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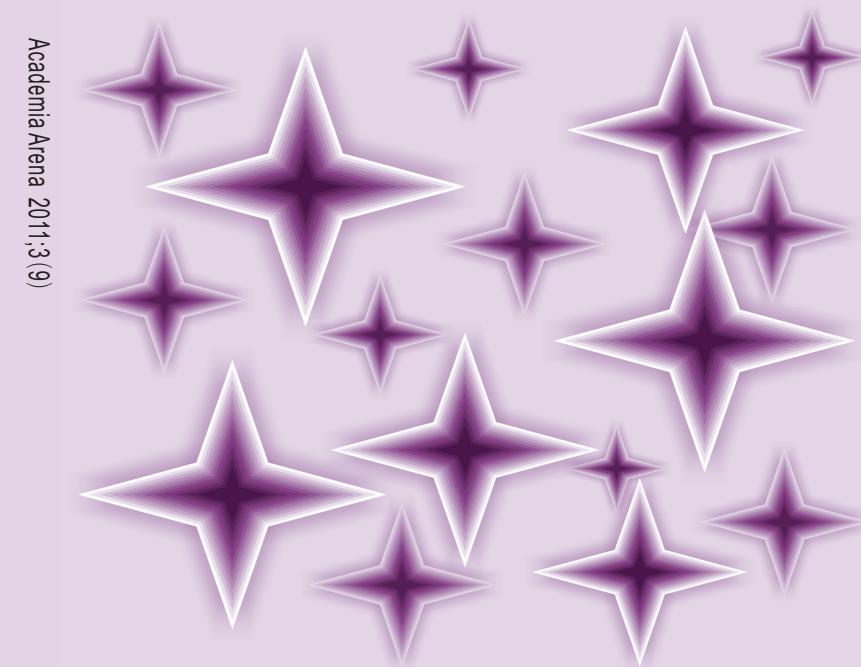aarena@gmail.com
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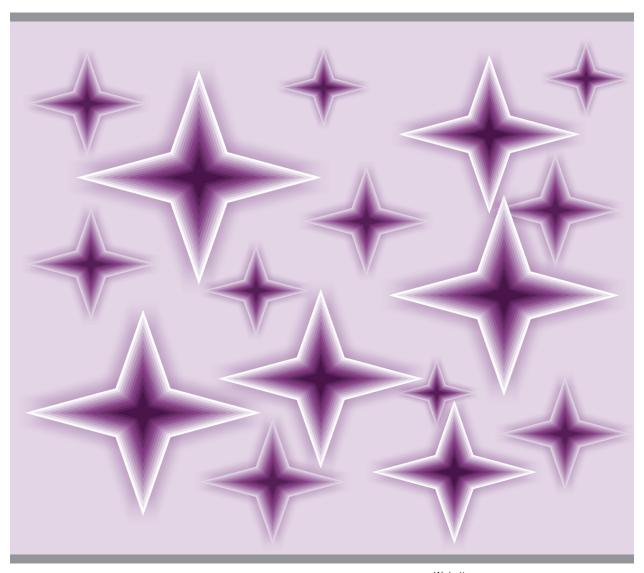
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CONTENTS

MANUFACTURING ACCIDENTS COST ESTIMATION MODEL

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ABSTRACT: In this study, manufacturing accident cost model is proposed. The cost of each class of accidents (C_i) was developed in terms of probability of accident occurrence (ρ_{ai}), degree of fatality (f_i), establishment average annual salary (γ), establishment maximum allowable service year (z), human severity for the class i (H_i), equipment damages (E_{qi}), service life of the equipment (L), usage life of equipment (T), interest rate (t), acquisition cost of machine (N), machine hour rate (MHR), machine down time (θ_i), economic implication cost (E_{ci}), value of goods (Q_i), total hour lost (β_i) and establishment's overall hourly cost of production (α). Data were collected from eleven textile industries in Nigeria on accidents occurrence and cost of consequences of accidents. Three classes of accidents were identified as: fatal, serious and minor. The collected were used to estimate the model parameters. The unit cost of each class of accidents was estimated to be fatal: ₦2,665,360.00, serious: ₦232,750.00 and minor: ₦56,000.00.

