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# Gender Dimensions of the Determinants of Climate Change Perception in Farming Communities of Southwest Nigeria

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## Abstract

Gender perception analysis is a necessary precondition for developing climate change adaption interventions. This paper examined farmers' perceptions of climate change in Ogun and Ekiti States Nigeria. A multi-stage sampling procedure was employed to select 358 male and 222 female farmers. Data were collected through a questionnaire and analyzed with frequency counts, mean, Chi-square, Pearson's Product Moment Correlation (PPMC), t-test, linear regression analysis, and principal component analysis. The majority of the respondents had more than two decades of farming experience. There were differences in male and female farmers' perception of climate change, with male farmers having a higher perception of climate change. Significant associations ($p<0.05$) existed between male and female farmers' perception of climate change and marital status ($\chi^2$, men=311.23, $\chi^2$, women=337.61), religion ($\chi^2$, men=204.73), ($\chi^2$, women=134.71), education ($\chi^2$, men=579.56), ($\chi^2$, women=662.36) and membership of other associations ($\chi^2$, men=150.16), ($\chi^2$, women=74.53). Age ($t=17.54$, $p<0.01$) and marital status ($t=5.41$, $p<0.01$) emerged as the strongest determinants of male and female farmers' perception of climate change respectively. The study recommended explicit gender analysis of farmers' perception as an inevitable action to be taken before the formulation of policies meant to improve adaptation to climate change.

**Keywords:** climate change, determinants, farmers, gender, perception

## Introduction

Agriculture and climate are inseparable entities upon which the survival of man depends. The roles played by the agricultural sector in the economies of Nigeria cannot be overemphasized, but agriculture in this part of Africa is much more prone to climate change, which is a major challenge to food security (Mensah *et al.*, 2020). Agriculture is the most sensitive of all the sectors, as most of the farmers depend on rain-fed agriculture (Tarfa *et al.*, 2019). Climate change has become the primary environmental threat of the 21st century (Onwutuebe, 2019). It is caused basically by natural processes (biogeographical) and human activities (anthropogenic) (Elisha *et al*., 2017).

Nigeria's climate has been changing, and is evident in increases in temperature, variable rainfall, rise in sea level, flooding, drought, and desertification, land degradation, more frequent extreme weather events which affect freshwater resources, and bring about loss of biodiversity (Haider, 2019). Precipitation in southern Nigeria is expected to rise, and rising sea levels are expected to exacerbate flooding and submersion of coastal lands (Ebele and Emodi, 2016).

For farmers to decide whether or not to adapt to a particular condition, they must first perceive that climate change has actually occurred. Thus, perception is a necessary prerequisite for adaptation (Saguye, 2017). Because the climate has changed in the past, and will continue to change in the future, it is essential to understand how farmers view climate change in order to increase their ability to adapt to its effects. Farmers' perception about climate change strongly affects how they deal with climate-induced risks and uncertainties, and undertake specific measures or coping strategies to mitigate the adverse impacts of climate change on agriculture (Ansari *et al.*, 2018). Although previous studies have looked at farmers' understanding, perceptions, and adaptation options for climate change, more research is needed from a gender perspective because climate change affects men and women farmers differently. Gender analysis among smallholder farmers in Africa is necessary for unraveling how best to mainstream gender issues into climate change adaptation plans and policies (Ume *et al.*, 2021).

The study's goal was to look into the gender aspects of the factors that influence climate change perception in farming communities in southwest Nigeria. The specific objectives were to describe the socio-economic and production characteristics of male and female farmers, determine respondents' perception of climate change and ascertain the determinants of male and female farmers' perception of climate change. Also, the study hypothesized that there is no significant difference in male and female farmers' perceptions of climate change.

