CLIMATE CHANGE ISSUES: MISSING TOPIC IN SENIOR SECONDARY SCHOOL ANIMAL HUSBANDRY CURRICULUM IN NIGERIA.

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Abstract

The study was carried out to identify objectives, contents of climate change issues to be integrated into the senior secondary school animal husbandry curriculum as well as teaching and evaluation methods that could be used by teachers in Nigeria. Four research questions were answered by the study while four null hypotheses were formulated and tested at 0.05 level of significance. Descriptive survey research design was adopted for the study. The population for the study was 73 comprising of 46 teachers of and 27 extension agents. A 67-item structured questionnaire developed from literature was used for data collection. The questionnaire items were face-validated by three experts while Cronbach alpha method was used to determine the internal consistency of the items which yielded .85. The copies of the questionnaire were administered to the respondents with the help of two research assistants. Weighted mean was used to answer the research questions while ttest statistic was used to test the null hypotheses at .05 level of significance at 71 degrees of freedom. The findings of the study revealed that 13 objectives and contents needed to be infused into the animal husbandry curriculum, 22 teaching methods for teaching of the contents and 17 evaluation methods for student"s assessment. The study showed that there was no significant ($p > 0.05$) difference in the mean responses of agricultural science teachers and extension agents on each item in the objectives and content of climate change issues to be integrated, teaching and evaluation methods. The study recommended among others that the identified objectives and contents be infused into animal husbandry curriculum while the teaching and evaluation methods be utilized by teachers for teaching and assessing students in climate change issues integrated into animal husbandry curriculum in Nigeria.

Keywords: *Climate Change, Curriculum, Secondary School, Animal Husbandry,Integration*

Introduction

Climate change is one of the greatest threats facing humankind today. It is global in its causes and consequences. The Intergovernmental Panel on climate change (IPCC) (2007) defined climate change as statistically significant variation that persists for an extended period, typically decades. According to Ozor (2009) climate change is an alteration in climate over time, whether due to natural variability or as a result of human activity. Furthermore, Owolabi, Gyimah, and Amponsah (2012) defined climate change as a continuous rapid and prolonged alteration of weather conditions in one direction; it is the variation in global or regional weather conditions over time. Today, climate change is a global phenomenon which has multiple impacts on humans and the environment. There are two major categories of causes of climate change: human activities and natural phenomena. Human activities include pollution from industrial process and agricultural practices which directly influence the climate of the earth such as bush burning, deforestation, desertification, burning of fossil

fuels such as coal, oil and gas (Ozor, 2009). Spencer (2009) noted that the natural phenomena that contribute to climate change include solar output, variations in the Earth's orbit (orbital variations), volcanism, and ocean variations among others.

Furthermore, climate change is a function of the effects of increased carbon dioxide (CO_2) and other greenhouse gases (GHGs) such as methane (CH_4), water vapour, nitrous oxide (N_20) and chlorofluorocarbons (CFCS) into the atmosphere especially from human activities (Ajaero, Akukwe and Asuaha, 2009). Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorbs and re-emits infrared radiation, thus promoting atmospheric warming and climate change effect.

Climate change has a disproportionate impact on the poorest countries, which have contributed the least to the problem (IPCC, 2007). Africa accounts for less than 4 percent of global emissions, yet its 850 million inhabitants are the most vulnerable to climate change impacts (IPCC, 2007). Africa including Nigeria has the least intellectual, institution and technological capability to address the climate change challenges through mitigation and adaptation programmes. It has been perceived throughout the world, that Education plays a critical role in preparing and providing leadership to meet these challenges and to stimulate sustainable development (Bloom, Canning and Chan, 2005).

