



SOURCES OF INFORMATION ON THE USE OF AGRO-CHEMICALS BY ARABLE CROPS FARMERS IN ADAMAWA STATE, NIGERIA

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ABSTRACT

The study was carried out in Adamawa State to sources of information on the use of agro-chemicals by arable crops farmers in Adamawa State, Nigeria. Primary data was used for the study and the data was collected via the use of a well-structured questionnaire. Multi-stage and random sampling techniques were used to sample 365 respondents from the four ADP Zones in the state. Descriptive statistics such as frequency, mean, percentage and a 3 types rating scale were used. The result of this study established that majority (40%) of the respondents were within the age of 30-40 years, male respondents accounted for 56.4%, 33.4% had secondary education and 66% has no contact with extension workers while 60% of the respondents were not members of any cooperative association. Majority (74.8%) of the respondents sourced information on the use of agro-chemicals from fellow farmers. The study concluded that informal networks and personal relationships play a crucial role in the dissemination of information on agro-chemicals among farmers. The following recommendations were proffered; extension Services should be improved; use of digital platforms such as mobile apps and social media, ensuring that labels are clear, comprehensive and easy to understand can help increase their utility as a reliable source of information.

Key words: Agro-chemicals, Arable crops, Information and Sources

INTRODUCTION

Agro-chemicals are use in agriculture for their capacity to reduce pest and protect foods. Since their introduction in Africa by colonial masters, the use of these chemicals is constantly growing (Pouokam, 2019). The value or effectiveness of information is un-doubtfully dependent on how it is communicated to the people who needs it. For information to be useful to any category of beneficiaries, information has to be relevant, reliable, timely, and delivered through appropriate medium, (Boateng *et al.*, 2014). The dissemination of agricultural research information findings is critical in facilitating the application of reliable agricultural information by farmers. No matter how promising the agricultural information is, it needs to reach farmers for it to be useful (Lucky and Achebe, 2013). A good information source must be relevant, timely, accurate, cost effective, reliable, usable and exhaustive on an aggregate level. The information channels that people use may fulfill or fail to fulfill their information needs (Wilson, 1981). The objective of meeting the information needs of farmers depends not only on the existence of information needs, but also on the existing information access channels. Farmers relied on these sources of information because they are available to them most time and easily accessible by farmers. The information sources via these channels when properly utilize could influence high level of compliance to agro-chemical safety practice (Abegunrin *et al.*, 2020). The major source of agro-chemicals information to farmers comes from extension officers, agro-chemicals dealers, farmer colleagues, and the farmers' own self-intuitions. However, the majority of the smallholder farmers do not have access to extension services.



The effective use of agrochemicals is critical for enhancing agricultural productivity and ensuring food security. However, the sources of information that farmers rely on for the use of these chemicals present several challenges that can lead to improper usage, reduced effectiveness and adverse environmental and health impacts. Reliance on a wrong source can result in the dissemination of inaccurate or incomplete information, leading to improper use of agro-chemicals. Studies have shown that informal networks are often preferred due to their accessibility and trustworthiness within communities, but they may lack scientific accuracy (Johnson and Wilson, 2022). The insufficient knowledge regarding safe and proper pesticide handling by farmers in developing countries has led to extensive agricultural expansions at the expense of the health of farmers. The objectives of the study are to identify the socio-economics characteristics of the respondents and their sources of information on the use of agro-chemicals in Adamawa State.

