

# Overview of Pesticide Usage, Misuse and Its Impact on Environmental Degradation in South-western States and Some Part of Northern States in Nigeria.

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## Abstract

This study assessed and oversees the pesticides usage, misuse and its effects on environmental degradation in Southwest and some Northern part of Nigeria. It also gathered information on why farmers misused the pesticides. Data for this study were collected from secondary sources like books, electronic sources, experimental and field reports. It was discovered from the literature searched that males were majorly pesticide users than the females. Higher education levels of farmers reduced the misuse of pesticides. Majority of farmers were reusing pesticide containers for keeping valuable thing in homes and that pesticides which are highly toxic are being used by farmers. It was also noted that, farmers are misusing agrochemicals due to inappropriate use of PPE (Personal Protective Equipment), mixing of two chemicals which are meant to perform different role, lack of checking expiry dates on the pesticides containers and inability of many farmers to read and understand the instructions on pesticide containers. Many farmers experience discomforts such as vomiting, itching eyes, burning sensation, dizziness, nausea etc. Impact of pesticides on the environment were revealed to have detrimental effect on hatching of egg of some aquatic organisms, hinders reproductive and endocrine systems and contamination of food, water, death of livestock, fish death and loss of biodiversity as a result of environmental hazards caused by pesticide usage. It is therefore concluded that farmers should be encouraged to use their complete PPE during pesticides application to avoid having discomfort, and the use of pesticides should not be anchored by old age farmers. Moreso, banned pesticides should be monitored not to be sold in the market, adult education should be organized for the pesticide users and encourage proper disposal of pesticide cans into appropriate incinerator after used.

**Keywords:** Agrochemicals, PPE, Education, Storage, Misuse, Discomforts, Farmers, Incinerator, Nigeria.

## Introduction

Pesticides are regarded as chemicals that can be used to kill, repel the pest or use to reduce the damage the pest can cause to the farm product. A pesticide can also be a biological agents like virus, bacteria, fungi etc. which are used in controlling pest. It usually relies on predation, parasitism, herbivory or other mechanism but all requires active involvement of human being. There are vast majority of these pesticides which can be used on farmland depending

on which types of pests one is interested in reducing or eradicating. These include bactericides (bacteria killer) fungicides (fungi killer), Herbicides (weed control), Insecticides (insect killer) and can be classified as ovicides, larvicides or adulticides. nematocides (control nematodes), molluscicides which controls slugs and mollusks. Rodenticide and virucides for killing rodents and viruses are also included (USEPA, 2018). However, many of these pesticides are used simply or in combination to bring a desired result, whereas they constitute

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environmental degradation or pollution and many of them also attack non-target organism. In order to reduce the menace these pesticides constitute on the environment; varieties of organization and control body were established to anchor the use of pesticides in a way that will reduce perturbation of the environment. These agencies involved are National Agency for Foods and Drugs Control (NAFDAC), Standard Organization of Nigeria (SON), National Environmental Standard and Regulation Enforcement Agency (NESREA) to mention but a few. All these agencies were set up to fine-tune the minimum standards or limits that can enter human body through food chain as the farmers are applying the pesticide to farm so as to eradicate pest population that hinders high productivity of farm produce.

Nevertheless, there is no gain saying that an average Nigerian is misusing pesticides, particularly herbicides that are used to control weeds. Many Nigerians are using these herbicides to kill little weeds in their backyard almost every months or two months interval because they cannot use hoes for weeding as being primitive or claiming no time to do that because of their tight schedule. This may be the reason why many well waters or drinking water supply in the environment are flooded with heavy metal concentrations when tested. Asides, many authors have reported misuse of pesticides which results in environmental pollution and health hazard being caused to the users such as body itching, cough, difficulty in breathing, nausea, headache and eye trouble during and after the chemical usage (Sosan and Akingbohunge, 2009; Cheke and Oluwole, 2009).

