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ANALYSIS OF FARM SAFETY-RISKS AND HAZARDS COMMON AMONG SMALL-SCALE COCOA-FARMERS IN ABIA STATE, NIGERIA

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Abstract:
The study was conducted in Abia State, Nigeria. A sample size of 240 respondents generated through purposive and multi–stage sampling procedures. Data were realized using structured questionnaire and they were analyzed using descriptive statistics and Spearman's correlation co-efficient. About 62.5 %, 37.5 % and 64.4 % of the respondents were males, females and literates respectively. Means of 46.5 years, 8.5 persons and ₦31,458.00 respectively were recorded for age, household size, and monthly income respectively. Stepping on sharp objects (X = 3.08), cuts/ wounds from implements / tools (X = 3.38), insects bit/ stings (X = 3.25), sun – burns (X = 3.58), and poisoning from chemicals (X = 3.58) respectively were identified as the common farm- safety- risks and hazards in the study area. Avoidance of fatigue(X = 3.38), wearing of hats/ caps (X = 2.58), always armed with machetes (X = 3.2), protective clothing (X = 2.92), rain / jungle boots (X = 2.92), and experts handling chemical application(X = 2.58), among others were identified as preventive measures employed by the cocoa farmers. Results equally, revealed that the following agro – chemicals: mirex (X = 2.63), primegram (X = 3.50), galex (X = 3.58), glamozone (X = 3.63), karate (X = 3.00), furandan (X = 3.50), primextra (X = 3.38) and copper sulfate (X = 3.25), among others were still in use by cocoa farmers in the study area. About 79.9 % of the respondents indicated that the following operations in cocoa production in the study area still involved the use of child – labor: harvesting, weeding, transportation, planting, harvesting and fertilizer application respectively. The study therefore, recommends that government agencies and stake holders charged with monitoring and enforcement of banned chemicals in Nigeria, mostly in the study area should step-up activities mostly now that the protection of environment is a very topical issue in the world.

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Introduction

Farming is one of the most dangerous occupations. Farms may differ in sizes, locations, levels of technology applications, efficiency and capability of the farmer among others, but the common thing amongst them all, is that they are very hazardous. International Labour Organizations (ILO) (2000) reported that diseases caused by agricultural work vary considerably in different parts of the world and are conditioned by a range of factors such as climate, fauna, population density, working conditions, standard of hygiene, level of education, occupational training, technological development and access to services among others. However, Ajayi (2006) classified the common safety – risks and hazards in agricultural work to include:

(i) equipment safety;
(ii) environmental hazards;
(iii) chemical hazards;
(iv) natural hazards;
(v) livestock safety;
(vi) man-made hazards;
(vii) general safety practices among others.

He further stated that farm–related accidents are preventable, if proper safety procedures are used by all workers at all times. In Nigeria, farming is done both as a profession and a way of life (Obinna and Chukwu, 2015). Farming occupation in Nigeria (Ajayi, 2006) is mostly inherited from parents to children through socialization and other traditional processes as handed down by their forefathers. It was based on the above premise that Ijere and Mbanasor (1998) characterized the farming occupation in Nigeria as very traditional, subsistent in nature, rain–fed dependent, with very low external inputs, high level of drudgery, low yield, lack of record keeping, and high labour costs respectively. Ekong (2010) equally, noted that about 90 % of all agricultural and livestock productions in Nigeria are carried out by small- scale farmers, who are mostly illiterates, and elderly, with very large household sizes. He further, added that despite these deprecating characteristics of these small–scale farmers that they produce about 80 % of food required in Nigeria.

Cocoa agriculture, which is mainly carried out in the Southern part of Nigeria is labour intensive and prone to pests and diseases attacks (Ajayi, 2006). In like manner, Tijani (2006) reported that cocoa agriculture in Nigeria involves the use of child–labour.

He also noted that cocoa farmers use a wide range of pesticides in- order to limit losses which were about 30 % from pests and diseases attacks. In a similar situation, Udoh and Umoh (2011) noted that pesticides were introduced into the Nigerian farming systems due to high level of damage caused by pests and diseases mostly in cocoa agriculture. They equally, reported that human exposure to pesticides was an important health and social issue as it usually resulted in serious health problems and even death. Asamu (2005) equally, reported that children work in various activities in the agricultural sub–sectors such as crop and livestock farming, fishing, agriculture and herding. He further stated that children are fragile since the various organs of their bodies and minds are still in the development process. Therefore, that they were very susceptible to hazards associated with pesticides and herbicides.