## Materials and Methods

### *The study area*

The study was conducted in Ekiti and Ogun States Nigeria. Ekiti State was carved out from the old Ondo State on October 1st, 1996. Geographically, the State is located in the Southwest of Nigeria between longitudes 4°51` to 5°45` east of Greenwich meridian and on latitudes 7°15[1] to 8°5[1]N of equator. Ekiti State is bounded to the north by Kwara and Kogi States, to the west by Osun State, to the east by Edo State and to the south by Ondo State (Figure 1). The State occupies an area of 6,353kmsq and enjoys generally tropical climate with two distinct seasons. The annual temperature of Ekiti State ranges from 21° – 28°C (Oluwasusi and Tijani, 2013) with a mean annual humidity of 75% (Olujobi, 2015). The State is an upland zone and experiences a mean annual rainfall ranges between 1200mm and 1800 (Ugwuja *et al*., 2011). The major vegetation being rain forest, deciduous forest and semi-grasslands. Tropical forest exists in the south of the State while guinea savannah occupies the northern peripheries of the State.

Ogun State was created on February 3rd, 1976 from the old western region. Geographically, the State lies within latitudes 6° 12[1] and 7 ° 47[1]North of the Equator, and longitudes 3° 0[1] and 5 °0[1] East of Greenwich meridian (Adeleke *et al*., 2015) (Figure 2). The State covers about 16,409.26 square kilometres, and shares an international boundary with the republic of Benin to the West and

interstate boundaries with Oyo State to the north, Lagos and the Atlantic Ocean to the South and Ondo State to the east. The State is located in moderately hot, humid tropical climatic zone of Southwest, Nigeria. The climate of Ogun State follows a tropical pattern with two distinct seasons (the rainy season which lasts from March/ April to October/ November till March/ April). The annual rainfall of the State ranges from 1,400mm to 1500mm, with an average temperature of 30$^{o}$C. The humidity is lowest at the peak of the dry season in February, usually at 37-54% and highest between June and September with a value of 78-85% (Adeleke *et al.*, 2015). Ogun State has two main vegetation, namely, tropical rain forest and guinea savannah.

### *Sampling*

A multi-stage procedure was employed to select the respondents for this study. At stage one, two States (Ekiti and Ogun States) were purposefully selected from the six States in southwest Nigeria because of their similarities in ecological features. At stage two, 2 zones were randomly selected out of the three zones in Ekiti State, and out of the four zones in Ogun State Agricultural Development Programme. At stage three, six and eight blocks were randomly selected from the chosen zones in Ekiti and Ogun States respectively. Finally, at stage four, using Krejcie and Morgan's (1970) method of sample size determination, sample sizes of 302 and 278 respondents were randomly selected from the lists obtained from Ogun and Ekiti States respectively, and interviewed.

**Table 1**: Selection procedures for sample size in Ekiti and Ogun States

| State/ADP Zones | Blocks | Selected blocks | NACOP Members | Selected Male farmers | Selected Female farmers | Total |
|---|---|---|---|---|---|---|
| **Ekiti State** | | | | | | |
| Aramoko | 5 | 3 | 500 | 57 | 31 | 88 |
| Ikere | 5 | 3 | 900 | 118 | 97 | 215 |
| Total | 10 | 6 | 1400 | 174 | 128 | 303 |
| % | | | | 57.8 | 42.2 | |
| **Ogun State** | | | | | | |
| Abeokuta | 12 | 6 | 574 | 86 | 44 | 130 |
| Ilaro | 4 | 2 | 428 | 98 | 50 | 148 |
| Total | 16 | 8 | 1002 | 184 | 94 | 278 |
| % | | | | 66.2 | 33.8 | |

NACOP = National Cooperative Programme

### *Data Collection and Analysis*

The study employed a questionnaire survey for data collection. The instrument was pre-tested using the test-retest method to check for consistency and stability. Data obtained at the interval of two weeks were correlated, and obtained reliability coefficients of 0.85 for the perception of climate change. Male and female farmers' perception of climate change was measured on a four-point Likert-type rating scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The mean scores obtained explain the agreement of the respondents towards the perceptual statements. The grand means of all the statements were calculated to be able to place all the responses on a continuum that enabled a conclusion to be drawn on the perception of the farmers on climate change among male and female farmers. Male and female farmers' levels of

