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SOCIOECONOMIC FACTORS INFLUENCING THE KNOWLEDGE AND ATTITUDE OF MAIZE FARMERS ON THE SAFE USE OF AGROCHEMICAL IN AGAIE AND BIDA, NIGER STATE, NIGERIA

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ABSTRACT
The study accessed the Socioeconomic factors influencing the knowledge and attitude of Maize farmers on the safe use of agrochemical in Zone I, Niger State, Nigeria. To achieve the study objectives, 4-stage sampling technique was used to randomly select 110 maize farmers for the study. Data were collected using questionnaire, complimented with interview schedules, and analyzed using descriptive statistics and Probit regression model. Based on the findings of the research, it was discovered that the mean age of the respondents were 42 years, 85% of the maize farmers were male, 89% were married, mean number of dependents of the maize farmers was 8. The mean of total years spent in school was 10 years, about 95% had no training on agrochemical handing while 92% had no extension contact. About 24% of the maize farmers use agrochemical to increase yield, with fertilizer as one of the major agrochemicals used. More so, 24% of the respondents used safety face mask, 29% claimed that Personal Protective Equipment use slows one down, while on knowledge and attitude, knowledge that agrochemical use improves crop yield had mean score of 2.05 and knowledge of agrochemical hazards had mean score of 2.01. Sex, marital status, level of education and farm size were positively significant while maize farming experience, source of capital and amount of credit where negatively significant at different probability levels. The study recommends that trainings on safe agrochemical use should be organized for farmers by extension agencies, since experience does not increase awareness.

Keywords: Maize farmers, Knowledge and Attitude, Agrochemical and Safe use

INTRODUCTION

Agrochemicals are chemicals (pesticides and fertilizers) that are used to boost agricultural production. They are used as soil conditioners, acidifiers, nutrients and they are also used to manage diseases caused by fungi, bacteria, pests and viruses, thereby improving agricultural productivity. Agrochemical use has led to increased food production (Omari, 2014).. Nevertheless, exposures to other organisms during the periods of application, including human beings, is poorly controlled (Apeh, 2018). Maize (*Zea mays*) has become a very important staple food that is being consumed by millions of Nigerians. Researches in the production and marketing of maize in various parts of the nation have shown the increasing importance of this crop. However, the continued cultivation of maize as a staple food is threatened by certain problems, such as those of pest and diseases. The use of agrochemical is not without safety or precautionary routines and practices contained on the labels and also supported by relevant national and international agencies

in every country (e.g. WHO, Federal Environmental Protection Agency (FEPA), National Environmental Standards and Regulations Enforcement Agency (NESREA) etc, in Nigeria) that are expected to keep farmers from ill health related problems (Mc Arthur and Mc Cord, 2014). Hence this study tends to find out the Socio-economic factors influencing the knowledge and attitude of maize farmers on the safe use of agrochemical in Zone I, Niger State, Nigeria. The specific objectives are describe the socio-economic characteristics of maize farmers in the study area, to identify the various uses of agrochemical, type of agrochemical and personal protective equipment (PPE) used by the respondents in the study area; determine the knowledge and attitude level of respondents on the safe use of agrochemical in the study area; determine the socio-economic factors influencing the knowledge and attitude of the respondents.

Table 1: Distribution of maize farmers in Niger State

ZONE	Local Government Area (LGA)	Name of Communities/Villages	Sample Frame	Sample Size (20%)
I	Bida	Bida	205	41
		Dabarako	110	22
	Agaie	Nami	122	24
		Jipo 1	115	23
	Total		552	110

Source: Niger State Agricultural Mechanization and Development Agency, 2018.