In affirmation to the above Udoh (1998) reported that more than 6,00,000 farming households in Akwa Ibom State were exposed to various problems and hazards of pesticides stored in farm- homes due to their poor handling and use. In a related situation, Okopido (2002) observed that pesticides misuse and abuse were likely to be rampant due to inadequate education on the guidelines and controls of safe use and disposal of containers and limited awareness about the lethal toxicity of these chemicals. It was based on the above that the study sought to investigate the farm safety-risks and hazards common among small–scale cocoa farmers in Abia State, Nigeria. The following objectives guided the study, to:

(i) examine the socioeconomic characteristics of the respondents;
(ii) identify the different types of farm safety-risks and hazards the respondents are exposed to;
(iii) ascertain the level of awareness of the respondents on the farm-safety risk and hazards;
(iv) identify the preventive measures employed by the respondents;
(v) identify the types of insecticides and herbicides commonly used by the respondents; and
(vi) identify the operations that involve child–labour in cocoa production in the study area.

The null hypothesis ($H0_1$) which states that there is no significant relationship between the level of awareness of the respondents on farm safety-risks and hazards and their preventive measures employed in the study

Methodology

The study was conducted in Abia State, Nigeria. The population of the study was all the small scale cocoa farmers in Abia State. The State is divided into three main agricultural zones namely: Ohafia, Umuahia, and Aba Agricultural Zones respectively (Abia ADP, 2006). Ohafia and Umuahia Zones were purposively selected for the study since it is in these two agricultural zones that cocoa production is carried out in Abia State. A sample size of 240 respondents comprising 120 from each zone were randomly generated and used for the study. Primary data were realized using structured questionnaire. Data analysis was carried out by using descriptive statistics and Spearman's correlation analysis respectively.

Model Specifications

Pooled mean, weighted and scored by 4 point Likert type scale as follows:

(a) very much aware, scored 4 points;
(b) aware, scored 3 points;
(c) not very much aware, scored 2 points;
(d) not aware, scored 1 point respectively.

The level of awareness was established as follows:

0 - 1.5 = low level of awareness;
1.6 - 3.1 = moderate level of awareness;
3.2 – 4 = high level of awareness.

$H0_1$ which states that there is no significant relationship between the level of awareness of the respondents on farm – safety risks and hazards and their preventive measures employed in the study area, was analyzed using spearman's correlation index.

Mean = X =Σf/n …… (1)

Where,
X = MEAN,
Σf = summation of frequencies,
n = number of observations.

Formula for the Spearman's Correlation Coefficient

$$r_s = 1 - \frac{6 \Sigma D^2}{n (n^2 - 1)} \ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where,
Γs = Spearman's Correlation Coefficient,
ΣD2 = Squared differences between ranked pairs,
n = number of observations.

Results and Discussion

Socio-Economic Characteristics of the Respondents

Table1 shows that 62.5 % of the respondents were males and 37.5 % were females. The mean age were 46.5 years and about 64.6 % of the respondents attending formal schooling comprising primary and tertiary schooling. The mean household size was 8.5 persons with a mean monthly income of about ₦31,458.00 and 21.4 years as mean farming experience respectively. The implication is that more men engaged into cocoa farming than the women in the study area. The mean age (46.5 years) indicates that the cocoa farmers were still strong and energetic in order to face the high labor intensity involved in cocoa farming. Also, the mean monthly income (₦31,458.00) indicates that cocoa farmers earn much higher income than the national minimum wage of (₦18,000.00) established by the Federal Government of Nigeria.