perception were obtained using the means as follows; 0 to 2.49 (low perception) and 2.50 to 3.49 (high perception). The analytical tools employed in this study were descriptive (tables, means, percentages and frequencies) and inferential statistics (Chi-square, Pearson's Product-Moment Correlation, t-test, Principal Components Analysis (PCA), and regression analysis. Descriptive tools were used to summarize farmers' responses on socio-economic and production characteristics as well as their perception of climate change. Chi-square and Pearson's Product-Moment Correlation were used to determine the relationships between the dependent variable and independent variables, t-test was used to ascertain if there is significant difference among variables, PCA was done to reduce 24 perceptual items into 6-factor groupings to discover the group with the dominant perception while linear regression analysis was used to capture the determinants of male and female farmers' perception of climate change.

## Results and Discussion

### *Male and Female Farmers' Socio-economic and Production Characteristics*

Table 2 presents the descriptive analysis of the socio-economic and production characteristics of the respondents. Male farmers were, on the average, 49 years old, while female farmers were 45 years old, according to the findings. This could suggest that the respondents were active and concerned with climate-related issues. This result supports Haq and Ahmed (2017). There were more male (61.7%) than female farmers (38.2%) interviewed in this study, thus implying that there were more male, than female, farmers who participated in the national agriculture cooperative initiative. The majority of men (85%) and women (82%) farmers were married, with an average of six persons per family. This reveals that family members may improve people's perspectives of climate change. This observation is in tandem with the findings of Ifeanyi-Obi *et al*. (2017).

Furthermore, the results indicate that 25.1% of the male and 18.9% of the female farmers had no formal education. This result conforms to the findings of Ubisi *et al. (*2017) which contained similar findings. Also, the majority of the respondents earned less than 20,000 Nigerian Naira (NGN) per annum, and cultivated an average of 4.2 hectares by the male, and 1.7ha by the female farmers. This suggests that the respondents were small-scale farmers. This result is similar to the observations of Ifeanyi-Obi *et al.* (2017).

Male (43.3 percent) and female farmers (38.7%) both had more than 20 years of farming experience, according to the research. This could be a sign of increased awareness of climate change as a result of personal experience, which is important for a deeper understanding of the issue. In addition, 53.1 percent of male and 58.1 percent of female farmers were members of organizations other than the national agricultural cooperative initiative. This could hint that more women farmers were members of other organizations. This result is similar to the finding of Koyenikan and Anozie (2017). Also, the majority of the respondents were Christian (73%), 26.5% were Muslim and 4.5% were believers of traditional religion. This means that the farmers belonged to at least one religious group. Religion gatherings could create avenues for discussing issues relating to climate change and thereby enhance members' perception of climate change.

**Table 2**: Socio-economic and production characteristics of Men and Women

| Variables | Male farmers (n=358 ) | Female farmers (n-222) |
|---|---|---|
| **Age (years)** | | |
| Below 20 | 0.03 | 0.05 |
| 21-30 | 13.4 | 14.9 |
| 31-40 | 15.1 | 20.3 |
| 41-50 | 29.5 | 41.9 |
| 51-60 | 19.8 | 13.1 |
| Above 60 | 24.9 | 9.5 |
| Mean ( $\bar{x}$ ) | 49 | 45 |
| **Marital status** | | |
| Single | 11.5 | 6.3 |
| Married | 85.0 | 82.0 |
| Widow(er) | 2.8 | 8.6 |
| Divorced/separated | 0.8 | 3.2 |
| **Household size** | | |
| 0-5 | 17.6 | 45.9 |
| 6-10 | 73.5 | 52.3 |
| 11-15 | 7.5 | 1.8 |
| 16-20 | 1.4 | 0.0 |
| >20 | 0.0 | 0.0 |
| Mean ( $\bar{x}$ ) | 6 | 6 |
| **Education** | | |
| No formal education | 13.5 | 24.2 |
| Formal education | 86.5 | 75.8 |
| **Farming experience (years)** | | |
| 0-5 | 13.1 | 19.8 |
| 6-10 | 18.2 | 18.5 |
| 11-15 | 13.7 | 9.0 |
| 16-20 | 11.7 | 14.0 |
| Above 20 | 43.3 | 38.7 |
| Mean ( $\bar{x}$ ) | 23 | 19 |
| **Farm size (hectares)** | | |
| 0-2 | 17.0 | 75.2 |
| 3-5 | 67.1 | 9.5 |
| 6-8 | 8.4 | 7.2 |
| Above 8 | 7.0 | 0.1 |
| Mean ( $\bar{x}$ ) | 4.2 | 1.7 |
| **Average annual income** | | |
| Less than 21,000 | 43.3 | 42.8 |
| 21,000-40,000 | 12.5 | 14.4 |
| 41,000-60,000 | 21.7 | 22.5 |
| 61,000-80,000 | 4.5 | 4.1 |
| 81,000-100,000 | 3.9 | 5.4 |
| Greater than 100,000 | 13.9 | 10.9 |
| **Religion** | | |
| Islam | 26.5 | 21.2 |
| Christianity | 73.0 | 74.3 |
| Traditional | 0.5 | 4.5 |
| **Membership of other associations** | 53.2 | 58.1 |

