Knowledge, Attitude and At-risk Behaviour of Livestock Farmers towards Global Warming in Oyo State, Nigeria

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Abstract
The negative consequences of global warming have debilitating effects on human and environment. Due to some unfavourable practices that are associated with livestock productions, the world is experiencing worsening air quality, rising temperatures and increased frequency of extreme weather events. Despite its inimical health consequences on human and environment, the preceding studies focused mainly on knowledge, attitude and practices of global warming, with little attention on behaviours that can increase the risk of experiencing global warming, particularly among livestock farmers. Hence, this study investigated knowledge, attitude and at-risk behaviour towards global warming among livestock farmers inOyo State, Nigeria. A cross-sectional research design was employed in this study, while livestock farmers were the population. The disproportionate stratified and simple random sampling techniques were used to select a total of one hundred (100) respondents. A self-developed questionnaire was used for data collection. The descriptive and inferential statistics of Pearson Product Moment Correlation were used for data analysis. The results revealed that the level of knowledge of global warming was high (weighted mean=1.79) among livestock farmers in Oyo State, attitude (weighted mean=2.65) was positive; while at-risk behaviour (weighted mean=1.64) were negative. Moreover, there was a significant positive relationship between knowledge and attitude towards global warming (r=0.897) among the livestock farmers; while knowledge had negative relationship with at-risk behaviour (r=-0.800) among the respondents. It was established that, the level of knowledge of global warming was high among livestock farmers in Oyo State; attitude was positive; while their at-risk behaviour was negative. Knowledge had a significant positive relationship with attitude, but had a negative relationship with at-risk behaviour of the farmers. The Oyo State Ministry of Environment should ensure that periodic health education is organised for livestock farmers to improve their attitude and behaviour that could contribute to global warming.

Keywords: Global warming, Livestock farmers, Knowledge, Attitude and At-risk Behaviour

Introduction

The issue of global warming has become a crucial and impending concern across the world. As such, its effects are already visible as the planet's average temperature continues to rise. This in turn has already seen an increase in the intensity of natural disasters, the extinction of species, rising sea levels and the loss of human lives. In relation to this, timely climate intervention is not only important, but also necessary for human survival. Extreme weather has caused the deaths of 2 million people and $4.3 trillion in economic damage over the past half a century (United Nations, 2023; World Meteorological Organization, 2023). Since 1880, the earth's average temperature has increased by 0.140 degrees Fahrenheit every decade. Then, since 1981, the rate of warming has increased by more than twice that amount; which is 0.180 Celsius (0.320 Fahrenheit) (Lindsey & Dahlman, 2022). Also, since the industrial revolution, the temperature of the air on earth has increased; due to human action as well as notably emissions of heat-trapping greenhouse gases (Intergovernmental Panel on Climate Change [IPCC] 2020).

In the same vein, it has been established that the detrimental effects of global warming affects agriculture directly and indirectly. In addition, there are connections between global warming and agriculture as well as two worldwide phenomena. The warmest year on record is a tie between the years 2016 and 2020 (National Aeronautics and Space Administration [NASA]. 2020). The five warmest years on record have all happened since 2015, while nine of the ten warmest years since 1880 have happened since 2005 (Mac Millan & Turrentine 2021). It was further established that the effects of climate change are already impacting people, refuting the assertion made by climate change skeptics that there has been a pause or slowdown in the rise of global temperatures (Natural Resources Defense Council, 2022).

The term global warming refers to the shift in temperature mostly caused by various human activities, such as the burning of fossil fuels (coal, oil and gas) and extensive deforestation, which release greenhouse gases into the atmosphere (Houghton 2005). These gases act as blankets over the earth, absorbing infrared radiation and maintaining a cooler climate. Extreme weather occurrences like heat waves, droughts, cyclones, wildfires, blizzards and rainstorms are on the rise as a result of this. Based on its negative consequences on ecosystems and human populations which include significant sea level rise; global warming is one of the most important environmental problems (Conserve Energy Future, 2020). This can prevent some of the sun's heat from bouncing back into space and maintain a habitable climate on earth; greenhouse gases are a natural occurrence and are vital to the existence of people and numerous other species.

