FARM MANAGEMENT ASSOCIATION OF NIGERIA

faman

AGRICULTURE AND ECONOMIC DEVELOPMENT:
STRENGTHENING THE NEXUS IN A COVID-19 ERA

PROCEEDINGS OF THE

34th

ANNUAL CONFERENCE
OF FARM MANAGEMENT ASSOCIATION OF NIGERIA

HELD AT:
**UNIVERSITY OF CALABAR, CALABAR
CROSS RIVER STATE, NIGERIA**

ON THE:
15TH – 18TH NOVEMBER, 2021

EDITORS:
IDIONG C. IDIONG, SUSANA B. OHEN,
EKANEM A. ETUK, JOHN B. EFFIONG,
IDEBA E. ELE, EMMANUEL O. EYO, AND
SYLVANUS O. ABANG.

PROCEEDINGS OF THE 34TH ANNUAL CONFERENCE OF THE FARM MANAGEMENT ASSOCIATION OF NIGERIA

CALABAR 2021

HOSTED BY
UNIVERSITY OF CALABAR, CALABAR
CROSS RIVER STATE

THEME:
AGRICULTURE AND ECONOMIC DEVELOPMENT:
Strengthening the Nexus in a Covid 19 era

DATE:
15TH – 18TH November, 2021.

EDITED BY:
IDIONG C. IDIONG, SUSANA B. OHEN, EKANEM A. ETUK, JOHN B. EFFIONG, IDEBA E. ELE, EMMANUEL O. EYO, AND SYLVANUS O. ABANG.

FAMAN NATIONAL EXECUTIVE COUNCIL

Dr. Damian I. Agom - - - - National President
Prof. Harana Usman - - - - 1st Vice President
Prof. P. C. Ike - - - - 2nd Vice President
Mr. F. D. Mulak - - - - National Secretary
Dr. Tau Adamu- - - - - Assistant National Secretary
Dr. Sale Idi - - - - - National Treasurer
Prof. Abdulhamid Auwal - - - National Financial Secretary
Ashaye W. Oladele -- - - Business Manager
Mercy Emefiene - - - - National PRO
Nal. A. B. Suleiman - - - - National Auditor
Prof. Dicta Ogis - - - - (Immediate Past President/Ex Officio)
Prof. Ernest Aiyedun - - - - Ex Officio.

FAMAN CALABAR 2021 LOCAL ORGANGISING COMMITTEE

Prof. Susana B. Ohen - - - - Chairman, LOC
Dr. Ekamen A. Etuk. - - - - Secretary
Mr. Uket I. Ofem - - - - Assistant Secretary
Dr. Eucheria A. Ajah - - - - Financial manager
Prof. Idiong C. Idiong - - - - Technical Adviser
Dr. O. Okorafor - - - - Business Manager

SUB-COMMITTEES
Secretariat

Dr. E. A. Etuk - - - Chairman
Mr. U. I. Ofem - - - - Member
Dr(Mrs). M.O.Effiong - - Menber
Mr. M. E. Amalu - - - - Member
Miss A.E. Uzoiqwe - - - - Member
Mr. V. C.Ihejiamaizu - - - Member
Mr. A. J. Ayade - - - - Member
Mr. B. E. Odure - - - - Member

Logistics

1. Dr.G.N.Odok - - - - Chairman
2. Mr. U.I.Ofem - - - - Member
3. Dr. Pascal Ozung- - - - Member
4. Dr. Eyo Edet - - - - Member

Entertainment/Welfare Committee

1. Dr. Affiong Joseph Henry - - - Chairman
2. Dr. Eno D.Uwah- - - - - Member
2. Mrs. Offiong E. Hogan- - - - Member

Security
Members

1. Mr.K.O. Itam - - - - Chairman
2. Mr. Melvin E.Amalu- - - - Member
3. Mr. Victor C. Ihejiamaizu - - Member

Finance Committee
1. Dr. E.A. Ajah-   -   -   -   Chairman
2. Dr. Josephine Ayuk-   -   -   Member
3. Mr. Nyambi Ndifon-   -   -   Member
4. Mrs. Victoria Ediene-   -   -   Member
5. Dr. Eyo Edet-   -   -   -   Member

