of allocative inefficiency is significant. Therefore, a classical Cobb-Douglas production function will be inappropriate.

The elasticity coefficients of inputs used by the farmers are presented in the table. Land area has coefficients that are statistically significant ($p<0.01$) for all categories of farmers. However, family labor coefficient is -0.068 for the HIV affected farmers and statistically insignificant ($p>0.10$), while that for non-affected farmers (0.220) and CAF (0.207) are statistically significant ($p<0.01$). This shows that non-affected farmers have better chances of increasing their gross margin by increasing their family labor input. Hired labor coefficient (-0.027) is statistically insignificant ($p<0.10$) for HIV affected farmers, while those of non-affected farmers (0.183) and CAF (0.146) are statistically significant ($p<0.01$). This implies that non-affected farmers could increase their gross margin by employing more hired labor. Fertilizer parameters do not have expected sign and are statistically insignificant ($p>0.10$) for all the analyses. However, all the categories of farmers can increase gross margin by increasing the cost of seeds with positive coefficients for all analyses and are statistically significant ($p<0.01$).

The determinants of inefficiency are reported at the middle part of table 3. The results show that the farming experience increases efficiency among non-affected farmers and CAF ($p<0.05$). Experience of the farmers is not an important factor for the HIV affected farmers. In line with the finding of Weir and Knight (2000), years of formal schooling increase efficiency for non-affected farmers ($p<0.10$), but not for the affected farmers. This shows that education's impact on productivity is eroded by HIV infection.

In the CAF, the HIV infection was estimated as a dummy variable. The result shows that AIDS affected farmers have higher inefficiency than those not affected. This implies that the research hypothesis will be rejected. The estimated parameter is 0.036 and it is statistically significant ($p<0.01$). Therefore, the constant term of the inefficiency equation, for those who are HIV affected, is higher. Farm days lost through illness influences inefficiency for HIV affected farmers ($p<0.05$). Also, the total market days lost due to illness have a significant impact on the inefficiency equations for the HIV affected farmers and CAF. Marketing of farm produce is of critical importance in agricultural production. With HIV infection, inefficiency increases if the marketing days missed increases.

Use of mulching by HIV affected farmers significantly reduces inefficiency ($p<0.05$). This variable is not statistically significant for the non-affected farmers, although that for CAF (-0.199) is statistically significant ($p<0.05$). The practice of soil mulching reduces erosion and depletion of soil nutrients and this finding goes in line with expectation. Farmers that were using crop rotation have significantly higher inefficiency in all the analyses ($p<0.10$). Crop rotation is not a good practice for the farmers. This may be due to lack of sufficient knowledge on the choice and rotation pattern of crops.

Also, the application of organic manure is another important source of inefficiency for the CAF ($p<0.05$). This shows that farmers that were using organic manure have higher inefficiency than those not using it. The application of organic manure, as reported by the farmers, referred to compost with low fertility. Many of them do not have access to poultry dung. Organic manure is bulky and the process of carrying them could constitute gross inefficiency. However, the use minimum tillage significantly contributes to reduction in inefficiency for the non-affected farmers and CAF. Minimum tillage or zero tillage could be a good practice for many tropical soils, especially where erosion is very predominant.

The distance of the market to farmers' village significantly increases inefficiency ($p<0.01$). Long distance of major markets implies higher marketing cost in terms of transportation and this may translate into lower productivity. The diversification indices of farmers also have a significant effect on inefficiency ($p<0.01$). The results show that as the indices increases (showing more specialization), inefficiency decreases. More specialization, therefore, translates into increased efficiency for the farmers. This finding goes in line with the result of Amaza (2000) where increase in crop diversification significantly reduced production efficiency. More specialization in food production by farmers in the rainforest belt offers a lot of potentials for increased efficiency.

