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Full Length Research

Assessment of Cattle Production Practices among Crop-Livestock Farmers in South West, Nigeria

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Incessant crop farmers/herders crisis is a long-age problem with cattle production in South West Nigeria. The study assessed cattle production practices and provided information for the policy framework on livestock productivity. A multi-stage sampling technique was used to purposively select 220 crop-livestock respondents in the study area. Participatory Rural Appraisal approach was used to elicit information while parameters measured include age and size of household, cattle Tropical Livestock Unit (TLU) per household, average landholding per Household (HH/ha) and production constraints and possible solutions. Data obtained were subjected to descriptive statistics. Inadequate biomass quantity and quality of feed resources is the major constraint limiting cattle production in the dry season while crop-livestock production system adoption was the solution proffered. The average age of the Households was 40.5±1.0 with an age interval of 20-58, the mean family size was 9.0, 9.4 and 11.1 for rain-forest, derived and guinea savannah zones, respectively. The total cattle per Household (TLU) of 15.7±0.2, 20.2 ± 0.4 and 40.5 ±2.5 and average landholding per Household (HH/ha) of 0.6±0.3, 1.8±0.2 and 4.2 ±0.2 were recorded. In conclusion, the abundance of pasture during the wet season and the controlled tsetse fly makes South West Nigeria suitable for crop-livestock integration.

Keywords: Cattle Production, Crop-livestock System, Ecological Zones, Feed Resources, Livestock Policy.

INTRODUCTION

Cattle production is largely in the hands of the Pastoralist and about 90% of the cattle population is being managed extensively on a commercial scale (FAO, 2015). Increased human population, urbanization, marketing channels among various factors had bought tremendous pressure on the extensive system of management. On commercial scale and modern animal production management system, extensive cattle production practices are no longer sustainable in the twentieth century, coupled with the wanton destruction of lives and properties associated with frequent crises between crop farmers and pastoralists (Sosina, 2017). To forge ahead, there is a need to appraise and assess the existing cattle production practices in the dominant cattle production area like South Western Nigeria especially in the dry season (Onyeonagu and Njoku, 2010). Cattle production plays an important role in

the economies and livelihoods of farmers and pastoralists (Amole and Ayantunde, 2016). Livestock is therefore closely linked with the economic, social and cultural lives of millions of resource-poor farmers for whom animal ownership ensures varying degrees of sustainable farming and economic stability. Numerous authors used different criteria to classify livestock production systems in Nigeria (Olafadehan and Adewumi, 2011; Lawal-Adebowale, 2012). The following systems have been defined as pastoral, agro-pastoral or mixed crop-livestock farming, urban and peri-urban dairy farming and specialized intensive dairy farming systems (Bolorunduro et al., 2004; Mohamed et al., 2004).

The potentials for increased livestock production and productivity is proportionally lowered by various livestock management problems, catalogs of challenges, insufficient data to plan improved animal breeding, marketing, processing and livestock management practices (Kedija et al*.,* 2008).

Identification of overall management activities with their constraints and opportunities associated with cattle production are preconditions for designing suitable cattle production development strategies (Guyo and Tamir, 2014; Heffernan, 2004). In the dry season, there are influxes of cattle in Ibadan/Ibarapa area, South West, Nigeria, the general cattle husbandry practices have not been studied in the study area. Therefore, the study has the objective of assessing the cattle husbandry practices to assess associated opportunities and constraints in the South West of Nigeria.

MATERIALS AND METHOD

Description of the Study Area: The study was undertaken in the Ibadan/Ibarapa Area of Oyo State, Nigeria. The district is ethnically heterogeneous with a high concentration of smallholder crop and livestock farmers, considered nationwide as the occupational group with the highest incidence of poverty (Babayemi et al., 2014). The population is 81,115, out of which 52% are males and 48% are females (Sosina 2017). The district lies within Longitudes 1°5’ W and 1°39’ W and Latitudes 7°9’ N and 7°36’ N, covering an area of 1,782.2 km^2. It has a bimodal rainfall pattern ranging between 1200 and 1500 mm with a major rainy season from April to August, and a minor rainy season from August to November. The average humidity is 83%. The study area experience climatic and vegetation conditions that could be classified as rain forest derived savannah and guinea savannah (Sosina, 2017). The national boundaries have Osun state to the East, Ogun state to the south and Afijio LGA to the north while her international boundary with the Benin Republic to the West.