On the other hand, the amount of greenhouse gases in the atmosphere has increased to record levels not seen in three million years following more than a century and a half of industrialization, deforestation and large-scale agriculture (United Nations, 2019). The total amount of greenhouse gas (GHG) emissions increases along with population growth, economic expansion, and improvements in living standards. Alarming research suggests that crucial tipping points that could

have resulted in permanent changes to the planet's climate system and major ecosystems have already been achieved. Moreover, Amazon rainforest may be on the verge of contributing significant change to ecosystem due to warming and drying (Rasmuseen, 2021; Mohanty, Robson, Ngueping& Swayam, 2021). Due to a decrease in precipitation and an increase in temperature, droughts have also become a constant in Nigeria and are anticipated to persist in Northern Nigeria (Eze, 2018; Orakpo, 2021; Ragatoa, Ogunjobi, Klutse, Okhimambe&Eichie (2019; Haider, 2019). Reducing agricultural emissions, namely methane and nitrous oxide, could play a substantial role in mitigating global warming, as agricultural activities contribute significantly to anthropogenic global warming (Lynch, Cain, Frame &Pierrehumbert, 2020). Although some natural occurrences contribute to greenhouse gases emissions, the overwhelming consensus among the world's most reputable climate scientists is that human activities are responsible for most of this increase in temperature.

A number of recent, well-known papers have also called attention to agricultural emissions especially, livestock (Poore, & Nemecek, 2018). It also emphasized the possibility of a reduction in order to adhere to environmental commitments (Springmann, Clark, Mason-D'Croz, Wiebe, Bodirsky&Lassaletta, 2018). The impact of methane (CH_4) and nitrous oxide (N_20), the two main greenhouse gases emitted from agricultural output and specifically how they differ from carbon dioxide, appear to be increasingly neglected or misinterpreted in many studies of agriculture's involvement in global warming (CO_2). Understanding these variations is essential for understanding what the mitigation of various gases may accomplish in the context of the Paris temperature goal as well as for informing policy decisions. Methane and nitrous oxide, two potent greenhouse gases are released in substantial quantities by animal and crop production, respectively (United Nation Environment Programme, 2021; Environmental Defence Fund, 2018). Livestock create methane during digestion as a result of enteric fermentation, which is then expelled through the farts and belches of ruminant animals.

Methane is a byproduct of the digestion process known as enteric fermentation, which occurs in the rumen of cattle and transforms carbohydrates into simple molecules for blood absorption. It can also escape from organic waste and manure that have been stored in landfills. Since the start of record keeping in the 1980s, methane has been responsible for around 30% of the global warming that has occurred (United Nation Environment Programme [UNEP], 2021). In actuality, carbon dioxide emissions decreased during the pandemic-related lockdowns of 2020, but atmospheric methane increased (National Oceanic and Atmospheric Administration, 2020). In spite of nitrous oxide's growing contribution to global warming and impact on the ozone layer, not much has been done to control this climatic pollutant.

Agriculture, particularly bacteria in fertilized soils and animal dung, is the primary source of nitrous oxide. It is a powerful greenhouse gas that can trap heat around 300 times better than carbon dioxide (Shankman, 2019). One of the main greenhouse gases is nitrous oxide. Pesticides,

fertilizers and other harmful agricultural chemicals have the potential to contaminate fresh water, marine habitats, air, and soil. Such harmful agricultural may also linger in the environment for many years. Numerous pesticides are suspected of interfering with both people and wildlife's hormonal systems. Also, runoff from fertilizers affects coral reefs and streams. Agriculture-related land-use changes have a much greater impact on global warming (World Wildlife Fund, 2018). In order to comprehend and address the global climate catastrophe, demographic patterns and variables are crucial. By 2050, an extra 2 billion people will join the human race, and an additional 1 billion by 2100 (United Nations, 2019).

Emissions of greenhouse gases, which affect the climate, tend to rise as a result of population growth and rising consumption. Rapid population expansion exacerbates the effects of global warming by taxing resources and putting more people at danger from climate-related hazards, particularly in areas with limited resources (Population Action International, 2011; NASA & Goddard Institute for Space Studies, 2020). The global average temperature has increased to nearly 10 C (nearly 20 F) above pre-industrial levels; which estimates that human emissions of greenhouse gases like carbon dioxide (C02), methane (CH4), and nitrous oxide (N2O) are for increase in greenhouse gasses (World Meteorological Organization, 2019).