### *Results of the Principal Components Analysis*

The result of the principal components analytical procedure (Table 2) showed Bartlett's test of sphericity with a value of 8178.14 ($p<0.05$) and Kaiser–Meyer Olkin (KMO) statistical sampling adequacy of 0.81 is considered meritorious (Kaiser, 1974), Eigenvalues of one or greater were

**Table 3**: Results of the principal components analysis

| **Factor groupings of farmers' perception of climate change** | **Factors** | | | | | |
|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** |
| **Perception on rainfall** | | | | | | |
| Increased volume of rain | 0.72 | | | | | |
| Occurrence of heavy rainfall and hail | 0.79 | | | | | |
| Decreased volume of rain | 0.84 | | | | | |
| Shorter duration of rainfall | 0.69 | | | | | |
| Increased frequency of rainfall | 0.71 | | | | | |
| Decreased volume of rainfall | 0.71 | | | | | |
| Shorter duration of rainfall | 0.61 | | | | | |
| Frequency of rainfall longer | 0.53 | | | | | |
| Shift in rainy season's months | 0.69 | | | | | |
| Volume of rainfall is normal and adequate | 0.61 | | | | | |
| Rainfall arrives late | 0.51 | | | | | |
| Rainy seasons are no longer predictable | 0.40 | | | | | |
| Volume and duration of rainfall is the same | 0.53 | | | | | |
| The force with which rain is fall is low | 0.69 | | | | | |
| **Perception on drought** | | | | | | |
| Increased frequency of drought | | 0.79 | | | | |
| Longer duration of drought | | 0.75 | | | | |
| **Perception on temperature** | | | | | | |
| Observable changes in temperature | | | 0.66 | | | |
| Increasing temperature resulting heat stress | | | 0.78 | | | |
| **Perception on floods** | | | | | | |
| Higher occurrence of floods | | | | 0.80 | | |
| Occurrence of severe floods | | | | 0.81 | | |
| Seasonal incidence of floods | | | | 0.84 | | |
| Increased duration floods | | | | 0.84 | | |
| **Perception on storm** | | | | | | |
| Storm is more severe | | | | | 0.74 | |
| Frequent incidence of storm | | | | | 0.88 | |
| **Perception on effects of climate change** | | | | | | |
| Change in planting dates due to climate change | | | | | | 0.62 |
| Reduction in the population of animal | | | | | | 0.45 |
| Plant and animal species' extinction | | | | | | 0.65 |
| **Eigen values** | 6.44 | 4.12 | 2.47 | 1.51 | 1.25 | 1.13 |
| **% of Variance** | | | | | 67.74 | |
| **KMO** | 0.81 | | | | | |
| **Bartlett's test of Sphericity** | 8178.14 | | | | | |
| **Df** | 300 | | | | | |
| **P value** | 0.00 | | | | | |
| **Cronbach's alpha** | 0.59 | 0.75 | 0.68 | 0.92 | 0.74 | 0.83 |
| **Means ($\bar{X}$)** | 2.51 | 2.59 | 2.85 | 3.38 | 1.94 | 2.68 |

