

Socio-Economic Characteristics of Lagoon Cattle Farmers in Côte d'Ivoire

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Abstract

This study examines the socio-economic profile of livestock farmers in coastal Côte d'Ivoire. A total of 43 people were interviewed using well-structured questionnaires. The collected data were analyzed using descriptive methods. The results showed that local Lagoon breeders are divided into two zones: southwest and southeast. Breeders in the south-western region are generally located in two sub-prefectures of the Tabou Department (Grabou and Oulodio). Tabou's department alone accounts for 42% of the Lagoon breed in Côte d'Ivoire. Agriculture in this area is traditionally sedentary, practiced for social reasons. On the other hand, the south-eastern zone, located in the departments of Aboisso, Adzopé, Agboville, Grand-Lahou, Jacquville, Abidjan, Dabou and Sikensi, represents 58% of the Lagoon breeding area in Côte d'Ivoire. This second group is characterised by improved breeding. Most of the farmers interviewed in this zone breed for economic reasons. However, the risk of cross-breeding, which already affects the local Lagoon breed, could be increased by the presence of other species such as the Zebu and Ndamas, or even the Baoulé, in this south-eastern herd.

Keywords

Socio-Economic, Côte d'Ivoire, Breeding, Lagoon Cattle, Farmers

1. Introduction

Lagoon cattle are small animals (smaller than the Baoule cattle). It is well adapted

to its farming environment, where parasitic diseases are prevalent. They are robust and trypanotolerant [1]. They are also docile animals. Like goats, the Lagoon breed likes to live around houses [2]. Unfortunately, in some countries in which they occur, the Lagoon breed is only a trace [3]. In Côte d'Ivoire, this breed is on the verge of extinction [4]. For several decades, Côte d'Ivoire livestock statistics have estimated this cattle numbers declined from 7000 to 1000 in 1994 [5]. Furthermore, in countries where the Lagoon breed is found, it is excluded from breeding development programs. The reason for this is its small size. However, the breed has been replaced by the Baoule and Ndama breed within the framework of the "Élevage sous Palmeraie" project [2]. There is a trend among farmers to systematically crossbreed with Peuhl's zebu to increase size and productivity at a cost to trypanotolerance and resistance to certain diseases [1]. The current status of the Lagoon breed in Côte d'Ivoire is unknown. Therefore, a major and fundamental problem in the management of animal genetic resources is the alarming situation of the breed. It is feared that the Lagoon breed will disappear completely if nothing is done. We need to understand the industry and how it is organized, and the breeders who are the main actors, to develop local breeds. The sociology of breeders, their training, and their economic activities must be considered when determining a viable strategy. This study was designed to contribute to the sustainable management and development of Lagoon breed in Côte d'Ivoire.

2. Material and Methods

2.1. Study Area

Data collection was carried out in 6 regions of southern Côte d'Ivoire, divided into two zones. Zone 1 is located in the southwest of Côte d'Ivoire and includes Tabou Province. Zone 2 includes Agnéby-Tiassa, Abidjan' district, the Grands ponts, Mé and Sud-Comoé.

The four major rivers, the Cavally, the Sassandra, the Bandama, and the Comoé, flow through the region on the south coast of Côte d'Ivoire. The climate on the west coast (Tabou) is characterized by an average annual rainfall of 2335 mm and an average temperature of 26°C. The eastern coast of Côte d'Ivoire is occupied by Aboisso City, which has an average temperature of 27°C and an average annual rainfall of 1848 mm. The main export crops are cocoa, coffee, rubber, palm oil, sweet bananas, pineapple, and coconut. Food crops are cassava, plantain, banana and rice in Tabou [6]-[8].

2.2. Data Collection Method

Based on a literature review and information from the Department of Livestock Production of the Ministry of Animal and Natural Resources, the locations of the lagoon farms were identified. The departments covered were Aboisso, Abidjan, Adzopé, Agboville, Dabou, Grand-Lahou, Tabou, Sassandra, and San Pedro.

