
**PERCEPTION OF HEALTH HAZARDS ASSOCIATED WITH AGRO-CHEMICALS
USE AMONG ARABLE CROP FARMERS' IN MUBI AGRICULTURAL ZONE,
ADAMAWA STATE, NIGERIA**

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ABSTRACT: *Unsafe use and handling of agro-chemicals among Nigerian farmers continue to constitute health hazards and environmental degradation. The study investigated respondents' socio-economic characteristics; agro-chemicals use; awareness of safety practices; information sources and perception of health hazards in agro-chemicals use. Multi-stage random sampling technique was used to select 251 respondents. Data was analyzed using frequency, percentages and correlation. Respondents' mean age was 40 years; 68.1% were male; 70.1% were married; and 69.9% had 1-5 persons per household. Most respondents (48.6%) attained only primary school, 69.8% had farming experience of ≥ 10 year, 96.3% used agrochemicals, 74.5% were unaware of safety precautions and 43.4% perceived agrochemical use as hazardous. Farm associates/friends and radio were the most used information sources. Perception of health hazards in agrochemicals use was positively correlated to educational attainment($r=-0.82$), farming experience($r=0.35$), age($r=0.20$) and household size($r=0.16$). Agricultural extension outfits/agents should educate farmers on safe use of agrochemicals.*

KEYWORDS: Perception, Health Hazards, Arable Crop Farmers and Agro-chemicals.

INTRODUCTION

Modern farming relies on the use of several agro-chemicals such as fertilizers, pesticides and crop preservatives to produce and preserve an abundance of high-quality food Desaluet *al.* (2014). Agro-chemicals as they are generally referred to are considered as technology for improving agricultural production. According Govinda(2014) though agrochemicals are costly inputs, balance use, optimum doses, correct methods and right time of application ensures increased crop production. Agro-chemicals may appear harmless and safe, but they are complex chemical compounds which can have serious and harmful effects on humans, animal and even the environment on exposure over. Agro-chemical exposure can occur through four routes: mouth, skin, inhalation into the lungs and the eyes. These agro-chemicals play prominent roles in effective control of crop diseases and pests, however, they have also been found to constitute health hazards to human beings, animals and the environment due to their active ingredients and inert material. The improper storage, disposal and use of these chemicals in agriculture over the years have caused exposure and serious health problems in many developing countries including Nigeria Ibitayo, (2006) in Desaluet *al.* (2014). Agro-chemicals include chemically synthesized compounds,

devices or organisms that are routinely utilized in agriculture to manage, destroy, attack or repel pest, pathogens and parasites which can be organic or inorganic moieties and may be classified into different groups based on their chemical composition such as organochloride, organophosphates, carbonates, formamidines, theocyanates, organotines, denitrophenols, synthetics pyrethroids and antibiotics Bo *et al.* (2010). Crop damage from pest infestations often results in serious consequences, warranting the need to use pesticides. However despite their benefits, pesticides pose potential hazards to human health and the environment when not properly handled Govinda(2014).

Several studies have documented the adverse health hazards of the pesticides' usage as series of chronic end-points including prostate cancer; neurotoxic; immunotoxic; endocrine and reproductive defect. The high level of indiscriminate use of pesticides and other agro-chemicals by farmers is still high and the over use of this chemicals have caused severe effects on humans animals and the environment that may lead to an immediate and long term effect Govinda(2014). This study therefore is designed to assess the perception of health hazards associated with agro-chemicals handling and use among arable crop farmers in Mubi agricultural zone, Adamawa state, Nigeria. The specific objectives were to investigate respondents' (a) socio-economic characteristics (b.) use of agro-chemicals, (c) awareness of safety practices in agro-chemicals handling and use, (d) information sources on agro-chemicals handling and use (e) perception of health hazards associated with agro-chemicals handling and use.

METHODOLOGY

Study Area

The study area is Mubi Agricultural zone of Adamawa state, Nigeria. The zone is made up of five Local Government Areas(LGAs) namely; Madagali, Maiha, Michika, Mubi-North and Mubi-south LGAs with a population of 163, 417; 123, 046; 187,718; 183,216 and 157, 146 respectively NPC (2012) . According to [1] the zone lies between latitude $9^{\circ}55'$ and $11^{\circ}35'$ north of the equator and longitude $13^{\circ}45'$ and $18^{\circ}55'$ east of the Green witch meridian. It is bounded in the north by Borno state, in the west by Hong and Song LGAs and in the south and east by the Republic of Cameroon. It has a land area of 4728.77km^2

Sources of Data and Data Collection

Primary data was generated and used for the study with the aid of a questionnaire. Multi stage random sampling technique was employed to select respondents for the study.

