Short Research Article
Cattle breeding practices in the Savannah Region of Togo

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ABSTRACT– ABSTRACT HAS TO BE ONE PARAGRAPH

Due to its geographical position, the Savannah region of Togo is more affected by the effects of desertification. Climate change and human actions are degrading the natural resources on which cattle breeding depends; which pushes breeders to adapt the practices of their activities. Our study aims to analyze the different practices in the management of cattle breeding in this region of the Savannah.
To this end, a representative sample of 150 breeders is constituted on the basis of their spatial distribution and the number of animals kept. A two-part questionnaire is submitted to him. The first part of the questionnaire allows us to have data on the breeder's operation while the second part provides us with information on the cattle herd. The analysis of the farm is carried out on the basis of the social status of the breeder and that of the herd concerns the number, breeds raised and management.
The result is that the average age of farm managers is 52 ± 6 years. These breeders combine agriculture with livestock breeding and they have no fallow plots or land reserves. What emerges is the coexistence of three breeding practices largely dominated by the fulani ethnic group: “Cultivating Breeders”, “Breeding Farmers” and “Agro-breeders”. Cattle farms also include other species including sheep (48% of farms), goats (17%) and the sheep-goat association (26%). The herds are formed from purchase (49%), inheritance (31%), donations (10%) and borrowing (10%). Faced with the degradation of natural resources, the former cattle breeding areas (prefectures of Tône, Tandjouare and Cinkassé) are intensifying agricultural activities; while new ones (Kpendjal, Oti and Oti-sud) are emerging in livestock areas. Please include short conclussion

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Keywordscattle herd; breeding practice; natural resources; Savannah region; Togo

UNDER REVIEW

1. INTRODUCTION

In Togo, livestock farming has most often retained a traditional character, a strong direct dependence on natural resources and low productivity(add citation). The growth of cattle breeding is gradually reaching limits because available land is becoming scarce and in agropastoral areas the common rangelands allocated to livestock breeding are gradually being replaced by crops (add citation). Competition over available land is increasingly strong and modern customary and legal powers show limits in managing access to resources, so much so that conflicts between users are increasing. The mobility of herds across territories is reduced during the cultivation period, which often poses feeding problems (Bourbouze 2007, Vall and Diallo 2009) please replace old citation .
The Savannah region of Togo borders the Sahelian countries and therefore constitutes a gateway for transhumant cattle. To access increasingly rare plant resources, cattle breeding systems are changing and local and foreign herds are adapting through mutual competition.

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This study aims to describe the current breeding systems and practices of livestock households in the Savannah region.

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2. MATERIAL AND METHODS

2.1- MATERIAL

2.1.1- Study area

The study area is the Savannah region located in the extreme northern part of Togo between 0° and 1° East longitude and 10° and 11° North latitude. It covers an area of 8,470 km2 or 14.9% of the Togolese territory with a population of 1,054,700 inhabitants. It has seven (07) prefectures, 16 communes, and 69 cantons.

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The economic life of the region is mainly dominated by subsistence agriculture practiced by 96% of households (RNA, 2012). The region excels in pastoralism and mainly raises small ruminants, poultry and cattle. The breeding system is of a traditional type focused on the exploitation of natural rangelands.

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2.1.2- Technical material

The material used to characterize farms and breeding practices consists of a two-part questionnaire (herd and farm) submitted to farm managers and an interview guide submitted to the technical services in charge of breeding.

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Other equipment was also used, notably: a GPS receiver to locate the position of different points in our study area, CSPro software for mask design and data entry, SPSS software for statistical analyses, Microsoft Office Excel for charts, Microsoft Office Word for designing the questionnaire and the interview guide.

2-2- METHODS

2.2.1- Sampling

The study site was chosen because of the relative importance of cattle breeding compared to other activities carried out in the area; and on the other hand in relation to other geographical areas of the country.