1. Introduction

When accidents occur, the victims suffer a great agony. There is a gross loss in the level of productivity and medical bills payable. The Insurance cover also takes the impact in form of compensations of the victims, while the organizations profit suffers from the down time and reduced workforce. Putting cost of accident will draw the attention of the worker and the management on the need for organized safety programme. This will allow them to compare the actual cost being incurred by the management on accidents occurrence as well as organizing safety programme. Several accident estimation models are reported in the literatures (Charles-Owaba and Adebiyi, 2001); Adebiyi, 2002; Ozbay et al, 2001; Fayad et al; 2003 and National Safety Council 2003).

An agreed model for evaluating the loss due to different classes of accident has not been reported to the knowledge of the authors. However, National Safety Council (2003) stated that the best approach is to estimate the costs which are a measure of money spent and income not received due to accidents, injures and fatalities.

The problem is in the qualification of human life. But the price tag on human life is in no way related to the amount of life insurance that a person may have. Thus, it depends upon the country and circumstances. For example, in United States of America (USA), the cost of life is estimated as the sum of Average Gross National Product, Average Court Penalty and Insurance Compensation (Harold and Moriarity, 1990). In the United Kingdom (UK), cost of life was estimated as sum of 50% of average salaries and wages of establishment employees and related expenditure on accidents involving life. (Phelps, 1999).

In Nigeria, the cost of fatal accident (involving life) may be estimated as:
Compensation = % of disability x monthly salary x 54% months (Ige, 1999).

Although, a more academic approach is that compensation should be based on loss of earning, taking view that nothing can compensate for the actual loss of life. But different circumstances may not allow that.

Therefore, the focus of this study is to develop a manufacturing accident cost model so as to provide a framework for estimating the cost of accident so as to justify the need for organized safety programme for manufacturing industry.

2. Model Development

When accident occurred, it results into injury, damage, loss and emotion to the initiators of accident, that is, the people, equipment, environment, plant and systems (Barber and Donovan, 1998).

The resultant effects of accidents are basis for developing most accidents estimating models. The existing accidents cost estimating models employ deterministic approach. But the occurrence of accident is probabilistic in nature and also the

associated costs. Therefore, in the current model, the probability of occurrence of accidents and costs of accident consequences are considered. First, the notations used are defined.

Notations

ρ_{ai} = Probability of occurrence of accident class i (Dimensionless)

H_i = Human severity cost for accident class i (₦)

γ = Establishment average annual salary (₦/year)

z = Establishment maximum allowable service year (year)

f_i = Degree of severity (Dimensionless)

L = Service life of the equipment involved in the accident (Year)

t = Interest rate

N = Acquisition cost of damaged equipment (₦)

MHR = Machine Hour Rate (₦/T)

θ_i = Period of idleness of equipment due to accident i (T)

Q_i = Value of goods/materials damaged in accident class i (₦)

β_i = Total production down time due to accident class i

α = Establishment's overall hourly cost of production (₦/T).

i = Counter of class of accidents

G = Number of identified class of accidents

1 = Fatal

2 = Serious

3 = Minor

The unit Cost of Accident Class i (C_i) may be given as:

$$C_i = f(\rho_{ai}, P_c) \dots\dots\dots\dots\dots\dots\dots\dots 1$$

Using dimensional consistency,

$$C_i = \rho_{ai} * P_c \dots\dots\dots\dots\dots\dots\dots\dots 2$$

However,

$$P_c = f(H_i, E_{qi}, E_{ci}) \dots\dots\dots\dots\dots\dots 3$$

Applying dimensional consistency,

$$P_c = \rho_{ai} (H_i + E_{qi} + E_{ci}) \dots\dots\dots\dots\dots 4$$

But,

$$H_i = f\gamma z \dots\dots\dots\dots\dots\dots\dots\dots\dots 5$$

While

$$E_{qi} = f\left[\frac{(1+t)^{L-T}}{(1+t)^{L-T}-1}\right]N + MHR\theta \dots\dots\dots 6$$

Also,

$$E_{ci} = Q_i + \beta_i\alpha \dots\dots\dots\dots\dots\dots\dots\dots 7$$

Substitute equations 5, 6 and 7 in equation 4

$$C_i = \left[f\left[\gamma z + N\left[\frac{(1+t)^{L-T}}{(1+t)^{L-T}-1}\right]\right] + MHR\theta + Q_i + \beta_i\alpha\right] \dots 8$$

3. Model Application

The model was applied to estimate the coast of accident in textile industries. Data were collected from eleven textile industries in Nigeria. The data include the accident occurrence and other model parameters. As a matter of fact, no single factor can cause an accident. Accident occurrence involves combination of two or more contributory factors and also the cost of potential consequences. Thus consequences of accidents may be categorized into human severity, property damaged and economic implication. The estimate of the model parameters are presented in Table 1.