Stage I: Two out of the five LGAs that made up the zone were purposively selected

Stage II: Five out of the eight ADP extension blocks in the two LGAs sampled were selected.

Stage III: Proportionate sampling technique was used to selected 251 respondents

Table 1: Sampling procedure

LGAs selected	Extension blocks selected	Number of respondents selected
Mubi North	Mubi I	60
	Mubi II	57
	Mayo-bani	58
Michika	Bazza	39
	Garta	39
Total		251

Source: Field survey 2012

Analytical Technique

Descriptive statistics was used to analyze the data for the study. This involved the use of mean, frequency count and percentages.

Mean;

$$\text{For grouped data, } \bar{x} = \frac{\sum fX1}{N} \quad (1)$$

Where: \bar{x} = mean $\sum fX1$ =sum of variance

N =sample size

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the respondents

Table 2 show that, majority (72.9%) of the respondent were relatively young and fall within the age range of 30 to 49 years, 15.9% were within the age of 50 to 59 years while 11.2% were 60 years and older. The preponderance of young farmers among the respondents depicts the fact that, their productivity is expected to be high since they are active, energetic and can easily adopt agricultural innovations. It also indicated that, farmers who are older may be relatively less efficient in food crop production than younger farmers. Thus, because crop production in the study area is relatively labour intensive, especially during weeding and harvesting operations, younger farmers tend to be more productive. The younger farmers are also likely to be more progressive, hence, more willing to adapt new practices, thus leading to higher efficiencies in their production. Distribution of respondents' sex as presented in Table 2 reveals that 68.1% were male farmers. This depicts that, most of the farming activities in the study area is being undertaken by male and that male may have wider and greater impact in terms of contribution to farming activities.

The results of marital status in Table 2 indicates that 70.1% were married, 23.1% were single while 2.8% and four percent were divorced and widowed respectively. Table 2 also indicates respondents' household size. Majority (60.9%) of the respondents had household size of 6 – 10 persons with a mean size of nine.

Educational attainment of the respondents revealed that 16.3% were non literate, 32.3% had primary education while only 17.1% were educated beyond secondary school. Though 87.6% of respondents had one form of education or another, more respondents (48.6%) had primary education or less. This implies that the adoption of farming technique may not be difficult to the

respondents as they are fairly educated to want to adopt innovations. However, the low level of education of majority of the respondents makes it difficult for them to comprehend highly technical innovations and instructions on agro chemicals. The study lend credence to the works of Lawalet al. (2010) who reported that, education has been found to be a catalyst in the adoption of innovations for agricultural production. The result of farming experience in Table 2 reveals that majority (48.6%) of the respondents had farming experiences of between 11 and 20 years. Farming experience would to a large extent affect farming decision and it has a positive relationship with technical efficiency Adewumiet al. (2001). This implies that, the more experienced a farmer is, the more efficient the farmer might be in the use of productive resources.

Table 2: Socio-Economic Characteristics of the Respondents

Variable	Frequency	%age
Age		
< 30	43	17.1
30 – 39	60	23.9
40 – 49	80	31.9
50 – 59	40	15.9
60 and above	28	11.2
Total	251	100
Mean	39.59	
Sex		
Male	171	68.1
Female	31.9	31.9
Total	251	100
Marital Status		
Single	58	23.1
Married	178	70.1
Divorced	7	2.8
Widowed	10	4.0
Total	251	100
Household Size		
1 – 5	50	19.9
6 – 10	153	60.9
11 – 15	33	3.6
16 – 20	9	3.6
> 20	6	2.4
Total	251	100
Mean	9	
Educational attainment		
No form of education	41	16.3
First school leaving certificate	81	32.3
SSCE	86	34.3
NCE/Diploma	38	15.1
Degree	5	2.0

Total	251	100
Farming Experience		
1 – 10	48	19.1
11 – 20	122	48.6
21 – 30	50	19.1
> 30	31	12.4
Total	251	100
Mean	19	

Source: Field Survey, 2012

Respondents' use of agro-chemicals

Result on Table 3 indicates that almost all (98.0%) the respondents used agro-chemicals in their farming activities for the purpose of crop protection from pests and diseases, ease of cultivation as well as increased yield to meet the increasing food demands at the family and national levels. The results lend credence to Asogwa *et al.* (2009) who reported high dependence of arable crop farmers in Nigeria on agro-chemicals use in their production.

