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Crop farmers' perceptions on climate change's impact on farm produce in Gwagwalada area Council, Abuja

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Abstract

In Gwagwalada Area Council, Abuja, the study looked at crop producers' assessments of the consequences of climate change on farm produce. To sample 100 people, a basic random sampling procedure was used. The information gathered was evaluated with descriptive statistics. The purpose of the study was to discover several climatic elements that can effect farming systems, such as dawn (high temperature), rainfall, coldness, wind, and so on. High temperatures can affect crop yields, and severe rainfall can induce flooding and wash away nutrients in soil, rendering it inappropriate for planting, according to the study. Farmers are aware of a range of elements that can contribute to climate change, such as changes in rainfall, strong wind, high temperatures, and a lack of rainfall, according to the study's findings. The responders were on average 20 years old, with males accounting for 83 percent and females for 17 percent. It was also suggested that while organizing training programs, extension organizations consider the farmers' low level of education to ensure that they get the most out of the programs. Personal observation, family and friends, and personal observation, respectively, accounted for 40% and 23% of the climate change information available to rural farmers in the study area, with personal observation accounting for 63 percent of the climate change information available to farmers. According to the report, the communication gap between researchers and extension agents should be bridged. Extension professionals will be able to use this information to assist farmers in adjusting to the negative consequences of climate change.

Keywords: climate change, perceptions, farmers, agriculture, extension, rural

Introduction

In many nations, agriculture, particularly the production of food crops, is climate-dependent, as any change in optimal plant requirements can affect crop yield and productivity. It's a worldwide issue and one of the most basic issues the cosmos has ever confronted. It jeopardizes the livelihoods and well-being of millions of the world's poorest people (Agriculture Nigeria, 2014) [3]. Climate change's effects on water balance and agriculture, which are the primary sources of livelihood and survival for the vast majority of rural communities in the region, are having a significant impact on developing countries. Climate change, on the other hand, has had a significant impact on agricultural production in recent years. It's worth mentioning, though, that Africa accounts for less than 4% of global warming-related greenhouse gas emissions (Agriculture Nigeria, 2014) [3]. Experts say climate change has a wide range of impacts on agriculture (Agriculture Nigeria, 2014) [3]. Extreme weather occurrences, such as thunderstorms, strong winds, and flooding, can cause crop failure. In reaction to climate change and variation, pests and diseases migrate, producing uncertainty at the start of crop seasons. Overgrazing by rural populations has been blamed for desertification in the Sahel.

Natural rather than man-made elements, however, have had a greater impact in recent years. Farmers have been forced to adapt to changing conditions as a result of climate change, despite this. Climate change and fluctuation have already been predicted by academics from a wide range of disciplines on agricultural production. According to Ajadi *et al*. (2011) [4], variation in various climatic indicators indicates variation in crop output. Others pointed out that farmers are aware of climate change and its implications for their livelihoods, and that their perceptions influence the coping techniques they employ. For example, Ayanwuyi (2014) discovered that while arable farmers were increasingly aware of climate change and its consequences on their livelihood, due to poverty and illiteracy, their strategies for dealing with and limiting the scourge remained rudimentary.

As can be seen from the preceding, a large amount of research has been conducted in Nigeria to evaluate the impact of climate change and fluctuation on food crop productivity. Given the importance of food to human survival, this is predictable. However, the majority of these studies concentrated on rural agricultural output or arable farming. This is definitely true, given that rural areas meet the majority of the metropolitan population's agricultural needs. It's critical to distinguish between climate change and climate variability at this point. Many people use the terms

"climate change" and "climate variability" interchangeably. The two terms should not be used interchangeably. The former refers to long-term (decades) changes in climatic conditions, such as 25–30 years, whereas the latter refers to yearly or seasonal changes. Climate variability, according to Dinse (2011) [5], is the way the climate fluctuates yearly above or below a long-term average value, whereas climate change is a long-term continuous shift (increase or decrease) in average weather conditions (e.g. average temperature).