### History of Pesticides

The use of pesticides was dated back to United States in 1930s and became well known after second world war in other countries including Nigeria in 1950s. Farmers were dependent on synthetic pesticides to combat insects attacking their crops then. Synthetic pesticides include: Organochlorines, Organophosphates, Carbonates and Pyrethroids. There are so many dangers related to the use of synthetic pesticides amongst which are: disrupting reproductive, nervous endocrine and immune system. They also affect Central Nervous System and poor comprehension. Their impact could be acute,

delayed and allergic in human beings. Moreso, these synthetic pesticides are still in use in Nigeria till date. Even though they have been banned in many developed countries. In Nigeria before the advent of these chemicals, cultural practices such as bush fallow, crop rotation, manure application and host plant resistance have been in used before in order to eradicate pest in Nigeria (Ojo, 2016). This statement is also affirmed by Alliance for Action on Pesticides in Nigeria (AAPN) (2022) and Oge (2022) who reported that about 40% of pesticides used in Nigeria are highly toxic to humans and had been banned in Europe and other places. The chairman small holder Women Farmers Organization (SWOFON) in Nigeria also said that their organization discovered about 94.2% of surveyed women farmers used synthetic chemical pesticides to manage pest issues in their farms in Benue, Nasarawa, Abuja and Plateau States. Later, the Association called for ban of highly hazardous pesticides at Conference organized by AAPN on pesticide use among small-scale women farmers in Nigeria held in Abuja. According to Heinrich Boll Stiftung in his research conducted, he found out that 65% of the registered pesticides in Nigeria have active ingredients that are highly hazardous to human and Environmental health. However, the National Agency for Food and Drug Administration and Control (NAFDAC) had dismissed this statement and gave reasons why Nigeria cannot place a blanket ban on some of the imported agrochemicals restricted but instead of that, initiated a four –year phase-out plan for obsolete and unsafe agrochemicals. The Director general of NAFDAC also said that what is obtained in advanced countries in many cases are not welcome in developing countries since regulations is done in the interest and safety of the citizens.

The director also stated that some of these pesticides banned by European Union (EU) from being used to produce certain crops are due to the nature of the crops. She further said it was done to safeguard a class of the population that consumes such crops. In that regard, it will be unethical to do something in Nigeria, where the class of crops in question are not grown here and the chemicals in questions are not used on similar fresh crops in Nigeria. Hence, lists of pesticides banned by NAFDAC in Nigeria are stated bellows:

## National Agency for Food and Drug Administration and Control (NAFDAC)

## List Of Banned Pesticides in Nigeria

S/N	PESTICIDES	CATEGORY	STATUS
1	ALDRIN	INSECTICIDE	BANNED
2	BINAPACRYL	FUNGICIDE	BANNED
3	CAPTAFOL	FUNGICIDE	BANNED
4	CHLORDANE	INSECTICIDE	BANNED
5	CHLORDIMEFORM	INSECTICIDE	BANNED
6	DDT	INSECTICIDE	BANNED
7	DIELDRIN	INSECTICIDE	BANNED
8	DINOSEB & DINOSEB SALTS	HERBICIDE	BANNED
9	HEPTTACHLOR	HERBICIDE	BANNED
10	LINDANE	INSECTICIDE	BANNED
11	ETHYLENEDICHLORIDE	FUMIGANTS	BANNED
12	PARATHION	INSECTICIDE	BANNED
13	METHYL PARATHION	INSECTICIDE	BANNED
14	PHOSPHAMDON	INSECTICIDE	BANNED
15	MONOCROFTOPHOS	INSECTICIDE	BANNED
16	METHAMIDOPHOS	INSECTICIDE	BANNED
17	CHLOROBENZILATE	INSECTICIDE	BANNED
18	TOXAPHENE	INSECTICIDE	BANNED
19	PENTACHLOROPHENOL	HERBICIDE, INSECTICIDE	BANNED
20	ETHYLENEOXIDE	FUMIGANT, DISINFECTANT	BANNED
21	HCF(MIXED ISOMERS)/BHC	INSECTICIDE	BANNED
22	EDB(1,2-DIBROMOETHENE)	FUMIGANT	BANNED
23	2,4,5TRICHLOROPHENOXY ACETIC ACID	HERBICIDE	BANNED
24	ENDRIN	INSECTICIDE	BANNED
25	MIREX	FUMIGANT	BANNED
26	ETHYLENEDIBROMIDE	FUNGICIDE	BANNED
27	HEXACHLOROBENZENE	ACARICIDE	BANNED
28	ENDOSULPHAN	INSECTICIDE	BANNED
29	DELTA HCH	AGRICULTURAL INSECTICIDE	BANNED
30	FLOURACETAMIDE	RODENTICIDE	BANNED