Table 3: Respondents' use of agro-chemicals

Variable	Frequency	%age
Use agro-chemicals	246	98.0
Not use agro-chemicals	5	2.0
Total	251	100

Source: Field Survey, 2012

Respondents' awareness of safety practices in agro-chemicals handling and use

Table 4 presents respondents' awareness of safety practices in handling and use of agro-chemicals. It shows that, majority (74.5%) of the respondents were not aware of safety practices in agro-chemical handling and use even though they use agro-chemicals in their production activities. This result indicates low level of awareness on the use of safety measures in agro-chemicals handling and use in the study area. Therefore extension agents and other stakeholders in information dissemination to farmers should design extension packages that will sufficiently address this low level of awareness. This becomes imperatives as all most all the farmers in the study area handle and use one form of agro-chemicals or another.

Table 4: Respondents' Awareness of safety practices in agro-chemicals handling and use

Variable	Frequency	%age
Aware	64	25.5
Unaware	187	74.5
Total	251	100

Source: Field Survey, 2012

Sources of information on agro-chemicals use

Table 5 shows that 24.8%, 14.3% and 13.5% of the respondents sourced information from relations/friends/farm associates, radio and agricultural extension agents respectively. The

respondents also sourced information from the newspapers (12.3%), television (12.1%), mobile phone (9.6%), the internet (7.8%) and extension bulletins/posters (5.5%) and NGOs (0.1%)

Table 5: Sources of information on agro-chemicals use

Source of information	Frequency	Percentage
Radio	214	14.3
Television	180	12.1
Internet	116	7.8
Mobile phone	144	9.6
Newspapers	184	12.3
Bulletin/posters	82	5.5
Extension agents	202	13.5
Relatives/ friends/ farm associates	370	24.8
NGOs	1	0.1
Total	1493**	100

Source: Field Survey, 2012

** Multiple responses

Respondents' Perception of health hazards associated with agrochemicals handling and use

Table 6 shows respondents' perception of health hazards associated with agrochemicals handling and use. More (56.6%) respondents perceived agro-chemicals handling and use as non-hazardous. This indicated that majority of the respondents were unaware of the hazards associated with the handling and use of agro-chemicals. Therefore it is imperative that efforts be made by the government; the agricultural extension agents and other stakeholders in development information dissemination to educate the farmers on the dangers associated with handling and use of agro-chemicals.

Table 6: Categorization of arable crop farmers' perception of health hazards associated with agrochemicals usage

Variable	Frequency	Percentage
Hazardous	109	43.4
Not hazardous	142	56.6
Total	251	100

Source: Field Survey, 2012

Relationship between respondents' socio-economic characteristics and perception of health hazards.

Pearson Product Moment Correlation (PPMC) was used to test the relationship between socio-economic characteristics and perception of hazards in agro-chemicals use. Table 7 shows that, perception of health hazards is positively related to educational attainment ($r = 0.82$), farming experience ($r = 0.35$), age ($r = 0.20$) and household size ($r = 0.16$). This result is for the fact that education informs, liberates the mind while experience is also part of education as people learn by doing. Age also comes with experience which is part of education. Household size maybe related

to perception of health hazards for the fact that larger households may compose of individuals who have link with more informed individuals hence, it is expected that there would be more experience among larger households than in households with few individuals.

Table7: Correlation between respondents' socio-economic characteristics and perception of health hazards.

Variables	r- values (P = 0.05)
Educational attainment	0.82
Farming experience	0.35
Age	0.20
Household size	0.16

Source: Field Survey, 2012.

CONCLUSION

Most of the respondents were young, in their prime but not educated beyond primary school. Most of the respondents were experienced farmers; they used agro-chemicals in one way or another in their farming activities but most of them were unaware of safety practices in the use of agro-chemicals and perceived agro-chemicals handling and use as non-hazardous. Relations/friends/farm associates, radio and agricultural extension agents were respondents' major sources of information on agro-chemicals handling and use. Perception of health hazards associated with use of agrochemicals was influenced by farmers farming experience, age, family size and educational attainment. Based on the findings the following recommendations were made:

- i. The state Agricultural Development Program (ADP) and other agricultural extension outfits should package methodologies for educating farmers on safe handling and use of agro-chemicals ;
- ii. Government, extension agents and other stakeholders in the information dissemination framework should collaborate towards enlightening farmers on technical knowledge and skill of agrochemicals handling and use;
- iii. Agro-chemical companies targeting developing countries like Nigeria should use bold, simple and catchy safety instructions in product branding.

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