The obvious difference is that climate change is slow and gradual, and it is extremely difficult to discern without scientific data, unlike year-to-year variability (Dinse, 2011) [5]. Farmers' perceptions and awareness of climate change may influence how they respond to weather changes. According to study, people make decisions in their environment based on how they perceive it rather than how it truly is. Furthermore, farmers' perceptions tend to influence their coping strategies, which in turn determine the extent to which climate impacts agriculture (Ajadi *et al*., 2011) [4]. Climate change has climbed to the forefront of the twenty-first century's most critical challenges. Climate change will have an influence on human health, livelihood assets, food production and distribution networks, as well as changing purchasing power and market flows.

Agriculture is one of Africa's most vulnerable sectors to climate change's consequences (Falaki *et al*. 2012) [8]. Climate change has a greater impact in countries like Nigeria, where rain-fed agriculture is essential for daily existence. Changing rainfall patterns and rising temperatures are already affecting millions of Nigerians. Rainfall, cloudiness, and rainfall intensity are all expected to rise in the humid regions of southern Nigeria, especially during severe storms. Similarly, less rainfall is expected in northern Nigeria's savannah areas, which, combined with rising temperatures, may reduce soil moisture availability (Ogbo *et al*., 2013) [11]. The country's massive coastal population is exposed to rising sea levels and storm surges due to the country's 853-kilometer-long coastline. Drought and desertification threaten nearly two-thirds of Nigeria's land area. As a result, the availability of water is mostly governed by the weather, which has an impact on Nigerians' health and, eventually, poverty levels. Food, livelihoods, and survival are largely dependent on the physical environment for the country's almost 200 million people. Unfortunately, Nigeria lacks the financial and technological resources required to address the predicted negative effects of current and future climate change, and it has yet to fully establish an institutional and legal framework, systematic approach, or policies aimed at mitigating and adapting to the effects of climate change. Given the preceding, it is clear that ignoring climate change will significantly obstruct Nigeria's long-term poverty reduction and economic growth goals. Despite technological advancements such as improved varieties, genetically modified organisms, and irrigation systems, weather and climate continue to play a significant effect in agricultural output and soil quality.

According to the Climatic Institute, solar radiation, temperature, and precipitation are the major drivers of agricultural growth; as a result, agriculture has always been heavily reliant on climate patterns and fluctuations. Intensive agricultural methods are reported to have negative environmental effects and have been changing the global climate by emitting large amounts of greenhouse gases into the atmosphere, resulting in higher global temperatures and affecting hydrological routes; intensive agricultural methods are reported to have negative environmental effects and have been changing the global climate by emitting large amounts of greenhouse gases into the atmosphere, resulting in higher global temperatures and affecting hydrological routes; intensive agricultural methods are reported to have negative environmental effects and have been changing the global climate by emitting large amounts of greenhouse gases into the global According to Enete *et al*. (2011) [7], climate change has a direct impact on agricultural production because agricultural systems are climate-dependent, and the impact is especially significant in developing countries where agriculture provides employment and income for the majority of the population.

Objectives of the study

- describe the respondents' demographic information;
- identify the various climate changes that farmers are experiencing and how they are affecting their crop yields;
- find out where farmers can get information about climate change;
- identify the many sorts of climate change information that crop growers require.

Method and Materials

Study Area

Gwagwalada Area Council is one of the six Area Councils of the Federal Capital Territory administration (FCT). The study area is one of the Area Councils in Nigeria's Federal Capital Territory (Abuja). The location is between latitudes 805515211N and 90113411N, and longitudes 605113611E and 701113511E. (Ishaya and Baji, 2013). It is ideally located in the middle of the FCT, surrounded by highly productive agricultural territory. It is bordered on the south by Kwali Area Council, on the east by Kuje Area Council, on the north by Suleja, and on the east by the border town of Izom.

Among the settlements in the study area are Gwagwalada town, Kutunku, Dobi, TungaGayan, Gwako, Dukwa, Dagiri, Paso, Ibwo, Wumi, Zuba, TungaMaje, Giyabiri, Kwaita, Gurfata, Ashara, Ledi, Giri, Kaida, Kuturu, and a few others. For this investigation, the communities of Kaida Tsoho and Paiko in Dobi were chosen. The Area Council's climate, like that of most tropics climates, is characterized by a number of climatic factors, most notably the wet and dry seasons. The average annual temperature in the area ranges from 30°C to 37°C, with the highest temperature in March and about 1,650mm of rainfall per year. During the months of July to September, 60 percent of the annual rainfall falls. The area is drained by the major rivers within the research region, including the FCT, the River Usuma, and the River Gurara. With a population of 23,114 people, Gwagwalada, the study area's major community, is one of the largest satellite towns and the FCT's third largest urban center (Ishaya and Baji, 2013) [9].