Adapted from [vmmap@nafdac.gov.ng](mailto:vmmap@nafdac.gov.ng), [vmapnafdac@gmail.com](mailto:vmapnafdac@gmail.com)

### Rationale for the Study

The reason behind this review is to be informed about the way farmers and other users of pesticides are using it and its impacts on environmental degradation so as to make people to be aware of the dangers of inappropriate use and storage of pesticides in Southwest and some parts of North, in Nigeria.

### Methodology

The data and information used for this study were collected from secondary sources such as Journals, Books, News, Research articles, Experimental and Field work reports. Other related materials were also contacted from various electronic sources like Academia, Elsevier, Research gate, Google scholars

among others. All were examined vividly, reviewed and evaluated for the purpose of writing this review paper.

### Discussion

#### Why Misusing Pesticides by Farmers

There are so many reasons why farmers are misusing pesticides according to authors from different areas of study.

Many authors observed different reasons that leads to misuse of pesticides on our environment; among them is Bon et al. (2015) who listed reasons such as Illiteracy of farmers, lack of knowledge on the risks of pesticides from bad uses, absence of clear instructions, uses of pesticides on crops for which it was not meant for, difficulty to properly prepare the

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solution to be used and poor respect of dosage. Improper labeling on the container of pesticides and inability of farmers to read the instructions on the pesticides' containers which could increase the risk factors of exposures and poisoning as also observed by Ugwu et al. (2015).

A number of tools and techniques that exists but do not fit all situations when farmers are applying pesticides on farm are also noted by Pouokam (2019). It was also reported in a study conducted in Akwa-Ibom that unsafe practices in application of pesticides among farmers could lead them to various problems as a result of poor handling of equipment and misuse of pesticides (Udoh, 2009). Poor use of PPE during pesticide application and poor disposal practice was reported among farmers in Ogun State by Taofeek-Ayo-bello and Olufunso (2017) in their study of health risk posed by Agricultural pesticides among farmers in Ikenne. They also reported poor practice of cloth changing, hand-washing and showering after pesticides application.

Lack of using appropriate protective equipment is also a major problem of misusing pesticides. As reported by Cheke and Oluwole (2009) in Ekiti State and Ugwu et al. (2015) in Oyo State. They also observed that about 90% of farmers responded to non-use of personal protective equipment but they use their normal clothes during application. They also reported misuse of chemicals by farmers as they mixed different kinds of pesticides before use as they buttressed their action that mixing two or more pesticides increased the efficacy of the pesticide solutions and enabled effective control of the target pest. Expired pesticides are always mixed with newly bought pesticides due to high cost of new product more than the price of the one at hand as observed by Cheke and Oluwole (2009) in their study conducted in Ondo and Kaduna States. Similar observation was observed by Aminu et al. (2020) in their study of pesticide use and health among Cocoa farmers in Ondo and Kwara States, they associated mixing two or more chemicals to making it strong and more effective. They also noted that majority of farmers do not wear full protective garments during application in the two states. However, Oshatumberu et al. (2023) reported use of complete PPE in Osun States while about 67% of respondents indicated the use one or two PPE during pesticides handling and spraying in Lagos State (Adesuyi et al., 2018). They also reported some farmers (24.7%) not washing their PPE after pesticides application and associated it to exposing farmers to health issues. Nevertheless, more than (35%) respondents do not consider the