Registration
1. Dr.Innocent Asuquo-   -   -   Chairman
2. Mrs Juliana Igiri-   -   -   -   -   Member
3. Dr. G.Elemi-   -   -   -   -   Member
4.Dr. Hilda Ettah-   -   -   -   -   Member

Technical committee
1. Prof. I.C. Idiong-   -   -   -   -   Chairman
2. Prof. S.B.Ohen-   -   -   -   -   Member
3. Dr. E.A.Etuk-   -   -   -   -   Member
4. Dr. J.B. Effiong-   -   -   -   -   Member
5 Prof. E. O. Eyo-   -   -   -   -   Member
6. Prof. S. O. Abang --   -   -   -   Member
7. Prof. I. E. Ele   -   -   -   -   Member
8. Dr. Ekemini Obok -   -   -   -   Member

Publicity committee
1. Dr. Bethel Ewung (CSDP) -   -   Chairman
2. Dr. Paul Bassey-   -   -   -   Member

SUB THEME: THE PARADOX OF NIGERIA'S LIVESTOCK DEVELOPMENT IN AN EMERGING ECONOMY

ANALYSIS OF FARMERS' PRODUCTIVITY AND PRODUCTION CONSTRAINTS IN LIVESTOCK ENTERPRISES IN KWARA STATE, NIGERIA

*[1]ADEWUMI, A., [2]YISA, E. S. [2]OMOBABA, Y. R., AND[3]SALISU, J.

[1]*Department of AgriculturalTechnology,Federal College of Freshwater FisheriesTechnology,New Bussa, Niger State, Nigeria*

[2]*Department of Agricultural Economics and Farm Management, Federal University of Technology, P. M. B. 65, Minna, Niger State, Nigeria.*

[3]*Department of AgriculturalExtension and Management, Niger State College of Agriculture Mokwa, Niger State, Nigeria*

*Corresponding author: +2347063155051, adewumiadeoluwa@gmail.com

ABSTRACT

The study analysed farmers' productivity and production constraints in livestock enterprises in Kwara State, Nigeria. Multi-stage sampling procedure was used to select 127 smallholder livestock farmers. A structured questionnaire complimented with interview schedule was used to obtain cross-sectional data from the farmers. Total factor productivity formula and Kendall's non-parametric statistics were used to analyse the data obtained. Results show that sheep with TFP value of 3.85 was the most productive livestock enterprise in Kwara State while broiler enterprise with TFP value of 2.96 was the least productive. The most severe production constraints encountered by the farmers were high cost of acquiring credit facilities ($\overline{X}$ = 15.62), high cost of feed ($\overline{X}$ = 13.22), high incidence of diseases ($\overline{X}$ = 13.14), poor/shortage of veterinary services constraint ($\overline{X}$ = 12.98), Limited capital ($\overline{X}$ = 12.83) and high cost of acquiring breed stock ($\overline{X}$ = 12.77) among others. About 64% farmers were in agreement with the ranking of the constraints affecting livestock enterprises in the area. The study concluded that the livestock farmers were relatively productive in the area but are faced with production constraints that pose significant threat to their productivity. It was recommended that government's intervention and remedial efforts should be tailored towards subsidized inputs such as feeds and brood stock, improved veterinary services as well as adequate and effective farm advisory/extension services.

Keywords: Productivity, Constraints, Livestock Enterprises, Farmers, Kwara

INTRODUCTION

Agriculture has continued to contribute immensely to the wellbeing of Nigerians as well as the economy of the country. It does not just feed the population at large but also creates employment to large number of people, especially in the rural areas, and provides raw materials for agro-based industries (Sani *et al.,* 2013). The livestock industry as an important component of the general agriculture is a key contributor to the economic growth and development of any nation as it has the capacity for providing food, employment, farm energy, manure and revenue for the farmers and even the government as argued by Ojiako and Olayode (2008). Livestock production in Nigeria constitutes 6% of the total Gross Domestic Product (GDP) and 25% to the agriculture sector over the last two decades (Ogunniyi and Ganiyu, 2014). The authors further reported that there are about 1 million heads of sheep and 7 million goats in the sub humid region of the country representing 3% and 16% respectively of the total ruminant animals in the region.