Table 1: Distribution of the Respondents According to Socioeconomic Characteristics

S/No	Variables	Frequency	Percentage	Mean
01	Gender			
	Male	150	62.5	
	Female	90	37.5	
02	Age in Years			
	20 - 30	40	16.67	
	31 - 40	35	14.58	
	41 - 50	50	20.83	46.5 years
	51 - 60	70	29.17	
	61 and above	45	18.75	
03	Level of Education			
	No formal Education	85	35.41	
	Primary Sch.	90	37.50	
	Secondary Sch.	50	20.83	
	Tertiary Sch.	15	6.25	
04	Household Sizes (No Persons)			
	1 - 4	80	33.33	
	5 - 8	90	37.50	8.5 persons
	9 and above	70	29.17	
05	Monthly Farm Income in Naira			
	10,000 - 30,000	40	16.67	
	31,000 - 50, 000	100	41.67	₦31,458.00
	51,000 - Above	100	41.67	
06	Farming Experience in Years			

< 10	40	16.67	
10 - 20	60	25. 00	
21 - 30	90	37.50	21.4 years
31 and above	50	20.83	

Source: Field survey 2016

Identification of the Different Types of Farm Safety-Risks and Hazards

Table 2 shows that out of eleven farm safety-risks and hazards common among cocoa farmers in Abia State, only eight were significant. They include: cuts/wounds from implements, tools, and sun burns which scored 100% respectively. Others include insects bit/ stings which scored 95.83 %, stepping on sharp objects with score of 91.67 %, poisoning from chemicals with a score of 87.5 %, snake bite with a score of 83.33 %, wounds from chemicals with a score of 81.25 %, and other animals bites and attacks with score of 62.5 % respectively.

Table 2: Distribution of the Respondents According to Farm Safety-Risks and Hazards Common in the Study Area

S/No	Variables	Frequency	Percentage	Significance
01	Stepping on sharp objects	220	91.67	S
02	Cuts / Wounds from Implements / Tools	240	100	S
03	Insects bit / Stings	230	95.83	S
04	Snake bite	200	83.33	S
05	Poisoning from Chemicals	210	87.50	S
06	Wounds from Chemicals	1195	81.25	S
07	Other Animals bites / attacks	150	62.50	S
08	Human Attacks	80	33.33	N/ S
09	Sun Burns	240	100	S
10	Thunder Strikes	50	20.83	N/ S
11	Falls from Heights	60	25.00	N/ S

Source: Field Survey 2016.

- = Multiple Responses recorded.
- = Responses ≥ 50 % were regarded as significant while responses <50 % were regarded as insignificant.

Awareness Levels of Farm Safety-Risks and Hazards

Table 3 shows that out of eleven variables investigated in the study area, the respondents were only aware of nine. They include: poisoning from chemicals and sun burn scored 3.58 and ranked 1st respectively. Others include cuts / wounds from implements / tools and other animals bites / attacks scored 3.38 and ranked 3rd

respectively. Insects bit / stings and snake bites scored a mean of 3.25 and ranked 5th respectively. Stepping on sharp objects and wounds from chemicals scored a mean of 2.00 and 1.92 and ranked 10th and 11th respectively.

Table 3: Distribution of the Respondents According to their Level of Awareness of the Farm Safety–Risks and Hazards

n= 240

S/No	Variables	V/M/A	A	N/V/M/A	N/A	MEAN	LEVEL	RANKS
01	Stepping on sharp objects	100	100	20	-	3.08	Moderate	7th
02	Cuts / Wounds from implements / tools	120	90	30	-	3.38	High	3rd
03	Insects bit / stings	100	100	40	-	3.25	High	5th
04	Snake Bite	120	80	20	20	3.25	High	5th
05	Poisoning from chemicals	150	80	10	-	3.58	High	1st
06	Wounds from chemicals	90	100	30	20	3.08	High	7th
07	Other animals bites / attacks	100	130	10	-	3.38	High	3rd
08	Human attacks	-	160	60	20	2.58	Moderate	9th
09	Sun Burns	140	100	-	-	3.58	High	1st
10	Thunder strikes	-	90	60	90	2.00	Moderate	10th
11	Falls from heights	-	80	60	100	1.92	Moderate	11th

Source: Field survey 2016

Preventive Measures for Farm Safety–Risks and Hazards

Table 4 shows that out of eleven variables investigated only six were significant. They include avoidance of fatigue which scored a mean of 3.38 and ranked 1st and always armed with machetes with a score of 3.2 and ranked 2nd. Others include: wearing of protective clothing, rain/jungle boots, always accompanied by someone, experts handling chemical applications, always being observant, wearing of sun hats/caps,

always armed with guns, wearing hand gloves, and nose gears respectively. They scored 2.92, 2.58, 2.17, 2.08, 1.96, 1.92 and 1.42 respectively and ranked from 3rd to 11th positions respectively in descending orders.