direction of winds when applying pesticides which can cause blowing of pesticides towards farmer's body, faces and triggering environmental pollution. All these reports are corroborated by WHO (1996), which reported that the largest part of pesticides toxicities and fatal consequences are through pesticides used by small scale farmers without adequate knowledge acquired through formal training and failure to wear appropriate clothing.

According to Akeem and Sofoluwe (2012) in their study of farm level pesticide use among maize farmers in Oyo State, they identified that old age also contributed to the misuse of pesticides because many of them preferred old method of controlling pest which are outdated, banned and not in use again. They also reported in their investigation that old age reduces the farmer's ability to take risk and also their adoption of new techniques and ideas. They also noted the impact of education on the use of pesticides as educated farmers were able to read publications and access information on the internet on how to apply workable pesticide in correct proportion unlike the illiterate farmers. Corroborated report was observed by Adesuyi et al. (2018) in Lagos State. However, Bulu et al. (2017) reported contrary opinion that about 77.9% of farmers read through the instruction written on the pesticides containers before applying while 69.9% and 54.0% either followed the instructions given by the sellers or friends and relatives in Osun and Ogun States. They also reported about 23.4% respondents that applied pesticides based on the observations of how others applied it.

They also observed that majority of the pesticide users in Ogun and Osun States do bath after spraying while little percentage of the users do visit clinics, wear protective glasses and nose protector. The farmers were reported to have awareness on the expiry date and that they can kill non-target organisms and that, few of them drink or smoke cigarette while spraying in the two States. Use of bare hand to scoop the pesticides was also reported. About 54% of farmers in Fadan Daji Local Government in Kaduna identify expiry dates on the pesticides labels while about 46% of the respondents either checked dates on containers or ask the dealers expiry dates before using the pesticides as reported by Bassi et al. (2016) in Kaduna State.

In the study of Adejumo et al. (2014) on potential hazards due to misuse of Aluminum phosphide in Kaduna State, Nigeria, It was observed that majority of maize farmers were misusing these chemicals for storage of maize and even kept them in their houses where innocent children are playing, which may

exposes them to heart and kidney problems. They also noted that majority of farmers were males and illiterates who could not identify the banned pesticides or the one in vogue to be used. This is due to many of them having low education level i.e. (50%) had primary education. Similar observation was made by Adesina et al. (2015) who reported Aluminium phosphide, organochlorines and alkane compounds as major chemical residues in the food products examined in major markets of Oyo State.

Additionally, Olufade et al. (2014) observed high percentage of insecticide residues (Aldrin) more than the required limits in the food items (beans and dry yam chips) examined in markets at Ile-Ife Southwest, Nigeria, in the name of preservation.

However, contrary report was observed by Adeola and Oluwole (2022) in Ondo State, where they reported full compliance of farmers with safety precautions of using pesticides such as proper handling, not mixing herbicides with fungicides and use of appropriate measurements in their cocoa farms. This was associated to the majority of farmers being well- educated and able to understand label directions and manual of instructions for chemicals. Oluwola and Aderemi (2019) reported indiscriminate use of pesticides by farmers as cowpea and beans examined in selected markets in Ibadan contains high level of pesticide residues in the name of preservation against pests. Similar observation was reported by Oshatumberu et al. (2023) in their study of pesticides residues in grains in selected markets in Southwest where high levels of pesticide residues of selected grains in all the states examined was observed. They also noted that majority of the pesticide's users in Ondo and Ekiti States do not read the labels on the pesticides before application. Same observation of not reading the labels and not following the instruction was also observed in Lagos State by Adesuyi et al. (2018) in their study of pesticide related knowledge, attitude and safety practices among small-scale vegetable farmers in Wetland Lagoon. Adeleke (2009) in Ilorin also reported misuse of deadly chemicals on yam flour which causes food poisoning that affected three households in Kano and the poisoned yam flour also affected five families in Ilorin Central Nigeria (Adedoyin et al., 2008).