It has been widely reaffirmed in the Paris Agreement's objective of keeping the rise in the world's average temperature well below 20 C and pushing efforts to keep it at or below 1.50 C (United Nations, 2021). The United Nations member countries continued by expressing shock and grave concern over the 1.10 C of warming that has been produced by human activity to date and the fact that effects are already being felt in every region. The average temperature increase on earth is predicted to reach 1.50 C between 2030 and 2052 if current warming trends continue (IPCC, 2018). It was revealed that any increase in global warming above this point would harm many of the planet's terrestrial and marine ecosystems by sharply increasing the probability and frequency of extreme weather occurrences. It also requires reducing the amount of tree cutting and cow farting. It has been established that global energy efficiency improvements, energy production from renewable resources like solar and wind, electrification of transportation as well as the use of backpacks to collect cow fart and belch would all help to lower greenhouse gas emissions (Gradin& Luttropp, 2018; Bhatnagar, 2020).

The actions of livestock farmers among others that are adding to the planet's warming, according to a growing body of scientific evidence. Sea levels have generally risen in recent decades as a result of the livestock sector increased emissions of greenhouse gases such carbon dioxide, methane and nitrous oxide. Based on initial observations, at-risk practices of commercial farmers include deforestation, bush burning, rice cultivation, usage of nitrogen fertilizer and enteric fermentation from cattle continue to contribute to global warming. If the effects of global warming are left unresolved, the impact on ecosystems and human quality of life may be devastating. As such, the knowledge, attitude and at-risk behaviour of critical stakeholders like livestock farmers

are important to mitigation of the obstinate effects of global warming, particularly in an agrarian state such as Oyo State. However, there is a dearth of research efforts on this, specifically among commercial livestock farmers in Oyo State.

Research Questions

The following research questions were answered in this study:

1. What is the level of knowledge of global warming among livestock farmers in Oyo State?
2. What is the attitude of livestock farmers in Oyo State towards global warming?
3. What is the at-risk behaviour of livestock farmers in Oyo State towards global warming?

Hypotheses

The following hypotheses were tested in this study at 0.05 alpha level.

1. There is no significant relationship between knowledge and attitude towards global warming among livestock farmers in Oyo State.
2. There is no significant relationship between knowledge and at-risk behaviour towards global warming among livestock farmers in Oyo State.

Methodology

A cross-sectional research design was used in this study; while the registered livestock farmers who were members of the Oyo State Agric-business Development Agency constituted the population for the study. Multistage sampling procedure was used to select a total of one hundred (100) respondents.A self-developed and validated instrument titled Knowledge, Attitude and at-risk behaviour towards Global Warming Questionnaire; with a reliability value of 0.72. The descriptive statistics were used to analyse the demographic data and research questions. Also, inferential statistics of Pearson Product Moment Correlation was used to test the hypotheses.

Results

Demographic variables:

Table 1: Distribution of the Respondents by Gender and Age

S/n	Variables		Frequency	Percent (%)
1.	Gender	Male	84	84.0
		Female	16	16.0
2.	Age	18-24 years	3	3.0
		25-31 years	8	8.0
		32-38 years	7	7.0

		39 years and above	82	82.0

As indicated in table 1, most of the respondents were male (84.0%), the females constituted 16.0%. Similarly, most of the respondents were 39 years and above, followed by those in the age range of 2531 years (8.0%) as well as those in the age range of 32-38 years (7.0%) respectively; while those in the age range of 18-24 years (3.0%) were few.

Research Questions:

Research Question 1: What is the level of knowledge of global warming among **livestock farmers in** Oyo State, Nigeria?

Table 2: Summary of Result on the Knowledge of Global Warming

S/n	Statement	Yes (%)	No (%)	Mean	SD
1.	Global warming is a gradu al increase in the earth's temperature generally due to the greenhouse effect	81 (81.0%)	19 (19.0%)	1.81	0.39
2.	Global warming describes the current rise in the average temperature of earth's air and oceans	81 (81.0%)	19 (19.0%)	1.81	0.39
3.	Agricultural and industrial activities like deforestation can have effect on the atmosphere	67 (67.0%)	33 (33.0%)	1.67	0.47
4.	Application of nitrogen fertilizer can cause global warming	69 (69.0%)	31 (31.0%)	1.69	0.47
5.	Global warming is responsible for fluctuat ion of different pattern of rainfall	71 (71.0%)	29 (29.0%)	1.71	0.46
6.	Global warming has Significant effect on the yield of crop production in Nigeria	96 (96.0%)	4 (4.0%)	1.96	0.20
7.	Global warming is responsible for heavy rainfall and scorching sunshine.	77 (77.0%)	23 (23.0%)	1.77	0.42
8.	Some of the floods in this country are due to global warming	80 (80.0%)	20 (20.0%)	1.80	0.40
9.	Excessive heat waves and windstorm are consequences of global warming	79 (79.0%)	21 (21.0%)	1.79	0.41