The sample size is determined from the following formula:

$$\mathbf{n} = \frac{T^2 * P(1-P) * N}{T^2 * P(1-P) + (N-1) * Y^2}$$ (Rea L.M.4 *et al.*, 1997)

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n= sample size ; **N**= size of target population; **P**= expected proportion of a population response. In this case, P=0.5 ; **T**= sampling confidence interval. By placing ourselves in a 95% confidence interval, T= 1.96 ;**Y**= margin of sampling error. For our study, the error is estimated at 5%.

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This formula made it possible to obtain a size of 150 livestock breeder households to survey. The identification of these breeder households is made from the nominative list of 1266 breeder households established by the agents of the services in charge of livestock. The choice of breeders by prefecture is based on the proportion of breeders in this prefecture compared to the total number in the region. The choice of farms at the level of each prefecture is made by drawing lots with the condition of a minimum number of five (5) head of cattle (see figure 1).

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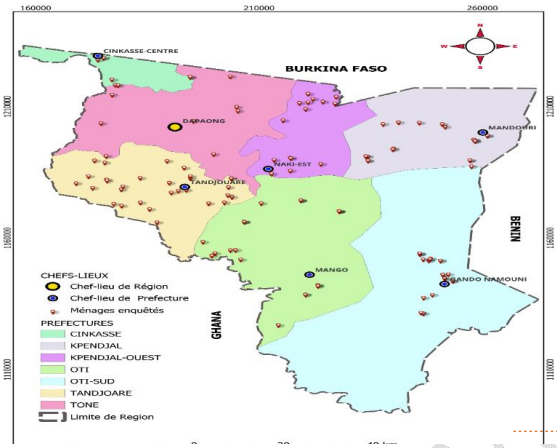

Figure 1: livestock households surveyed

2.2.2- Survey support

This survey support has two (2) parts including the identification and configuration of the herd.
The identification of the herd provides information on the name of the breeder head of household, origin, gender, age, marital status, other activities and available land.
The configuration and operation of the herd provide information on its establishment, its composition (breeds of cattle raised, average number of animals, etc.) and the know-how of the breeder (feeding, zoo-sanitary monitoring, animal dynamics in the herd).

2.2.3- Field data collection

Before the survey itself, seven (7) information and harmonization meetings, one per prefecture, brought together prefectural, cantonal and village breeder managers to provide them with the context, objectives and expected results of the study.
The surveys are carried out from April to September 2022 and concerned breeders who are heads of households in individual interviews; while in groups, they brought together the breeders sampled by canton.

2.2.4- Data management and exploitation

The data collected is entered into the CSPro software using a mask conforming to the questionnaires described above. The data are processed using the statistical software SPSS 20. The necessary tables and graphs were produced in Excel. For quantitative variables, means and standard deviations are calculated. Analyzes of variance (ANOVA) and comparison of means are carried out on zootechnical and socio-economic data.
Cattle breeding practices are determined using multiple correspondence factor analysis (AFCM) on 150 breeders. The study of the correlations between the various variables considered made it possible to retain a set of 17 active variables giving 44 modalities. An ascending hierarchical classification (CAH) is carried out with all the data.

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3. RESULTS AND DISCUSSION

3.1- RESULTS

3.1.1-Socio-economic characteristics of cattle herds

In terms of marriage, polygamists represent 54% compared to 46% of monogamists. Cattle breeding is the prerogative of the Fulani (70%), followed by the Moba (16%) and the Mossi (5.5%); the Gourma, Hausa and other ethnic groups represent 8.5% (See figure 2). The average age of farm managers is 52 ± 6 years. The Fulani are omnipresent and operate in the 7 prefectures of the region.

