Awareness of Hazardous Implication of Agrochemicals used in Dabar Kwari Dawakin Kudu Local Government Area of Kano State, Nigeria

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ABSTRACT

Improper uses, handling and disposal Agrochemical could have adverse health and environmental pollution Dabar kwari in dawakin kudu is selected due it higher numbers of farmers, it is surrounded with lake and other source of irrigation farming. The main objectives are assessing the knowledge and practice regarding uses, handling Agrochemical and disposal of it. 200 farmers were randomly selected from Dabar Kwari. 70.5% used Agrochemical in the farm without protective equipment, 35.4% uses their bare hands in mixing Insecticide, herbicide and pesticide, and more 80.0% wash Agrochemical containers in the lakes surrounding the village with is main sources of water for the community, most of the farmers store Agrochemical at home. The ability to apply the right quantity of Agrochemical is low. On average the respondents have low awareness of heath implication of Agrochemical. State, Local Government and NGO can create awareness for safety measure, handling and disposal of Agrochemical among farmers and sellers of Agrochemicals. Though number of children in school, Radio program, and training program in the field. It is there recommended to included Agrochemical safety in our primary and secondary curriculum.

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INTRODUCTION

Food production is one of the main sources of Economy in Nigeria. Agro chemical is any chemical is used in agricultural production to improve productivity and control pest and diseases (Omari 2014) Many of the chemical pesticides can have harmful effects on human beings either as acute or chronic toxicity. Acute exposure to pesticides can lead to death or serious illnesses. About 355,000 people die globally each year due to unintentional acute poisonings.[7] Two-thirds of these deaths occur in developing countries where such poisonings are associated with excessive exposure and or inappropriate use of toxic chemicals and pesticides present in occupational and domestic environments. The cumulative health impacts of human exposures to various agrochemicals can be a factor in a range of chronic health conditions and diseases like cancer, reproductive, endocrine, immunological, congenital and developmental disorders (Jurewicz and Hanke 2008). Achieving food security, addressing climate change, and halting environmental and natural resource degradation are among the key challenges the agricultural sector faces in efforts to achieve sustainable development goals (SDGs[1]) and the Paris Agreement to limit the global temperature increase to below 2 °C (Wollenberg *et al.*, 2016).

Agrochemical mishandling constitutes one of the most several farm operation hazards confronting farmers, their produce, and the environment. Wrong application time and dosage, mishandling, ignorance of safety precautions, and the use of adulterated or expired

agrochemicals in circulation have been shown to impact both aquatic and terrestrial ecosystems and degrade the quality of groundwater destined for human consumption (Nikolaidis *et al.*, 2007; Tekwa *et al.*, 2010)

Many farmers do not have adequate knowledge and information on health implication associated with handling and use of pesticides (Okoffo *et al.*, 2016). The use of personal protective equipment (PPE) remains a thing of choice to the Farmers. Other precautionary measures like avoiding eating, drinking, and smoking during application is still not adhere by the farmers. Instead of farmers to properly dispose empty containers of Agro chemicals, they use them for fetching water, keep cooked food. The ablity to apply the right quantity is dependent on awareness of the health. The use of pesticide continues as agricultural production intensifies. However agricultural production is fraught with abuse, misuse and over use of the chemicals (Asante and Ntow 2009). Though the benefits are substantial, studies have associated the use of certain agrochemicals with some important environmental and health damages (Clarke *et al.*, 1997; WHO, 1997; Krebs *et al*., 1999; Greenpeace, 2008). This Research has primarily focused on toxicity, hazardous and mishandling Agrochemical among our Farmers health and the environment.

MATERIAL AND METHODS

The study was conducted within the Dabar kwari Dawakin kudu Local Government in Kano State which occupies about 100 square kilometres of land, with population of about 60,000. 90% of its population engaged in subsistence and commercial farming. Mixed cropping is practiced by most farmers with most crops grown for home consumption. A questionnaire was designed in English and translated into Hausa as local language that is understood by majority of the farmers, and was administered to 200 Farmers verbally in Hausa. Questions were in a multiple choice format so that respondents had to select only the appropriate answer or answers that they thought well described their opinion or attitude on a particular issue. The questionnaire contained three main sections. The first section was designed to collect information on personal characteristics of the farmers including age, educational level, and years of farming experience. The second section focused on collecting information on farmers' level of awareness of pesticide laws and regulations, and knowledge and understanding of pesticides with respect to the environmental and human health. In addition, we also collected data of knowledge on hazard nature of Agrochemicals. The third section included questions regarding pesticide handling and safety practices including reading and following label instructions, storing and disposing of pesticides and empty containers, and use of PPE and other protective practices during and after pesticide application.

RESULTS

Characteristics and Profile of the Farmers

All farmers surveyed in the study were men, as farming activities especially those related to pesticide use are performed exclusively by men in Dabar Kwari. The majority of the farmers are male nearly all farmers (90%) were within the young and middle age category (≤ 55 years) while only 3% were aged more than 60 years. Furthermore, most farmers were married, followed by divorced, with the widowed being the least. Data shown in Table 1 also indicated 42% attended Qur'an school 36% of the farmers had attained education up to primary level, 20% up to secondary level, and 2% up to tertiary level. This is an indication that farming is not attractive to tertiary education graduates. However, none of the farmers were illiterate. Majority of the farmers (37%) considered farming a temporary or part-time occupation whilst 63% were full-time employed farmers. Furthermore, whiles more than half of the farmers had other source of income.