Analytical Tools

Descriptive statistics was used to achieve *objective one (i) and two (ii) while Probit regression model was used to achieve objective three (iii).*

RESULTS AND DISCUSSION

The result revealed that the mean age of the respondents was 42 years,85% of the maize farmers were male, 89% were married, mean number of dependents of the maize farmers was 8. The mean of total years spent in school was 10 years, about 95% had no training on agrochemical handing while 92% had no extension contact. The study is in line with the findings of Tijjani *et al.*, (2018) who reported that respondents in the in Jere Local Government Area of Borno State where male, with mean household size of 8 and mean age of 39. Findings from this study also reveals that 24.02% of the respondents used agrochemical to increase yield, 22.70% used agrochemical to improve quality of crop. Ladapo *et al.*, (2020) reported that agrochemical increase yield.

Table 2: Distribution of respondents according to reasons for agrochemical use

Reason	Frequency	Percentage
Increase yield	110	24.02
Improve quality of crop produce	104	22.70
Control pest and diseases	104	22.70
Improve appearance of farm produce	59	12.88

As advised by extension agent	81	17.69

Note Multiple responses recorded Source: Field survey, 2021.

About 31% of the respondents used fertilizer, 30% used herbicide and 27% used insecticide, while only 8% used fungicide. This implies that the respondents use more of fertilizers than any other agrochemical. This finding does not correspond with the findings of Mengistie *et al.*, (2017), who reported that in vegetable farming, insecticides (58 %) are the mostly used agrochemicals due to serious insect pests in vegetable production.

Table 3: Distribution of respondents according to types of agrochemical used

Agrochemical	Frequency*	Percentage (%)
Fertilizer	110	31.70
Herbicide	106	30.55
Fungicide	31	8.93
Insecticide	96	27.67
Nematicide	2	0.57
Rodenticide	2	0.57

Note; * Multiple responses recorded Source: Field survey, 2021

Furthermore, findings reveal that about 24% of the respondents used safety face mask, 16.4% used safety boots, 15.2% used safety overall, 15.2% used safety hand gloves, 12.6% used safety nose mask, 9.1% used safety goggles, while 7.6% used safety hat. This implies that the respondents make use of safety face mask more than any other protective equipment, this is probably due to the Covid 19 protocol that was compulsorily put in place to avoid its spread, and this also helped to inform many about the ability of one to contact health problems from the air. Therefore, they may now also have dread for chemicals that are applied in the air (whether in powdery or liquid form). Fadlullah, *et al.* (2015) reported in their study that farmers do not wear protective clothing,

Table 4: Distribution of respondents according to use of Personal protective equipment/clothing (PPE)

Safety PPE	Frequency	Percentage (%)
Safety overall	40	15.2
Safety boot	43	16.4
Safety goggle	24	9.1
Safety hat	20	7.6
Safety nose mask	33	12.6
Safety hand gloves	40	15.2
Safety face mask	63	23.9

Note Multiple responses recorded Source: Field survey, 2021.

On the reasons why farmers do not use PPE, 29% of the respondents claimed that PPE use slows one down, 22% claimed it is not comfortable, .17% claimed they don't see need for one, 16% claimed it is not available and 14% claimed is too expensive. This could be due to the nature the PPE, which could be quite burdensome, the claims of seeing no need shows complete ignorance. Khalid *et al.* (2013) who reported that 87% of the farmers apply fertilizer to their crop.

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Table 5: Distribution of respondents according to reasons why respondents do not use PPE

Reason	Frequency	Percentage (%)
Too expensive to afford	29	14.0
Not available	34	16.4
Not comfortable	46	22.2
Slows one down	61	29.5
Don't see need for one	37	17.9

Source: Field survey, 2021.

Further analysis reveals the response of the farmers as regards their knowledge and attitude; knowledge that agrochemical use improves crop yield (mean=2.05), knowledge of agrochemical hazards (mean=2.01), trained on PPE use and handling (mean=1.88), Knowledge of the name of the agrochemical used (mean=1.85), knowledge that not all agrochemical have the same adverse effects (mean=1.78) while trained on handling and use of agrochemical (mean=1.6).