rotated by the varimax analysis; 24 items from the factor analysis resulted in 6-factor groupings and explained 67.74% of the total variance in the perception of climate change. Values of Cronbach alpha obtained for the six factors varied from 0.58 to 0.915. Cronbach's alpha of >0.5 was considered acceptable as evidence of common factors underlying the responses (Nunnally, 1967). The results indicated that among all the dimensions, the perception of male and female farmers on floods was the most prominent, with a mean of 3.38 (Table 3). This could indicate that the respondents acknowledged floods as a sign of climate change, and took measures to adapt when necessary.

### *Men and Women Farmers' Perception of Climate Change*

The findings in Table 4 show that men farmers' views of climate change ranged from 1.81 to 3.45, while women farmers' perceptions of climate change ranged from 1.64 to 3.47. In addition, variations in male and female farmers' perceptions of climate change were discovered. In 14 perceptual statements, men farmers had higher perceptions of climate change; in 9 statements, women farmers had higher perceptions of climate change; and in two (2) perceptual statements, both categories of farmers had equal perceptions of climate change. There were statistically significant differences in twelve (12) items, with male farmers having eight (8) significant means and women farmers having four (4) significant means (Table 4).

**Table 4:** Male and female farmers' perception of climate change

| Perceptual statements on climate change | Men- $\bar{x}$ | Women- $\bar{x}$ | t- value |
|---|---|---|---|
| There has been an increase in the volume of rainfall | 2.52 | 2.19 | 3.59** |
| There has been the occurrence of heavy rainfall and hail | 2.53 | 2.30 | 2.33* |
| There is a decrease in the volume of rainfall in the last few years | 2.69 | 2.62 | 0.78 |
| The duration of rainfall is shorter | 2.55 | 2.67 | 1.84 |
| Frequency of rainfall longer | 2.55 | 2.51 | 0.45 |
| There is a shift in the rainy season's months | 3.00 | 3.25 | 3.15* |
| The volume of rainfall is normal and adequate | 2.31 | 2.07 | 2.88** |
| Rainfall arrives late | 2.94 | 3.03 | 1.10 |
| Rainy seasons are no longer predictable | 2.83 | 3.16 | 3.82** |
| The volume and duration of rainfall are the same as in the past | 1.98 | 1.92 | 0.55 |
| There is increased frequency of drought | 2.59 | 2.59 | 0.67 |
| The duration of drought is longer | 2.59 | 2.58 | 0.56 |
| There is observed changes in temperature | 2.82 | 2.82 | 0.37 |
| Temperature is increasing resulting to heat stress | 2.92 | 2.81 | 1.39 |
| There has been higher occurrence of floods | 2.59 | 2.32 | 2.88** |
| Flood is more severe than in the past | 2.67 | 2.29 | 4.10** |
| There is seasonal incidence of flooding | 2.76 | 2.50 | 2.86** |
| The duration of flood is increasing | 2.49 | 2.40 | 0.94 |
| Storm is more severe than in the past | 2.08 | 2.12 | 0.48 |
| Storm is more frequent | 1.81 | 1.74 | 0.84 |
| There is change in planting dates due to climate change | 2.60 | 2.83 | 2.50* |
| There is reduction of plant and animal species | 2.42 | 2.67 | 2.48* |
| Plants and animals' species' extinction | 2.72 | 3.08 | 4.36** |
| The force with which rain falls is low compared with how it was in the last few years | 2.00 | 1.64 | 4.05** |

* = P<0.05); ** = P<0.01

As a result of this study, it was discovered that there was a substantial difference in how male and female farmers viewed climate change, with men having a higher perspective of climate change than women. The findings of this study are conformed to Ubisi *et al. (*2017) and Badmos *et al*. (2018) who reported that climate change is perceived differently by male and female, and that they adapt differently to its effects.