In estimating the manufacturing accident cost, the data on occurrence of accidents has to evaluate the probability of each class of accidents as: 0.24, 0.35, and 0.32 for fatal, serious and minor accidents respectively. This reflects that serious accidents has greatest probability of occurrence, however, the fatal accident has the greatest economic implication. This was applied to potential consequences of accidents estimates to obtain the manufacturing accidents cost as ₦2,665,360.00, ₦232,750.00 and ₦56,000.00 for fatal, serious and minor accidents, respectively.

Table 1: Estimation of Model Parameter

Parameter	Estimates
γ	₦420,000.00
z	35 years
L	20 years
T	12 years
t	10%
N	₦2,000,000.00
θ_1	10 days
θ_2	8days
θ_3	3 days
MHR	₦5,000.00
α	₦50,000.00
f_1	1
f_2	0
f_3	0
Q_1	₦150,000.00
Q_2	₦75,000.00
Q_3	₦10,000.00
β_1	6 hours
β_2	11 hours
β_3	3 hours
ρ_{a1}	0.24
ρ_{a2}	0.35
ρ_{a3}	0.32

Results and Discussion

Using the parameters, the cost of each of class of accidents is estimated as shown in the below:

Table 2: Cost Estimation

	Class of accident		
	Fatal	Serious	Minor
H_i	₦ 14,700,000	₦ 0	₦ 0
E_{qi}	₦ 1,798,000.00	₦ 40,000.00	₦ 15,000.00
E_c	₦ 450,000.00	₦ 625,000.00	₦ 160,000.00
C_i	₦ 2,665,360.00	₦ 232,750.00	₦ 56,000.00

Conclusions

In this study, the cost estimation model was formulated and applied to the data collected from the eleven textile industries. Although, the inflationary effect was not put into consideration, notwithstanding, the application estimated the costs of fatal, serious and minor accidents as ₦2, 665,360.00, ₦232, 750.00 and ₦56, 000.00

respectively. Based on this, it could be concluded that the fatal accidents have the greatest contribution to adversity, while serious accident has greatest probability of occurrence in textile industry.

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Effects of HIV/AIDS on Smallholder Agriculture and Food Security in Imo State, Nigeria

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Abstract: The HIV/AIDS epidemic is challenging all aspects of the development agenda. The disease has decimated sub-Saharan Africa's agricultural labour force and will continue to do so for generations, depleting the region of its food producers and farmers. Not only is the epidemic causing severe reversals in development gains, but it is making development interventions impractical. Communities livelihoods are being permanently eroded and assets depleted with the reoccurring periods of sickness and deaths that the epidemic brings. Inspite of its incapacitating effects on agricultural production and rural livelihoods, and of the fact that up to 80% of the people-in the most affected countries depend on agriculture for their subsistence, the agricultural sector has not been as forthcoming and as innovative in its response, as the situation requires. Labour, a much valued human asset and the foundation of development interventions, is becoming scare and this lack of labour strains traditional coping mechanisms and increase vulnerability. This paper thus investigation the areas HIV/AIDS has affected food production, and rural livelihood such as depletion of labour, loss of generational knowledge and skills, loss of income, land inheritance rights of women and youth and decreasing nutritional status of households. It also reveals extension role in HIV/AIDS mitigation.
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Introduction

Human Immunodeficiency Virus (H1V) which causes Acquired Immune Deficiency Syndrome (AIDS) has emerged as a major problem facing humanity today. It is a wide spread virus that confers stigmatization upon millions of people already infected by it. The cumulative death toll estimates in Nigeria for 2006 stood at 1.7 million. It is a serious health, economic and rural development threatening scourge. Risky lifestyles such as unprotected sex indulgence, that are common among itinerant workers, who spend nights away from homes, endanger and predispose many to this HIV/AIDS infection. There is a linkage between health status of a people upon the emergence of HIV/AIDS, rural development index and the productivity of farm labour (Munonye and Okoli, 2009).