Table 6: Distribution of respondents' knowledge and attitude level

Knowledge and attitude	NK(1)	K(2)	VK(3)	WS	Mean	Rank	Decision
Agrochemical use improves crop yield	26(26)	52(104)	32(96)	226	2.05	1st	Knowledgeable
Knowledge of agrochemical hazards	24(24)	61(122)	25(75)	221	2.01	2nd	Knowledgeable
Trained on PPE use	37(37)	37(74)	32(96)	207	1.88	3rd	Not knowledgeable
Knowledge of the name of agrochemical used	25(25)	55(110)	23(69)	204	1.85	4th	Not knowledgeable
Not all agrochemical have the same adverse health effects	37(37)	60(120)	13(39)	196	1.78	5th	Not knowledgeable
Consequences of mishandling agrochemical	44(44)	56(112)	9(27)	183	1.66	6th	Not knowledgeable
Trained on handling and use of agrochemical	57(57)	40(80)	13(39)	176	1.6	7th	Not knowledgeable
knowledge of alternative forms of pest control	56(56)	43(86)	11(33)	175	1.59	8th	Not knowledgeable

Note: NK; Not knowledgeable, K; Knowledgeable, VK; Very knowledgeable Source: Field survey, 2021.

Socio economic factors influencing the knowledge and attitude of respondents

The Probit model revealed that sex was significant at 5% implying that the more males are involved in farming the more awareness is created about agrochemical use Ndaghu *et al.* (2017); Abayomi, (2018) reported that most farmers in the study areas where married and tends to comply with agrochemical safety practices. Marital status was significant at 10% implying that the more married farmers are involved, the higher the knowledge level, this could be due to the fact that

there is a sense of responsibility attached to married people. Hence, they need to take care of themselves not just for their sakes, but also their spouse and family at large. Level of education was significant at 10% implying that the more educated the farmers are the more their knowledge level increases. Maize farming experience was significant but negatively at 10% which implies that increase in farming experience does not necessarily increase knowledge level. Because farmers can have experience even in ignorance and can continue in a wrong direction for a long time. Farm size was positively significant at 1% implying that the more hectares a farmer has the more his knowledge level is increased. This is because, as expansion takes place the chances of meeting more extension agents, other farmers increase thereby causing a positive change to take place. Source of capital and amount of credit were significant but negatively at 5% which implies that the amount did not influence the knowledge level of farmers. This could be because many farmers tend to receive loans or grants and channel it to family affairs/problems and not just for farm operations, this in turn affects their productivity in the farm.

Table 7: Probit model estimates of Socio economic factors influencing the knowledge and attitude of respondents

Variables	Coefficient	t-value	P-value
Age	-0.0005	-0.01	0.990
Sex	1.1772	2.12	0.034**
Marital status	0.4642	1.67	0.096*
Number of children	-0.0956	-1.23	0.220
Level of education	0.1554	1.67	0.096*
Maize farming experience	-0.0517	-1.75	0.081*
Farm size	2.2119	2.72	0.007***
Source of capital	-0.5767	-2.03	0.043**
Amount of credit	-0.00002	-2.27	0.023**
Amount spent on pesticide/herbicide	0.00003	0.63	0.528
Amount spent on fertilizer	5.15e-06	0.22	0.823
Constant	-0.9574	-0.64	
Source of labour	-0.3898	-1.25	0.211
Extension agent visit	0.3201	1.53	0.127
LR Chi^2 (13)			
Prob > Chi^2 = 0.0000			
Pseudo R^2 = 0.3391			
Log likelihood = 43.83297			

Source: Field survey, 2021. *** Significant at 1%, ** Significant at 5% and *Significant at 10%

Recommendations

i. Extension programs strictly based on the peoples dialect and traditions should be held to help the uneducated farmers understand and catch up with others.
ii. Extension agents should sensitize farmers on need to use personal protective equipment (PPE) and training on safe agrochemical use should be organized for farmers, since experience does not increase awareness
iii. Agencies producing personal protective equipment and clothing, should manufacture new and moderate or more flexible design/style for PPE products to enable farmers be more comfortable wearing them on.

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