The livestock enterprises provide suitable strategies for the farmers towards augmenting their farm income and in all intent, enterprise diversification.Kayouli (2007) argued that livestock production is predominantly practiced by the resource poor smallholder farmers who are mostly rural dwellers. These smallholder farmers are faced with many production constraints which has inhibited their productivity and income in livestock enterprises. Many research efforts have been made to analyse profitability, technical efficiency and production constraints of these farmers in livestock enterprises in Nigeria. Some of these efforts are evident in the works Baruwa (2013), Bamaiyi (2013), Ogunniyi and Ganiyu (2014), Bamiro*et al.* (2015), Ibeun*et al.* (2019) and Jacob (2019) among others. Some of these studies have reported that middlemen exploitation, high and rapid increases in feed price, high volatility of output prices, insufficiency of market information, inadequate funds, diseases, poor extension service and lack of veterinary facilities constitutes some of the major setbacks in livestock production which could have significant implication for the farmers productivity.

However, in Kwara State, only meagre efforts have been made to analyses the livestock enterprises as well as the productivity and production constraints of the farmers. This study therefore attempted to analyse the productivity and production constraints of the livestock farmers in Kwara State, Nigeria. It specifically brought to fore the total factor productivity of the farmers in livestock enterprises and described theseverity of the production constraints encountered by the farmers in Kwara State. The output of this study is expected to reveal areas of policy interventions that could help alleviate the smallholder livestock farmers' production constraints and enhance their productivity. Additionally, agricultural project administrators, policy makers, extension agents and researchers both in the public and private sectors will find the outcome of this study beneficial to their work.

METHODOLOGY
Area of Study
The study was conducted in Kwara State, Nigeria. Kwara State is located in North Central Nigeria between Latitudes 7°45′N to 9°30′N and Longitudes 2°30′E to 6°25′E. The mean annual rainfall ranges between 1000mm and 1500mm. The State has a total population of 2,371,089 persons (Kwara State Planning Commission (KWSPC), 2007) and a projected population of 3,490,209 as at 2020. The State has a total land area of 32,500 square kilometres (Kwara State Ministry of Agriculture and Natural Resources (KWSMANR), 2010). The average temperature ranges between 30°C and 35°C. The topography of the State which is mainly plain to slightly gentle rolling lands and the climatic condition favours the cultivation of various arable crops and rearing animals. The major tribes in the State are Yoruba, Nupe and Baruba. Other tribes present include Fulani, Igbo and Hausa.

Sampling Procedure
A multi-stage sampling procedure was employed for this study. All smallholder livestock farmers in Kwara State constituted the population of study. The farmers were identified and selected with the assistance of the village heads and the resident extension agents.A total of 127 livestock farmers were sampled for the study.

Method of Data Collection
Primary data were used for this study. The cross-sectional data were collected from the farmers with the aid of a structured questionnaire. The structured questionnaire was complimented with interview schedules. Resident extension agents and enumerators were trained to assist during the data collection process. This was to facilitate access given this category of extension agents and enumerators are conversant with the study locations and are familiar with the target farmer populations.

Analytical Techniques
Data analysis was done with total factor productivity and Kendall's non-parametric test statistics.

Factor productivity analysis
The productivity of the livestock farmers in Kwara State was determined with the total factor productivity formula adapted from Durba *et al.* (2019) and Ibeun*et al.* (2019). The formula is expressed in equation (1) as follows:

$$\text{Total Factor Productivity (TFP)} = \frac{VOP}{VIE} = \frac{VOP}{TVC} \qquad (1)$$

Where;
VOP= Value of livestock output (₦).
TVC = VIE = Value of inputs employed (₦).