HIV/AIDS is a major threat to rural development and food security because its menace reduces active work force and productivity through diminished and or demise of human labour force. The pandemic has registered a negative impact on economic development through: overwhelmed healthcare system, decreasing life expectancy, deteriorating child survival rate, increasing the number of orphans and the marginalization of surviving widows from land ownership through inaccessibility to land based on local culture and inheritance practices. Thus HIV/AIDS epidemic affects the most active segment of the population between ages 15-49 years, causing great losses to a nation's unrealized economic growth and development potentials in all facets of human endeavour. One of the major issues in rural development is poverty eradication and the fight against hunger. A large proportion of the African population has a lower nutrition status resulting in a higher susceptibility to HIV/AIDS infection. For rural development strategies to be relevant and on course, the role of nutrition and food security in combating the negative effects of the epidemic needs to be addressed effectively. HIV is retrovirus that infects cells of the human immune system and destroy or impairs their function. Infection with this virus results in the progressive depletion of the immune system leading to immune deficiency. The immune system is considered deficient when it can no longer fulfill its role of fighting-off infection and diseases. Immunodeficiency people are much more vulnerable to wide range of infections, most of which are very rare among people without immune deficiency. Diseases associated with severe immunodeficiency are known as opportunistic infections, because they take advantage of a weakened immune system (Munonye and Okoli, 2009).

AIDS emerged against a backdrop of poverty, conflict and inadequate infrastructure. By eroding social capital, its effect has been to make those problems and their consequences far worse. HIV/AIDS has decimated the young generation of young adults poised to take Africa's future into their own hands. There are over 25 million people living with HIV/AIDS. AIDS is not a disease of poverty, and often those first affected by the epidemic are the better educated and more mobile sections of the population. However over time, AIDS and poverty cemented their relationship.

In Nigeria, an estimated 3.6-percent of the population are living with HIV and AIDS. Although HIV prevalence is much lower in Nigeria than in other African countries such as South Africa and Zambia. The size of Nigeria's population (around 149 million) meant that by the end of 2010, there were almost 3 million people living with HIV. Approximately 192,000 people died from AIDS in 2009.With AIDS claiming so many lives, Nigeria's life expectancy has declined significantly. In 1991 the average life expectancy was 54 years for women and 53 years for men. In 2009 these figures had fallen to 48 for women and 46 for men (NACA, 2010).

The first two cases of HIV and AIDS in Nigeria were identified in 1985 and were reported at an international AIDS conference in 1986. In 1987 the Nigerian health sector established the National AIDS Advisory Committee, which was shortly followed by the establishment of the National Expert Advisory Committee on AIDS (NEACA) (Adeyi, 2006; WHO, 2008). At first the Nigerian government was slow to respond to the increasing rates of HIV transmission and it was only in 1991 that the Federal Ministry of Health made their first attempt to assess Nigeria's AIDS situation. The results showed that around 1.8 percent of the population of Nigeria were infected with HIV. Subsequent surveillance reports revealed that during the 1990s HIV prevalence rose from 3.8% in 1993 to 4.5% in l998 (Kanki, 2006).

When Olusegun Obasanjo became the president of Nigeria in 1999, HIV prevention, treatment and care became one of the government's primary concerns. The President's Committee on AIDS and the National Action Committee on AIDS (NACA) were created, and in 2001, the government set up a three-year HIV/AIDS Emergency Action Plan (HEAP). In the same year, Obasanjo hosted the Organization of African Unity's first African Summit on HIV/AIDS, Tuberculosis, and Other Related Infectious Diseases (Sofo, *et al.,* 2003). In 2005 a new framework was developed covering the period from 2005 to 2009. Despite increased efforts to control the epidemic, by 2006 it was estimated that just 10 percent of HIV-infected women and men were receiving antiretroviral therapy and only 7 percent of pregnant women were receiving treatment to reduce the risk of mother-to-child transmission of HIV (All Africa 2010).

In 2010 NACA launched -its comprehensive National Strategic Framework to cover 2010 to 2015, which requires an estimated N756 billion to implement. Some of the main aims included in the framework are to reach 80 percent of sexually active adults and 80 percent of most at-risk populations with HIV counseling and testing by 2015; ensure 80 percent of eligible adults and 100 percent of eligible children are receiving ART by 2015; and to improve access to quality care and support services to at least 50 percent of people living with HIV by 2015 (UNAIDS, 2008). Despite being the largest oil producer in Africa and the 12th largest in the world, Nigeria is ranked 158 out of 177 on the United Nations Development Programme (UNDP) Human Poverty Index. This poor economic position has meant that Nigeria is faced with huge challenges in fighting its HIV and AIDS epidemic (UNDP, 2008).