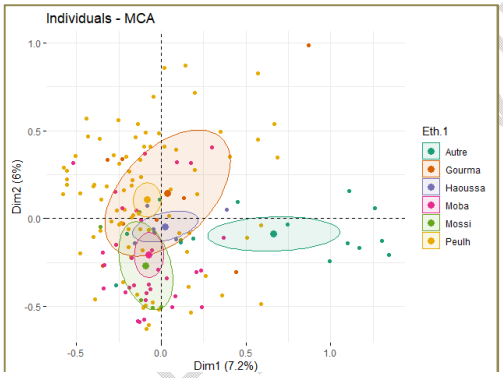

Figure 2: Distribution of respondents according to ethnicity

The herds are mainly formed by purchase (49%), by inheritance(31%), by donation(10%)and by loan(10%). (See Figure 3a).
Livestock breeding is associated with agriculture for 94% of respondents on an average surface area of 5.21 ± 4.54 ha of which they are not always the owners (See figure 3b). Due to the low availability of land, more than 90% of the livestock farms surveyed have neither fallow plots nor land reserve plots.

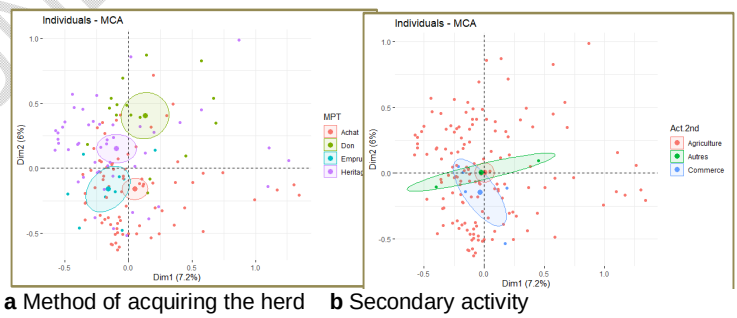

Figure 3: **a** Method of acquiring the herd **b** Secondary activity

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3.1.2- Zootechnical characteristics of cattle herds

The average number of cattle per farm is 51±36. The cattle raised are zebu and bull breeds; but we find herds there which raise the two mixed breeds. Of the 150 herds sampled, we found 13% zebu herds, 15% bull herds, 33% mixed herds and 39% mixed race herds resulting from the cohabitation of the first two (see figure 4).

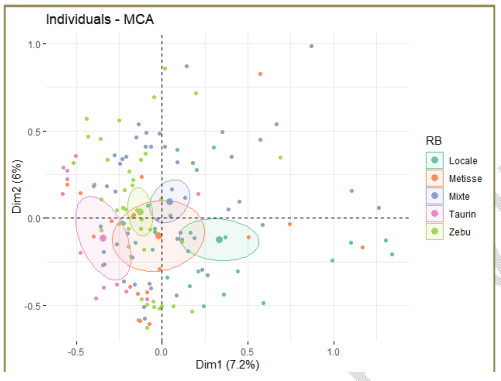

Figure 4: Distribution of respondents according to race

The total number of cattle from different herds surveyed amounts to 20,960 out of the 70,369 heads recorded. These herds are made up of 18% calves; 23% heifers; 9% bull calves; 40% cows; 4% bulls; 5% draft animals and 1% cattle for fattening. These cattle are raised in a single herd (9%) or in association with sheep (48%), goats (17%) and sheep-goats (26%).

3.1.3- Breeding practices

Three groups of different practices emerge from cattle breeding in the Savannah region of Togo (see figure 5) but natural grazing constitutes the basis of the animals' diet.

