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Assessment of Climate Change Copping Strategies among Backyard Snail Farmers in Owo Metropolis, Ondo State, Nigeria

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Abstract
The study was conducted to assess backyard snail farmers' socioeconomic characteristics, awareness of change in climate and climate change copping strategies used in snailproduction management in the study area. The study employed a snowball sampling procedure to select 29 respondents for the study. Data were collected with the aid of structured questionnaire. Data collected were analysed with the aid of descriptive statistics such as frequency count, simple percentage, mean and standard deviation. Results of analysis revealed that 72.41%of the respondents were male. The mean age of the respondents was 50.55±5.1 years. Majority (40.3%) of the respondents had no formal education while the mean year of production experience was 4.97±3.1. Results further revealed that 89.66%and 93.10% of the respondents indicated awareness of increased weather temperature and sunshine hour. The climate change copping strategies used by the respondents were frequent water application, shade making and raising of varying species of snail. Snail producers should be encouraged to raise more than a species of snail as well as ensure dependable water source before commencing the enterprise.

Keywords: Climate change, copping strategies, backyard, snail, farmers

Introduction

Snail is a shelled gastropods. The commonly domesticated ones which are of West African origin are *Archachatina* spp., *Achatina* spp and *Limcolaria* spp. Snail farming creates a good source of livelihood for both rural, semi-urban and urban dwellers.Snail serves as an important source of protein for both rural and urban dwellers in the tropics including, Nigeria, (Ngenwi *et al*., 2010). Snail was mainly known as forest inhabitant, found mainlyin the humidhabitat and ismainly collected from the wild for consumption.Snail farming was not a very popular micro livestock enterprise in Africa until few decades ago when the needs arose for protein demand, biodiversity conservation and livelihood option (Woogeng *et al*., 2013).

In Nigeria, the non-conventional farming system has started to gainpopularity in the recent years probably due to the awareness of its nutritional, therapeutic, cosmetic and industrial properties (Ezeano, 2016). Snail farming is limited by a number of factors such as climate change, pests and diseases as well as lack of good quality stock(Etchu *et al*., 2008). The major challenge of snail production is climate because of the humid nature of their habitat (Woogeng *et al*., 2013). Snail's vulnerability to change in climate is unique because of the special condition requirements of their habitat (Rekha *et al*., 2015). Climatic variables are among the determining factors in the survival, growth and sustenance of any organism in its niche, including Mollusks (Ngenwi *et al*., 2010; Bekele, 2017). Climate change is already having a negative impact on nature through extremely high temperatures, reduced rainfall pattern and intense (IPCC, 2007), with a great adverse effect on snail growth and development (Rekha *et al*., 2015). Better domestication, improved management and yield of snail, calls for snail producers needs to cope with the incessant adverse change in climate for optimum output. Over the years, climate change researches have focused on crop while few have focused on livestock, hence the study.

Materials and Methods

The study was conducted in Owometropolis in Owo Local Government Area (LGA) of Ondo State. The town was selected in the LGA for the study based onhousehold's involvement in backyard snail farming. Ondo State is located in the western part of Nigeria. The state falls on longitude 4^0 45` and $6^0$00 east of the Greenwich meridian and latitude $4^0$ 45` north of the equator. The inhabitants of the metropolis are mainly civil servants and artisans who engage in secondary occupation mainly backyard farming among which is snail keeping.Snowball sampling procedure was used for the study. A backyard snail producer was located who helped identify other snail keepers in the study area. A total of 29 backyard snail keepers were identify for data collection. Data were collected on the socio-economic characteristics of the snail producers, awareness of variation in climate and climate change copping strategies used in the study area.

Data collected were analyzed with descriptive statistics such frequency counts, simple percentage, mean and standard deviation.

Results and Discussion

Socio-economic characteristics of the respondents: Table 1 reveals the socioeconomic characteristics of the respondents. The results in the table reveal that 72.41%of the respondents were male while just 27.59% of them were female. This implies that backyard snail farming in the area is dominated by male farmers. The results also revealed that majority (34.4%) of the respondents fell in the age range of 41-50 years, while 20 percent, 25 percent, 9.4 percent and 10.6 percent fell in the age ranges of ≥40 years, 51-60 years. 61-70 years and ≥71 years, respectively. This implies that active men were in the enterprise. Majority (45%) of the respondents were widowed while 6.9 percent, 31.4 percent, and 16.1 percent were single, married and divorced, respectively.