HIV/AIDS has added significantly to the problems of agriculture and food security in Africa by severely affecting subsistence agriculture, where production depends very heavily on labour. Africa is currently experiencing high mortality and morbidity as a result of the HIV/AIDS epidemic. In poor rural households, cause severe labour and economic constraints that disrupt agricultural activities, aggravate food insecurity, and undermine the prospects of rural development (ECA, 2006). The overall result of the impact of HIV/AIDS is a decline in agricultural production and off farm sources of livelihood. There is increasing evidence that all dimensions of food security-availability, stability, access and use of food are affected where the prevalence and impact of HIV/AIDS is high. Food shortages across the sub-region, in 2002 and 2003 resulted in a humanitarian crisis. The main cause of food shortages in the sub-region has been widely identified to be the recurrent drought, but the HIV/AIDS, pandemic was singled out to have exacerbated the situation. HIV/AIDS is rapidly eroding the coping strategies used by communities to survive and recover from frequent drought and natural disasters (All Africa, 2010).

More than 70 percent of people in Africa reside in the rural areas and depend on rain fed smallholder agriculture as the main source of livelihood. Access to food at household level depends on own production, the availability of

income to purchase food and the availability of both formal and informal sources of food transfers. This production or ability to purchase food is made possible by utilizing the livelihood assets essential to their livelihood strategies: human, natural, financial, social and physical capital (Jayne *et al.,* 2004). HIV/AIDS affects the household through its impact on the availability of these assets that are required to undertake agricultural production, the household's ability to generate income and the ability of social support system to meet the household's needs (CHGA 2004).

There exist linkages between HIV/AIDS and smallholder household agricultural production. The household's consistent goal is to maximize well-being in the absence of shocks and stresses such as HIV/AIDS. The standard of living is relatively high given available household resources and an environment conducive to production. Morbidity and mortality of one or more household members can affect each of the livelihood assets resulting in a reduction in the ability of the household to produce and adjust to future shocks. This can result in a multitude of adverse consequences such as lower nutritional status, poorer health, reduced schooling of children, as well as depletion of the productive asset base. The following sub-sections provide more details on the impact of HIV/AIDs on smallholder households.

Methodology

The study was conducted in Ezinihitte Mbaise local government area in Imo State. Imo state is in the South-east zone of Nigeria. The state is made up of twenty-seven local government areas out of which Ezinihitte Mbaise is chosen as the study area. Ezinihitte Mbaise was chosen because of the already existing community self help projects in the area. Ezinihitte Mbaise has a total population of about 190,767 persons in 2011. Ezinihitte has fifteen autonomous communities which are Oboama, Akpodim, Owuahia Eziudo, Umuore Eziudo, Ife, Amumara Ihitfe, Obizi, ltu, Chokoneze, Okpofe, Eziagbogu, Udo, Onicha and Umunama. Imo state occupies a land mass of about 5,530squàre kilometers with a total population of about 4,500 987 million persons in 2011. The state shares boundaries in the north with Anambra state, South and West with Rivers state while to the east, it shares boundary with Abia state (IMSG, 2001). Imo state lies between the latitude 5°12' and 5°56North of the equator and between longitudes 6°38' and 7°25' east of the Greenwich meridian. If is located within the south-east zone of Nigeria. The location of Imo State in this zone makes it a strategic commercial center. The people are known

for their traditional hospitality, revered as the cradle of peaceful co-existence and famed for their cultural affinity.' lmo state is endowed with abundant human resources. With her central location and abundant resources, the state is an attractive investment center for various types of industries including agro-allied petro-chemical mineral based tourism. Education is the biggest industry in the state (IMSG, 200l). The state has two dominant seasons; rainy and dry seasons. Rain falls between April and October while the dry season starts from November to early March, though rain starts by March. The lbos form the major ethnic groups in the state, Christianity and traditional African. religions are beliefs professed by the people in the state. Imo state falls within the tropical rain forest zone with dense forest in the south and rich savannah in the north (FGN, 2004). Three communities were purposively selected from the study area. The reason for the selection of these communities was because of the existing HIV/AIDS campaign going on in these communities. Thirty respondents were selected from these communities each; giving a sample size of ninety farmers (90). This study made use of primary and secondary data. The primary data were collected by administering questionnaire to the farmers in the selected villages. Oral interview with the informants was also held especially where the information so required did not fit into the questionnaire. The secondary data were collected from journals, magazines, gazette and other relevant materials. Data collected were analyzed using descriptive statistics these include frequency counts and percentages presented in tabular form. These were used to achieve all the objective of the study.