10.	Fart an d belch from cattle and other ruminant animals can contribute to increase global warming	82 (82.0%)	18 (18.0%)	1.82	0.39
11.	Use of backpacks for collecting cow's fart and belch usually help reduce global warming	84 (84.0%)	16 (16.0%)	1.84	0.39
Total				Weighted mean=1.79	

Decision Rule: <0.49=Low; 1.50–1.99=High; 2.00=Very High

Based on the responses, it was revealed that most respondents responded positively to the question items. As shown in table 2, 81 (81.0%) respondents affirmed that global warming is a gradual increase in the earth's temperature generally due to the greenhouse effect, while 9 (19.0%) did not. Furthermore, 81 (81.0%) respondents confirmed that global warming describes the current rise in the average temperature of earth's air and oceans, while 19 (19.0%) did not. Likewise, 67(67.0%) respondents acknowledged that agricultural and industrial activities like deforestation can have effect on the atmosphere, while 33(33.0%) did not. Furthermore, 69 (69.0%) respondents admitted that application of nitrogen fertilizer can cause global warming, while 31 (31.0%) did not. Additionally, 71 (71.0%) respondents confirmed that global warming is responsible for fluctuation of different pattern of rainfall, while 29 (29.0%) did not. Also, 96 (96.0%) respondents established that global warming has significant effect on the yield of crop production in Nigeria, while 4 (4.0%) did not.

Besides, 77 (77.0%) respondents acknowledged that global warming is responsible for heavy rainfall and scorching sunshine, while 23 (23.0%) did not. Also, 80 (80.0%) respondents acknowledged that some of the floods in this country are due to global warming, while 20 (20.0%) did not. Furthermore, 79 (79.0) respondents acknowledged excessive heat waves and windstorm are consequences of global warming, while 21 (21.0) did not. Additionally, 82 (82.0%) respondents acknowledged that fart and belch from cattle and other ruminant animals can contribute to increase in global warming, while 18 (18.0%) did not. Besides, 84 (84.0%) respondents acknowledged that use of backpacks for collecting cow's fart and belch usually help reduce global warming, while 16 (16.0) did not. Table 2 further revealed that the weighted mean was 1.79 which indicated that the score was high based on the decision rule. This means that the level of knowledge of global warming was high among livestock farmers in Oyo State, Nigeria.

Research Question 2: What is the attitude of livestock farmers in Oyo State towards global warming?

Table 3: Summary of Result on Attitude towards Global Warming

S/n	Statement	SA	A	D	SD	**Mean**	**SD**
1.	I don't believe in bio enzyme method of clearing bush.	38 (38.0%)	4 (4.0%)	7 (7.0%)	51 (51.0%)	2.71	1.42
2.	I don't believe that emissions from cattle can affect the environment	37 (37.0%)	4 (4.0%)	8 (8.0%)	51 (51.0%)	2.73	1.41
3.	I don't believe that deforestation increases the amount of carbon dioxide in the atmosphere	33 (33.0%)	7 (7.0%)	21 (21.0%)	39 (39.0%)	2.66	1.30
4.	Fart and belch from cattle have no relationship with increase in global warming in my own view	26 (26.0%)	14 (14.0%)	21 (21.0%)	39 (39.0%)	2.73	1.23
5.	The use of backpacks for collection of cow's fart and belch is not necessary	41 (41.0%)	9 (9.0%)	19 (19.0%)	31 (31.0%)	2.40	1.30
						Weighted mean=2.65	

Decision Rule: *Highly positive=4.00-3.00, Positive=2.99-2.00, Negative=1.99-0.99, Highly negative= 0.01-0.00.*

Table 3 reveals that 38 (38.0%) respondents strongly agreed that they don't believe in bio-enzyme method of clearing bush, 4 (4.0%) agreed, 7 (7.0%) disagreed, while 51 (51.0%) strongly disagreed. Furthermore, 37 (37.0%) respondents strongly agreed that they don't believe that emissions from cattle could affect the environment, 4 (4.0%) agreed, 8 (8.0%) disagreed, while 51 (51.0%) strongly disagreed. Additionally, 33 (33.0%) respondents strongly agreed that they believe deforestation increases the amount of carbon dioxide in the atmosphere, 7 (7.0%) agreed, 21 (21.0%) disagreed, while 39 (39.0%) strongly disagreed.