Therefore, if education is going to make a contribution to the current challenge then there is urgent need for institutional innovations and changes to ensure that graduates produced from senior secondary school keep abreast with the climate change issues including mitigation and adaptation strategies. This can be achieved by integrating climate change issues into the curriculum of animal husbandry in senior secondary schools as it is not reflected in the current curriculum in Nigeria. Animal husbandry is the science and art of rearing, marketing and distribution of animal and other animal related products for the benefit of man and industry. In senior secondary school which is the upper class of the secondary education starting from SSI, SSII to SS3, the animal husbandry curriculum is planned to enable students acquired knowledge, skills, and proper disposition for animal production and management activities. However, Animal husbandry activities are carried out in an environment faced with climate change challenges and it is worrisome as climate change issues are not part of the present day topics in animal husbandry curriculum. The animal husbandry curriculum did not capture environmental factors affecting animal productivity as it was captured in agricultural science curriculum where climatic factors with emphasis on rainfall, temperature, wind and light among others were discussed (Ikehi, Ifeanyieze, & Ugwuoke, 2014). Furthermore, animal husbandry teachers also lacked the competencies and skills for adopting the best methods for teaching and evaluating climate change issues even if integrated in the curriculum.

Curriculum refers to all the learning experiences which are planned and directed by the school to attain its educational goals (Tyler, 1975). Onwuka (1981) defined curriculum as a

structured series of intended learning experiences through which educational institutions endeavour to realize the hopes of the society. Curriculum includes the teachers, subjects, content, method of teaching and evaluation as well as the physical and psychological dimensions of the experiences (Offorma, 2002). Curriculum is regarded as the process of determining and pursing set societal objectives through the instrumentality of the school and may be seen as a document, plan or blue print for instructional guide used for teaching and learning to bring about positive and desirable change in the learners behaviour (Offorma, 2002). It seeks to translate the hopes of society into concrete reality. The senior secondary school curricular are developed and packaged by the Nigerian Education Research and Development Council (NERDC). In every society, curriculum must be reflections of the solutions to the problems facing the society like climate change to enable the members of the society tackle such problems.

Animal husbandry curriculum is in position to provide better opportunities to address this issue of climate change. However, the present curriculum of animal husbandry as reviewed by the researchers did not reflect the issues of climate change, which is a serious threat to the present generation. The themes reflected in the present curriculum of animal husbandry were twenty three in numbers thus: seven in SSI, seven in SSII and nine in SSIII. The themes include livestock production; classification of farm animals; parts, organs and functions of farm animals; livestock reproduction; livestock management; livestock management systems and livestock management practices in SSI. Animal nutrition; processing and marketing of animal products; meaning and classes of animal feed; sources of animal feed stuff; livestock rations; pasture management practices and characteristics, method and importance rangeland to livestock production in SSII. And animal improvement, farm animal improvement, methods of farm animal improvement, artificial insemination, advantages and disadvantages of artificial insemination technique; animal health, farm animal diseases and causal agents; livestock parasites and prevention and control of farm animal diseases and pest (parasites) in SSIII (NERDC, 2009). It is obvious for urgent inclusion of climate change issues in existing animal husbandry curriculum to balance the imbalance in it. The National Climate Change Response Strategy (NCCRS) in Kariuki, Mokaya, Kinuthia, Dennis, and Jepkorir (2016), acknowledged that little has been done in the infusion of climate change into the curriculum, they blame this on the lack of adequate climate change information, knowledge and longperiod data to researchers, planners, policy makers and the general public on climate change impacts, adaptation and mitigation measures. To ensure that students of animal husbandry fully understand and grasp the meaning, causes, mitigation and adaptation strategies of climate change among others, and the implications of climate change locally and globally.

There is need for climate change issues to be integrated to the senior secondary school animal husbandry curriculum in SS1 as livestock production and climate change.

Integration is the act or process of combining two or more related concepts or things so that they work together for a common objective (Alaribe, Okirie and Olaitan, 2013). Integration in this study entails combining climate change issues with the existing senior secondary animal husbandry curriculum for the training of students in senior classes. Integrating climate change issues in senior secondary

school animal husbandry curriculum means that the curricular content, teaching materials, methods, evaluation and delivery approaches should be designed in such a way as to equip the students with the necessary skills and knowledge to tackle this global threat called climate change. Orusha et.al. (2012) stated that curricular content, teaching materials and methods and delivery approaches should be designed in such a way as to equip the student with the necessary skills and knowledge to tackle these global challenges and their interpretation in specific local situations. Researchers like Alaribe, Okirie and Olaitan (2013) andIkehi, Ifeanyieze and Ugwuoke (2014) outlined the materials for teaching climate change in senior secondary schools agricultural science to be anemometer, barometer, computer devices and software, wind vane, flowmeter, rain-gauge and container among others.