Socio-economic characteristics of respondents

Table 1 shows the socio-economic characteristics of the respondents in the study area. About 16.6% are within the age bracket of 41 – 50 years, 11.1% are between 30-40, while 22.2% are within the ages of 61 and years. Then 50% are within 51 – 60 years. This is in fact the active farming age in the study area. They are the majority who are involved in agricultural production. Again, 58.8% have a large family size of between 7-10 members. They are followed by 16.6% who have from 10 members and above. Only about 8.8% have from 1 to 3 individuals in their families. The high number of individuals in a family join hands in working on the farm, this makes for higher productivity as family labour here is readily available. Furthermore, 54.4% have secondary education, with 25.5% attending terrier education.

Only 12.2% and 7.7% have primary school education and adult education respectively. The high number of respondents with formal education (54.4% and 25.5%) secondary and tertiary could be reason for their high level of awareness of HIV/AIDS epidemic in the area. Then 72.2% of the respondents have stayed in the villages for more than 10 years, this could be reason for their knwoeldge of the farming system in the area and changes that takes place over time. Majority (55.5%) are married, while 27.7% are widows, whose spouses may have died of HIV/AIDS related diseases or illness. Greater percentage (52.2%) have no leadership status, while 31.1% and 16.6% have between 1-2, 3 titles. One extension visits, only about 22.6% agreed to have been contacted weekly or forthnightly respectively. These visits explain, why greater number of the respondents are aware of the spread of HIV/AIDS among farming populations. Finally, 80% belonged to social organizations, with 11.1% not belonging. Social organization are agents of socialization through such individuals become fully aware of events in the society. These are in line with Akubuilo (2008) and Mgbada, (2010) who said that a farmer who belongs to many social organizations will tend to adopt innovations more than his counterpart who belongs to few social organizations. Social organizations provide forums where a wide range of topics are discussed. A member of a social organization could have an agricultural problem which he can feely dices with other members of the group. Another may have other interesting experiences about farming which he may wish to share with other members of the group. Furthermore, formal years of schooling are associated with adoption. Farmers who have had formal education are more reception to new ideas than those who are illiterate. They also support the fact that extension agents are the most important source of information to farmers on agricultural innovations and agricultural-related information.

Awareness of HIV/AIDS Epidemic among farming population

Table 2 shows that the respondents are aware of the HIV/AIDS scourge n the study area. It could be said that the awareness level of the respondents is very high as indicated by their responses. HIV/AIDS is real has a response percentage of 88.8%, followed by 94.4% who agreed that. It could be gotten sexually response percentage of 88.8%, followed by 94.4% who agreed that. It could be gotten sexually. The respondents agreed that HIV/AIDS campaign is going on using various media. They also agreed

that people go for screening on their area. On whether HIV/AIDS is no longer a killer disease, they (88.8%) said that it is false. The above finding is in line with Goe (2005); and Topouzis (1998) who said that the AIDS epidemic is affecting women and girls in increasing numbers. Women and girls make up almost 57% of adults living with HIV in sub-Saharan Africa and are disproportionately affected by HIV across the region. In the past, rates of HIV/AIDS in urban populations were greatly than in rural areas.

Rural areas are considered to be far removed from the epicenter of the epidemic of the epidemic, as they tend to have lower HIV prevalence rates than urban areas. In actual fact, the number of possible people living with HIV may, in absolute numbers, predominate in rural areas. The truth remains that HIV/AIDS is no longer an urban centered or western disease. Finally, Ijioma *et al.,* (2011) showed that Nigerian youths have positive benefit towards the existence of HIV/AIDS in the society. The youths are fully aware that unprotected sex facilitate the spread of HIV/AIDS, and that it is real and a killer disease.

Effect on Smallholder Agriculture

Table 3 reveals that HIV/AIDS has serious effect on smallholder agriculture and livelihoods. The table reveals that the greatest effect is that of low yield/productivity with 100% response. This is followed by damaging rural livelihoods with 94.4%, increase work load for healthy member (88.8%), exacerbating poverty (88.8%), loss of physical/financial assets (86.6%) and decrease in area of land cultivated (81.1%). Other effects are decrease in nutritional level or status with 83.3%, reduced time for farm activities, (75.5%), increased demand for casual labour 77.1%, reduced skill labour, 72.2%, less access to food 76.6%, and landlessness with 65.8%. HIV/AIDS also erode farm management skills as shown, by 64.4%, and leads to gender inequality with 55.5%. It also reduces income of farmers.