Also, 26 (26.0%) respondents strongly agreed that fart and belch from cattle have no relationship with increase in global warming, 14 (14.0%) agreed, 21 (21.0%) disagreed, while 39 (39.0%) strongly disagreed. Besides, 41 (41.0%) respondents strongly agreed that use of backpacks for collection of cow's fart and belch is not necessary, 9 (9.0%) agreed, 19 (19.0%) disagreed, while 31 (31.0%) strongly disagreed.Based on the responses, it was revealed that most respondents responded positively to the negatively developed question items. Table 3 further revealed that the weighted mean was 2.65 which indicated that the score was positive based on the decision rule.

This means that attitude towards global warming was positive among livestock farmers in Oyo State.

Research Question 3: What is the at-risk behaviour of livestock farmers in Oyo State towards global warming?

Table 4: Summary of Result on At-risk Behaviour towards Global Warming

S/n	Statement	RE	SM	NE	Mean	SD
1.	I apply nitrogen fertilizers to my farm land as it pleases me.	85 (85.0%)	15 (15.0%)	0 (0.0%)	1.15	0.36
2.	I engage in bush-burning at any convenient time	82 (82.0%)	18 (18.0%)	0 (0.0%)	1.18	0.39
3.	I adopt open grazing of cattle and other livestock in my farm	51 (51.0%)	48 (48.0%)	1 (1.0%)	1.50	0.52
4.	I don't stop t he escape of methane into the atmosphere during rice cultivation	51 (51.0%)	6 (6.0%)	43 (43.0%)	1.92	0.97
5.	I don't use backpacks for collecting cow's fart and belch in any of my routine farming operation	53 (53.0%)	5 (5.0%)	42 (42.0%)	1.89	0.97
6.	I don't adopt changes to my method of farming	48 (48.0%)	12 (12.0%)	40 (40.0%)	1.92	0.94
7.	Monitoring of crop production and livestock activities that can lead to global warming gives me challenges	50 (50.0%)	10 (10.0%)	40 (40.0%)	1.90	0.95
					Weighted mean=1.64	

Decision Rule: *Highly positive=4.00-3.00, Positive=2.99-2.00, Negative=1.99-0.99, Highly negative= 0.01-0.00.*

Table 4 reveals that 85 (85.0%) respondents regularly apply nitrogen fertilizers to their farm land as it pleases them, 15 (15.0%) sometimes involved in it, while none of the respondents (0=0.0%) never engaged in it. Furthermore, 82 (82.0%) respondents engaged in bush-burning at any convenient time, 18 (18.0%) sometimes involved in it, while none of the respondents (0=0.0%). Additionally, 51 (51.0%) respondents adopted open grazing of cattle and other livestock in their farms, 48 (48.0%) sometimes involved in it, while 1 (1.0%) respondent never engaged in it. Also,

51 (51.0%) respondents don't stop the escape of methane into the atmosphere during rice cultivation, 6 (6.0%) sometimes involved in it, while 43 (43.0%) never engaged in it.

Furthermore, 53 (53.0%) respondents don't use backpacks for collecting cow's fart and belch in any of their routine farming operation, 5 (5.0%) sometimes involved in it, while 42 (42.0%) never engaged in it. Also, 48 (48.0%) respondents don't adopt changes to their methods of farming, 12 (12.0%) sometimes involved in it, while 40 (40.0%) never engaged in it. Additionally, 50 (50.0%) respondents acknowledged that monitoring of crop production and livestock activities that can lead to global warming gives them challenges, 10 (10.0%) sometimes involved in it, while 40 (40.0%) never engaged in it. Table 4 further revealed that the weighted mean was 1.64, which indicated that the score was negative based on the decision rule. This means that at-risk behaviour towards global warming was negative among livestock farmers in Oyo State.

Test of Hypotheses

The following hypotheses were formulated and tested at 0.05 alpha level:

$H_0$1: There is no significant relationship between knowledge and attitude towards global warming among livestock farmers in Oyo State.

Table 5: Summary of Result on Relationship between Knowledge and Attitude towards Global Warming

Variables	Mean	Std. Dev.	Knowledge	Attitude	N	Sig. (p value)	Remark
Knowledge	18.91	4.21	1	0.897**	100	0.000	Significant
Attitude	13.23	6.29	0.897**	1			

Correlation is significant at 0.05 alpha level ($p<0.05$)

Table 5 showed that knowledge was tested significant on attitude towards global warming ($r=0.897$, $p<0.05$) among livestock farmers in Oyo State. It was further established that knowledge had positive correlation with attitude towards global warming among the respondents; while correlation coefficient's magnitude was strong. There was a significant positive relationship between knowledge and attitude towards global warming among livestock farmers in Oyo State. The null hypothesis was therefore rejected. The positive relationship of knowledge and attitude towards global warming implied that, the understanding of the livestock farmers about global warming would positively influence their attitude towards global warming.

