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Economic Analysis of Farming Household's Health on Crop Output in Kwara State, Nigeria

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Abstract: In ending the declining agricultural productivity in Nigeria, the health of farmers being the key factor in production should not be overlooked. Simple analysis of farmers' health status and indicators can be of great practical assistance to increased crop productivity. This study therefore, provides some indices as a measure of farmers' health and examines the impact of such indices on farmers' crop output in some selected Local Government Areas of Kwara State, Nigeria. With the use of structured questionnaires in data collection and regression analysis in data analysis, the study reveals that the output of crops in the study area was affected by the health status of farmers .Among others, the study recommends that health insurance scheme be initiated, more health care facilities be provided at affordable costs to farmers. It also recommends the provision of rural infrastructures and revitalization of health extension services.

Key words: Farmers' health, crop output, prevalence, duration, frequency of occurrence

INTRODUCTION

Nigeria agriculture contributes more than 30% of total annual Gross Domestic Products (GDP), employs about 60% of labour force, accounts for over 70% of the non-oil exports and provides over 80% of the food needs of the country (Adegboye, 2004). Despite its importance, Nigeria agriculture has to a large extent, not divorced itself from most of the characteristics of the peasant economy that were present in the pre-independence period (Adewumi *et al*., 2002). There is presently a shortage of food in Nigeria (Oyenuga, 1985). A fairly large proportion of our human population is in a state of permanent food scarcity and starvation. Assessment of agricultural production in Nigeria overtime also reveals that the real share of agriculture in the Gross Domestic Product declined dramatically over the years (Central Bank of Nigeria, 2000; Jeter, 2004).

A number of factors are responsible for the downward trend in the Nigeria agricultural sector. Among which are: instability of government and policy, rural-urban migration of able bodied youths leading to old aged farming population in rural areas, death and illness of farmers. The consequent mass migration of educated and able bodies citizens to urban areas for better life and dignified employment has resulted into the complexities of life emanating from a poorly ordered society to the extent that streets of some cities are disgracefully littered with beggars, sick persons and occasionally with dead bodies. Furthermore, it has been concluded that bad health condition reduces productivity and generally labour output and thus farmers' food output (Barlow and Grobar, 1986; Brieger, 1990; Breslow, 1972; Neit, 2001; WARDA, 2003; Adewala *et al*., 2004).

The problems notwithstanding, agriculture is still the largest single employer of labour engaging about 70% of the labour force both directly and indirectly. There is, therefore, the need to consider the farmers who have for a long time borne the brunt of feeding the nation since only healthy people can practice agriculture successfully. By examining farmers' health status one might be examining an important factor affecting economic growth and agricultural productivity. Hence, the study broadly identifies prevalent diseases in the study area, describes the health status of the households and examines the effects of the health indices on agricultural output of the households. This is with a view to highlighting the policy implications of our findings.

Different specialists measure health status in different ways. The Geneva-based World Health Organization (WHO) defined health as the state of complete physical, mental and social well being and not merely the absence of disease and infirmity (McMahon *et al*., 1992). According to Phillips (1980) measures of health include

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measures that provide estimates on the incidence or number of people contracting the disease during any particular period of time; the duration of the disease, the severity of the disease and the end-result which may be a cure or mortality. Lafiagi COBES Group (Lofiagi, 2003) also used the percentage frequency of occurrence of common diseases and ailments in Lafiagi, Kwara State, Nigeria as measure of health status.

Although researchers across the world worked on health status (Over *et al*., 1992; CTA, 2002), impact of health and particular disease on agriculture; As well as on health care facilities (Katung, 2000) it is however useful to identify the particular health indices that have effects on crop output in Nigeria.

MATERIALS AND METHODS

This study was conducted in Kwara State, Nigeria. The state is located in the north central geo-political zone of Nigeria. It has about 247,975 farm families and 254,242 hectares cropped area. The annual rainfall ranges between 750 and 1500 mm and the average temperature range is between 30 and 35°C. The state has a total population of about 1,566,469 people with Yoruba, Baruba, Fulani and Nupe as the major ethnic groups, with a few migrants of Igbo origin (NPC, 1991).

A multi-stage simple sampling technique was employed for the cross section data used for this study. The first stage involved the selection of Agricultural Development Project Zone B in the state; the second stage entailed the random selection of 5 villages from each of the two Local Government Areas (LGAs) in the zone. The 4th stage involved the random selection of twelve farming households from each of the ten villages. A total of 120 interview schedules were administered on farming household heads drawn from ten villages. Data obtained were analyzed using descriptive statistics and multiple regression analysis. The indices used to appraise household health status are:

- The prevalence of illness (The number of persons who fell sick, during the 2004 cropping season).
- The duration of illness (Number of days lost from farm work due to illness in the cropping season.
- End result of illness i.e., the cost of medication (or prevention) in 2004.
- The frequency of occurrence of illness or the number of times illness occurred in 2004.