Agriculture is one of the most important economic activities in Gwagwalada Area Council due to the favorable climate and soil conditions. The majority of Gwagwalada Area Council's indigenous people work in agriculture, which

includes peasant farming, logging, pond fishing, and animal farming (Ishaya and Baji, 2013) [9].

Method of Data Collection

The data was gathered in two ways: primary and secondary sources. Questionnaires were used as primary sources, with secondary sources including textbooks, the internet, journals, published and unpublished articles, and government publications.

Sampling Techniques

Two villages in the Paiko ward of the Gwagwalada Area Council that are known for their farming activities were chosen using simple random sampling. Angwan Bassa Deshi and Kaida Tsoho are the villages in question.

Method of Data Analysis

The descriptive statistical tool used to analyze the study data included frequency counts, mean, and percentage, which were used to analyze the respondents' socio-economic characteristics.

Socio-Economic Characteristics

Table 1 shows that the average age of the respondents was 20.0 years, with the majority (32%) falling between the ages of 31 and 40, and the least (2%) falling between the ages of 61 and above. This suggests that the majority of respondents were still in their working years and may require training to expand their knowledge, as farmers of this age are eager to learn new ways to improve their farm work. Men made up about 83 percent of those polled, and 98 percent of those polled were married. The majority of respondents had received formal education, with 45 percent having received the highest level of education (SSCE) and 14 percent graduating, while 21% had received no formal education. Because all (100%) of respondents had farming as their primary occupation, this implies that the majority of respondents had formal education and will require the assistance of an extension agent to fully understand climate change as it affects agriculture. Furthermore, 44% had been farming for 11 to 20 years. Farming lasted an average of 16.6 years. This means that a large number of farmers were aware of climate change and its negative impact on crop production firsthand.

Table 1: Distribution of respondents by socio-economic characteristics

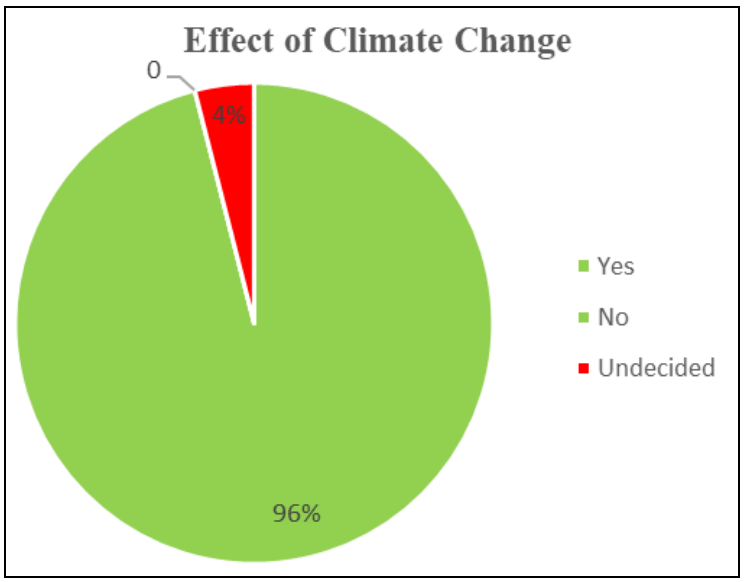
Variable	Frequency	Percentage	Mean
Genders of respondents			
Males	83	83	
Females	17	17	
Marital status			
Married	98	98	
Single	2	2	
Literacy level			
Literate	23	23	
Illiterate	77	77	
Educational qualification			
No formal education	21	21	
Primary education	11	11	
Secondary education	45	45	25.0
Tertiary education	23	3	
Occupation			
Crop farmers	100	100	
Age distribution of respondents			
20-30	24	24	
31-40	32	32	
41-50	31	31	
51-60	11	11	20.0
61 and above	2	2	
Years of farming distribution			
0-10	7	7	
11-20	44	44	
21-30	29	29	
31-40	15	15	16.7
41-50	4	4	
51 and above	1	1	