Kendall's non-parametric analysis
A five-point Likert type rating scale was employed to measure the perception of the livestock farmers on the severity of the production constraints they face in their production activities. The 5-point Likert type rating scale was allotted as follows: Not a constraint = 1, Not Severe = 2, Undecided = 3, Severe = 4 and Very Severe = 5. This was then subjected to Kendall's non-parametric analysis adopted from Legendre (2005) to generate mean scores for each constraint and a

coefficient of concordance (W) which is a measure of the extent of agreement ordisagreement among respondents based on mean ranking. The value of Wis positive andranges from zero to one. Zero implies perfect disagreement while one implies perfect agreement among the respondents based on ranking. The constraints were ranked according to their severity based on the mean scores to be generated from Kendall's non-parametric analysis. The Kendall's formula is mathematically expressed in equation (2) as:

$$W = \frac{12S}{m^2(n^3 - n)} \qquad (2)$$

S was computed as specified in equation (3):

$$S = \sum_{i=1}^{n} (R_i - \bar{R})^2 \qquad (3)$$

$\bar{R}$ was computed as specified in equation (4):

$$\bar{R} = \frac{1}{n} \sum_{i=1}^{n} R_i \qquad (4)$$

$R_i$was computed as specified in equation (5):

$$R_i = \sum_{j=i}^{m} r_{ij} \qquad (5)$$

Where;

W = Kendall's coefficient of concordance,

S = Sum of squared deviations,

m = Number of respondents,

n = Number of objects (farmers' constraints) considered,

$\bar{R}$ = Mean value of the total ranks

R_i = Total rank given to the ith object (farmers' constraint) considered,

r_{ij} = Rank given to the ith object (farmers' constraint) by the jth respondent,

$i = i^{th}$ object (farmers' constraint) considered, and

$j = j^{th}$ respondent.

RESULTS AND DISCUSSION
Analysis of Farmers Productivity in Livestock Enterprises in Kwara State

The results of the total factor productivity of the farmers in livestock enterprises were presented in Table 1. The resultsshow that at total of 14 livestock enterprises were identified in the area. These enterprises comprise of both ruminants' animals and poultry birds. Based on the estimated TFP values, it was evident that the farmers were relatively productive in all the livestock enterprises in the area. The pooled result gave an average TFP values of 3.33. This implied that the farmers were relatively productive in the use of the available resources at their disposal. Hence, the production factors contributed to the productivity of livestock farmers in the study area. The results specifically show that farmers were most productive in sheep enterprise with a TFP value of 3.85. This implied that the farmers were able to recoup more than 3 times the amount invested. This was closely followed by cattle/sheep, cattle/goat/sheep and cattle/goat as the most productive enterprises with TFP values of 3.76, 3.71 and 3.63 respectively. On the hand, broiler, broiler/cockerel and layer enterprises were the least productive livestock enterprises with TFP values of 2.96, 3.06 and 3.09 respectively.The productivity of livestock enterprises in the study area is in consensus with the reports of Bamiroet al. (2015) and Jacob (2019) that livestock enterprises areproductive and profitable farm enterprises in Nigeria.

Table 1: Factor productivity analysis of the livestock farmers

Livestock farm enterprises	Total factor productivity value
Cattle	3.16
Goat	3.60
Sheep	3.85
Cattle/Goat	3.63
Cattle/Sheep	3.76
Goat/Sheep	3.30
Cattle/Goat/Sheep	3.71
Broiler	2.96
Layer	3.09
Cockerel	3.15
Layer/Cockerel	3.22
Broiler/Cockerel	3.06
Broiler/Layer	3.29
Broiler/Layer/Cockerel	3.37
Pooled result	**3.33**

Source: Computed from Field Survey Data, 2019.

Livestock Enterprises' Production Constraints in Kwara State

The perception of the smallholder livestock farmers on the production constraints they face was analysed using the that Kendall's coefficient of concordance. The constraints were ranked in a hierarchical order according to their severity and the result presented in Table 4.17. The result of the analysis shows that the significance of the estimated value of Kendall's coefficient of concordance (0.636) at $p \leq 0.01$ probability level indicates that there is a 63.60% concordance or agreement among the smallholder farmers with respect to the ranking of the constraints affecting livestock enterprises in the area.