Table 1: Socio-economic characteristics of the respondents

Variable	Frequency	Percentage	Mean±Std. Dev.
Sex			
Male	21	72.41	
Female	8	27.59	
Age of respondents			
≤40	6	20	
41-50	10	34.4	50.55±5.1
51-60	7	25	
61-70	3	9.4	
≥71	3	10.6	
Marital status			
Single	2	6.9	
Married	9	31.4	
Divorced	5	16.1	
Widowed	13	45	
Household size			
≤2	5	18.9	
3-4	6	19.4	5.01±2.4
5-7	5	16.1	
8-9	13	43.9	
Level of education			
No education	12	40.3	
Primary education	10	35.6	
Secondary education	4	14.5	
Tertiary education	3	9.1	
Year of snail keeping			
≤1	5	17.5	
2-3	6	19.7	
4-5	13	43.9	4.97±3.1
6-7	5	16.7	
Ownership of building			
Owned	19	65.52	
Otherwise	10	34.48	

Std. Dev = Standard deviation

Majority (43.9%) of the respondents had household size range of 8-9 while 18.9 percent, 19.4 percent and 16.1 percent had household size ranges of ≤2, 3-4 and 5-7, respectively. The mean household size in the area was 5.01±2.4. Majority (40.3%) of the respondents had no formal education while 35.6 percent, 14.5 percent and 9.1 percent of the respondents had primary, secondary and tertiary education, respectively. Majority (43.9%) of the respondents had snail production experience range of 4-5 years while 17.5 percent, 19.7 percent and 16.7 percent of the respondents had snail farming experience ranges of ≤1 year, 2-3 years and 6-7 years, respectively. Majority (65.52%) of the respondents owned the building they live in while 34.48 percent of them indicated otherwise. Building ownership may be the reason for involvement in the enterprise.

Awareness of variation in climate elements: Table 2 reveals the results of respondents' awareness of variation in the elements of climate. The results show that while 89.66% of the respondents indicated awareness of increase in weather temperature, 10.34% indicated no awareness. This implies that majority of the respondents are aware of the incessant increase in weather temperature. Also, while 75.86% of the respondents indicated awareness of the reduction in rainfall length, 24.14%of them indicated no awareness. This implies that majority of the respondents are aware of the state of the current rainfall pattern. Finally, while 93.10% of the respondents indicated awareness of the increased sunshine hour, 6.89% of them indicated no awareness. This implies that majority of the respondents are aware of the current increase in sunshine hour.

Table 2: Awareness of variation in climate elements

Item	Frequency	Percentage
Are you aware of the increase in weather temperature?		
Yes	26	89.66
No	3	10.34
Are you aware of the reduction in rainfall length?		
Yes	22	75.86
No	7	24.14
Are you aware of the increase in sunshine hour?		
Yes	27	93.10
No	2	6.89

Climate change copping strategies used by backyard snail farmers: Table 3 reveals the respondents' climate change copping strategies in the study area. The results in the table show that all respondents indicated frequent application of water as the climate change copping strategies usedin the study area. This implies that the farmers frequently apply water to mitigate the dryness that may result from incessant sunlight because snails need humid habitat for optimum performance. While 34.48% of the respondents indicated that they grow vegetation in the artificial habitat, majority (65.52%) indicated otherwise. The reason for the low use vegetation planting might be due to lack of space for tree and shrubs planting. Similarly, while majority (86.21 %) of the respondents indicated temporary shade erection as climate change copping option, 13.79 percent of them indicated otherwise. Also, while majority (93.10%) of the respondents indicated that they raise varying species of snail to cope with the change in climate, just 6.9% of them indicated otherwise. This implies that frequent water application to the artificial habitat, shade making and raising varying species of snail are the major climate change copping strategies used by the backyard snail farmers in the study area.

Conclusion

The study concluded that the backyard snail farmers were still in their active ages. Majority of the respondents indicated awareness of variation in weather temperature, rainfall pattern and sunshine hour. The major climate change copping strategies used by the respondents were frequent water application, shade making and raising varying species of snail. Producers are encouraged to cope with the climate for optimum performance.

Table 3: Climate change copping strategies among the farmers

Copping strategies	Frequency	Percentage
Frequency of water application		
Yes	29	100
No	-	-
Vegetation planting		
Yes	10	34.48
No	19	65.52
Shade making		
Yes	25	86.21
No	4	13.79
Raising of varying species		
Yes	27	93.10

No	2	6.90

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