Source: Field Survey, 2021

Figure 1 depicted the negative effects of climate change in the research area, which are affecting crop productivity. Climate change has had an impact on crop output, according to 96 percent of respondents, while the remaining 4% were unclear. However, among the 96 percent, 15 percent said climate change has caused heavy rainfall and flooding, lower grain quality due to rainfall shortage and rise in pests and diseases caused by temperature, 23 percent said climate change has caused lower grain quality due to rainfall shortage and rise in pests and diseases caused by temperature, 16 percent said climate change has caused lower grain quality due to rainfall shortage, and 25 percent said climate change has caused lower grain quality due to rainfall shortage and rise in pests and diseases caused by

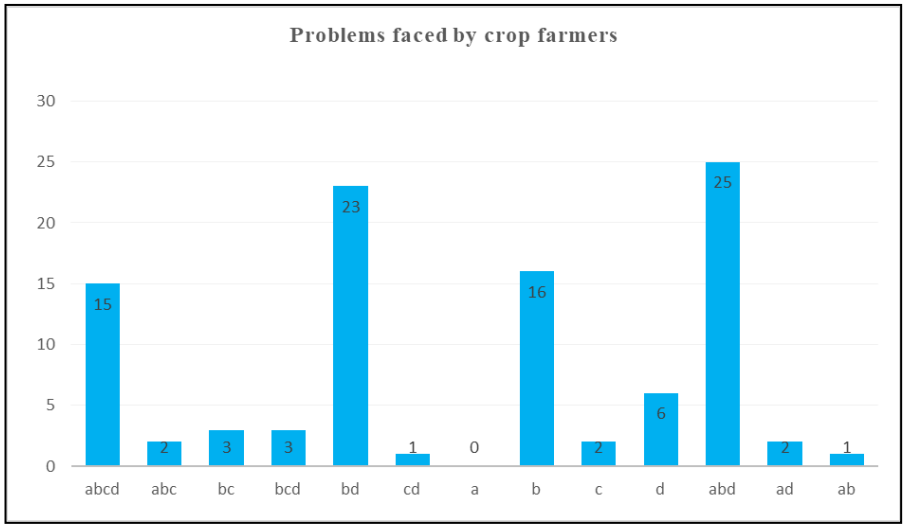
temperature. According to the data, about 25% of the respondents had similar climate change effects, such as flooding, a lack of rainfall, and an increase in pests and diseases, all of which were prevalent climate change effects in the study area.

These findings are in line with those of Parry *et al*. (2007), who claimed that diseases are expected to move from the tropics to the temperate and northern areas as a result of climate change. They also claimed that a number of nations in Sub-Saharan Africa (SSA) were already suffering from severe water scarcity due to low and irregular rainfall, as well as flooding.



