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Pesticides Usage, Awareness, Practices and Health Effects among Farmers in Jere Bowl, Borno State, Nigeria

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Abstract: This study analysed farmers' pesticides usage, awareness and health effects on the field. Information was obtained from 265 farmers through structured questionnaire and results were analysed using frequency and percentage to present the results. The results of this survey indicated 13 variety of chemicals were being applied heavily use as pesticides for control of different pests and diseases. As a result, farmers use pesticides without full understanding of their effects on human health 69.8%, this attributed to lack of agriculture extension services. Farmers behavior related to pesticides use showed that 30.2% ate and drinks during application, 15.1% do not wear protective cover and 11.3% smoke during pesticide application, this attributed to 35.8% of farmers are illiterate. Majority of the farmers showed different toxicity symptoms of sickness resulting from pesticides exposure. This study recommended that government and NGO's should participate in minimizing health risks caused by the misused of pesticides.

Keywords: Jere Bowl: Pesticides: Awareness: Knowledge and health.

1. Introduction

There is an increasing concern regarding the widespread use of pesticides and their potential effects on public health. Pesticides are of vital importance in the fight against diseases, for production and storage of food, they are being widely used for pest control in agriculture and gardening [1]. Despite their popularity and extensive use, pesticides serious concerns about health risks arising from the exposure of farmers when mixing and applying pesticides or working in treated fields and from residues on food and in drinking water for the general population have been raised [2, 3].

In developing countries, farmers face great risks of exposure due to the use of toxic chemicals that are banned or restricted in other countries, incorrect application techniques, poorly maintained or totally inappropriate spraying equipment, inadequate storage practices, and often the reuse of old pesticide containers for food and water storage [4]. The effects of pesticides on human health are more harmful based on the toxicity of chemical and the length and magnitude of exposure. The exposure to pesticides can cause skin irritation, birth defects, genetic changes, nerve disorder, endocrine disruption and somatic cell mutation [5]. The objectives of this study are to identified the pesticides use and examined the level of awareness, practices and health effects among farmers in Jere Bowl.

2. Material and Methods

2.1. Study Area

Jere Bowl is situated below 305 above means sea level North of Maiduguri. It is located between latitude $11^0$48' – $11^0$58'N and longitude $13^0$06' – $13^0$20'E in the Sudan-Savanna transition zone. Jere Bowl cover an area of about 22,000 ha, out of which a gross area of 15,850 ha was identified as suitable for irrigated agriculture. This area was selected because irrigation farming is the main occupation in the area and different types of pesticides are used due to the diversity of vegetables cultivated.

The survey was conducted from March to May 2015, covered five [5] areas which were Bolo, Masu, Dusuman, Gongulon and Kachallari. Purposive sampling technique was used to obtain information from the farmers based on the objective of the study. 265 respondents (53 from each area) were targeted for the purpose of this research work. Questionnaire had five [5] sections namely, Socio-economic characteristics, pesticide used in the area, behaviors of farmers during pesticide handling and application, knowledge of pesticides and self-reported pesticide toxicity symptoms.

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2.2. Data Analysis

Data collected were analyzed using the statistical package for Social Sciences (SPSS Version 16) and Descriptive Statistics of Frequency, Percentage and table were employed.

3. Result and Discussion

The study revealed that (table 1) 19% of farmers ranged between 15 – 25 years, 22.6% were between 26 and 35 years of age, 30.2% were between 36 to 45 years, 18.9% were between 46 to 55 years old while 11.3% of the farmers were 56 years and above. Farmers without formal education were 35.8%, 30.2% attended Primary school, 18.7% were at Secondary level, while 15.1% had access to Tertiary education. 64.2% farmers were married and 35.8% were single. 39.6% of the farmers said that they inherited the farmland from their parent, 26.4% get the farmland through lease while 34.0 farmers purchase the farmland.

Table-1. Socio-economic characteristics of the farmers in the study area (N=253)

Variables	Frequency	Percentage
Age (years)		
15 – 25	9	17.0
26 – 35	12	22.6
36 – 45	16	30.2
46 – 55	10	18.9
56 and above	6	11.3
Total	**53**	**100%**
Education status		
Non-formal	19	35.8
Primary	16	30.2
Secondary	10	18.9
Tertiary	8	15.1
Total	**53**	**100%**
Marital status		
Married	34	64.2
Single	19	35.8
Total	**53**	**100%**
Land ownership		
Inherited	21	39.6
Lease	14	26.4
Purchase	18	34.0
Total	**53**	**100%**

Table-2. Type of pesticides used by farmers in study area (N=265)