MATERIALS AND METHODS

The Study Area

The study was conducted in Adamawa State; located in the North Eastern part of Nigeria. Adamawa State lies between Latitude $7^{\circ} 15^1$ and $10^{\circ} 58^1$ North of the equator and between longitude $11^{\circ} 09^1$ and $13^{\circ} 47^1$ E of the Greenwich Meridian (Adebayo *et al.*, 2020). It seats on a land area of 36, 917 square kilometers making it one the largest states in Nigeria. It has a population of 3,178,950 (2006 census) and projected to be approximately 4.2 million in 2024 (NPC, 2023). Adamawa State is bordered by Borno to the northwest, Gombe to the west, and Taraba to the southwest. It also shares International borders with Cameroon to the East. The mean monthly temperature of the State ranges from 26.7°C in the south and 29°C in the north eastern part of the state. Adamawa State has bimodal rainfall which starts in April and ends in October; the mean annual rainfall ranges from 700mm in the north eastern part of the state to 1600mm in the southern part of the state (Adebayo *et al.*, 2020). The monthly distribution of relative humidity is extremely low (20-30 %) between January and March but increases from April and reaches the peak of 83% in August. The major occupation of the people in Adamawa State is farming and trade. The main crops cultivated in the state include groundnut, soybean, maize, millet guinea corn, rice, yam cassava among others.

Sampling Procedure and Sample size

Four ADP Zones of Mubi zone (Zone 1), Gombi zone (Zone 2), Mayo-belwa zone (Zone 3) and Guyuk zone (Zone 4) were involved in the study. Multistage sampling technique was used to sample 365 arable crop farmers for the study. In the first stage, 30% of the LGAs in each of the ADP Zones was randomly selected; (Mubi Zone comprises five LGAs, 30% gave two LGAs, Gombi Zone comprises four LGAs, 30% gave one LGA, Mayo-belwa Zone comprises seven LGAs, 30% gave rise to two LGAs, while Guyuk Zone comprises of five LGAs, 30% two LGAs), these put together gave rise to seven LGAs that was used for the study. Also, 30% of the agricultural extension blocks in each of the selected LGAs blocks was randomly selected, this gave rise to 15 blocks. Again, 30% of the agricultural extension cells in each of the blocks selected was randomly selected for the study making up the 32 cells that was used for the study. Finally, Yamane Taro formula was employed to get the sample size of 365 from the list of the registered farmers.

Method of Data Collection

Data were sourced collected through the use of questionnaire while the secondary data were sourced through journal publications, ADP and through surfing the internet. Data obtained

were analyzed using descriptive statistics (such as percentage and frequency) and presented on a Table and Figures.

RESULTS AND DISCUSSION

Respondents' age distribution

The result in figure 1 shows that majority (41%) of the respondents are between the ages of 31-40 years and 21.2% are between 41-50years. Respondents between the ages of 20-30 are 15%, and 0.6% are above 70 years, 0.8% are less than 20 years. Those between the ages of 51-60 are 13.7% and 7.9% are between 61-70years accounts for the older respondent. These results indicate that the majority of the respondents are young and within their active age, as such, they will have multiple sources of information on the use of agro-chemicals. The mean age of all respondents is given as 42 years, . This is also the findings of Akioya and ikoyo-Eweto (2018), who reported that the average age of 42 years, which indicates that they are young, and fall within the economically active age group as such, they are most likely to be active in farming and tends to develop more interest in sourcing for information from various sources.