Table 3: Average Economic Efficiency of Farmers in the Rainforest Belt of Nigeria

	HIV/AIDS Affected		Non-Affected		All Farmers (CAF)	
Efficiency range	Freq	Average Value	Frequency	Average Value	Frequency	Average Value
0 < 0.1	1	0.0677	0	0.00	0	0.00
0.1 < 0.2	18	0.1698	2	0.1810	5	0.1714
0.2 < 0.3	25	0.2501	5	0.2391	7	0.2397
0.3 < 0.4	28	0.3540	13	0.3628	34	0.3565
0.4 < 0.5	28	0.4536	27	0.4531	49	0.4555
0.5 < 0.6	13	0.5413	63	0.5541	86	0.5486
0.6 < 0.7	10	0.6362	77	0.6631	114	0.6480
0.7 < 0.8	6	0.7446	96	0.7552	130	0.7502
0.8 < 0.9	6	0.8402	90	0.8424	84	0.8406
0.9 – 1.0	0	0.00	7	0.9168	6	0.9143
Average efficiency	40.66%		68.21%		64.40%	

Source: Filed Survey, 2004

Table 3 shows the distribution of economic efficiency of the HIV affected and non-affected farmers. The table shows that while the highest proportions of the CAF and non-affected farmers have average efficiency levels of 75.02 percent and 75.52 percent, respectively, the highest proportion of the HIV affected farmers has 45.36 percent. The highest efficiency levels for the HIV affected, non-affected farmers, and CAF are 88.05 percent, 92.68 percent and 93.29 percent, respectively. Average overall economic efficiency for the HIV positive farmers is 40.66 percent as against the 68.21 percent for the HIV negative. Also, CAF has an average efficiency of 64.40 percent. The frequency distribution is also shown in fig.1, where it is clearly shown that the highest proportions of HIV affected farmers have efficiency levels between 0.1-0.4, as compared to 0.6-0.9 for the non-affected farmers.

Recommendations and Conclusion

This study presents an analysis of the effect of HIV on the allocative efficiency of food production in Nigeria. This is to determine the effect that HIV/AIDS would have on agricultural development in Nigeria. The policy issues arising from the key findings are discussed as follows:

First, we found that younger farmers are most affected by HIV/AIDS. There is need for understanding the driving factors that predispose them to higher vulnerability. Most of these younger farmers take motorcycle business as secondary occupation that exposes them to higher risks. The need to ensure that these Okada riders are well informed is hereby underscored. Extension of the National Directorate of Employment (NDE) programs to rural youths will reduce this problem, as more decent alternative sources of income will be found.

Second, we found that the number of people contributing to home finances reduced with HIV infection. There is the need for the Nigerian Government to provide financial assistance to those households that are suffering from HIV/AIDS. These efforts can be approached through encouragement of individuals, corporate bodies, and international organizations to show commitment towards assisting HIV/AIDS patients. These can be channeled towards the provision of free drugs for those suffering from the disease.

Third, in order to address food problem in Nigeria, efforts must be made to increase allocative efficiency of farmers irrespective of whether they have HIV/AIDS problem or not. This study finds that all the farmers are grossly inefficient and use of some soil conservation practices will be of help to increase efficiency. Therefore, extension agents should promote cultural practices, such as mulching and zero tillage, among the farmers. Access to formal education promises to lead to reduction in inefficiency if the scourge of HIV/AIDS is not present. The Nigerian Government should, therefore, seriously pursue the Universal Basic Education (UBE) program being currently implemented in all rural areas. The study finds that long distance of available markets leads to increased inefficiency. Therefore, each of the communities in rural Nigeria also needs to consider development of local market infrastructure. This study finds that specialization will lead to increased efficiency. Therefore, farmers must concentrate on few crops that are best performing in their ecological zone.

Conclusively, AIDS poses serious threat to agricultural production in Nigeria. This results from different unfavorable relationships that exist between ill-health and productivity. The chronic nature of HIV/AIDS symptoms, when fully blown, presupposes that without providing appropriate solution, HIV/AIDS will completely wipe out the human resources in the rural areas and food production for subsistence or commercial purpose will be most affected. The Nigerian Government and other stakeholders must, therefore, rise to the challenge with all seriousness, without merely paying leap services.

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