Sampling Procedure: The study area comprises of sixteen local government areas, nine agrarian and seven cosmopolitans. Each local government area was referred to as Block while each block had about eight cells with a cell composed of about ten to twenty villages. Three blocks, cell, and villages were randomly selected using the multi-stage sampling techniques as rain-forest ecological zone (Egbeda LGA), derived savannah ecological zone (Ido LGA) and guinea savannah ecological zone (Ibarapa East LGA). Participatory Rural Appraisal (PRA) technique (Venkatasubramanian and Rao, 2010; Babayemi et al., 2014) was employed comprising of focus group discussion (FGD) and structured questionnaires. The FGD involved about 10-15 farming households from each location, invited to a half a day interactive meeting to try to proffer likely solutions to their identified cattle production constraints. Individually structured questionnaires involving about 220 respondent farmers to elicit ideas, constraints and possible solutions with a sizeable farming household, this should be a true representation of the sample population.

Data collected through a questionnaire at FGD included bio-data of the farmers, household characteristics, range of farm sizes farm labor availability, seasonal pattern, types of animals raised by households, the purpose of raising an animal, etc. Parameters measured included production constraints and possible solutions, age and size of household, cattle Tropical Livestock Unit (TLU) per household and average landholding per Households (HH/ha) while data were subjected to descriptive analysis.

The techniques included were reviewing secondary data, questionnaire surveys, interviewing key informants, focus group discussions and a one-time farm visit. Survey results were summarized using descriptive statistics like mean, range, standard error of mean and percentage values of various

Table 1. Households sex, age, family size, age structure, and educational level Ecological Zone.

Parameter	Rain forest	Derived savannah	Guinea savannah	Summary
Sex of HHs				
M	75	80.3	95	57
F	25	19.7	5	43
The average age of HHs/year				
Mean ±SE	46.6±2.24	41.3±1.3	30.7±2.1	39.5±1.0
Average family size				
Maximum	13	16	17	17
Minimum	65	75	0.0	15
Mean ±SE	9.0±0.5	9.4±0.3	11.1±0.5	9.65±0.25
Level of education (%)				
Illiterate	57	60	63	60
Basic education	35	22	18	25
Elementary school	25	20	15	20
Junior 2ndry school	10	8	6	8
High school	2	1	0	1

parameters.

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics: The farm families used for the study were based on a family unit with a separate kitchen. This agreed with the farm family representation of Babayemi et al. (2014) that reported similar farm families in Osun and Oyo states. Household's sex, age, family size, age structure, and educational level were as shown in (Table 1). Savannah's ecological area had about 95 % of the respondent male farmers and 5% female while derived savannah had 80.3 % and 19.7% of males and females, respectively. The % of male and female for humid zone were 60 and 40 male and females, respectively. The summary of the respondent (%) had 57 males and 43 females in Ibadan/Ibarapa area. The average (Mean ± SE) age of the herds/household (HH) was 39.5±1.0 with an age interval of 20-58 were significantly different among ecological zones. Average family size in rain forest and derived savannah area were higher than that of guinea savannah. This agreed with findings of Olafadehan and Adewumi (2011) who reported similar findings in. derived and guinea savannah of Nigeria and Ethiopia, respectively. The survey result indicated that the educational status of the HHs was 45.0% literacy among the farm families in the Ibadan/Ibarapa area. Farming System Characteristics Livestock Holding and Cattle Holding: Average livestock holding of HH vary across the three ecological zones has shown in (Table 2). The total cattle per HH (TLU) were 15.7±0.2, 20.2±0.4 and 40.5±2.5 in rain forest, derived savannah and guinea savannah ecological zones, respectively. The number of livestock holding and the objective of the farm production systems differs significantly for the zones and available resources in the area. Similar studies of Guyo and Tamir (2014) and Fakoya, (2002) indicated that cattle production systems and livestock holding differ markedly due to differences in resource endowments, climate, human population, and economic development. The overall mean cattle holding (HH) was 15.7 ±0.2 and this was lower compared with cattle holdings in most parts of Northern Nigeria as reported by Bolorunduro et al.