Source: Field Survey, 2021

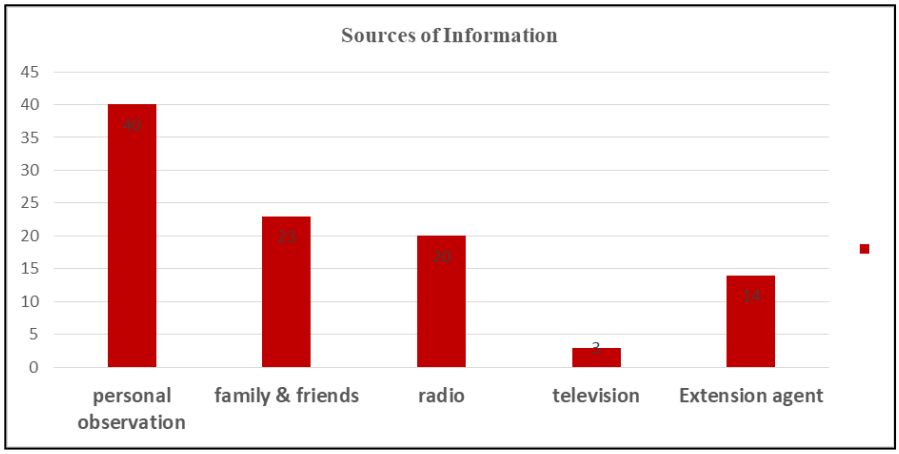
Fig 1: Effect of climate change



Source: Field Survey, 2021

Fig 2: Alleged problems resulting from climate variations

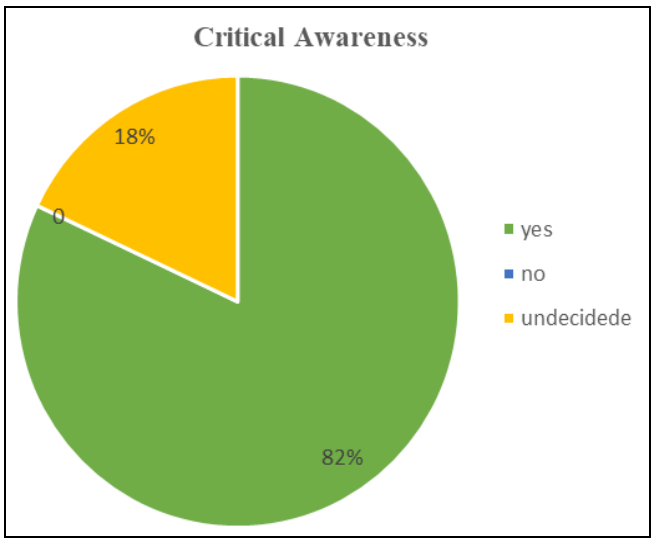
Keys: (a) Heavy rainfall and flooding**. (b)** Lower grain quality due to shortage of rainfall. **(c)** Erosion caused by excessive rainfall. **(d)** Rise in pests and diseases caused by temperature.



Source: Field Survey, 2021

Fig 3: Sources of Information

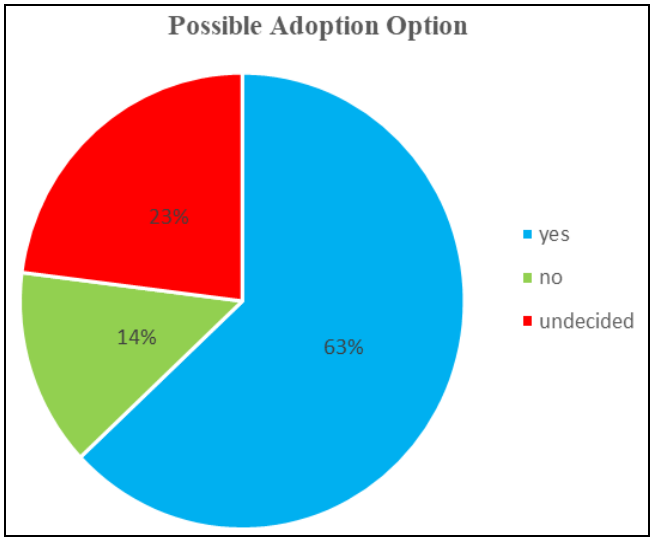
Fig 3 depicted the major sources of information through which rural farmers in the study area received information on climate change: personal observation (40%), family and friends (23%), radio (20%), and television (3%), with only 14% indicating extension as a source of knowledge on climate change. According to respondents' perceived reliability of information sources, personal observation and family and friends accounted for 40% and 23% of the information on climate change available to farmers, respectively, accounting for 63% of the information on climate change available to farmers. And the implication was that these were not scientifically based agricultural knowledge. Television was the least used source of information, accounting for 3%, implying that fewer people owned televisions due to a lack of electricity in the communities.



Source: Field Survey, 2021

Fig 4: Critical Awareness

According to Fig 4, approximately 82% of respondents believe that climate change can be controlled through critical awareness, while 18% believe that climate change is a natural phenomenon that cannot be controlled.



Source: Field Survey, 2021

Fig 5: Possible Adoption Option

According to Fig 5, approximately 63% of respondents indicated that farmers can adopt possible climate change adaptation options, 23% were undecided, and 14% indicated no possible climate change adaptation options. This implies that the majority of farmers are eager to learn about and implement possible adaptation options for controlling and managing climate change. Farmers' perceptions and understanding of climate change may influence how they react to weather variations. It has been established that people make decisions in their surroundings based on how they perceive them rather than how the surroundings are. Furthermore, farmers' perceptions tend to influence their coping strategies, which ultimately determine the degree to which climate impacts agriculture (Ajadi *et al*. 2011) [4].