Table 1: Summary of the characteristics of farmers in the study area (n = 100)

Selected Characteristics	Categories	Frequency (%)
Gender	Male	85
	Female	15
Age (years)	Young (18 – 30)	28
	Medium (31 – 50)	69
	Older (>60)	3
Marital status	Married	61
	Single	18
	Widowed	3
	Divorced	18
Employment status as farmer	Full-Time	63
	Temporary/Casual	37
Role/status household	Head	85
	Spouse	15
Educational Level	Qur'an Schools	42
	Up to Primary Education	36
	Up to Secondary Education	20
	Up to Tertiary Education	2

Farmers' Knowledge, Attitude, and Understanding about Agrochemicals

The farmers' level of knowledge of Agrochemical, including exposure routes, effects on the environment and human health, and their awareness of pesticide laws and regulations was analyzed in Table 2. The majority (86%) of the farmers had not received any training on safe handling of pesticides herbicide and insecticide, while 14% were trained. Although most farmers agreed that pesticide use poses some risk to human health (71%) and the environment (65%), they also indicated that pesticides were indispensable for high crop yield (80%). Over 60% of the farmers did not read or follow instructions on Agrochemicals labels, because they were unable to read and understand the meaning of the labels (56%), the labels were written in English (a foreign language like Chinese).

Table 2: Summary of the characteristics of farmers in the study area (n = 100)

Selected Characteristics	Categories	Frequency (%)
Training on safe handling	Yes	14
	No	86
Risk on Health	Yes	71
	No	29
High crop yield by pesticide	Yes	69
	No	31
Follow label on Agrochemicals	Yes	40
	No	60
Understanding the level	Yes	44
	No	56

Agrochemical use, human health and the environment hazard

In Table 3, most farmers (86%) used various types of agrochemicals on their farms. 70.5% used Agrochemical in the farm without protective equipment, 35.4% uses their bare hands in mixing Insecticide, herbicide and pesticide, and more 80.0% wash Agrochemical containers in the lakes and river around them, most of the farmers store Agrochemical at home.

Table 3: Farmers' Responses to Selected Characteristics (n = 100)

Selected Characteristics	Categories	Frequency (%)
Use Agrochemical on farm	Yes	86
	No	14
Mixing of 2 or more Agrochemicals with bare hand	Yes	70
	No	30
Wearing of protective clothes before use of Agrochemicals	Yes	20
	No	80
wash Agrochemical containers in the lakes and river	Yes	80
	No	20
Stored Agrochemical at home.	Yes	95
	No	5

DISCUSSION

Generally very few of the farmers interviewed were female and this was because most of the female farmers were reluctant to be interview compared to the male. Again, women generally faced more constraint than men in accessing productive resources, markets and services; and this "gender gap" tends to hinder their productivity and reduce their contributions to the agriculture sector and to the achievement of broader economic and social development goals (FAO, 2011).

Understanding farmers' level of knowledge and practices regarding the safe use of Agrochemicals is vital for providing sound educational and policy strategies that aim at limiting the health and environmental hazards caused by it. The majority of farmers in this study were well aware of the harmful effects of Agrochemicals with regard to the environment and human health, but contrary to expectations, this did not significantly change their practices or attitudes towards safe pesticide use. This suggests that even though farmers may know the hazards of pesticides very well, they may often adopt risky behaviors because of lack of education and poor knowledge and understanding of safe practices in pesticide, insecticide and herbicides uses (Khan and Ilahi 2019) The low access to extension and research program by farmers could be attributed to the inadequate number of skilled staff for such programmers and this affects the activities of farmers in terms of awareness of modern agricultural practices. The percentage of farmers who used agrochemicals is high. The perceived low awareness of the hazards associated with the use of agrochemicals among the farmers interviewed could be attributed to the low educational level as corroborated by Ibitayo (2006). There is high probability that a greater

percentage of farmers with higher educational background read the labels on the agrochemicals before purchase and use and this category of farmers are conscious of the expiry date and the implications of their activities on the environment. In a study, Islam and Kashem (2000)

Use of appropriate PPE, such as coveralls, and the adoption of other protective measures and good personal hygiene such as showering, not smoking, eating or drinking while handling pesticides are considered good practices to reduce occupational pesticide exposure.

The failure of farmers to read the labels could mean that, unaware, these farmers are using expired chemicals/fake chemicals. The combination of two or more agrochemicals before application has associated effects on the environment. Generally, the efficacy of a cocktail of chemicals could be predicted from the impact of individual chemical. The components of a mixture can react together to form another compound that may have a higher or lower potency than the individual chemicals (Olayiwola, *et al.*, 2017).

CONCLUSION

Though agrochemicals help improve productivity, wrong application time and dosage, mishandling, ignorance of safety precautions, and the use of adulterated or expired agrochemicals have deleterious effects on the environment and human health. This study has revealed that most farmers have low levels of awareness of the negative effects of the use of agrochemicals on themselves, consumers of their produces and the environment. Increased accessibility to extension and research programmes should be encouraged by all major stakeholders in agriculture. Also modern trends of agricultural practices that present fewer hazards to environment and health should be advocated. State, Local Government and NGO can create awareness for safety measure, handling and disposal of Agrochemical among farmers and sellers of Agrochemicals. Though enrollments of children to school, Radio program, and training program in the field. It is there recommended to included Agrochemical safety in our primary and secondary curriculum

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