Table 2. Average Livestock Holding and Cattle Herd Structure Ecological Zone.

Livestock species	Rain forest	Derived savannah	Guinea savannah	Overall Mean ±SE
Dry cow	2.6±0.3	2.01±0.2	10.0±0.2	2.4±0.2
Calves female	2.2±0.2	1.35±0.1	2.1±0.3	1.7±0.1
Calves male	3.0±0.2	4.32±0.1	2.3±0.3	1.6±0.1
Heifers	2.0±0.2	1.96±0.2	5.0±0.8	3.2±0.3
Milking cows	2.0±0.2	6.71±0.1	15.2±0.4	2.4±0.2
Bull	4.3±0.3	5.83±0.2	6.1±0.4	2.5±0.2
Total cattle	15.7±0.2	20.21±0.4	40.5±2.5	25.53±1

NB: TLU: Tropical Livestock Unit is 280Kg live weight of cattle. All the above data were expressed in TLU.

Table 3. Average Landholding per HHs in the three Ecological zones.

Ecological zones	Maximum (ha)	Minimum (ha)	SEM
Rain forest	2.45	0.52	0.6±0.3
Derived savannah	4.56	1.03	1.8±0.2
Guinea savannah	20.34	3.50	4.2 ±0.2

(2004) such as in Taraba and Nassarawa, 60.8±0.3 and 86.9±0.2, respectively.

Landholding and Land Use Pattern: Generally, there are two categories of Pastoralist which are sedentary and nomads. The sedentary are residents; they often speak the local language of the locality in question with access to a few hectares of land majorly for small scale crop farming. The proceeds from such crop production are for domestic consumption while the crop residues are for the livestock kept close to their abode. Such sedentary farmers are regarded as Landless in this study. The average landholding per HHs in the rain forest derived savannah and guinea savannah ecological zones was 0.6±0.3, 1.8±0.2 and 4.2 ±0.2 ha respectively, which was arable and private grazing land of the respondents and excludes other communal lands. The landholding of HH (ha) of respondents ranged from 0.52 to 20.34 (Table 3). The two main farming systems found in the study area were crop-livestock and livestock (pastoral) production systems. The result was similar to that of Olafadehan and Adewumi (2011) and Samiredypalle et al. (2014). There were significant differences in average landholding capacity of households among the three ecological zones which was at variance with report of Kedija et al. (2004) and Guyo and Tamir (2014) that stated that landholding was higher than that of Southern Ethiopia while Mohamed et al., (2004) reported that the average land size owned by a farmer is about 2.5 ha. This result was lower compared with the mean average landholding of 5.28 ± 0.215 ha per household (Babayemi et al., 2014). Seasonality in feed availability and lack of knowledge on feed conservation has created feed shortage both in the highland and lowland ecologies of Ethiopia (Guyo and Tamir**,** 2014).

Cattle Feed Resources: Dry cattle was significantly highest in the guinea savannah ecological area compared with other zones. The average HH of dry cows (TLU) for the rainforest, (as in Table 2) derived savannah and guinea savannah were 2.6±0.3, 2.0±0.2 and 10.0+0.3, respectively while average HH dairy cows were 2.0±0.2, 6.7±0.14, 15.2 ±0.4, respectively. As expected, the average total cattle (HH) of the ecological zones were 15.7±2.0, 20.6±1.0, 40.3±2.5, respectively.

Ibarapa East had the highest average herd size of

cattle producers in the study area closely followed by Ido Local Government. This could be traceable to the large expanse of derived savannah in the area that supports the commercial or large scale pastoralism compared with other locations in the study area. The area is well endowed with natural grassland appropriate quality and quality fodder or forage both at the dry and wet season with its fair share of water resources surrounding the locations. These are primary indices for efficient large scale cattle production. The report supported the work of Olafadehan and Adewumi (2011) that obtained a similar result with some ILRI Pastoralist in the derived savannah area of southern Nigeria.