With the support of national or local livestock support structures, villages and livestock farmers in the different zones selected for study were identified. This work

was carried out in the administrative districts along the main transport routes. A radius of at least 25 km was defined for each district. The criteria used to select farmers to interview and sample animals were: accessibility of the herd to facilitate visits, availability of the farmer, presence of the herd of Lagoon bulls, and/or crossbred cattle resulting from crosses between these bulls and Zebus.

The interview guide was semi-structured. The collected information concerned the following: the socioeconomic characteristics of farmers and farms. The questionnaire was presented to the owners of the farms in person by the interviewer. Other household members could participate as translators or provide additional relevant information. Before presenting the questionnaire to the farmer, his farm was visited to confirm the presence of Lagoon cattle.

2.3. Data Processing and Statistical Analysis

Excel® was used to process the collected data. The processing involved calculating descriptive statistics, in particular, the frequencies of different modalities.

3. Results

3.1. Origin and Sociodemographic Characteristics of Lagoon Cattle

Forty-two percent of the farmers interviewed were from the south-western region of the Tabou region, in particular the prefectures of Oulodio and Grabo. In the southeast zone, 58% respondents came from the departments of Grand-Lahou, Agboville, Aboisso, Adzopé, Sikensi, Jacqueville, Dabou, and Abidjan (**Table 1**). Nineteen (19) percent of the breeders were non-natives, and 81% were from breeding areas. Most Lagoon breeders are male (42/43). By age group, 9.30% of the farmers are between 30 and 40 years old and 74.42% are between 40 and 60 years old. Farmers over 60 years of age represented 16.23%. Furthermore, 21% respondents had primary education. Secondary and university-educated farmers constitute 37%. Five percent (5%) of the Lagoon breed farmers attended Koranic school (**Table 1**).

Table 1. Distribution of farmers based on origin of breeder, education level and age group.

Particulars	Category	Frequency	Percentage (%)
Origin of breeders	Non native	8	18.60
	Native	35	81.30
Education	Informal	2	4.65
	Primary	9	20.93
	Secondary	16	37.21
	University	16	37.21
Age	Young age (≤ 40 years)	4	9.30
	Middle age (40 - 60 years)	32	74.42
	Old age (≥ 60 years)	7	16.28

3.2. Livestock with Socioeconomic Characteristics

Most farmers in Tabou gave or inherited animals (17 out of 18). Farmers in Southeast Asia acquired animals either through savings (25.60%) or inheritance (27.9%). For social reasons, all farmers in the southwestern zone keep animals. Livestock are kept for either social or economic reasons in the southeast of the country (Table 2). Out of 1020 animals, 157 were bulls, 574 were cows, and 116/174 were calf. There were 375 cattle in the southwest zone and 645 in the southeast zone. Other cattle breeds like Ndama and Zebu, are present in some herds on farms in the Southeast. Zebu was introduced on only 2 of the 18 farms in the southwest zone. Ndama cattle or zebu were introduced to 20 farms in the southern zone (Table 3). Cows from 18 (18) farms in southwest zone were native-born and local. In contrast, cattle in the southeast zone were of either herd origin or from other regions (Table 3). Most farmers in both zones (74%) inherited lagoon cattle or selected them for their hardiness and meat flavor. However, in the south-eastern zone, 19% of respondents preferred lagoon cattle for its profitability and 5% for its morphology (Table 3).

Table 2. Responses regarding economic motivation for lagoon cattle farming.

Breeding area	South west	South east	Percentage
Characteristics			
Acquisition of first animals			
Donate + Heritage	17	0	39.50%
Saving	0	11	25.60%
Heritage	1	11	27.90%
Don + saving	0	1	2.30%
Heritage + saving	0	2	4.70%
Total	18	25	100%
Reason for breeding			
Social	18	11	67%
Business	0	14	33%
Total	18	25	100%
Reason for selection			
rusticity, heritage, taste	18	14	74%
economic viability	0	8	19%
morphology	0	2	5%
rusticity and taste	0	1	2%
Total	18	25	100%

Table 3. Responses regarding mains breeds and number of cattle obtained.