However, This study reviewed a wide variety of literature and established that most of the studies conducted in Africa and specifically in Nigeria delved on issues of students' awareness of climate change (Henry et. al., 2012); teachers' awareness (Joy and Eunice, 2014; Ekpoh and Ekpoh, 2011; Nkechi, 2014); integration of climate change into secondary school agricultural science (Orusha, et. al. 2012; Alaribe, Okirie, and Olaitan, 2013; Ikehi, Ifeanyieze and Ugwuoke, 2014; Kariuki, Mokaya, Kinuthia, and Jepkorir, 2016). From reviewed literature, this study established that no study had been conducted to establish efforts being made by curriculum developers and stakeholders, in a bid to integrate climate change issues into the curriculum of animal husbandry in Nigeria. Therefore, the general purpose of this study was to integrate climate change issues into senior secondary school animal husbandry curriculum. Specifically the study sought to determine the:

1. Objectives of climate change issues that could be integrated into the senior secondary school animal husbandry curriculum.
2. Contents of climate change issues for integration into the senior secondary school animal husbandry curriculum.
3. Teaching methods and techniques for teaching climate change issues in senior secondary school animal husbandry curriculum
4. Evaluation methods that could be used by teachers for assessing the students for the objectives of climate change issues in senior secondary school animal husbandry curriculum.

Methodology

The study adopted a descriptive survey research design. A survey research design in the view of Anyakaoha (2009) uses questionnaires, interviews and observations to determine the opinions, attitudes, preferences and perceptions of persons. The design was considered appropriate since the study obtained data from animal husbandry teachers and extension agents through the use of questionnaire. Four research questions guided the study while four null hypotheses were formulated and tested at the probability level of .05 level of significance. The study was conducted in Enugu State Nigeria. Population for the study was 73 comprising of 27 extension agents and 46 teachers of agriculture in both Nsukka and Obollo-Afor Educational Zones. The entire populations were studied because of the manageable size. A structured questionnaire consisting of 67 items was used to collect information from the respondents. Each item in the questionnaire was assigned a four response options of Highly Needed (HN =4), Averagely Needed (AN=3), slightly needed (SN=2) and Not Needed (NN =1). The instrument was subjected to face validation by three-experts, two from the Department of Agricultural Education and

one from curriculum and instruction unit Department of Education Foundation University of Nigeria, Nsukka. The internal consistency of reliability of the instrument was established using Cronbach Alpha method which yielded the reliability co-efficient of 0.85. The questionnaire was administered to the respondents with the assistance of three research assistants who were briefed of how to administer and retrieved it to ensure timely completion of data collection. Mean was used to analyze research questions, Nominal values were assigned to different scaling items of the questionnaire and corresponding mean scores were interpreted using real limit of numbers based on the grand mean. Any item that had a mean value of 3.50 and above was regarded as highly needed, 2.50-3.49 as averagely needed,

1.50-2.49 as slightly needed and 0.50-1.49 as not

needed. T-test was used for testing the null hypotheses at probability level of 0.05 significance. **Research Question 1:** What are the objectives of climate change issues that could be integrated into **Results and discussion** the senior secondary school animal husbandry

The results of the study were obtained based on the curriculum? four research questions answered and the four null hypotheses tested and presented in table 1 to 4 below.

Table 1: Mean, standard deviation, and t–test values of the Responses of teacher and extension agents on the objectives of climate change issues to be integrated into the senior secondary school animal husbandrycurriculum. (N_1+N_2 =77, teacher and extension agent).