$H_0$2: There is no significant relationship between knowledge and at-risk behaviour towards global warming among livestock farmers in Oyo State.

Table 6: Summary of Result on Relationship between Knowledge and At-risk Behaviour towards Global Warming

Variables	Mean	Std. Dev.	Knowledge	At-risk Behaviour	N	Sig. (p value)	Remark
Knowledge	18.91	4.21	1	-0.800**	100	0.000	Significant
At-risk Behaviour	11.46	4.32	-0.800**	1			

Correlation is significant at 0.05 alpha level ($p<0.05$)

Table 6 showed that knowledge was tested significant on at-risk behaviour towards global warming ($r=-0.800$, $p<0.05$) among livestock farmers in Oyo State. It was further established that knowledge had negative (inverse) correlation with at-risk behaviour towards global warming among the respondents; while correlation coefficient's magnitude was strong. There was a significant negative relationship between knowledge and at-risk behaviour towards global warming among livestock farmers in Oyo State. The null hypothesis was therefore rejected. The negative relationship of knowledge and at-risk behaviour towards global warming implied that, the understanding of the livestock farmers about global warming would negatively influence their at-risk behaviour towards global warming.

Discussion of Findings

The finding of this study revealed that the level of knowledge of global warming was high among livestock farmers in Oyo State, Nigeria. This was evident through the responses of the respondents which established that global warming is a gradual increase in the earth's temperature generally due to the greenhouse effect. In addition, respondents confirmed that global warming describes the current rise in the average temperature of earth's air and oceans. Likewise, most respondents acknowledged that agricultural and industrial activities like deforestation could have effect on the atmosphere. Furthermore, majority of the respondents admitted that application of nitrogen fertilizer can cause global warming. Additionally, most of the respondents confirmed that global warming is responsible for fluctuation of different pattern of rainfall. Also, respondents established that global warming has significant effect on the yield of crop production in Nigeria.

In the same vein, most respondents acknowledged that global warming is responsible for heavy rainfall and scorching sunshine. Also, most respondents acknowledged that some of the floods in this country are due to global warming. Furthermore, majority of respondents acknowledged that excessive heat waves and windstorm are consequences of global warming.

Additionally, majority of the respondents acknowledged that fart and belch from cattle and other ruminant animals can contribute to increase in global warming. Besides, respondents acknowledged that use of backpacks for collecting cow's fart and belch usually help reduce global warming. The finding of this study on high level of knowledge of global warming among livestock farmers in Oyo State was in agreement with the outcome of Oluwatayo & Ayodeji (2016) which affirmed that the farmers were aware of climate change effects with varying levels of knowledge.

The outcome of this study revealed that attitude towards global warming was positive among livestock farmers in Oyo State. This was established through the responses of most respondents through which most of them disagreed on the negatively developed question items. In this regard, most respondents disagreed that they don't believe in bio-enzyme method of clearing bush. Furthermore, majority of the respondents disagreed that they don't believe that emissions from cattle could affect the environment. Additionally, most respondents disagreed that they believe deforestation increases the amount of carbon dioxide in the atmosphere. Also, most respondents disagreed that fart and belch from cattle have no relationship with increase in global warming. The finding of this study on positive attitude towards global warming among livestock farmers in Oyo State was in line with the outcome of Islam et al. (2015) which proven that the greater comprehension of farmers' perspectives on global warming would have an impact on their propensity for practices.

The finding of this study revealed that at-risk behaviour towards global warming was negative among livestock farmers in Oyo State. The outcome of this study is evident through the responses of most respondents which established that majority of them regularly and sometimes engaged in some risky health behaviour which have consequences on global warming. In line with this, most of the respondents stated that they regularly apply nitrogen fertilizers to their farm land as it pleases them. Furthermore, majority of respondents regularly and sometimes engaged in bushburning at any convenient time. Additionally, respondents adopted open grazing of cattle and other livestock in their farms. Also, most respondents regularly and sometimes don't stop the escape of methane into the atmosphere during rice cultivation. Furthermore, most respondents regularly and sometimes don't use backpacks for collecting cow's fart and belch in any of their routine farming operation. Additionally, a considerable number of respondents acknowledged that monitoring of crop production and livestock activities that can lead to global warming give them challenges.