The mean ranking shows that the farmers viewed high cost of acquiring credit facilities ($\bar{X} = 15.62$)as the most severe production constraint they face in the area. Credit facilities are hardly available to smallholder farmers and where they are available there are lots of bottle-necks and constraints to accessing such. Many of the smallholder farmers involved in livestock enterprise production depends on other sources of finance for their farming activities. This result is in line with the findings of Baruwa (2013) and Ogah *et al.* (2014) who all identified difficult access to credit facilities as a limitation to livestock enterprise production in Nigeria.

Feed is essential for increased productivity of livestock enterprises. The farmers ranked high cost of feed ($\bar{X} = 13.22$) as the second most severe constraints in the area. This implies that nutritious animal feeds are not readily available and easily affordable for the smallholder livestock farmers. Since farmers venture into animal production for profit, they need to obtain feed at a price will ensure they break-even as well as make significant profit. Many livestock and poultry farmers have resulted to compounding their own animal feeds but are also faced with the challenge very expensive or unavailable raw materials. This finding is similar to that of Bamaiyi (2013) in a study on factors militating against animal production in Nigeria. High incidence of diseases ($\bar{X} = 13.14$)is also a major constraint to the smallholder farmers as it was ranked third on the list. This is similar to the finding of Adesehinwa *et al.* (2004), Maass *et al.* (2012) and Jacob (2019) who all reported that high incidence of diseases poses a major challenge to livestock farmers. Bamaiyi (2013) also argued that livestock diseases remain a veritable threat which inhibits the productivity of the livestock production industry. The spread of diseases among livestock is capable of wiping out the whole stock and thereby limiting the attainment of optimum plan by the farmers.

Next to this is the poor/shortage of veterinary services constraint ($\bar{X} = 12.98$) ranked fourth by the farmers. Veterinary services are needed by livestock producers in order to curtail infections and its spread of diseases among the animals.

Table 4.17: Analysis of livestock enterprise production constraints

Constraints	Mean Score	Rank
High cost of acquiring credit facilities	15.62	1st
High cost of feeds	13.22	2nd
High incidence of diseases	13.14	3rd
Poor/shortage of veterinary services	12.98	4th
Limited capital	12.83	5th
High cost of acquiring breed stock	12.77	6th
Inadequate processing storage facilities	12.15	7th
High cost of medications	11.86	8th
High mortality rate	11.80	9th
Low and unattractive prices for produce	10.97	10th
Difficulty in getting good quality breed	9.99	11th
Middlemen exploitation	9.98	12th
Inadequate market information	9.32	13th
Scarcity of fodder	8.59	14th
Limited livestock capacity space	8.30	15th
Weak/poor cooperative or farmers' association support	8.26	16th
Pilfering/theft	7.98	17th
Poor feed quality	7.78	18th
Inadequate access to quality water	6.81	19th
Inadequate extension and farm advisory services	5.64	20th

Diagnostic Statistics

Kendall's Coefficient of Concordance (W)	0.636
Chi-Square	255.620***

Source: Computed from Field Survey, 2019.

Limited capital ($\bar{X}$ = 12.83)ranked sixth among the livestock farmers' production constraints. This implies that the smallholder farmers are not able to afford the required inputs and other facilities that they need for maximum productivity. Capital is one of the most essential resources of production known to man. It is highly required to make investment in farm business such as the livestock enterprises and to sustain its productivity. Capital is one of the major constraining factors to the growth of the livestock sector especially in developing economies like Nigeria. Financial inadequacies have led to the slow growth and the contribution of the sector to the nations GDP. Smallholder farmers who are characterized by low income earnings dominates the livestock industry and as such, they are not able to handle the huge financial investment demands of the industry towards optimum productivity. This result is in line with the findings of Bamaiyi (2013), Baruwa (2013), Ogah *et al.* (2014) andJacob (2019) who all identified that financial limitations as a major setback to livestock enterprise production in Nigeria.