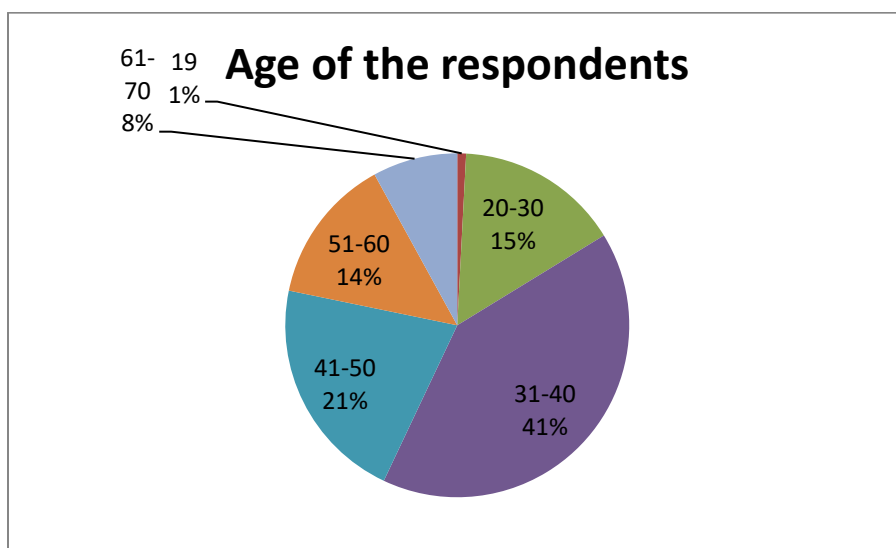


Figure 1: Respondents age distribution

Respondents' educational level

Educational level of the respondents determines if they could handle agro-chemicals safely or not. The majority (71.2%) of the respondents were literate, with an average period of 10 years spent in formal education. The result shows that 16.7% of the respondents had no form of education, 37.8% and 33.4% attained secondary and tertiary level of education respectively. The result further revealed that 9.9% of the respondents attained primary education and 2.2% had non-formal education. This result shows that the respondents were mostly educated. This result is in line with the work of Yirdaw (2021), who reported that farmers with high educational levels had better advantage over those with low education in terms of access to information on good and recommended agro-chemicals practices. Chen and Lu (2019), reported that those with lower

education level are more likely to get the information they need from their fellow-villagers or neighbour.

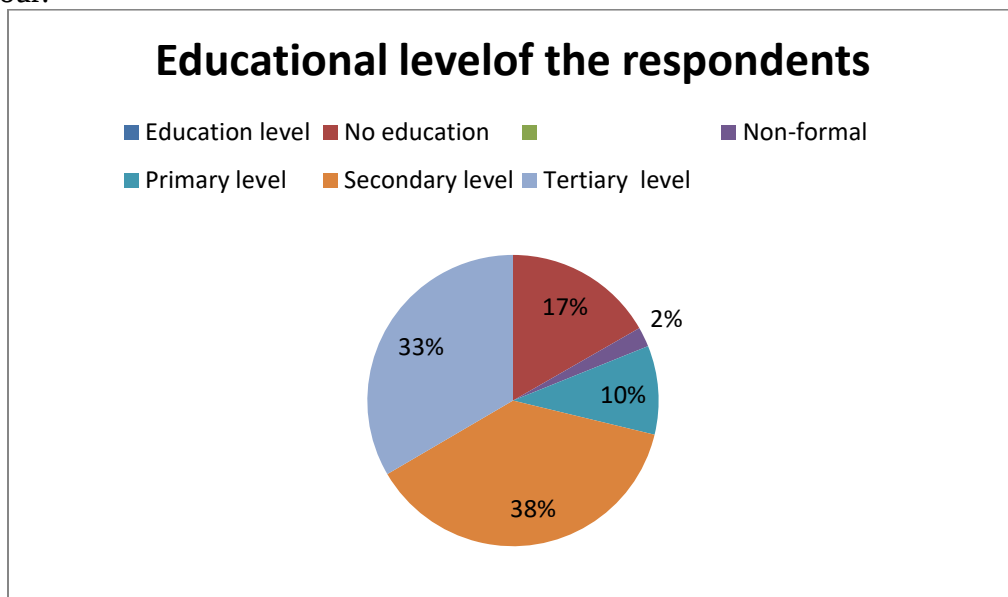


Figure 2: Respondents educational level

Respondents Sex distribution

Majority (56.4%) of the respondents were male and 43.6% were female. This finding may be so because men have more purchasing power than women. It is expected that male have more knowledge about agro-chemicals safety compared to female farmers, this could be attributed to the fact that male respondents had more access to many sources of information on the use of agro-chemicals. This finding is also similar to that of Tanko *et al.* (2018) who revealed that majority of the respondents were male.