It is now widely understood that the HIV/AIDS epidemic has a debilitating impact on rural farming households and their livelihoods is developing countries. HIV/AIDS prevalence rates continue to be high in developing countries, especially sub-Saharan Africa. This epidemic has been singled out to be aggravating food insecurity and negatively impact rural livelihood. The above findings are on line with Munonye and Okoli (2009) who posited that the impact of HIV/AIDS now cuts across all sectors of human development and it poses serious challenge to the survival of several vulnerable poor, whose livelihood depends solely

on agriculture. According to FAO (2004), up to 80% of the population in most African countries reside in rural areas and depend on agriculture (crops and livestock) and other natural resource products as a source of livelihood. HIV/AIDS in Nigeria has led to the emergence of health challenges such as the prevalent opportunistic infections associated with it like tuberculosis (21.3%), Cetaceous mycosis (14.6%), candidacies (12.3%), Herpes zoster (7.7%), Herpes simplex (7.5%). Other opportunistic infections include pneumonia (6.5%), urinary tract infection (5.8%), gastroenteritis (5.7%), meningitis (0.7%), lymphoma (0.6%) and others (6.5%). The inception of HTV infection is usually associated with diarrhea (19.3%), weight loss (18.9%), prolonged fever (15.8%), skin rashes (13.3%), loss of appetite (3,8%), lumphadenopathy (3.3%), body weakness (2,9%), anemia (1.5%), vomiting (1.4%), body pains (0.9%), and night sweats (0.7%). The rural and urban communities in Nigeria are now exposed to the danger of HIV (Idigbe *et al.,* 2000), with its attendant socio-economic implications. The socio-economic impact of the disease will be quite enormous in the country if urgent efforts are not put in place now to halt the trend. Idigbe *et al.,* (2000) noted that sero positive rates were highest in the age group 20-49 years followed by the age group 10-19 years, Ninety six percent of all AIDS related deaths occurred in the age group of 20-49 years, and 1.63% in the age group of 1 to 19 years. This result indicated that the epidemic strikes adolescents who are economically and sexually active groups.

In Imo State, the trend is similar. Results showed that those aged between 10 and 6o years constituted 94% HW positive group in the surveyed hospital. These are men (53%) and women (41%) who are in their adolescence and adult age and active in the economy and procreation. About 6.7% of the total number screened for HIV in, Owerri was found to be sero positive and this figure is not significantly different from the national figure of 5.4%. The vulnerability of adults to HIV/AIDS is also buttressed by the facts that the number of new HIV infection estimate for 2006 was 379,600. The infection estimate for children less than 15 years of age was 19.6% while 80.4% represents adults. Thus the active and productive segment of the population was weakened and wasted. This has the consequence on developmental issues. As regards the number requiring antiretroviral therapy (ART) for the year 2006, 17.67% represents children of less than 15 years in age while the productive adult age represents 81.25%. This increasing percentage for adults underscores the need for overhauling

Nigeria's healthcare system to contain antiretroviral therapy. HIV/AIDS impact negatively on economic development of a nation coupled with decreasing life expectancy. Studies reveal that for the succeeding generation of children, there is a deteriorating child survival rate. The cumulative death estimates for 2006 was 1.7million, while the number of children orphaned by HIV/AIDS stood at 1,500,000. These orphans with no productive skills will remain liabilities to economic growth and rural development (Hospital Records, 2000).

HIV infections have diminished the resources available for expanding agricultural production and rural livelihoods occasioned by less labour, less capital, lost traditional knowledge, weakened informal institutions and shrunken formal institutions. Agriculture as the largest employer of labour in sub-Saharan Africa, is particularly affected by the HIV/AIDS pandemic. About 70% of Africans and nearly 90% of poor people work primarily in agriculture. HIV/AIDS is depleting the region of its food producers, hitting those who are least equipped to deal with its consequences. The pandemic has become a determining factor of, food insecurity as well as a consequence of food and nutrition insecurity in the region. With the reduction in agricultural labour force in HI1V/AIDS communities, only the elderly and children are often left to carry on with farming. As a consequence, less land is cropped, farmers switch to crops easier to grow, traditional farming knowledge and skills are lost, seasonal crop deadlines are missed, overall production is reduced and farmers' income fall (Hope World Wide Nigeria, 2007).