Table 4: Distribution of the Respondents According to Preventive Measures against Farm – Safety- Risks and Hazards

n= 240

S/No	Variables	V/O	O	N/V/O	N	MEAN	RANKS	Significant
01	Protective Clothing	100	80	20	20	2.92	3rd	S
02	Wearing of Rain / Jungle boots	90	90	10	50	2.92	3rd	S
03	Wearing of Hat/ Cap	-	90	80	70	2.08	8th	N/S
04	Avoidance of Fatigue	120	90	30	-	3.38	1st	S
05	Wearing of Sun shades / Googles	-	80	70	90	1.96	9th	N/S
06	Being Very Observant	-	90	100	50	2.17	7th	N/S
07	Wearing of Nose Gear/ hand gloves	-	-	100	140	1.42	11th	N/ S
08	Always accompanied by someone	-	150	80	10	2.58	5th	S
09	Always armed with Guns	-	60	100	80	1.92	10th	N/ S
10	Always armed with machetes	100	90	50	-	3.2	2nd	S
11	Expert handling Chemical Application	40	100	60	40	2.58	5th	S

Source: Field Survey 2016

V/ = Very Often, weighted and scored 4 points

O = Often, weighted and scored 3 points

N/ V/ O = Not Very Often, weighted and scored 2 points

N = Never, weighted and scored 1 point

Decision Rule: Any mean score ≥ 2.5 was adjudged significant, while any mean < 2.5 was adjudged insignificant respectively.

Identification of Types of Insecticides, Herbicides and Other Agro-Chemicals Used by Cocoa Farmers in the Stud Area

Table 5 shows that out of twenty agro- chemicals investigated only eight were in use by the respondents. They include; Glamozone which scored a mean of 3.63 and ranked 1st. Others include Galex, Primegram, Furandan, Primextra, Copper Sulphate, Karate and

Mirex respectively and they had mean scores from 3.58 to 2.63 respectively and ranked from 2nd position to the 8th one respectively in descending orders. Table 5 equally, shows that some banned agro – chemicals though not to a significant level were still in use in the study area. This implies that the monitoring agencies on banned chemicals are weak. The finding collaborates Udoh and Umoh (2011) who observed that some banned agro–chemicals such as DDT and Aldrin were still in circulation in Akwa Ibom State, Nigeria.

Table 5: Distribution of the Respondents According to Types of Agro- Chemicals Employed by the Cocoa Farmers in the Study Area

n= 240

S/No	Agro – Chemicals	V/O	O	N/V/O	N	MEAN	RANKS	Level of Significance
01	Dicchloro- Diphenyl Trichoto ethane(DDT)	-	-	40	200	1.17	18th	N/S
02	Aldrin	-	-	60	180	1.25	17th	N/S
03	Chlodene	-	20	80	120	1.42	15th	N/S
04	Lindane	-	30	70	120	1.46	14th	N/S
05	Dieldrin	-	-	-	240	1.00	19th	N/S
06	Parathion	-	-	-	240	1.00	19th	N/S
07	Ethylene Oxide	-	60	40	140	1.67	11th	N/S
08	Hepta Chlor	-	80	20	140	1.75	10th	N/S
09	Endrin	-	-	150	90	1.63	12th	N/S
10	Mirex	-	150	90	-	2.63	8th	S
11	Risane	20	80	60	80	2.17	9th	N/S
12	Primextra	100	120	20	-	3.33	5th	S
13	Primegram	120	100	20	-	3.50	3rd	S
14	Galex	140	100	-	-	3.58	2nd	S
15	Glamozone	150	90	-	-	3.63	1st	S
16	Karate	80	60	80	20	3.00	7th	S
17	Decis	-	-	150	90	1.63	12th	N/S
18	Furandan	160	40	40	-	3.50	3rd	S
19	Copper Sulphate	120	60	60	-	3.25	6th	S
20	Benlate	-	-	80	160	1.33	16th	N/S

Source: Field Survey 2016

N/B:

V/O = Very Often weighted and scored 4 points

O = Often, weighted and scored 3 points

N/V/O = Not Very Often, weighted and scored 2 points

N = Never, weighted and scored 1 point respectively

Decision Rule: Any mean score ≥ 2.5 was adjudged significant, while any mean score < 2.5 was adjudged not significant.