Lists of Pesticides Commonly Used in Nigeria and Gender that Pertake in their Usage. Most commonly use pesticides are Atrazine, Chlorpyrifos, Paraquat, Dichloride, Glyphosate and Cypermethrin in Norina farm, Niger State and that organophosphate pesticides like Chlorpyrifos were used for crops like maize, millet and cassava (Raimi, 2021).

Oriyzo-plus, Dithane M-45, Round up, saroset and Dexate, Attacke, Bordeaux, No-pest and Benlate were the major pesticides used by the farmers of yam and cassava in South Eastern Nigeria (Sanzidur and Chidiebere, 2018). It was noted from their study that availability of these pesticides and quality-cum knowledge of how best they can apply them on farm was the major problem. Experience and gender of farmers determined the use of fertilizer. However, Adeniyi et al. (2017) reported insignificant relationship of experience and age of the farmer in the use of pesticides on the farm studied in Nigeria. They also reported larger percentage of male using pesticides than female. Similar observation was made by Cheke and Oluwole (2009) in Ekiti State in which Paraquat (98.7%), Pentahydrate (90.7%) Mancozeb+metalaxy (87.3%), Metolachlor (86.79%) Monocrotophos (78.0%), Atrazine (64.0%) and Metalaxy-Difenoconazole, Thiamethoxam (47.3%) were the commonly used pesticides by farmers in their study. They also reported males involvement than females in pesticides use and application. Similar observation of high number of males as pesticides users were reported by many authors in different area of study, amongst are: Adesuyi et al. (2018) who reported about 94.8% males in Lagos State. Babatunde et al. (2021) also observed 88.7% males as users of pesticides in Osun State and that they use herbicides (88.3%) more than thrice in a year compared to other pesticides as responded by respondents. Helen and Olugbenga (2022) reported more than 67% in Ejigbo, Osun State. They also reported Cypermethrin, Karate and pest-off as frequently used pesticides. Adekunle et al. (2017) also reported about 93.3% respondents' male involvement in the usage of pesticides than females. They also observed farmers that have education up to tertiary level as 44% and common pesticides used were Paraquat (89.3%, fungicides (20.0%), insecticides (18.33%), Lindane and Monocrotophos.

Aminu et al. (2020) also reported pesticides commonly used as Paraquat dichloride (90.9%) and Glyphosate (88.2%) as common herbicides used by Cocoa farmers while Copper 1 Oxide+Metalaxy (72.7%) in Kwara State while Lindane (71.3%) was the most popular insecticides, Copper 1 Oxide+Metalaxy (66.4%) are the most commonly used fungicides and herbicides in Ondo State respectively. Tijani (2006) also reported Thionex, Perenox, Cacaobre-Sandoz e.t.c in Ondo State. They also observed high percentage of literates and males among Cocoa farmers in Ondo, pesticides commonly used for Cocoa were listed as Gammalin 20, Copper