Conclusion

The researcher came to the following conclusions based on the study's findings:

- All respondents stated that the climate has changed. As a result, the likelihood of farmers taking adaptive measures in response to observed climate changes is high.
- The majority of respondents had only a passing

understanding of agricultural climate change issues. This has serious consequences for farmers' ability to adapt to the effects of climate change.

- Many sources of climate change information, such as extension agents, radio, and television, had limited availability and usage. As a result, farmers may be lacking in scientific knowledge on agriculture-related climate change issues.
- Long years of farming experience played important roles in farmers' climate change decision-making processes, as the majority of respondents considered personal observation to be the most reliable source of climate change information.
- Farmers were less interested in the causes and effects of climate change, which could be due to respondents' belief that they were powerless to intervene.
- vi. In the study area, poor extension services and infrastructure were major barriers to effective climate change communication.
- As a result, farmers perceived that improved extension services and infrastructure could be used to improve information dissemination on climate change among rural farmers.

Recommendations

- In Gwagwalada, extension agents should be mobilized for a huge enlightenment campaign on agriculture-related climate change issues, particularly on market days and through social and religious groups. The University of Abuja's Faculty of Agriculture's outstanding efforts to disseminate climate change information to rural people should be commended by the university administration and the state government, so that the gestures might be expanded to other area councils outside of Gwagwalada.
- Farmers must be taught climate change adaptation and mitigation strategies in a participatory manner (interactive telephone program) by specialists in climate change communication through the mass media. To cope with the unpredictability of climate change, farmers should be trained how to use superior varieties and modify the timing of farm operations.
- The communication gap between researchers and extension agents must be bridged. Extension agents will be better positioned to assist farmers in adapting to the negative consequences of climate change as a result of this.
- The needs of the target audience for whom the climate change information is intended should be considered, and this information should be disseminated by experts who are fluent in vernacular language. To achieve the desired multiplier effects, local and religious leaders should be utilized.
- Extension organizations should consider the farmers' low level of education when designing training programs in order to fully benefit them from the programs.

References

1. Adesiji GB, Matanmi BM, Onikoyi MP, Saka MA. Farmers' perception of climate change in Kwara State, Nigeria. World Rural Observer. 2012;4(2):46-54.
2. Agriculture Nigeria. Climate change effects on agriculture in Nigeria. Retrieved from http.//www.agriculturenigeria.com. 19th October, 2021.
3. Agriculture Nigeria. Climate change effects on agriculture in Nigeria. Retrieved from http.//www.agriculturenigeria.com. 2nd may, 2014.
4. Ajadi BS, Adeniyi A and Afolabi MT. Impact of climate change on urban agriculture: A Case Study of Ilorin City, Nigeria. Global Journal of Human Social Science. 2011;11(1):25-29.
5. Dinse K. Climate variability and climate change: What is the difference? Retrieved from: www.miseagrant.umich.edu/climate (Accessed 12/10/2021). 2011.
6. Egbule CL, Agwu EA. Sources of information and awareness of government programmes on climate change among rural households in the Niger Delta region of Nigeria. Journal of Agricultural Extension Society of Nigeria. 2011;15(2):9-22.
7. Enete AA, Madu II, Onwubuya EA, Onyekuru AN, Mojekwu JC, Eze F. Indigenous agricultural adaptation to climate change: Study of southeast Nigeria. African technology Policy Studies Network TECHNOPOLICY BRIEF/ No. 25 Website: www.atpsnet.org, 2011.
8. Falaki AA. Analysis of climate change and rural farmers' perception in North central Nigeria. Global Journal of Agricultural Research. 2012;43(2):133-140.
9. Ishaya S, Baji AJ. Indigenous People's Perception of Climate Change Impact on Biodiversity in Gwagwalada Area Council of Federal Capital Territory of Nigeria. International Journal of Agricultural Economics, Rural Sociology and Development (IJARD). 2013;5(1)1-11.
10. Nsukka JC, Onyek AN, Onwubuya EA, Eze. Indigenous Agricultural Adaptation to Climate Change: Study of Southeast Nigeria. Published by the African Technology Policy Studies Network, Nairobi Kenya. Enugu State Government Official, 2011.
11. Ogbo A, Lauretta NE, and Ukpere W. Risk management and challenges of climate change in Nigeria. Journal of Human Ecology. 2013;41(3):221-235.