Breeding area	Southwest	Southeast	Total	Percentage
Characteristics				
Herd composition				
Number of males	53	104	157	15%
Number of females	212	362	574	56%
Number of male calf	50	66	116	11%
Number of female calf	60	114	174	17%
Herd size	375	645	1020	100%
Other breeds in the herd				
none	16	4	20	47%
Ndama; Zebu	0	6	6	14%
Zebu	2	13	15	35%
Ndama	0	2	2	5%
Total	18	25	43	100%
Animal origin				
Born in herd and region	18	4	22	51%
Born in the herd	0	18	18	42%
Born in herd and outside region	0	3	3	7%
Total number	18	25	43	100%

3.3. Lagoon Cattle Housing

44% of the holdings (17 holdings in south-west and 2 holdings in south-east) had bovine animals outdoors. On the other hand, in the south-eastern zone, the animals were kept in pens (44% of holdings) or tied to a support (7%) (**Figure 1**). Finally, 5% of the farms have already built an enclosure (**Table 4**). It should also be noted that 60% of these habitats (18 holdings in the southwest zone and eight (8) in the south-east zone) are located in villages. In the southern area, they were kept in palm and rubber plantations (10%), coconut plantations (7%), farms and community parks (5%) and, finally, on the farms' own lands (14%) (**Table 4**).

**Figure 1.** Lagoon cattle in Songon village tied to a pole.

Table 4. Lagoon cattle habitats in Côte d'Ivoire.

Breeding area	Southwest	Southeast	Total	Percentage
Characteristics				
Animal habitat				
Homeless	17	2	19	44%
Enclosure	0	19	19	44%
Homeless and attached to a support	0	3	3	7%
Homeless and enclosure under construction	1	1	2	5%
Total	18	25	43	100%
Localisation de l'habitat				
In the village	18	8	26	60%
Palm plantation	0	2	2	5%
Field of hevea	0	2	2	5%
Within the concession	0	6	6	14%
Communal park	0	2	2	5%
Farm	0	2	2	5%
Coconut plantation	0	3	3	7%
Total	18	25	43	100%

4. Discussion

The total number of Lagoon cattle inventoried on all farms in the study areas (Southeast and Southwest) was 1020, including 157 males, 574 females, 116 calves, and 174 calves. This estimate may be revised upwards if a survey is organized in the other southern Côte d'Ivoire localities (San-Pedro and Sassandra) where the Lagoon breed has traditionally lived. Population structure also indicates that there are more females than males. This is because males are more often butchered for ceremonies, whereas females are kept for breeding.

Livestock farmers in the southwest zone are generally located in Tabou in the southwest of Côte d'Ivoire, in villages and sub-prefectures that are very difficult to access due to the state of roads and tracks. The breeders are indigenous. They belong to the local Kroumen ethnic group. Their education level ranges from primary to secondary. In the Tabou district, more than seven in ten women (70.2%) and almost six in ten men (59.8%) have no education. Illiteracy affects more than two out of three people (66.6%) [8]. Pastoralists are exclusively male. The ownership of herds is a family affair rather than an individual affair. Livestock are the property of extended families in each village. The management of the herd is entrusted to an influential member of the family, usually the patriarch. The patriarch chooses a family member responsible for recording herd births and losses. Young boys do not play an important role in the herd other than catching animals when necessary. However, the daughters of shepherds acquire cattle when they marry.