Role of Agricultural Extension in addressing HIV/AIDS

Table 4 shows the roles of extensions in addressing the impact of Technical messages to address specific needs scourge in the study area. Extension will play numerous roles addressing the scourge. Extension will identify and work households living with Technical messages to address specific needs with a mean score of 2.77. Assisting men and women farmers get skills and knowledge with X = 3.11. Share technical advice and information regarding Technical messages to address specific needs (x=2.83), supporting women and men farmers from groups (x=2.66), encourage men and women farmers work together (x=2.88), facilitation of behaviour change in rural areas (x=3.1), support the families with Technical messages to address specific needs (x=3.11). Encourage income generating activities (3.15), support poverty relief effort with mean score of

2.77, staff training on Technical messages to address specific needs awareness (x=3.22) incorporating Technical messages to address

specific needs messages into extension education campaign with x=3.0 as well involving rural youths in extension programmes.

Table 1: Socio-economic characteristics of respondents

Attribute	Frequency	Percentage
30 – 40	10	11.1
41 – 50	15	16.6
51 – 60	45	50.0
61 and above	20	22.2
Household size		
1 – 3	8	8.8
4 – 6	14	15.5
7 – 10	53	58.5
10 and above	15	16.6
Education level		
Primary	11	12.2
Secondary	49	54.4
Tertiary	23	25.5
Adult education	7	7.7
Years in village		
1 – 5	5	5.5
6 – 10	20	22.2
10 and above	65	72.2
Marital status		
Married	50	55.5
Widow	25	27.7
Widower	15	16.6
Leadership status		
Non	47	52.2
1 – 2	28	31.1
3 and above	15	16.6
Extension visits		
Weekly	15	16.6
Forthnightly	20	22.6
Monthly	55	61.1
Membership or organization		
Yes	80	88.8
No	10	11.1

Table 2: Farmers Awareness of HIV/AIDS Epidemic

Statement	True	Percentage	False	Percentage
HIV/AIDS is real	80	88.8	10	11.1
Farmers dead of HIV/AIDS	60	66.6	30	33.3
There are HIV/AIDS victims here	50	55.5	40	44.4
People go for HIV/AIDS counseling	57	63.3	33	36.6
People collect drug free from government	63	70	27	30.0
People haere go for screening	70	77.7	20	22.2
HIV/AIDS is no longer a killer disease	10	11.1	80	88.8
HIV/AIDS only exist in western lands	20	22.2	70	77.7
HIV/AIDS could be gotten sexually	85	94.4	5	5.5
HIV/AIDS campaign is for everyone to listen	74	82.2	16	17.7

Table 3: Effects of HIV/AIDS on Smallholder Agriculture N = 90

Effects	Frequency	Percentage
Reduced income	67	74.4
Increased workload on healthy members	80	88.8
Reduced time for farm activities	68	75.5
Reduced skilled labour	65	72.2
Increased demand for causal labour	70	77.7
Decrease in area cultivated	73	81.1
Leads to less access to food	69	76.6
Erosion of farm management skills	58	64.4
Leads to landlessness	62	68.8
Results in low yield/productivity	90	100
Loss of physical/financial assets	78	86.6
Leads to gender inequality	50	55.5
Decrease nutritional level	75	83.3
Exacerbating poverty	80	88.8
Damages rural livelihoods	85	94.4
Erosion of food security	60	66.6

Table 4: Role of Extension in HIV/AIDS mitigation

Roles	Mean
Identify and work with households living with HIV/AIDS	2.77
Assist men and women farmers get skills and knowledge	3.11
Share technical advice and information regarding HIV/AIDS	2.83
Support women and men farmers form groups	2.66
Encourage men and women farmers to work together	2.88
Staff training of HIV/AIDS awareness and counseling	3.22
Facilitation of behaviour change in rural areas	3.40
Support to families with HIV/AIDS infect members	3.11
Enhance income generating activities	3.45
Support poverty relief efforts	2.77
Technical messages to address specific needs	3.0
Involving rural youth in extension programme	3.5

Conclusion

The findings revealed that the respondents make up an active farming population ranging from ages 51-60 with large family size, receive the visits of extension agents. They are aware of the spread and scourge of Technical messages to address specific needs as shown by their responses. The main pathway of impact is through morbidity and mortality-induced loss of labour, loss of income and assets, loss of tenure of land and loss of traditional skills and knowledge. Extension can play important roles in addressing Technical messages to address specific needs by identify an working with households living with Technical messages to address specific needs, encourage men and women farmer to form groups and work together, tailor messages to suit infected household and other measures.

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