The finding of this study revealed that knowledge was tested significant on attitude towards global warming among livestock farmers in Oyo State. It was further established that knowledge had positive correlation with attitude towards global warming among the respondents; while correlation coefficient's magnitude was strong. There was a significant positive relationship between knowledge and attitude towards global warming among livestock farmers in Oyo State. The positive relationship of knowledge and attitude towards global warming implied that, the

understanding of the livestock farmers about global warming would positively influence their attitude towards global warming.

The outcome of this study further revealed that knowledge was tested significant on at-risk behaviour towards global warming among livestock farmers in Oyo State. It was further established that knowledge had negative (inverse) correlation with at-risk behaviour towards global warming among the respondents; while correlation coefficient's magnitude was strong. There was a significant negative relationship between knowledge and at-risk behaviour towards global warming among livestock farmers in Oyo State. The negative relationship of knowledge and at-risk behaviour towards global warming implied that, the understanding of the livestock farmers about global warming would negatively influence their at-risk behaviour towards global warming.

Conclusion

Conclusion was made in this study that, the level of knowledge of global warming was high among livestock farmers in Oyo State. It was further established that attitude towards global warming was positive among livestock farmers in Oyo State. It was also concluded that at-risk behaviour towards global warming was negative among the respondents. It was affirmed that there was a significant positive relationship between knowledge and attitude towards global warming among livestock farmers in Oyo State. Additionally, there was a significant negative relationship between knowledge and at-risk behaviour towards global warming among livestock farmers in Oyo State.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Efforts should be organised by the Ministries of Health and Environment in Oyo State to organise periodic sensitization programme for livestock farmers on knowledge of global warming.
2. The Oyo State Ministry of Environment should ensure that periodic health education is organised for livestock farmers to improve their attitude and behaviour that could contribute to global warming.

References

Bhatnagar, G.V. (2020). With Pusa Decomposer, IARI Hopes to offer Organic Solution to S t u b b l e Burning Problem Retrieved on 20/07/2023 from https://www.google.com/amp/s/ m.thewire.in/article/agriculture/pusa-decomposer-iari-stubble-burning/amp

Conserve Energy Future (2020). Environmental Problems That Our World is Facing Today. Retrieved on 20/07/2023 from

Environmental Defence Fund (2018). Nitrous oxide emission on rice farms are a cause for concern for global climate. Retrieved on 24/08/2023 from http://www.edf.org/media/nitrous-oxideemissions-rice-farms-are-cause-concern-global-climate

Eze. J.N, (2018). Drought occurences and its implications on the households in Yobe State, Nigeria. Geo environ Disasters5. Retrieved on 15/08/2023 from http://www.doi.org/10.1186/ s40677-0111-7

Gradin K.J, & Luttropp C, (2018). Scrutinising the electric vehicle material backpack, Journal of Cleaner production. Retrieved on 15/08/2023 from https://doi.org/10.1016/j.jclepro 2017. 12.035

Haider. H, (2019). Climate change in Nigeria: Impacts and responses. Available online: http://www.preventionweb.net/publication/climate-change-Nigeria-impacts-and- responses

Houghton. J, (2005). Global warming. phys. 68 1343, Retrieved on 24/08/2023 from https://iopscience.iop.org.article/10.1088/0034-4885/68/6/R02/meta

Lindsey. R. & Dahlman. D. (2022). Climate Change: Global Temperature. Retrieved on 24/08/2023 from https://www.climate.gov/news-features/understanding-climate/climate-change-globaltemperature.

Lynch. J, Cain. M, Frame. D, & Pierrehumbert. R. (2020). Agricultural's contribution to Climate Change and Role in Mitigation is Distrinct on Predominantly Fossil CARBON DIOXIDEEmitting Sectors, 2020. Retrieved on 24/08/2023 from http://doi.org/10.3389/ fsufs.2020.518039

Mac Millan. & A, Turrentine. J, (2021). Global warming 101. Retrieved on 24/08/2023 from https://www.nrdc.org/stories/global-warming-101

Masson-Delmotte .V, Zhai. P, Portner. H.O, Roberts. D, Skea. J, Shukla. P.R, Pirani. A, MoufoumaOkia. W, Pean. C, Pidcock. R, Connor. S, Matthews. J.B.R, Chen. Y, Zhou. X, Gomis. M.I, Lonnoy. E, Maycock. T, Tignor. M, & Waterfield. T, Edior (2018). IPCC, Summary for Policymakers. In: Global warming of 1.5^{0} C. An IPCC Special Report on the impacts of global warming1.5^{0} C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available online: www.ipcc.ch/sr15/chapter/spm.