Farmers do not have the help of Peuhl staff in their work. The southeast zone breeders are in Aboisso, Adzopé, Agboville, Grand-Lahou, Jacquville, Abidjan, and Sikensi. In this zone, trypanotolerant animal husbandry is more village-based than peri-urban. In fact, 95.34% of farms are in villages, whereas 4.66% are in peri-urban areas, such as Abidjan and Adzopé. A similar observation was made in [9] characterization study of Baoule cattle in the Pays Lobi of Côte d'Ivoire by [9]. Most breeders are financially well-off people who live in towns. They are assisted by Fulani professionals who are employed as herders or even cattle breeders. Only one woman owns a Lagoon herd. Similar observations were made by [5] and [9]. In the central, northern, and north-eastern regions of Côte d'Ivoire, these authors highlighted the dominance of men on farms. In the central, northern, and northeastern regions of Côte d'Ivoire, these authors highlight the dominance of men on cattle farms. In Benin, women help their husbands look after animals, so efforts should be made to encourage women to take an interest in Lagoon cattle rearing [10]. Lagoon cattle are not kept for plowing, and even less so for the production of milk. It is practiced in the southwest for social reasons. A local bull (Lagoon breed) is slaughtered for the funeral of an important family member. A bull is also demanded as punishment for a serious crime or strange event. This observation explains the structure of these cattle. There are more females. The renewal of the herd may also be affected. For the dowry ceremony, a pair of Lagoon bulls (a male and a female) is required of the groom. Several authors have observed similar sociocultural practices. In Benin, cattle are used to meet the collective needs of the lineage: funerals, ritual sacrifices [11]. In Togo, animals are killed during ritual ceremonies [12]. Among the Lobi in northeast Côte d'Ivoire, Baoule cattle are slaughtered during ritual ceremonies, sacrifices, and funerals, but also during dowry ceremonies and other celebrations [9]. Lagoon breed meat is used to prepare an exceptional dish that is eaten only during rituals by the Koma in northern Cameroon, unlike zebu meat, which is part of the daily diet of consumers [13]. Lagoon cattle have also been owned by farmers in the Southwest Zone for decades. These animals were acquired mainly by inheritance or by being given as dowries.

In the southern-eastern zone, most of the farmers interviewed were involved in rearing for economic reasons. However, some farmers breed for prestige. This is the case of the Dappa farm in Grand-Lahou and the Ahouman farm in Aboisso. These breeders offer bulls to villagers for traditional festivals or to obtain administrative power. [14] studied this prestige-based breeding practice in Madagascar, and [15] observed the same practice in Benin. In summary, the reasons for Lagoon breeding in the southern region of Côte d'Ivoire differ among the areas. However, the organoleptic qualities of Lagoon meat are considered better than those of zebu meat by farmers in the two areas. Research is needed to confirm organoleptic quality and promote the use of this endangered breed.

Measures must be taken to improve the performance of these animals to meet the needs of the population. At the same time, emphasis must be placed on

preserving this genetic heritage. It would therefore be worthwhile to: raise awareness among stakeholders (especially breeders) about herd management that will enable them to increase the performance of this bull breed while preserving its adaptability. Breeders should be encouraged to form associations to promote the breed, which remains a rare resource in terms of performance. The creation of Laguanire bull nuclei should be considered in view of the risk of extinction.

5. Conclusion

This study of the socio-economic characteristics of Lagoon cattle rearing in southern Côte d'Ivoire shows that cattle rearing in this region is practiced for socio-cultural and economic reasons, but not for prestige. The Lagoon breed is exclusively male-dominated in Côte d'Ivoire. In the absence of the introduction of foreign breeds, such as the Peul zebu, the Lagoon herd in the southwest of Côte d'Ivoire could be described as a pure breed. It is a traditional herd maintained for sociocultural reasons. Improved livestock production is a characteristic of SEZs. Most farmers were interviewed mainly for economic reasons. However, the presence of other breeds, such as Zebu and Ndama or even Baoulé, in this second zone could increase the risk of crossbreeding, which already affects the local Laguanire breed.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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