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Sulphate, Basudin and Aldrex. Adejori and Akinagbe (2022) also reported that Radomil Gold, Ultimax Plus and Red Force were used by Cocoa farmers as major pesticides approved by Cocoa Research Institute (CRIN) in Ondo. They also reported 91.2% male as users of pesticides and high percentage literates which affects their usage of pesticides positively since they can effectively read and understand chemical instruction manuals. Omokore et al. (2009) also reported Combat, Karate, Pyrethroid and Neem extracts as insecticides used to control pest on cabbage in Giwa and Zaria, Kaduna State. They also reported about 62% of men and 38% of women farmers partaking in the use of pesticides. Bulu et al. (2017) also observed higher number of male involvement than females in pesticides application in their study in Osun and Ogun States. This observation was also made by Sokoya et al. (2017) who opined that the reason is not far fetch and is because agriculture is generally regarded as an occupation of men in Africa. This statement is corroborated by Adekunle et al. (2017) in their study of effects of agricultural pesticide utilization on health of farmers in Egbeda Local Government Area of Oyo State, where they observed that male are prone to pesticides related health signs and symptoms more than female, this is associated to Nigeria Agriculture being dominated by males than females and that male farmers participated more in pesticides usage than females.

Adejumo et al. (2014) reported Aluminum phosphide (Phostoxin) as major chemical being used for storage of maize before sales in Kaduna State, Nigeria. According to Sule et al. (2020) in their study of pesticides utilization and associated health hazards in Kano metropolis, they reported pesticides in use as being ranged from extremely hazardous to slightly-hazardous pesticides such as Paraquat, Cypermethrin. Though, organophosphate were the frequent pesticides in use in Kano before such as pyrethroid (23.7%), Triazine, Paraquat and Phenoxo (7.9%) each, Phospline (5.3%) and others (7.8%). They also reported none of 34 identified pesticides in the study area being banned by NAFDAC, rather, they were found to be approved pesticides which are freely available in the open markets. Farmers were exposed to pesticides due to non-compliance with complete use of Personal Protective Devices (PPDs) in the study area.

### **Storage of Pesticides in Nigeria**

Many authors reported that pesticides containers are used for storing other substances used in household as stated by agricultural workers. Recently, it was

reported that a family of 24 individuals in Sokoto including youth, died after consuming groundnut meal seasoned with fertilizer salt mistaken as food seasoning (PTN, 2021). It was also observed that agrochemicals were often stored in the home using unlabeled containers. It was discovered in the interview conducted for some workers in Niger State that there were no proper orientation for the use and storage of pesticides before using them on the farm. Majority of farmers were interviewed in Kaduna and Ondo States and they testified that they always stored pesticides within their homes without having special locations for storing them. They just kept it anywhere in their living rooms, bedrooms or store where their food items were also kept due to the fear that the chemicals may be stolen (Cheke and Oluwole, 2009). The authors also reported that pesticides were being stored for months or more than one year especially when it was not completely consumed in the previous year and kept it against subsequent year.

Majority of Cocoa farmers (87.5 %) in Ondo State responded that they always keep their pesticides in stores, living rooms, bathrooms and kitchen (Tijani, 2006). Ugwu et al. (2015) also reported usual habit of farmers storing pesticides in its non-original container made it impossible for them to read the related safety labels. Sule et al. (2020) also reported about 86.7% of the farmer transporting pesticides to their homes, store and farms which were well packed with the other items. Economic Importances of Pesticides Use in Nigeria. The use of pesticides to protect crops from pest helped to reduce the losses significantly and also improve the crop yield. Pesticides also prevent man from being infected by malaria by killing the vector as well as protecting the cattle from diseases. Additionally, pesticides if continually used on the fields, are poisonous and can contaminate soil, water, persist on the crops, enter the food chain and ingested by human through food and water intake (Taylor et al., 2003). Oshatumberu et al. (2023) reported varied symptoms experienced by pesticide users in some markets in south west, Nigeria. Tijani (2006) in Ondo State reported 80% of farmers experiencing discomforts such as headaches, tiredness, vomiting, nausea, and skin problems after spraying pesticides. However, chest pains, burning sensation, skin redness, excessive salivation, shortness of breath/cough, itching eyes among others were reported as symptoms encountered by farmers in Oyo State. Similar observation was made by Williamson et al. (2008) in Benin, Ethiopia, Ghana and Senegal. Aminu et al. (2020) also reported discomfort manifested by farmers in Ondo and Kwara States after exposure to pesticides. Adesuyi et al.