Mores so, high cost of acquiring breed stock ($\bar{X}$ = 12.77), inadequate processing and storage facilities ($\bar{X}$ = 12.15) were among the severe constraints faced by the smallholder livestock farmers as they were ranked sixth and seventh respectively. There is generally a lack of proper modern infrastructure required for processing and storage of farm produce such as the livestock produce in developing countries like Nigeria. This is a major setback for the livestock industry towards achieving optimum productivity especially among the smallholder farmers.

The farmers also claimed that high cost of medications ($\bar{X}$ = 11.86) and high mortality rate ($\bar{X}$ = 11.80) are among the major constraints to livestock production is the area. These are closely related to poor/shortage of veterinary services and their combination could cause a devastation havoc to the output of the smallholder farmers. These findings are in agreement with argument of Lawal-Adebowale (2012), Bamaiyi (2013) and Jacob (2019) who that the maintenance and sustenance of wellbeing of farm animals in

terms of their health constitute a major challenge to efficient livestock production among Nigeria livestock producers.

Another severe constraint faced by the farmers is low and unattractive prices for produce ($\bar{X}$ = 10.97). This is capable of discouraging the farmers from intensifying production towards achieving their profit maximization objective as they don't get the appropriate value for their produce. This may not be unconnected to the exploitative activities of the middlemen in livestock enterprises in the area.

In hierarchical order, a further perusal of the result in Table 4.17 revealed that the other production constraints faced by the smallholder farmers with mild to low severity includes difficulty in getting good quality breed ($\bar{X}$ = 9.99), middlemen exploitation ($\bar{X}$ = 9.98), inadequate market information ($\bar{X}$ = 9.32), scarcity of fodder ($\bar{X}$ = 8.59), limited livestock capacity/space ($\bar{X}$ = 8.30), weak/poor cooperative/farmers' association support ($\bar{X}$ = 8.26), pilfering/theft ($\bar{X}$ = 7.98), poor feed quality ($\bar{X}$ = 7.78), inadequate access to quality water ($\bar{X}$ = 6.81) and inadequate extension and farm advisory services ($\bar{X}$ = 5.64). These results are in line those of Adesehinwa *et al.* (2004), Bamaiyi (2013) and Jacob (2019) for livestock farmers in Nigeria. These constraints require urgent attention from the government and other relevant stakeholders in livestock industry to as to enhance optimum production of livestock enterprises among the smallholder farmers in Kwara State and Nigeria as a whole.

CONCLUSION

Onthe basis of the results of this study, it can be concluded that livestock farmers in Kwara State are relatively productive in their enterprises and are faced with several production constraints which poses great threat to their productivity. The constraints based on their severity calls for urgent intervention and remedy. It was therefore recommended that; government in through the Ministry of Agriculture and Natural Resources should consult policy makers and relevant agricultural institutions and agencies to formulate actionable remedial polices that will alleviate the constraints if the farmers and boost their productivity in livestock enterprises. Specifically, efforts should be tailored towards subsidized inputs such as feeds and brood stock, improved veterinary services as well as adequate and effective farm advisory/extension services.

REFERENCES:

Adesehinwa, A. O. K, Okunola, J. O. & Adewumi, M. K. (2004). Socio economic characteristics of ruminant livestock in some of South-Western Nigeria. *Livestock Research for Rural Development* 16 (8): 1 – 5.

Bamaiyi, P. H. (2013). Factors militating against animal production in Nigeria. *International Journal of Livestock Research,* 3(2): 54 – 66.

Bamiro, O.M., Adedeji, I.A., Otunnaiya, A.O., Soluade, W. & Ogunjobi, J.O. (2015). Enterprise combination in livestock sector in Southwestern, Nigeria. *Journal of World Economic Research*, 4(2): 38-44.

Baruwa, I.O. (2013). Empirical analysis of costs and returns to goat production under tropical condition. *Journal of Livestock Science,* 4: 44-50.