S/N	Item Statement	$N_{1=46}$ $\bar{x}_1$		$N_{2=27}$ $\bar{x}_2$		$\bar{x}_G$	SD_G	Df	t-cal	Remark	
			SD		SD						
1.	Define the term climate change	3.80	.48	3.55	.63	3.68	.56	71	.19	HN	N
2.	Mention the causes of climate change	3.90	.51	3.45	.47	3.68	.49	71	.06	HN	N
3.	List effects of climate change on human health and economy	3.74	.62	3.64	.55	3.60	.59	71	.64	HN	N
4.	List the effects of climate change on agriculture	3.71	.40	3.82	.46	3.77	.43	71	.47	HN	NS
5.	Define climate change adaptation	3.35	.98	2.73	.90	3.04	.94	71	.09	AN	N
	Define climate change mitigation	3.16	.88	2.82	.96	2.99	.92	71	.34	A	NS
7.	Outline ways of adaptation to climate change effects	3.29	.92	3.09	.77	3.19	.85	7	.51	AN	N
8.	Outline ways of mitigation to the effects of climate change	3.12	.88	2.73	.99	2.93	.94	71	.26	AN	N
9.	Explain greenhouse gases (GHGs)	3.00	.90	2.18	.96	2.59	.93	71	.08	AN	N
10.	Lists Greenhouse gasses that causes climate change	2.88	.86	2.55	.72	2.72	.82	71	.53	AN	N
11.	Explain Agro-biodiversity	3.03	.70	2.64	.78	2.84	.74	71	.30	AN	NS
12.	Bio-fuel	3.03	.36	2.63	.30	2.83	.33	71	.23	AN	NS
E	Explain global policy issues on climate change	3.00	.54	2.36	.58	2.68	.56	71	.07	AN	N

KEY: $\bar{x}$ = Mean, $\bar{x}_G$ =Grand Mean, SD=Standard Deviation, SD_G= Grand Standard Deviation, .NS= Not Significance, S= Significance

The result of the study in Table 1 showed the mean responses of teacher of agriculture and extension agents on objectives of climate change issues that could be integrated into the senior secondary school animal husbandry curriculum. The values of the grand mean ranged from 3.77 to 2.59. These values were within the real limit of 3.50 to 4.00 indicating that four out of the thirteen items were Highly Needed while the remaining nine were Averagely Needed. The standard deviation (SD) of the 13 items ranged from 0.33 to 0.94. Each of the values was less than 1.96; indicating that the respondents were not far from the

mean and from each other in their responses.

Furthermore, the result of the null hypotheses indicated that all the items had their t-cal ranging from 0.06 to 0.64 which were greater than 0.05. Therefore the null hypothesis of no significant differences was upheld for each of the thirteen items.

Research Question 2: What are theContents of climate change issues for integration into the senior secondary school animal husbandry curriculum?

Table 2: Mean, standard deviation, and t test values of the responses of teacher and extension agents on the contents of climate change issues for integration into the senior secondary school animal husbandry curriculum. ($N_1+N_2=77$, teacher and extension agent).

S/N	Item Statement	$N_{1=46}$		$N_{2=27}$		$\bar{G}$	SD_G	Df	t-cal	Remarks
		$\bar{1}$	SD	$\bar{2}$	SD					
1.	Concept of climate change	3.84	.60	3.65	.60	3.46 71	.16	HN	NS	
2.	Causes of climate change	3.61	.69	3.36	.76	3.50	.73	71	.37	HN NS
3.	Effects of climate change on human health & economy	3.71	.58	3.64	.62	3.68	.60	71	.74	HN NS
4.	Effects of climate change on agriculture	3.61	.64	3.83	.51	3.72	.58	71	.27	HN NS
5.	Concept of climate change adaptation	3.32	.76	3.55	.70	3.44	.73	71	.34	AN NS
6.	Concept of climate change mitigation	3.09	.94	2.73	.96	2.91	.95	71	.27	AN NS
7.	Strategies for climate change adaptation	3.03	.91	2.91	.99	2.97	.95	71	.71	AN NS
8.	Strategies for climate change mitigation	2.84	.98	2.82	.99	2.83	.99	71	.95	AN NS
9.	Concept of greenhouse gasses (GHGs)	2.87	.44	2.55	.46	2.71	.45	71	.42	AN NS
10.	Greenhouse gasses that causes climate change	2.84	.89	2.55	.97	2.70	.93	71	.38	AN NS
11.	Concept of Agro-biodiversity	2.94	.09	2.73	.07	2.84	.08	71	.62	AN NS
12.	Concept of Bio-fuels	2.71	.99	2.74	.94	2.73	.97	71	.23	AN NS
13.	Global and regional policy issues on climate change	2.87	.91	2.55	.93	2.71	.92	71	.30	AN NS