(2018) reported similar symptoms by farmers in Lagos State after pesticides spray.

According to investigation carried out by Cheke and Oluwole (2009) in Ekiti State, Nigeria on harmful effect they suffer in the process of using pesticides, it was discovered that above 91% of farmers suffered from pesticides-related health symptoms, such as nausea, headache, vomiting, skin problems and eye irritation during application or spraying of pesticides.

Based on the study carried out in Kaduna, it was noted that majority of farmers were aware of the various pesticides-related discomforts/illness. Majority of them experienced skin irritation, coughing and eye irritation in the cause of pesticides application (Issa, 2021). In the findings of Issa (2021) on the use of Agrochemicals in Kaduna and Ondo States, he noted that majority of farmers testified to the fact that pesticides do cause environmental hazard such as food contamination, death of livestock/fishes, contamination of water and loss of biodiversity.

Many pesticides containers are supposed to be disposed after use but unfortunately, they are washed, cleaned and reused for storing water and food which in due course of time can cause serious health hazards to farmers and their families (Dinham, 1993; Tijani, 2006). Some Farmers do dispose or sell these pesticide containers or leave them on the field after use which when rainfall on the containers can pose serious dangers to nearby streams, animal feeds and child health (Ajayi and Akinnifesi, 2007).

Many farmers in Kaduna and Ondo States were aware of the health impacts and environmental pollution of pesticides but turn deaf ear to the effect due to high productivity expected on their farms. However, continuous exposure to pesticides can lead to varieties of health issues depending on the toxicity of pesticides and the rate of exposure (Adams, 1995; Cobble et al., 2005). This implies that the farmers might have been suffering from chronic diseases associated with pesticides exposure, such as cancer, brain disorder, depression, hormone and reproduction damage (Cheke and Oluwole 2009). Garmalin 20 and Malathion used in crop lands and post-harvest storage have been reported in different States of Nigeria where the consumption of such "poisoned food" resulted in the death of family members (Kola and Lawal, 1999).

A large number of vegetable Farmers in Oyo State have been reported to have skin irritation, dizziness, tightness in the chest, diarrhea, and breathing difficulties in the course of using pesticides. It was also noted that majority of pesticide users were males

(81.3%) (Ugwu et al., 2015). The study also implied that subsistence farmers are more prone to pesticide hazards due to self-involvement with the pesticides and lack of training on the pesticide usage. Use of pesticides according to study conducted by Akeem and Sofoluwe (2012), revealed that pesticide increases production, prevents diseases infestation and enhance the growth of maize and cocoa tree. However, excessive use of pesticides could damage the maize stand which can finally lead to loss on farmer's end. They also revealed that about 64.9% respondents affirmed that pesticide usage has effect on their health and on the soil while about 6% respondents attested to the fact that pesticides contaminate water body and killing the aquatic animals. Bulu et al. (2017) also observed that majority of pesticide users receiving phone calls during herbicide application and few of them ate, drank and smoke cigarettes while spraying as habits that could predispose them to health-related issues.

The reuse of empty containers of herbicides as domestic buckets for fetching waters or carrying other materials did not only expose individuals to chemical poisoning but also put them at risk of diseases such as cancer, heart failure, kidney problems etc. Majority of respondents on their perception and extent of using insecticides in cabbage production in Giwa and Zaria also attested that the pesticides usage cause pollution of environment but effective in controlling insect pests affecting their cabbage and enhance product quality. About 35.4% of respondents were reported by Tijani (2006) in Ondo State to use pesticides container for keeping palm-oil for cooking and other purposes which may lead to diseases. Majority of the respondents in Fadan Daji were exposed to agrochemical side effects due to lack of using personal protective devices due to ignorance and inability to purchase the materials for use during pesticides application (Bassi et al., 2016).