Durba, A. M., Adewumi, A., Mohammed, U. S. & Adebayo, C. O. (2019). Effects of SG-2000 Improved Maize Production Technology on Farmers' Productivity and Food Security Status in Kaduna State, Nigeria. *FUDMA Journal of Agriculture and Agricultural Technology,* 5(1): 197 – 202.

Ibeun, B. A., Adewumi, A., Ogunleye, A. A., Pelemo, J. J. &Jeje, C. A. (2019). Productivity of Fish Farming Households in Kainji Lake Basin, Nigeria.Isong, A., Onwhughalu, J. T., Eze, J. T., Gbadeyan, S. T., Umar, F. A., Abubakar, H. N., Ismaila, A., Bassey, M. S., Kolade, M. O., Uyokei, U., Bello, O. L. (2019). (eds). Building a Resilient and Sustainable Economy through Innovative Agriculture in Nigeria. Proceedings of the 53rd Annual Conference of Agricultural Society of Nigeria (ASN) at National Cereals Research Institute (NCRI), Badeggi, Niger State, Nigeria on 21 – 25 October, Pp. 144-147.

Jacob, A. T. (2019). Optimum combination of crop, livestock and fishery enterprises among smallholder farmers in Niger State, Nigeria. Unpublished PhD Thesis, Department of Agricultural Economics and Farm Management, Federal University of Technology, Minna Nigeria.

Kayouli, C. (2007). Sustainable livestock production in the Tropics. A paper presented at a workshop held by the Belgian Platform on Tropical Animal Health and Production Brussels, 21 November. Accessed on 12 February, 2014 from www.be-tropilive.be.

Kwara State Ministry of Agriculture and Natural Resources (KWSMANR) (2010). Report of Kwara State farmer's census. Ilorin, Kwara State, Nigeria

Kwara State Planning Commission (KWSPC) (2007). Kwara State Year Book, Kwara State, Nigeria

Lawal-Adebowale, O. A. (2012). Dynamics of ruminant livestock in the context of the Nigerian agricultural system. Retrieved on 11/23/2015 from *http://dx.doi.org//10.5772/52923.*

Legendre, P. (2005). Species associations: The Kendal coefficient of concordance revisited. *Journal of Agricultural, Biological and Environmental Statistics,* 10(2): 226-245.

Maass, B.L., Musale, D.K, Chiuri, W.L. Gassner, A. & Peter, M. (2012). Challenges and opportunities for livestock production in post-conflict South Kiru, Eastern DR Congo. *Tropical Animal Health and Production* 44(6): 1221-1232.

Ogah, D. M., Ari, M. M. &Gyar, S. D. (2014). Productivity measures and challenges facing small holder livestock farmers in humid North Central Nigeria. Proceedings of the 6th All African Conference on Animal Agriculture, held at Nairobi, Kenya. Retrieved from https://www.researchgate.net/publication/267510381. Accessed 12 September, 2020.

Ogunniyi, L. K. & Ganiyu, M. O. (2014). Efficiency of livestock production in Oyo State of Nigeria. *Journal of Animal Science Advances,* 4(1): 690-698.

Ojiako, I. A. &Olayode, G. O. (2008). Analysis of trends in livestock production in Nigeria: 1970 − 2005. *Journal of Agriculture and Social Research,* 8(1): 114-120.

Sani, R.M., Haruna, R. & Sirajo, S. (2013). Economics of sorghum (*Sorghum bicolor (L.) Moench*) production in Bauchi Local Government Area of Bauchi State, Nigeria. Invited paper presented at the 4th International Conference of the *African Association of Agricultural Economists,* September 22-25, 2013, Hammamet, Tunisia, pp.1-12.

Sathyanarayan, K. Jagadeeswary, V., Murthy, V.C., Ruhan, S. W. & Sudha, G. (2010). Socio-economic status of livestock farmers of Narasapura Village: A benchmark analysis. *Veterinary World* 3(5): 215-218.