National Aeronautics and Space Administration & Goddard Institute for Space Studies (2020). GISS Surface Temperature Analysis, version 4.

National Aeronautics and Space Administration (2021). 2020 Tied warmest year on Record. Retrieved on 19/08/2023 from https://www.nasa.gov/press-release/2020-tied-for-warmestyear-on-record-nasa-analysis-shows

National Oceanic and Atmospheric Administration (2021). Despite Pandemic Shutdowns, carbon dioxide and Methane surged in 2020. Retrieved on 24/08/2023 from

http://research.noaa.gov/article/ArtMid/587/ArticleID/2742/Despite-pandemic-shutdownscarbon-dioxide-and -methane-surged-in-2020

Orakpo, E. (2021). Herdsmen/Farmers crises: How desertification, climate change trigger bloody clashes. Retrieved on 24/08/2023 from http://www.vanguardngr.com/ 2021/04/herdsmen-farmers-cises-hodesertification-climate-change-trigger-bloodyclashes/amp/

Poore, J, & Nemecek. T. (2018). Reducing food's environmental impacts through producers and consumers. Science 360:987. 2018. doi:10.1126/science.aaq0216

Population Action International (2011). Why population matters to climate change.; Retrieved on 12/08/2023 from http://pai.org/wp-content/uploads/2012/02/PAI-129 3-ClimateChange_compressed.pdf.

Ragatoa. D.S, Ogunjobi. K.O, Klutse. N.A.B, Okhimambe. A.A, &Eichie. J.O, (2019). A change comparison of heat wave aspects in climatic zones of Nigeria. Environmental Earth Science. 78(4), pp 111.

Rasmuseen, C. (2021). Index Ranks Rainforest's Vulnerability to Climate and Human Impacts. Retrieved on 24/08/2023 from https://climate.nasa.gov/news/3103/index-ranks-rainforestsvulnerability-to-climate-and-human-impacts/

Sejian. V, Prasadh. R.S, Lees. A.M, Lees. J.C, Al-Hosni. Y.A.S, Sulivan. M.L, & Gaughan. J.B, (2018). Assessment of the carbon footprint of four commercial dairy production systems in Australia using an integrated farm system model. Carbon Management. 2018; 57-70. doi: 10.1080/17583004.2017.1418595.

Shankman. S, (2019). What is Nitrous oxide and why is it a Climate Theat?. Retrieved on 04/08/2023 from http://insideclimatenews.org/news/11092019/nitrous-oxide-climate-pollutantexplainer-greenhouse-gas-agriculture-livestock/

Springmann. M, Clark. M, Mason-D'Croz. D, Wiebe. K, Bodirsky. B.L, Lassaletta. L, (2018).Options for keeping the food system within environmental limits. Nature 562. 519525. Available online: doi:10.1038/s41586-018- United Nations, 2023, Extreme weather caused two million deaths, cost $4 trillion over last 50 years. https://news.un.org/en/ story/2023/05/1136897

Intergovernmental Panel on Climate Change (2020). Global warming of 1.5^0 C. Available online: https://www.ipcc.ch/sr15/

The Natural Resources Defense Council, 2022. Extreme weather caused by climate change is already harming people around the world. Retrieved on 24/08/2023 from https://www.nrdc.org/ issues/climate-adaptation

United Nation Environment Programme (2021). Methane emissions are driving climate change, Here's how to reduce them. Retrieved on 24/08/2023 from http://www.unep.org/ news-andstories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them

United Nations Climate Action (2019). Climate Change. Retrieved on 08/08/2023 from https://www.un.org/en/global-issues/climate-change

United Nations (2019). World population prospect. Available online: https://population.un.org/wpp.

United Nations, (2021). COP 26: Together for our planet. Retrieved on 24/08/2023 from http://www.un.org/en/climatechange/cop26

World Meteorological Organization (2019). United in Science: High-level Synthesis Report of latest2 Climate Science Information convened by the Science Advisory Group of the UN Climate Action Summit. Retrieved on 24/08/2023 from http://wedocs.unep.org/bitstream/handle/20.500.11822/30023/climsci.pdf

World Meteorological Organization. (2023): Economic costs of weather-related disasters soars but early warnings save lives.https://public.wmo.int/en/media/press-release/economic-costs-ofweather-related-disasters-soars-early-warnings-save-lives

World Wildlife Fund (2018). Causes of global warming, 2018. Retrieved on 24/08/2023 from http://www.wwf.org.au/what-we-do/climate/causes-of-global-warming.