The result of Table 2 showed the mean responses of teacher of agriculture and extension agents on contents of climate change issues to be integrated into the senior secondary school animal husbandry curriculum. The values of the grand mean ranged from 3.73 to 2.59. These values were within the real limit of 3.50 to 4.00 indicating that four out of the thirteen items were Highly Needed while the remaining nine were Averagely Needed. The standard deviation (SD) of the 13 items ranged from 0.08 to 0.99. Each of the values was less than 1.96; indicating that the respondents were not far from the mean and from each other in their responses.

Furthermore, the result of the null hypotheses indicated that all the items had their t-cal ranging from 0.16 to 0.95 which were greater than 0.05. Therefore the null hypothesis of no significant differences was upheld for each of the thirteen items.

Research Question 3: What are the teaching methods and techniques for teaching climate change issues in senior

secondary school animal husbandry curriculum?

limit of 2.50 to 3.49 indicating that twenty two out of the twenty four items were

Table 3: Mean, standard deviation, and t test values of the responses of teacher and extension agents on the teaching methods and techniques for teaching climate change issues in senior secondary school. (N_1+N_2 =77, teacher and extension agent).

S/N	Item Statement	$N_{1=46}$		$N_{2=27}$		$\bar{G}$	SD_G	Df	t-cal	Remarks
		$\bar{1}$	SD_1	SD_2	$\bar{2}$					
1.	Lecturer method	2.23	.20	2.55	.24	2.39	.22	71	.46	SN
NS 2.	Seminars	3.07	.90	2.63	.96	2.85	.93	71	.34	AN
NS 3.	Group discussions	3.68	.66	3.00	.68	3.34	.67	71	.08	AN
NS										
4.	Visits to sites demonstrating the	3.36	.51	2.91	.57	3.14	.54	71	.34	AN
NS	impact of climate change									
5.	Visits to adaptation and	3.19	.65	2.64	.68	2.92	.67	71	.17	AN
NS	mitigation work in progress									
6.	On-farm discussion and surveys	3.06	.32	2.73	.36	2.90	.34	71	.38	AN
N										
7.	Guided discovery	3.19	.22	2.63	.22	2.91	.22	71	.10	AN
NS										
8.	Project	3.35	.19	1.90	.17	2.63	.18	71	.00	AN
S 9.	Demonstration	3.39	.39	2.64	.38	3.15	.39	71	.03	AN
S										
10.	Problem solving	3.22	.88	2.27	.86	2.75	.87	71	.03	AN
S										
11.	Library search	2.94	.65	2.46	.67	2.70	.66	71	.23	AN
NS 12.	Brain storming	2.97	.56	2.18	.58	2.58	.57	71	.05	AN
NS 13.	Experimental meth	3.22	.88	2.64	.87	2.93	.88	71	.14	AN
NS										
14.	Task analysis	2.77	.77	2.00	.67	2.39	.72	71	.05	AN
NS										
15.	Concept mapping	2.97	.35	1.91	.37	2.44	.36	71	.01	SN
S										
16.	Field trip	3.39	.57	2.27	.55	2.83	.56	71	.01	AN
S										
17.	Role playing	2.90	.99	2.73	.98	2.82	.99	71	.66	AN
NS										
18.	Supervised practice or workshop method	3.16	.77	2.64	.79	2.90	.78	71	.18	AN
N										
19.	Exhibitions	3.1.	.81	2.55	.77	2.83	.79	71	.11	AN
NS										
20.	Questioning	3.36	.49	2.73	.62	3.05	.56	71	.08	AN
NS 21.	Note-takin	3.19	.58	2.82	.65	3.01	.62	71	.38	AN
NS 22.	Use of internet	3.00	.6	2.91	.68	2.96	.69	71	.77	AN
NS										
23.	Use of Social media applications	3.13	.66	2.83	.68	2.98	.67	71	.25	AN
NS	for information dissemination									
24.	Online depository	2.75	.47	2.27	.46	2.51	.43	71	.13	AN
NS										