Ido LGA closely followed Ibarapa East in terms of the average herd size of cattle compared with other locations. This was due largely to the nomadic movement of cattle in moving further down to the ecological area of derived savannah especially at the peak of the dry season. This supports the work of Amole and Ayantunde (2016) that reported the movement of cattle farmers largely influenced by season while looking for forage to survive in the dry season. This finding also agreed with Bolorunduro et al. (2004) that described derived savannah season to be a haven for cattle especially during the severe dry spell of the dry season. Thus, the quality and quantity of forage have a direct influence on the nomadic life of the cattle producers. These support the word of Fakoya (2002) and Lawal-Adebowale (2012) that reported the dynamics of nomadic with cattle management systems.

Cattle feed resources were ranked depending on the abundance of feed resources for their cattle and availability both in dry and wet seasons. The survey results indicated that the majority of households used natural pasture and crop residues as feed resources both in dry and wet seasons. The natural pasture was ranked 1st in all altitudes of the study area both in dry and wet seasons. Similarly, crop residues ranked 2nd; both in derived and guinea savannah for dry and wet seasons, but browse was ranked 2nd as the source of livestock feed in rain forest area. This agreed with the findings of Guyo and Tamir (2014) that reported a high dependence on Cattle production practice on natural pastures. Focus group discussion with key informants indicated that the availability of feed resources and crop residues varied among the three ecological zones. Cassava and maize were the dominant crops grown in the three ecological zones. The survey results indicated that natural pasture was the major feed resource and contributes 95.2 % as feed resource and ranked 1st in both dry and wet seasons. This agreed with the findings of Olafadehan and Adewumi (2011) in derived savannah areas of South West, Nigeria and Kedija et al. (2008); Guyo and Tamir (2014) in Ethiopia in lowland ecological zone.

Browse ranked 2nd in the rain forest zone as a source of cattle feed, which is in agreement with the study of Elias et al. (2007) in the lowland agro-pastoral system. Other feed resources have taken minor place as a source of livestock feed and there were no practices of silage making and urea treated with crop residues used as a feed source and feed supplements. Urea treatment and silage technology were not developed and adopted. The result was not in agreement with the findings of Amole and Ayantunde (2016) and Elias et al., (2007). Many of the farmers who live in the three ecological zones were involved in crop production practice do not use the crop residues as animal feed resources during early and late-season harvest (Fakoya, 2002). The result agreed with Guyo and Tamir (2014) that indicated the availability of feed resources in the ecological zones depends on the intensity of crop production, population pressure, the amount of rainfall, and distribution pattern of rainfall and seasons of the year. This agreed with the findings of Olafadehan and Adewumi (2011) and Sosina (2017) that reported similar results.

Constraints of Cattle Production: Inadequate biomass quantity and quality of feed resources is major constraint limiting the production of cattle especially in the dry season. This agreed with the findings of Amole and Ayantunde (2016); Babayemi et al. (2014). Fakoya (2002) reported the effect of feed supplementation for ruminants in the dry season. Crises arising from the encroachment of crop invasion will be limited during the dry season. The secondary constraints were poor agricultural product pricing, limited access to loans, lack of subsidies and high cost of feed.

CONCLUSION AND RECOMMENDATIONS

Cattle are the most important livestock species of

households for their day to day activities such as cultivation, threshing, transporting, manure and income. Overall, the biomass quality and quantity of natural forage is a major constraint limiting livestock production practice in the study area. Therefore, sustainable and viable commercial ruminant production practices are feasible if the following recommendations are followed:

1. Feed resources development should be aggressively pursued in the establishment of grazing reserves for ruminant feeding, especially during the dry season. The government will not only make additional revenue from grazing but will also ameliorate the incessant crises among the agro-pastoralist.
2. Under-developed and underutilized feed resources which can also be an alternative to the existing forage which are highly nutritious could be harnessed by the smallholder farmers and are adaptable to the study area. Most of the losses due to low body live weight arising from the reduced quality of feed resources during the long dry season spell would be avoided.
3. Irrigation or fadama farming could be encouraged among farmers for the availability of crop residues for ruminant production.
4. Livestock extension services delivery should further be synergized for better and efficient ruminant production. The farmers' field school approach should be strengthened with a robust participatory approach that is goal-oriented.
5. There is a need to establish more grazing reserves in the guinea savannah area to cope with the increasing demand for land for pasture establishment and cattle carrying capacity of cattle among cattle farmers in such ecological areas.
6. Along with this development, adequate and proactive planning and policy framework is, therefore, important to increase cattle production in such areas of the country.

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