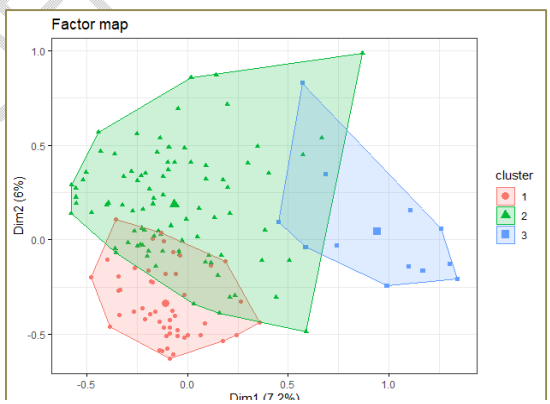

Figure 5: Projection of respondents in the factorial plan

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Group 1

It brings together 50 farms in the sample. The cattle raised are mainly of mixed breed in association with sheep. The animals are driven mainly by the Fulani(58%)and the Moba(30%),especially in the prefectures of Cinkassé, Tône and Tandjouaré. Pasture and water difficulties affect 94% of the 50 breeders, especially at the end of the dry season. This situation pushes 52%,or 26 breeders, to go on transhumance to overcome grazing difficulties, while 38%(19 breeders)dig holes in the dry beds of rivers or ponds to have water to water their herds. Farmers do not have fallow areas or fodder production plots. Members practice agriculture with increasing yields; these are "**Farmers-breeders**" (see table 1).

Table 1: Description of group 1

Variable		Terms
Designation	***Code***	***Group 1***
Lenghof rainyseason	L.Rs	Short (92%)
Lengh of dry season	L.Ds	Long (94%)
Amount of rain	A.R	Drought (86%)
Availability of pasture	A.P	Rare (94%)
Availability of surface water	A.Sw	Rare (94%)
Strategyyouadopt for wateringherds in difficult times	Str.wat	Dugholes (38%)
Moment of transhumance	MTr	Do not go on transhumance (48%)
Otherfarmedspecies	AFs	Sheep (60%)
Start of rainyseason	St.Rs	-
Cropyield	C.y	Rising (56%)
Animal health	A.h	Epidémic (14%)
Difficultperiod for wateringherds	DP.wat	End of dry season (80%)
Difficultperiod for grazingherds	DP.graz	End of dry season (58%)
Breeds of cattle	BC	Mixed (60%), Zébu (32%), Bullfighting (8%)
Préfecture	Pref	Tandjoare (31%), Tône (37), Cinkasse (32%)
Ethnic group	Eth.1	Fulani (58%) ; Moba (30%) ; Mossis (12%)

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Group 2

It is made up of 88 farms, or 59% of the sample. In this group, the cattle raised are mainly of taurine and zebu breeds. Pastures being increasingly rare and droughts harsh, breeders leave early with their herds on transhumance. This type of breeding is led by the Fulani (66%),the Gourma (12%),the Moba(10%) and the Hausa(7%). It is located in the prefectures of Kpendjal and Kpendjal-west. The harshest periods for feeding and watering animals are at the end of the dry season. Fallow fields and plots of natural grazing are becoming

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increasingly rare. In their associated activities, the members of these farms also practice agriculture with declining yields. These are the "**Breeder-cultivators**" (See table 2).

Table 2: Description of group 2

Variable		Terms
Designation	***Code***	***Group 1***
Lengh of rainyseason	L.Rs	
Lengh of dry season	L.Ds	Normal (2%)
Amount of rain	A.R	Drought (47%)
Availability of pasture	A.P	Abundant (45%)
Availability of surface water	A.Sw	
Strategyyouadopt for wateringherds in difficult times	Str.wat	Transhumance (43%)
Moment of transhumance	MTr	Start of dry season (38%)
Otherfarmedspecies	AFs	-
Start of rainyseason	St.Rs	-
Cropyield	C.y	Failing (72%)
Animal health	A.h	-
Difficultperiod for wateringherds	DP.wat	End of dry season (64%)
Difficultperiod for grazingherds	DP.graz	End of dry season (34%)
Breeds of cattle	BC	Mixed (10%), Zébu (38%), Bullfighting (52%)
Préfecture	Pref	Kpendjal (53%), Kpendjal Ouest (47%)
Ethnic group	Eth.1	Fulani (66%), Gourma (12%), Moba (10%), Haoussa (7%), autre (5)

Group 3

It has 12 farms, or 8% of the 150 sampled. The cattle raised are of the zebu (40%), bull(33%) and mixed(27%) breeds. The associated animal species are sheep and goats at 75%. These farms are mainly run by the Fulani (75%) and the Gangan (25%)in the prefecture of Oti-sud and Oti. The difficult periods for watering and grazing are the end of the dry season, but the herds do not go on transhumance (66%). There are sufficient fallow areas and natural grazing plots. Livestock breeding is practiced at the same time as agriculture without preference, these are "Agro-breeders" (See table 3).