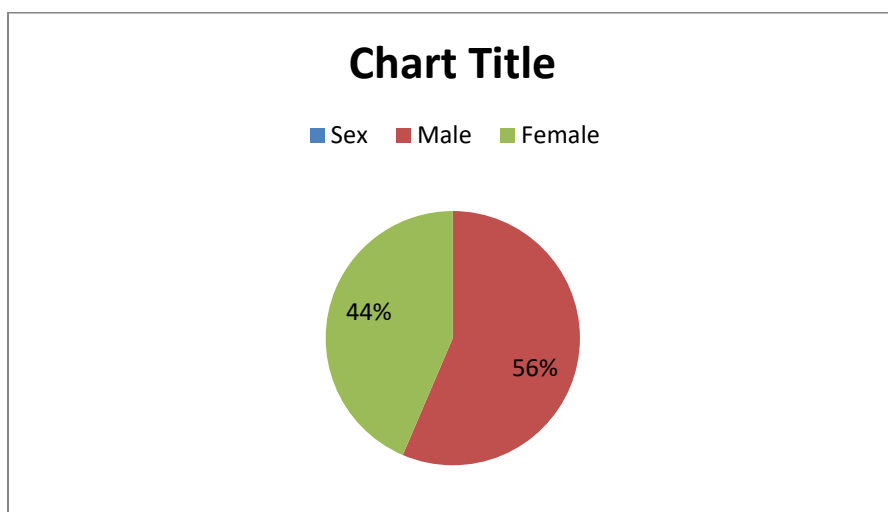


Figure 3: Respondents Sex distribution

Respondents' distributions of contact with extension workers

Contact with extension workers can significantly influence the type of information the farmers received on the use of agro-chemicals. Figure 4 shows that 66% of the respondents had no contact with extension workers, while 34% were reported to having contact with extension workers. The duties of the extension workers is to educate farmers about the safe handling of agro-chemicals, provide training on the proper use of protective gear and equipment to minimize exposure, raises awareness about the risks associated with unsafe handling of agro-chemicals including health and environmental hazards, promotes compliance to regulations and encouraging sustainable practices and strategies to alleviate risks, however, the finding of this research revealed that majority of respondents do not have contact with extension workers. This is in agreement with the works of Demi (2019); Lee (2020) who all reported that majority of the smallholder farmers do not have access to extension services. The implication of low contact with extension workers means majority of arable crop farmers in Adamawa connote not getting the correct information on the use of agro-chemicals. This finding is in agreement with the work of Bawa *et al.* (2020) who emphasized the importance of extension services in providing farmers with up-to-date information on safe agro-chemical use. Their study showed that farmers who had regular contact with extension agents were more likely to adopt safe practices and use protective equipment during pesticide application