Pesticide	Frequency	Percentage
Landa-cyhelothrin	5	9.4
Aldrin	4	7.5
DDT	4	7.5
Cypermethrin	3	5.7
Crush	2	3.8
Punch	6	11.3
DD- force	10	18.9
Imi-force	3	5.7
Caiman	1	1.9
Lera-force	2	3.8
Dichlorvos	3	5.7
Paraquat	6	11.3
Glyphosate	4	7.5
Total	**53**	**100%**

Table-3. Behavior of farmers during pesticides handling and application (N=265)

Behavior	Frequency	Percentage
Eating and drinking during application	16	30.2
Smoking during pesticides application	6	11.3
Put mask during pesticide application	9	17.0
Wearing protective uniform	3	5.7
Do not wear protective uniform	8	15.1
Used empty container in house	7	13.2
Dispose empty container in trash	4	7.5
Total	**53**	**100%**

Table-4. Knowledge of Pesticides (N=265)

Farmers knowledge of pesticides appl.	Frequency	Percentage
Reading label	7	13.2
Consult vendor	9	17.0
Consult agriculture extension	Nil	Nil
Do not read label	13	24.5
Self effort	24	45.3
Total	**53**	**100%**

Table-5. Self reported pesticide toxicity symptoms among farmers in the study area (N=265)

Symptoms	Frequency	Percentage
Headache	7	13.2
Skin irritation	4	7.5
Sneezing	10	18.9
Cough	6	11.3
Stomach ache	5	9.4
Vomiting	9	17.0
Dizziness	4	7.5
Constipation	2	3.8
Eye irritation	6	11.3
Total	**53**	**100%**

The results of this survey (table 2) showed that farmers depended heavily on the use of pesticides for control of different pests and diseases and over 13 different formulations were used. This probably because they believe that the only solution to pest problems is to spray more frequently and using different types of pesticides. The farmers were not receiving agricultural extension service, and relied heavily on pesticide use when dealing with pest problems but were constrained by the lack of appropriate knowledge [6, 7]. However, pesticide usage in the study area seems to be highly influenced by pesticides vendors who were carrying out their business right in the communities and very interested in achieving large sales of their pesticides [8, 9].

Regarding behavior of farmers during pesticides handling and application (table 2) the result show that 30.2% of farmers ate and drinks while spraying pesticide as were seen during the survey, while 11.3% farmers smoke during spray, 5.7% of the farmers wear protective uniform and 15.1% do not care to wear protective uniform. 17.0% of farmers put masks during spray, 13.2% disposed pesticide containers by using them at home, while 7.5% farmers discarding them with usual trash. This bad behavior among the farmers could be due to low level of knowledge about the safety measures on pesticide usage which is consistent with the results of studies [10, 11].

Farmers knowledge of pesticides shows that (table 4) 13.2% were able to read the label and follow the instruction before they sprayed pesticide. It was observed that source of farmers knowledge of pesticides was the vendors which constitute 17.0% of the farmers, 24.5% farmers do not care to read label on the container, they are mixed of literate and illiterate because of their attitude regarding pesticide knowledge. 45.3% of the farmers makes self effort toward knowing pesticide application and usage. This was inconsistent with the studies [1, 4].

Majority of farmers reported that they had felt sick after routine application of pesticides (table 5). The toxicity symptoms reported were headache 13.2%, skin irritation 7.5%, sneezing 18.9% and coughing 11.3%. Others includes stomach ache 9.14%, vomiting 17.0%, dizziness 7.5%, constipation 3.8% and eye irritation 11.3%. Farmers assume that pesticides toxicity symptoms were normal so they get used to them and they don't care to go for treatment in the health centre nearest to them**.** Similar study carried in Nepal [12] reported that pesticide applicators tended to accept a certain sickness as normal part of the work of farming and therefore do not report the symptoms in health centres for formal medical check.

4. Conclusion

This study concluded that the farmers lack appropriate knowledge on safe handling and use of pesticides. The effects of pesticides on human health are more harmful based on the toxicity of the chemical and the length and magnitude of exposure. Farm worker experience the greatest exposure to pesticides through direct contact with the

chemicals. The combination of using hazardous pesticides and lack of availability of appropriate precautionary tools are the important component of the environmental health and awareness among the farmers in Jere Bowl.

5. Recommendations

Base on the findings of the study, we recommend that extension services and training on the safety use of pesticides should be rendered to the farmers. Government should encourage farmers to reduce the use of pesticides through offering incentives the shift from synthetic pesticides to biopesticides and organic farming to prevents environmental pollution and health risks. Integrated pest management system would contribute to a significant reduction of the pesticide effects on human and the environment without affecting crop productivity or increasing the probability of crop losses.

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