Table 3: Description of group 3

Variable	Terms

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Designation	*Code*	*Group 1*
Lengh of rainyseason	L.Rs	Normal (58%)
Lengh of dry season	L.Ds	Normal (83%)
Amount of rain	A.R	Normal (58%)
Availability of pasture	A.P	Normal (50%)
Availability of surface water	A.Sw	Normal (75%)
Strategyyouadopt for wateringherds in difficult times	Str.wat	Water reservoirs (75%)
Moment of transhumance	MTr	Do not go on transhumance (66%)
Otherfarmedspecies	AFs	Sheeps and goats (75%)
Start of rainyseason	St.Rs	Normal (66%)
Cropyield	C.y	Normal (75%)
Animal health	A.h	-
Difficultperiod for wateringherds	DP.wat	End of dry season (83%)
Difficultperiod for grazingherds	DP.graz	End of dry season (83%)
Breeds of cattle	BC	Mixed (27%), Zébu (40%), Bullfighting (33%)
Préfecture	Pref	Oti Sud (66%) ; Oti (34%)
Ethnic group	Eth.1	Fulani (75%), Gangan (25%)

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3.2- DISCUSSION

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Cattle breeding remains the main activity of the Fulani and secondary for other ethnic groups as evidenced by the results of other studies in the same region (Douti, 2018). Similar results are obtained in Benin by (ALKOIRET et al, 2009) in the commune of Gogounou and by (DEHOUX and HOUNSOU-Ve, 1993) in the east of the Borgou department. Livestock management is presented under three main practices in the region; which practices result from the availability and accessibility of natural resources. Among the solutions to overcome these difficulties is the movement of breeders with their herds. The choice to move (nomadism, transhumance and migration) is determined by the water, nutritional and health needs of livestock and by the socio-cultural needs of breeders (Dehoux&HoussouVê 1993). In their travels, breeders and their animals are not concerned about the speed of progress. They make the most of the plant resources in their path. This behavior is similar to the result of Guilbert et al, (2009) when he states that this logic would require herds to be able to take maximum advantage of itinerant pastoral resources with the aim of avoiding weight loss or mortality due to an accelerated rhythm of movements.

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Other breeders choose association with agriculture. This association can gradually lead to reconversion depending on the assets in the prefecture. This is how the prefectures of Cinkassé, Tône and Tandjouaré are more suitable for agriculture.

Conversely, the prefectures of Kpendjal and Kpendjal-west are becoming major cattle breeding areas. Similar observations on the geographical distribution of cattle breeding have been made by certain authors (Sraïri, 2004; Dongmo et al., 2012).

In the prefectures of Oti and Oti-sud, the indigenous breeders encountered are agro-breeders. These are farmers who acquire a few head of cattle which they keep themselves or which they entrust to herdsmen. With their vast plains suitable for rice cultivation, the prefectures of Oti and Oti-sud constitute new centers of attraction for cattle breeding which benefits from rice straw after the harvest.
In general, “cultivating pastoralists” and “herding farmers” are the most common in almost all prefectures in the savannah region. Similar observations are made in northern Benin by certain authors (Sraïri, 2004); (Alkoiret et al, 2009) because these two geographical areas are juxtaposed and therefore suffer the same climatic effects and are home to the same ethnic groups.

4. CONCLUSION

Cattle breeding practices and systems are changing in the Savannah region to adapt to the agro-ecological conditions of the environment. The combination of challenges in cattle breeding increases pressure on pastoral resources. Thus, breeders, faced with difficulties with food resources, develop flexible strategies for organizing and managing the herd. The survival of cattle breeding in this region of the Savannah must rely on the provision or storage of food by targeting periods of unavailability of pasture during the year. In addition, anthropogenic activities must be environmentally friendly.

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DEFINITIONS, ACRONYMS, ABBREVIATIONS

RNA: Recensement National Agricole

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