Environmental Degradation Effects of Pesticides Majority of farmers interviewed in Ondo and Kaduna revealed that they do wash the equipment used for pesticides spraying in nearby water which may affect the quality of the water body and can lead to fish death and other aquatic organisms like snails, frogs, crustaceans etc. For instance, round up (glyphosate) pesticide used by the farmers can cause decrease in the frog population and other aquatic organisms (Cheke and Oluwole 2009). This study also revealed that beneficial birds, insects and other animals may have reduced in population in the study area. The decrease in number of organisms could be due to accidental contact by the animals. Application of

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pesticides contribute immensely to environmental perturbation particularly when the pesticides are intentionally applied into the ecosystem, to control pest in agricultural fields, stagnant water etc. Wind and soil erosion are also factors that significantly help in the spread of pesticides which kill wild life while others suffer damage of their vital organs (Maton et al., 2016)

Many authors reported burning and burying of pesticide containers after use, which can pollute soil and water in the same environment. Based on the report observed by Sule et al. (2020), in Kano metropolis, Farmers indicated that they disposed pesticide containers by burying (18.7%), burning (18.7%), throwing into refuse heaps (33.3%), selling to buyers (29.3%). Only smaller numbers (1.3%) washed their pesticides containers for other domestic use. Burying and throwing into refuse heaps produce leachates when there is rainfall and can percolate the water table which may be dangerous for human consumption. Samantha (2011) opined that pesticides introduced into the air environment travel far and can be toxic to wild life. For instance, frog had been reported to have reproductive problems when it comes in contact with Atrazine pesticide. They are not only impacting the animal but also affect human when they are absorbed in the colon and slowly poison the body. Pesticides harmful impacts have been related to causes of birth defects, nervous system, cancer, reproductive and endocrine problems. Pesticides spray on the land may leak into ponds, seas, oceans, wells and Rivers via runoff, erosion and flooding during wet season thereby exposing the aquatic organisms to danger. Also, water consume from these streams and rivers by human being can be poisonous and cause lethal toxicity.

### Conclusion

It was discovered from the review that majority of farmers were misusing pesticides due to low education level, inability to read labels on the pesticide containers thereby mixing two or more chemicals which function differently. Many pesticide users were in habit of not wearing their complete Personal Protective Equipment (PPE). Eating, drinking and smoking cigarettes without considering the direction of wind during pesticides application were their habit. Some farmers do baths after pesticide application while others will just change their clothes. There is no gainsaying that many farmers were aware of the harmful impact of pesticides in their health while some could not realize it. However, high usage of pesticide on crops and food products were noted by authors which lead to

pesticide residues on the food intake and killing of consumers. Paraquat, Glyphosate, Atrazine, Metolachlor, Mancozeb-Metalaxy, Lindane or Gammalin 20 to mention but few were majorly used by farmers from this review.

Additionally, majority of authors reported high percentage of males as pesticide users than their female counterparts due to the fact that males are predominant farmers in Africa. High level of education was discovered to have impact on the usage of pesticides. Farmers are storing their pesticides in the living rooms, kitchen, stores etc for fear of stolen and also, many of them are using pesticide container for keeping eatable stuff in their houses. Vast majority of farmers in Southwest and Northern part of Nigeria experiences discomforts like nausea, vomiting, itching eyes, chest pains, burning sensation, excessive salivation which leads to some of them suffering from diverse health issues depending on the duration of exposure and the toxicity of the pesticides. In a nutshell, pesticide usage contaminate soil, water and causes reproductive dysfunction, affect hatching of eggs and cancer of different types in human. Therefore, there is need to monitor, educate and control the number of pesticides to be used on crops which in turn go back to the environment. Full awareness of its danger must be communicated to the users so as to reduce its impacts on the environment for survival of its inhabitants. Farmers must be in their complete attire before applying pesticides and also have basic education; at least secondary education to be able to read and understand the instructions on the pesticide containers.

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