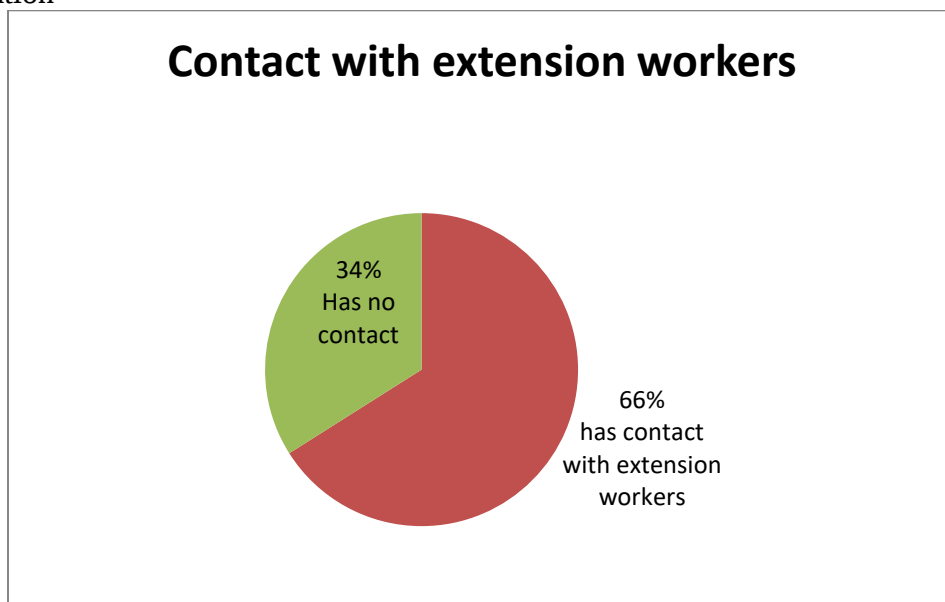


Figure 4: *Respondents' distributions of contact with extension workers*

Respondents' membership of social group

The membership in social groups or associations/cooperative societies can serve as a source of information on the use of agro-chemicals. Figure 5 shows that (60%) of the respondents do not belong to any social groups while 40% are members of social group/ cooperative societies. Being a member of a social group/association can provide access to information on best practices for agro-chemicals use, share knowledge and experiences, which can help improve awareness and promote safe use of agro-chemicals, provide opportunities for training and support. However, since the majority are not member of any social group, their chances of getting information on best

practices for agro-chemicals use was reduced. This agrees with the work of Bassi *et al.* (2016) who reported that not being a member of a social group can probably limit the farmers the opportunities to education in terms of proper procurement and use of agro-chemicals as knowledge on safety and health/risk management on agro-chemicals.

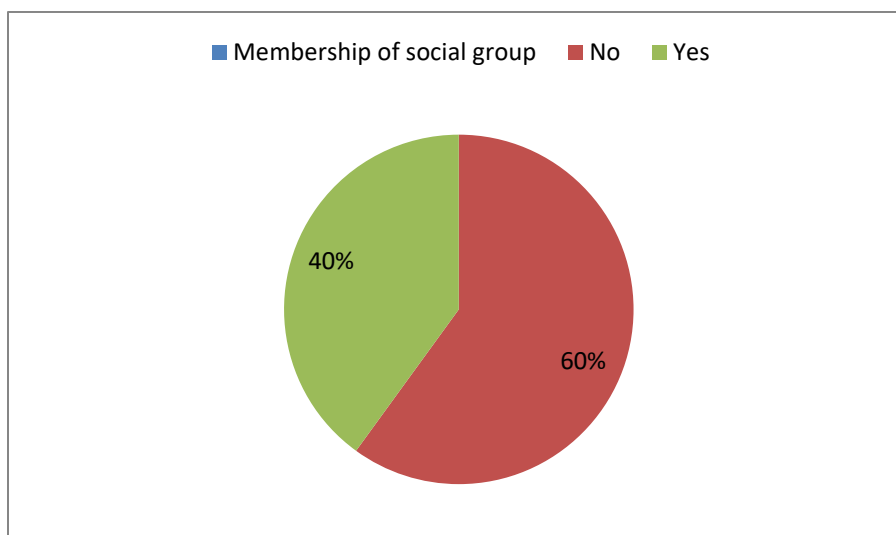


Figure 5: *Respondents' membership of social group*

Sources of information

The results show that only 8.5% of respondents always use radio as a source of information on agro-chemicals, while the majority, 67.4%, uses it sometimes, and 24.1% never use it. This suggests that radio is not a primary source of information for most respondents. Television: Similarly, television is always used by 4.4% of respondents, sometimes used by 70.5%, and never used by 25.2%. This indicates that television, like radio, is not a primary source of information.

Fellow Farmers: Majority (74.8%), always rely on fellow farmers for information, with 20.3% sometimes and only 4.9% never using this source. This indicates that fellow farmers are a highly trusted and frequently used source of information to arable crop farmers in Adamawa State. This is in tandem with the work of Akinola *et al.* (2020), who reported that farmers accessed most of their information on agro-chemicals use from fellow farmers, because fellow farmers are a highly trusted and frequently used source of information (Ali and Shah, 2021).

Dealers of Agro-chemicals: More than half of the respondents (52.6%) always use dealers of agrochemicals as a source of information, 22.2% use them sometimes, and 25.2% never use them. This suggests that dealers are a fairly common source of information. This finding is in line with the work of Shammi *et al.* (2018); Patel and Kumar, 2023, who reported that farmers accessed most of their information on agro-chemicals use from agro-chemicals dealers.