The result of Table 3 showed the mean responses of teacher of agriculture and extension agents on teaching methods and techniques for teaching climate change issues in senior secondary school. The values of the grand mean ranged from 2.51 to3.34. These values were within the real

Averagely Needed while the remaining two were Slightly Needed. The standard deviation (SD) of the 24 items ranged from 0.18 to 0.99. Each of the values was less than 1.96; indicating that the respondents were not far from the mean and from each other in their responses. Furthermore, the result of the null hypotheses indicated that

all the items had their t-cal ranging from 0.05 to 0.77 which were greater than or equal to 0.05 except for 5 items. Therefore the null hypothesis of no significant differences was upheld for each of the nineteen items except for five items. The reason for the variation in the opinion of the teachers and extension agents could be due to their different levels of professional coverage and experiences.

Research Question 4: What are the evaluation methods that could be used by teachers for assessing the students for the objectives of climate change issues integrated in senior secondary school animal husbandry curriculum?

The result of Table 4 showed the mean responses of teacher of agriculture and extension agents on evaluation methods that could be used by teachers for assessing the students for the objectives of climate change issues in senior secondary school animal husbandry curriculum. The values of the grand mean ranged from 2.50 to 3.50. These values were within the real limit of 2.50 to 3.49 and 3.50 to 4.00 indicating that thirteen items and one item out of the seventeen items were Averagely Needed and highly needed respectively while the remaining three were Slightly Needed. The standard deviation (SD) of the 17 items ranged from 0.46 to 0.92. Each of the values was less than 1.96; indicating that the respondents were not far from the mean and from each other in their responses.

Table 4: Mean, standard deviation, and t test values of the responses of teacher and extension agents on the evaluation methods that could be used by teachers for assessing students for the objectives of climate change issues in senior secondary school animal husbandry curriculum. (N_1+N_2 =77, teacher and extension agent).

S/N	Item Statement	$N_{1=46}$ $\bar{x}_1$		$N_{2=27}$ $\bar{x}_2$		$\bar{x}_G$	SD_G	Df	t-cal	Remarks	
		SD_1		SD_2							
1.	Essay type question	3.36	.90	2.83	.86	3.10	.88	71	.18	AN	NS
2.	Objective type question	3.48	.66	3.10	.64	3.29	.65	71	.23	AN	NS
3.	Performance test	3.45	.45	2.91	.47	3.18	.46	71	.13	AN	NS
4.	Interview	2.84	.60	2.81	.50	2.83	.55	71	.96	AN	NS
5.	Questionnaire	2.52	.81	2.18	.85	2.35	.83	71	.32	SN	NS
6.	Socio-metric technique	2.12	.76	2.18	.78	2.15	.77	71	.24	SN	NS
7.	Anecdotal records	2.77	.79	2.00	.98	2.39	.89	71	.03	SN	S
8.	Questioning	3.00	.80	3.58	.86	3.29	.83	71	.09	AN	NS
9.	Assignment (take home)	3.58	.58	3.27	.64	3.43	.61	71	.32	AN	NS
10.	Exams and Quizzes	3.61	.92	3.36	.90	3.50	.91	71	.37	HN	NS
11.	Checklists	2.97	.91	2.73	.85	2.84	.88	71	.47	AN	NS
12.	Self-evaluation	3.16	.94	3.00	.90	3.08	.92	71	.65	AN	NS
13.	Oral examination	3.10	.62	2.81	.55	2.96	.59	71	.53	AN	NS
14.	Supervised-practical examination	3.39	.79	3.27	.98	3.33	.89	71	.72	AN	NS
15.	Class work	3.19	.65	3.18	.69	3.19	.67	71	.97	AN	NS
16.	Online examination	2.45	.58	2.54	.52	2.50	.55	71	.82	AN	NS
17.	Subjective questioning	2.58	.78	2.64	.99	2.61	.89	71	.84	AN	NS

More so, the result of the null hypotheses indicated that all the items had their t-cal ranging from 0.09 to 0.97 which were greater than 0.05. Therefore the null hypothesis of no significant differences was upheld for each of the seventeen items except for one item. The reason for the variation in the opinion of the respondents could be attributed to their different levels of professional coverage.