The multiple regression analysis was used to confirm the existence or otherwise of any relationship between output and the 4 computed health indices. Three regression functions were fitted. For each function, 4 equations: The linear, exponential, semi-log and double log forms were estimated. The first function in its implicit form is:

$$Y = f(X_1, X_2, X_3, X_4, U) \quad (1)$$

Where Y = total household output in grain equivalent, X_1 = the number of persons who fell sick, during the 2004 cropping season, X_2 = Duration of illness or number of days lost from farm work due to illness per household in days, X_3 = Cost of medication/household (N), X_4= frequency of illness per household and U = the stochastic error term. Another production function was then fitted without the inclusion of the health indices. The function is represented by:

$$Y = f(Z_1, Z_2, Z_3, U) \quad (2)$$

Where Z_1 = Farm land in hectares, Z_2 =labour input in man-days and Z_3 = Cost of other variable inputs in Naira. Equation 2 presupposes that output is a function of farm size, labour, other variable inputs employed by the farming households and other variables captured by the stochastic error term. Another production function was then fitted to include the significant health indices resulting from Eq. 1.

$$Y = f(Z_1, Z_2, Z_3, X_1, X_3 U,) \quad (3)$$

All variables are as defined in the earlier models. Labour, land and cost of inputs are expected to have positive relationships with output. Prevalence of illness, duration of illness, cost of illness and frequency of illness are expected to have negative relationships with output.

RESULTS AND DISCUSSION

This study revealed that 67% of the respondents fall within the active farming age of 21-50 and the modal age is 31-40 years with 29% of the respondents. Most of the household heads are therefore young and are in the active age bracket. This implies that crop production has prospect of improving since it is concentrated in the hands of young individuals and their household members. Given the youthful nature of the sample, agricultural productivity in the study area may tend to increase and agricultural production could be enhanced with time. The area is also characterized by large household size as the mean household size is 12. This large family size implies a probable greater output.

Table 1. Prevalent health problems in the study area

Health problems	Frequency	(%)
Malaria	74	61.67
Stomach upset	32	26.67
Body pain/body weakness/back pain	37	30.83
Typhoid	17	14.17
Snake bite	24	20.00
Whitlow	16	13.33
Appendicitis	7	5.83
Cuts	18	15.00
Chicken pox	5	4.17
Sever/ headache	21	17.5
Sorption bite	8	6.67
Cholera	2	1.67
Rheumatism	1	0.83
Dysentery	8	6.67
Anemia	2	1.67
Total	272	100

Source: Field Survey, 2005

Table 2: Mean value of health indices

Health indices	Mean	Maximum	Minimum	Standard deviation
Prevalence of illness (X_1)	6.0	30.0	1.0	4.0
Duration of illness (X_2)	18.0	105.0	0.0	17.0
Cost of medication (X_3) (N)	3,661.83	28,000.	0350.0	3,462.94
Frequency (X_4)	7.0	48.0	1.0	6.0

Source: Field Survey, 2005

The study further revealed that 85% of the respondents could not read or write neither English nor other Nigeria languages essentially because most (71%) of them have no formal education. Almost all the respondents (96.70%) engaged in farming as their primary source of income. Land acquisition was mainly through communal and inheritance. About 85% of the respondents inherited their farmland. About 10% of the farmers have less than 10 years farming experience. This is expected to contribute positively to productivity. Majority (65%) of the respondents combined the family and hired sources of labour employed for farming operations.

Malaria is found to be the most prevalent disease in the area; about 61.7% of the respondents indicated that they were positive to this sickness during the production season (Table 1). This corroborates the findings of Parakoyi *et al.* (1987) that malaria is one of the greatest threats facing development in Africa. The effects of diseases/ illness such as whitlow, stomach upset, typhoid and other communicable diseases like chicken pox, are however, likely to have more impact on labour availability since farmers may have to stay away from work for at least a day for treatment.

An average of persons fell sick during the cropping season (Table 2). However, cuts, snake bite, whitlow, back pain/body pain, scorpion bite and stomach upset were essentially as a result of farming activities. An average of 18 man-days was lost by farming household per annum. For the sickness mentioned, the cost of medication ranges between N350 and N28,000 for each household depending on the nature and duration of illness. This translates to N3,661.83 per person per household. This represents about 14.86% of the total variable cost of production of farming households in the study area. The cost of medication is probably high because there are few health facilities available in the area. A member of the household who is sick has to rely mostly on traditional-medicine, chemists and village clinics when available; only serious cases are referred to hospitals in the urban area. It is evident from the study that each household records an incidence of illness at least once in the farming season. Only 2 households had the incidence of mortality as a result of typhoid and cholera illness in the last cropping season.