Family and friends are another primary source, with 74.2% of respondents always using them, 25.2% sometimes, and only 0.5% never using them. This finding is in line with the work Damalas and Khan (2017), who reported that majority of farmers, accessed information on the use of agro-chemicals from family and friend. Johnson and Wilson, (2022) emphasizes the importance of social networks in disseminating information.



Newspapers are the least used source of information, with only 0.8% always using them, 35.3% sometimes, and 63.8% never using them. This indicates that print media is not a preferred source of information among farmers. This is likely due to the lower literacy rates in rural areas and the limited reach of print media. As a result, valuable information on the safe use of agro-chemicals is not effectively communicated through this medium, (Ali and Shah, 2021).

Agro-chemicals Labels: Labels on agro-chemical products are always used by 13.7% of respondents, sometimes by 57.8%, and never by 28.5%. This shows that while labels are a significant source, they are not universally relied upon. This is in agreement with the work of Damalas and Khan (2017) that reveals that majority of respondents does not read the instructions written on pesticide containers.

Extension Workers: Extension workers are always used by 8.2% of respondents, sometimes by 39.4%, and never by 52.3%. This suggests that while extension services are valuable, they are not widely accessed or available to all respondents. The role of agricultural extension services cannot be overstated, as they are pivotal in disseminating information and providing on-the-ground support to farmers (Ghosh, 2019). However, they are not widely accessed or available to majority of the arable crop farmers in Adamawa State. This collaborated with the work of Demi (2019); Lee (2020) who all reported that the majority of smallholder farmers do not have access to extension services.

Table 1: sources of information on the use of agro-chemicals

Sources of information on the use of agro-chemicals	Always (%)	Sometimes (%)	Never (%)
Radio	31(8.5)	246(67.4%)	88(24.1)
Television	16(4.4)	257(70.5%)	92(25.2)
Fellow farmers	273(74.8)	74(20.3%)	18(4.9)
Dealers of agro-chemicals	192(52.6)	81(22.2%)	92(25.2)
Family and friends	271(74.2)	92(25.2%)	2(0.5)
Newspapers	3(0.8)	129(35.3%)	233(63.8)
Agro-chemical labels	50(13.7)	211(57.8%)	104(28.5)
Extension workers	30(8.2)	144(39.4%)	191(52.3)

Source: Field survey, 2024

CONCLUSION AND RECOMMENDATIONS

The study concluded that informal networks and personal relationships play a crucial role in the dissemination of information on agro-chemicals among farmers. This reliance on peers and family indicates a high level of trust and accessibility in these sources. However, the underutilization of extension services and traditional media highlights potential gaps in the formal dissemination of agricultural knowledge. The occasional use of agro-chemical labels suggests a need for better-designed and more user-friendly information on product packaging. The study recommended the following

- Strengthen Informal Networks:-** Given the high reliance on fellow farmers, family, and friends, efforts should be made to enhance the accuracy and reliability of information shared within these networks. Training and information sessions for key farmers and community leaders could be beneficial.



- ii. Improve Extension Services: - Since a significant portion of respondents never use extension services, increasing the accessibility and outreach of these services could improve the dissemination of accurate and up-to-date information on agro-chemicals.
- iii. Enhance Dealer Training: - Agro-chemical dealers are a key source of information. Providing them with comprehensive training and resources could ensure that they distribute accurate and safe usage instructions.
- iv. Utilize Mass Media: - While radio and television are not primary sources, they still reach a considerable portion of respondents. Developing targeted radio and television programs could help reach a wider audience.
- v. Leverage Agro-chemical Labels: - Ensuring that labels are clear, comprehensive, and easy to understand can help increase their utility as a reliable source of information.
- vi. Digital Platforms: - Exploring the use of digital platforms, such as mobile apps and social media, could provide additional avenues for information dissemination, especially among younger farmers.

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