Discussion of Findings

Thestudy revealed 13 objectives as climate change issues that could be integrated into animal husbandry curriculum.They include; climate change, causes of climate change, effects of climate change on human health and economy, effects of climate change on agriculture, climate change adaptation, climate change mitigation, ways of adapting to climate change effects, ways of mitigating the effects of climate change, greenhouse gases (GHGs), Greenhouse gasses that causes climate change, agro-biodiversity, bio-fuel, and global policy issues on climate change. The findings of the study were in line with the findings of Orusha et.al. (2012) and Kariuki, Mokaya, Kinuthia, and Jepkorir, (2016) that introduction to climate change, global warming, agrobiodiversity, bio-fuels, adaptation and mitigation strategies, and global policy issues on climate change as requisite areas to draw objectives of climate change issues to be integrated in agricultural science curriculum in Nigeria.

The study revealed 13 contents of climate change issues for integration into the senior secondary school animal husbandry curriculum. They include —concept of climate change, causes of climate change, effects of climate change on human health and economy, effects of climate change on agriculture, concept of climate change adaptation, concept of climate change mitigation, strategies for climate change adaptation, strategies for climate change mitigation, concept of greenhouse gasses (GHGs), greenhouse gasses that causes climate

change, concept of agro-biodiversity, concept of Bio- fuels and global and regional policy issues on climate change‖. The findings of the study are in concordance with the findings of Orusha et.al. (2012), Alaribe, Okirie, and Olaitan, (2013) and Ikehi, Ifeanyieze and Ugwuoke, (2014) that found out that the areas of climate change required for integration into the senior secondary school agricultural science curriculum include concepts, causes, and effect of climate change in addition to mitigation/adaptation strategies. Chikaire, Nnadi, Orusha, and Onogu, (2012) found areas such as introduction to climate change, global warming, agro-biodiversity, bio-fuels, adaptation strategies, mitigation strategies and global policy issues on climate change to be included in curriculum of agricultural science in secondary schools.

The study revealed in Table 3, teaching methods and techniques that could be used by animal husbandry teachers for teaching climate change issues in senior secondary school to be include; seminars, group discussions, visits to sites demonstrating the impact of climate change, visits to adaptation and mitigation work in progress, on-farm discussion and surveys, project, demonstration, problem solving, field trip among others. The findings are in line with findings of Chakeredza, Temu, Yaye, Mukingwa, and Saka, (2009) and Orusha et.al. (2012) that teaching and learning methods to be used include lectures (including guest lecturers), seminars, group discussions, visits to sites demonstrating the impact of climate change and or adaptation and mitigation work in progress, on-farm discussions and surveys.

The study revealed in Table 4, evaluation methods that could be adopted by teachers for assessing students for the objectives of climate change issues in senior secondary school animal husbandry curriculum to include; essay type question, objective type question, questionnaire, questioning, exams and quizzes, oral examination among others. The findings are in line with the findings of Wasiu (2013) that found out continuous assessment, oral, written and practical examination, multiple choices, objective and subjective questions as a means of evaluating students in secondary schools.

Conclusion

The study concluded that climate change issues are currently not integrated into existing animal husbandry curriculum for teaching and learning in Nigeria. The study determined the objectives, contents of climate change issues for integration into the animal husbandry curriculum, teaching methods and techniques that could be used by teachers for teaching climate change issues in senior secondary school, and as well as the evaluation methods for assessing student for the objectives of climate change issues in animal husbandry curriculum.

Recommendations

The following recommendations are made based on the findings of the study that:

1. The objectives and contents identified and documented be infused into the current curriculum of animal husbandry by the Nigerian Educational Research and Development Council (NERDC) to enable students keep abreast of climate change issues.
2. The teaching methods and techniques identified should be used by animal husbandry teachers in senior secondary schools in Nigeria for teaching climate change issues for proper students understanding of climate change.
3. The evaluation methods identified should be used by teachers for assessing students for the objectives of climate change in animal husbandry curriculum in Nigeria.
4. Workshops and seminars should be organized by NERDC and federal/state ministry of education for teachers of animal husbandry to enable them understand the objectives and contents of climate change issues to be infused into animal husbandry curriculum.

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