For the first implicit function, out of the 4 forms of the regression equation fitted, the Cobb Douglas was selected as the lead equation. The stepwise result reveals that only 2 of the 4 health indices: Prevalent of illness (X_1) and the cost of medication(X_3); were significant in explaining the variation in output These two variables were significant at 1% and the coefficients carry negative signs (Table 3). This implies that the more the number of people that fall sick, the less the farm output. As the cost of medication increases, the available capital for purchasing other variable inputs such as fertilizer, seeds/seedlings and other farm inputs reduces and hence output decreases. Prevalence of illness was the first variable to enter the stepwise regression equation. This variable alone accounted for about 46.7% of the variation in output. Cost of medication variable entered the equation on the second step.

The result of the production function fitted without the inclusion of health indices are represented by the first 4 results in Table 4. The double log function was selected as the lead equation. The function explained 61.8% of the variation in output. Labour and capital were found to be significant at 5%. When the health indices were included in the production function, the lead equation is $Y = 5.35 = 9.56^{E-02}\ln Z_1 - 7.63^{E-02}\ln Z_2 - 4.06^{E-03}\ln Z_3 - 0.87\ln X_1 - 0.27\ln X_3$ (Table 4).

In the production function that was fitted without the health indices, land and capital were found to be significant at 5% level and the model explained 61.8% of the variation in output. With the inclusion of the 2 significant health variables, the lead equation explained 86% of the variation in farmer's output. The 2 included health indices were still significant at 5% and their coefficients are rightly signed. Labour and land, were statistically significant variables while land, prevalence of

Table 3: Step wise regression results

Model	Independent variable	Regression coefficient	R^2	Incremental R^2	F	% Contribution
1	(X_1)	-1.227	0.468		3432.101*	46.80
2	(X_1)	0.711		0.6		
	(X_3)	-0.419	0.474		2158.796*	47.4

X_1 = Prevalence of Illness; X_3 = Cost of medication (N)

Table 4: Regression estimate of production function

	Constant term	Z_1 *Land (ha)*	Z_2*Labour (MD)*	Z_3*Capital (N)*	X_1*Prevalence of illness*	X_3*Cost of medication*	R^2	F
Linear	7345.603	-5.155	-0.297	0.106*			0.612	6.199
S.E	(745.658)	(58.136)	(0.311)	(0.030)				
T-value	9.851	-0.089	-0.956	3.582				
Semi log	3836.864	-1504.193	-3059.672	3976.792*			0.523	5.917
S.E	(7022.465)	(2847.770)	(2024.051)	(1704.234)				
T-value	0.546	-0.528	-1.512	2.333				
Exponential	3.757	1.964^{E-03}*	-2.76^{E-05}	4.901^{E-06}*			0.751	11.284
S.E	(0.043)	(0.003)	(0.000)	(0.000)				
T-value	86.604	0.581	-1.525	2.843				
Double log	3.698	6.778^{E-02}	-0.268*	0.220*			0.618	3.886
S.E	(0.397)	(0.161)	(0.114)	(0.096)				
T-value	9.311	0.421	-2.338	2.282				
Linear	12976.884	-24.075	-3.226^{E-02}	5.845^{E-02}*	-763.676*	-0.193	0.518	26.623
S.E	(906.503)	(45.077)	(0.232)	(0.002)	(432.315)	(0.518)		
T-value	14.315	-0.559	-0.139	2.615	-1.766	-0.373		
Semi log	59758.757	-408.926	-137.619	238.920	-96.178	-14917.50*	0.810	241.904
S.E	(4981.786)	(878.004)	(629.399)	(534.496)	(2326.444)	(17200.833)		
T-value	11.995	-0.466	-0.219	0.447	-0.041	-8.669)		
Exponential	4.202	2.858^{E-04}	-6.75^{E-06}	1.365^{E-06}*	-7.164^{E-02}*	1.083^{E-06}	0.731	117.626
S.E	(0.301)	(0.001)	(0.000)	(0.000)	(0.015)	(0.000)		
T-value	136.157	0.195	-0.858	1.795	-4.871	0.062		
Double log	5.353	9.566^{E-02}*	-7.628^{E-02}*	-4.060^{E-03}	-0.870*	-0.237*	0.869	749.952
S.E	(0.167)	(0.029)	(0.021)	(0.018)	(0.078)	(0.058)		
T-value	32.018	3.247	-3.612	-0.226	-11.148	-4.107		

• = Significant at 5% confidence level : Figures in parenthesis are the standard errors of the estimate : MD = Man-days

illness and cost of medication have expected signs. The negative signs of prevalence of illness, cost of medication coefficients confirm the apriori expectations. Other things being equal, reduction in the number of sick people per household leads to reduction in the cost of medication and this has the potential of increasing the households farm output.