The results also suggest that 70.8 percent of male and female farmers (58.3%) had a good mind-set toward climate change (Table 5). These findings could indicate that the majority of farmers had a favourable perception of climate change, although men farmers had a more positive view than women farmers. This result is in tandem with the report of Uddin *et al*. (2017).

**Table 5**: Respondents' levels of perception of climate change

| Levels of perception of climate change | Male farmers (n-358) | Female farmers (n-222) |
|---|---|---|
| High | 70.8% | 58.3% |
| Low | 29.2% | 41.7% |

***Results of Chi-Square test of relationships between the perception of climate and Independent Variables.***

The result shows that there were significant relationships ($p<0.05$) between male and female farmers' perception of climate change and marital status ($\chi^2$, men=311.23; $\chi^2$, women=337.61), religion ($\chi^2$, men=204.73; $\chi^2$, women=134.71), education ($\chi^2$, men=579.56; $\chi^2$, women=662.36) and membership of other associations ($\chi^2$, men=150.16; $\chi^2$, women=74.53) (Table 5). This suggests an indication of positive and direct relationships between the perception of climate change and the variables. This means that these variables had a significant association with the perception of climate change. The more the involvement of farmers in these variables, the higher the likelihood of favourable perception of climate change. Studies had reported a positive relationship between perception and education (Opiyo *et al*., 2015), religion (Morrison *et al.*, 2015), marital status (Agwu *et al*., 2018), and membership of associations (Ojo and Bayegunhi 2018).

**Table 6:** Results of Chi-square test

| | Male farmers | | Female farmers | |
|---|---|---|---|---|
| **Variables** | **$\chi^2$ value** | **Significance** | **$\chi^2$ value** | **Significance** |
| Marital status | 311.23 | 0.000 | 337.61 | 0.000 |
| Religion | 204.73 | 0.000 | 134.72 | 0.000 |
| Education | 579.56 | 0.000 | 662.36 | 0.000 |
| Membership of other associations | 150.16 | 0.000 | 74.53 | 0.000 |

***Correlation between Perception of Climate Change and Independent Variables***

Results in Table 7 show significant relationships ($p<0.00$) between male farmers' average annual income (r=-2.300), farming experience (r=-0.225), and perception of climate change, while age (r=0.022), family size (r=0.087), and farm size (r=-0.075) were not significantly related to perception of climate change. This means that the higher the men farmers' annual income and farming experience the better their perception about climate change.

The result of this finding supports previous studies where perception is statistically related to income (Huda, 2013) and farming experience (Uddin *et al.*, 2017). Furthermore, there were significant connections between women farmers' age (r=0.141), family size (r=0.0181), average yearly income (r=0.361), farming experience (0.250), and perception of climate change, whereas farm size (r=-0.013) had no positive influence. The findings could imply that only the size of the farm had an unfavourable association with women farmers' perception. This suggests that with the exception of farm size, men's perceptions of climate change rose with age, family size, average annual income, and farming experience. This result is in accordance with the findings of Uddin *et al.* (2017) and Agwu *et al*. (2018) who reported that family size, income, and farming experience were positively related to the perception of climate change.

**Table 7:** Correlation between independent variables and perception of climate change

| | Male farmers | | Female farmers | |
|---|---|---|---|---|
| **Independent variables** | **r value** | **Significance** | **r value** | **Significance** |
| Age | 0.022 | 0.677 | 0.141 | 0.035 |
| Family size | 0.075 | 0.157 | 0.181 | 0.007 |
| Average annual income | -2.300 | 0.000 | 0.361 | 0.000 |
| Farming experience | 0.225 | 0.000 | 0.250 | 0.000 |
| Farm size | 0.087 | 0.098 | -0.013 | 0.846 |