Identification of Cocoa-Production Activities that Involve Child-Labor

Table 6 shows that out of 9 operations involved in cocoa production in the study area, six involved the use of child-labor. They include: processing which scored 91.7 % and ranked 1st. Others include weeding/slashing, transportation, planting, and harvesting and fertilizer application respectively. They recorded percentage scores of 87.5, 83.3, 79.2, 70.8, and 66.7 % respectively and were ranked from 2nd to 6th positions respectively in descending orders. The finding collaborates Asamu (2005) who observed that most working children were located in the rural areas where agriculture is the major occupation and that children work in various activities in the agricultural sub – sectors, such as crop and livestock farming, fishery and cattle herding respectively.

Table 6: Distribution of the Respondents According to Cocoa Production Activities that Involve Child Labor

n = 240

S/No	Cocoa Production Activities that involve child labor	Frequency	Percentage
01	Clearing, Slashing, and Tillage		
	YES	90	37.5
	NO	150	62.50
02	Planting		
	YES	190	79.17
	NO	50	20.33
03	Weeding		
	YES	210	87.50
	NO	30	12.50
04	Pesticide Application		
	Yes	40	16.67
	NO	200	83.33
05	Herbicide Application		
	YES	30	12.50
	NO	210	87.50
06	Fertilizer Application		
	YES	160	66.67
	NO	80	33.33
07	Harvesting		
	YES	170	70.83

	NO	70	29.17
08	Transportation		
	YES	200	83.33
	NO	40	16.67
09	Processing		
	YES	220	91.67
	NO	20	8.33

Source: Field Survey 2016

Decision Rule: Any percentage score ≥ 50% was adjudged significant, while any percentage score < 50 % was adjudged not significant.

Test for Spearman's Correlation Index

Table 7: Analysis of Spearman's Correlation Index

	Level of Awareness on Farm- Safety-Risks and Hazards	**Preventive Measures Employed by the Respondents**					**D**	**D^2**
S/NO	Variables		Mean Score 1	Mean Score 2	Ranks 1	Ranks 2		
01	Stepping/Sharp Objects	Rain& Jungle Boots	3.08	2.92	7th	3rd	4	16
02	Cuts & Wounds	Avoidance of Fatigue	3.38	3.38	3rd	1st	2	4
03	Insect bits & Stings	Protective wears	3.25	2.92	5th	3rd	2	4
04	Snake bite	Rain /Jungle Boots	3.25	2.92	5th	3rd	2	4
05	Poisoning from Chemical	Experts Handling Chemicals	3.58	2.58	1st	5th	4	16
06	Wounds from Chemicals	Wearing hand-gloves / nose gears	3.08	1.96	7th	11th	-4	16
07	Other Animals Attacks	Always armed with Machetes	3.38	3.2	3rd	2nd	1	1
08	Human Attacks	Always accompanied by someone	2.58	2.58	9th	5th	4	16
09	Sun Burn	Wearing Hats / Caps	3.58	2.08	1st	8th	7	49
10	Thunder strikes	Always being	2.00	2.17	10th	7th	3	9

11	Falls from Heights	Observant Always being Observant	1.92	2.17	11th	7th	4	16
								∑=155

Source: Field Survey 2011

$\Gamma_s = 1 - 930/110 = 1 - 0.846 = 0.15$

Therefore, $\Gamma_s = 0.15$

This implies that there is no significant relationship between the levels of Awareness of the respondents on Farm safety-risks and hazards and preventive measures employed by the respondents in the study area.

Conclusion and Recommendations

The study concludes that there is no significant relationship between the levels of Awareness of the respondents on farm safety – risks and hazards and preventive measures employed by them in the study area, since Γ_s caculated < Γ_s tabulated. Also, that the following banned agro- chemicals were still in use by cocoa farmers in the study area: mirex, primegram, galex, glamozene, karate, furandan, prixextra and copper sulphate. The study equally, revealed that child-labor was still in use for the following operations in cocoa farming in the study area: processing, weeding, transportation, planting, harvesting and fertilizer application respectively in the study area. The study therefore, recommends that government agencies and stake holders charged with monitoring and enforcement of banned chemicals in Nigeria, mostly in the study area should step-up activities mostly now that the protection of environment is a very topical issue in the world.

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