CONCLUSION

Based on the findings of this study, there is the urgent need to pay attention to both preventive and curative health delivery systems in the area. Health insurance scheme can be a policy option. Strategies for an effective community participation in the design of concept and messages aimed at impacting knowledge about health to the household are recommended. Households should be given adequate health information, which will serve as preventive measures such as wearing of shoes and hand glove in order to prevent scorpions and snakebites and whitlow (during harvesting of yam) in an attempt to reduce production cost through reduction of medical cost.

Good communication is vital to ensure that impact of research outputs reach the widest audience possible. Public-private partnerships and closer working between agriculture, education and health sectors will provide exciting and innovative mechanisms for sharing resources and information to enhance the effectiveness and uptake of research.

Integrated pest management could as well be encouraged as the use of chemicals has been found not only to be hazardous to health but also not environmental friendly. Adequate information can be gotten from extension workers. Extension agents should be actively involved, as their impact was not felt in the study area.

REFERENCES

Adegboye, R.O., Land, 2004. Agriculture and Food security in nigeria. Faculty lecture delivered at the University of Ilorin, Faculty of Agriculture.

Adewale, B., M.A. Mafe, M.A. Sulyman: 2004. Impact of Guineaworm Disease on Agricultural Productivity in Owo Local Government Area, Ondo State. http:// www.ncbi.nlm.nib.gov/entrez/queryfcgi:?cmd

Adewumi, M.O. and O.A. Omotesho, 2002. An analysis of small rural farming households in kwara state, Nigeria. J. Rural Dev., 25: 201-211.

Barlow and L.M. Grobar, 1986. Costs and benefits of controlling parasitic diseases. Population Health Nutr. Tech., pp: 86-117.

Brieger, W.R., 1990. Farmer's loss due to guinea worm disease: A pilot study. J. Med., 93: 106-111.

Breslow, L., 1972. A quantitative approach to the world health organisation definition of health physical, Mental and Social well Being International.

Central Bank of Nigeria, 2000. Annual report and statement of accounts: Central Bank of Nigeria. pp: 136.

CTA, 2002. Poor health ,poor agriculture". Information for agricultural development in ACP countries, Spore Publication, pp: 97.

Jeter, H.F., 2004 .How to Retrieve Nigeria's Agricultural Sector. Vanguard (Lagos) http://allafrica.com/stories/200403040476.htm/

Katung, P.Y., 2000. Socio-economic factors responsible for poor utilization of the primary health care service in rural community in Nigeria. Sahel Med. J., 3: 30-31.

Lafiagi COBES Group, 2003. Unpublished report, Faculty of Health Science University of Ilorin,Ilorin, Nigeria.

McMahon, R., E. Barton, M. Piot, N. Geling and F. Ross, 1992. A Guide to Management in Primary Health Care on Being in charge (2nd Edn.), WHO Geneva, Switzerland, pp: 1-4.

McNeil, M.R., 2001. The Impact of Adult Death on Rural Smallholders In Kenya: Implication for HIV/AIDS: http://www.acc.msu.edu/agecon/2001 abstracts. htm.

National Population Commission NPC, 1991. National Population Census Report.

Over, M., P.E. Randall, H.H. Joyce and S. Orville, 1992. Consequences of Adult Ill Health In Richard, G.A.; Feachem, Tord; Kjellstrom, Christopher; Murrary J.L, Over M. and Phillips M.A (Eds.) The Health of Adults in Developing World. New York Oxford University Press.

Oyenuga, V.A., 1985. Keynote Address on Agricultural Productivity In: Makinde, O. (Ed). Agricultural Productivity in Nigeria, pp: 10-12.

Parakoyi, B.D., L.D. Edungbola and T.O. Alabi, 1987. Evaluation of the impact of the UNICEF-Assisted Rural Water Project On Guinea Worm disease in Asa Local Government Area of Kwara State, Nigeria UNICEF Report, 1: 135-138.

Phillips, J., 1980. The Economics of Health and Medical Care: An Introduction. University Park Press, Baltimore, U.S.A. 22: 26-27.

West African Rice Development Agency (WARDA), 2003. System Wide Initiative on HIV/AIDS and Agriculture. http://www.warda.cgiar.org/swiha/linkage.htm.