***Determinants of male and female Farmers' Perception of Climate Change***

Results in Table 8 show that each process of regression analysis on perception of climate change is reported with unstandardized regression coefficients, t-statistical values, values of constant, R square, and adjusted $R^2$ values. For men farmers, the coefficients of determination ($R^2$ and Adjusted $R^2$) were 0.26 and 0.22, accordingly, and 0.64 and 0.60 for women farmers. This means that the model accounted for 22% of the

**Table 8:** Result of regression analysis between the perception of climate change and independent variables

| | Perception of climate change | | | |
|---|---|---|---|---|
| | Male farmers | | Female farmers | |
| **Independent variables** | **β-value** | **t value** | **β-value** | **t value** |
| Age | -0.009 | 17.54** | 0.23 | 4.28** |
| Family size | -0.13 | -0.17 | 0.17 | 0.70 |
| Marital status | -2.75 | -2.21* | -5.43 | -5.41** |
| Religion | -2.51 | -2.64** | -1.50 | -1.84 |
| Education | -0.41 | -0.81 | -0.72 | -1.78 |
| Average annual income | -9.12 | -0.53 | 1.71 | 1.72 |
| Farming experience | 0.17 | 3.44** | -0.22 | -3.90** |
| Farm size | -0.13 | -1.46 | -0.11 | -1.60 |
| Membership of other associations | 2.38 | 0.89 | 4.63 | 4.03** |
| Constant | 72.85 | 17.54** | 71.10 | 19.57 |
| R | | 0.51 | | 0.80 |
| $R^2$ | | 0.26 | | 0.64 |
| Adjusted $R^2$ | | 0.22 | | 0.60 |
| Standard error | | 8.77 | | 5.35 |
| F change | | 5.75 | | 16.84 |
| P value | | | | 0.00 |

variance in the dependent variable for male farmers, and 60% of the variance in the dependent variable for female farmers could be attributed to all of the independent factors examined in this study. Based on the results from this study, it was be observed that four (4) independent variables had statistic significant beta coefficients for male farmers; these included age ($t=17.54$, $p<0.01$), marital status ($t=-2.21$, $p<0.05$), religion ($t=-2.64$, $p<0.01$) and farming experience ($t=3.44$, $p<0.01$) and, were thus the determinants of male farmers' perception of climate change.

The result of the regression analysis shows that age was the most significant and strongest determinant of male farmers' perception of climate change. This result shows that male farmers' perception increased with age and vice versa. Age ($t=4.28$, $p<0.01$), marital status ($t=-5.14$, $p<0.01$), farming experience ($t=-3.90$, $p<0.01$), and membership in other associations ($t=4.03$, $p<0.01$) were among the four (4) independent factors with statistically significant beta coefficients for female farmers. These variables were therefore the important determinants of the female farmers' views on climate change, with marital status being the most.important. This could indicate that women farmers' marital status had a favourable impact on how they perceived climate change. This assertion is in accordance with the reports of Asekun-Olarinmoye *et al*. (2014), Addisu *et al*. (2016) and Haq and Ahmed (2017), who had similar observations.

## Conclusion

The drivers of male and female farmers' perceptions of climate change were the subject of this study. Male farmers were found to have greater access to formal education than their female counterparts. As a result, the male farmers' ability to recognize climate change was expected to be strengthened, while their ability to adapt to climate change should improve, lessening their vulnerability to climate change's effects. The majority of the responders had been farming for almost two decades. This shows that the farmers may have had extensive experience with climate variability, resulting in a favourable view of climate change. When compared to the female farmers, the male farmers had more positive views of climate change. As a result, male farmers were more likely than female farmers to adapt to climate change, as higher perception predicts better adaptation. Farmers' perceptions of floods were the greatest, probably owing to the disastrous effect of floods on their livelihood activities, according to the mean values of factor groupings. Marital status, religion, education, and involvement in other organizations all influenced the respondents' views on climate change. The biggest predictors of gender variation in perceptions of climate change were age and marital status, for male and female respondents respectively.

Governments should educate the farmers, especially the less-educated female farmers, regarding climate change indicators through extension agents so that their perception of climate change could be enhanced to make timely decisions about adaptation to climate change.

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