

Analysis of cross-border transhumance of cattle in the department of Ouangolodougou

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ABSTRACT: The management of pastoral resources is today a real challenge for the West African sub-region, particularly in the north of Côte d'Ivoire. To help improve their exploitation, this study was carried out in the Department of Ouangolodougou. The objective of this is to carry out an analysis of cross-border transhumance in the said locality. To achieve this, a survey was conducted among the various stakeholders involved in the beef industry in this locality. The results showed that transhumant herders are mainly men of Peulh origin whose age range varies between 18 and 40 years (68%). They are mostly illiterate (97.33%) and experienced (6 to 15 years of experience). Zebus are the highest breed (37.33%). Heifers and bull calves make up the majority of the herd with 25.33% respectively. The small transhumance leaves from June to November and the large one takes place between November and May. The reasons for livestock mobility remain the lack of water (48.67%) and pasture (51.33%). The consequences of cross-border transhumance are crop damage and farmer-herder conflicts. Added to this is soil fertilization. The constraints of cross-border transhumance are the absence of passage corridors and rest areas. However, several measures have been taken by the State of Côte d'Ivoire to support cross-border transhumance.

KEYWORDS: Cross border transhumance, cattle, conflict, grazing, Ouangolodougou.

1 INTRODUCTION

In sub-Saharan Africa, livestock farming is an economic, social and cultural agricultural activity. In the Sahelian countries, livestock products account for 10 to 20% of the Gross Domestic Product (GDP) and sometimes up to 50% of export resources. The place of livestock farming in rural areas is even more decisive, with 47% of rural households carrying out livestock farming resources [1].

In West Africa, the cattle breeding system is mainly extensive and transhumant. The spatio-temporal variability of rainfall in these environments makes the availability of food resources for animals uncertain resources. Thus, cross-border transhumance is a very important strategy that allows herders to drive animals between complementary ecological zones resources [2].

Like the department of Ouangolodougou, transhumance is practiced throughout the north of Côte d'Ivoire. The observation is that in this locality, a strong migration of cattle herds is generally observed in the dry season. This migratory movement generates administrative hassles, causes crop damage and conflicts between farmers and herders [3]. Given the seriousness of the situation, the issue of cross-border transhumance has become a major concern for sub-regional institutions. To date, little scientific data exists on this phenomenon.

The general objective of this study is to contribute to improving the management of cattle herds on the northern border of Côte d'Ivoire.

2 MATERIAL AND METHODS

2.1 CHOICE OF STUDY AREA

The department of Ouangolodougou (Fig. 1) was chosen for this study because this locality is the entry point for herdsmen in Côte d'Ivoire by rail or land. There are two livestock entry points in this department: one in Niellé and the other in Ouangolodougou. Breeders from Mali and Burkina-Faso lead cattle herds in search of favorable breeding conditions in the dry season.



Fig. 1. Presentation of the study area

2.2 SAMPLING

2.2.1 CHOICE OF TRANSHUMANT HERDERS

The transhumant herder is retained as soon as he is encountered in one of the five sub-prefectures in the department of Ouangolodougou. They are spotted thanks to the president and tutor of the transhumants who know the routes taken by the latter. The veterinarian and the technical agents of the department also allowed direct contact with the breeders.

2.2.2 COLLECTION OF DATA

2.2.2.1 PRE-INVESTIGATION

The first step was to have the authorization of the administrative and customary authorities in order to carry out the work. The services of the Sub-Prefectures gave the authorization to meet the veterinary services, the presidents and the guardians of the transhumant herds. The objective was to identify the corridors used by transhumant herders in order to better prepare the meetings and the questionnaire. Adjustments were then made to the questionnaire based on the realities on the ground. This stage lasted one month, from June 10 to July 10, 2021.

2.2.2.2 PROPER INVESTIGATION

The five Sub-Prefectures in the department were criss-crossed for three months, from July 20 to October 20, 2021 in order to collect data.

The interview by groups of breeders in each Sub-Prefecture was held in French or Bambara and sometimes in Senoufo. During the interviews, the cattle were either grazing or in a space called a staging area.

2.2.3 STATISTICAL DATA PROCESSING

The data was processed and analyzed with several software including QGIS3.0, AnlyStat, IBMSPSS and Sphinx software. The QGIS 3.0 software allowed to make the maps of the study area. AnlyStat application was used for statistical inferential analysis. The Sphinx software was used to process and organize the questionnaire. Finally, the IBMSPSS software through ANOVA was used to determine the P-value and compare the results.

3 RESULTS

3.1 FARM CHARACTERISTICS

3.1.1 NUMBERS OF TRANSHUMANT HERDERS

Table 1 presents the numbers of transhumant herders in the various sub-prefectures. The majority of transhumant herders were identified in the Ouangolodougou Sub-Prefecture (42.67%). The lowest numbers were noted in Niéllé and Diawala with 10.66% and 8% of breeders respectively.

Table 1. Number of breeders by Sub-Prefecture

Sub-Prefectures	Number of herders	Percentages %
Ouangolodougou	32	42,67
Kaouara	18	24
Diawala	6	8
Niéllé	8	10,66
Toumoukro	11	14,67
Total	75	100

3.1.2 SOCIOECONOMIC PROFILE OF HERDERS

Composed solely of men, the cross-border transhumant were either Fulani from Mali, Fulani from Burkina-Faso and Fulani from Niger who graze their herds by criss-crossing the surroundings of classified forests and water reservoirs. Transhumant herds aged between 18 and 40 were the most numerous in the Sub-Prefectures of Ouangolodougou (34.67%) and Toumoukro (13.33%). Thus, at the level of the Department, 68% represented the highest rate of breeders aged between 18 and 40 followed by transhumant herders aged between 41 and 60 with a rate of 26.67%. The lowest rate of 5.33% represented breeders whose age was over 60 years. Transhumance was mainly practiced by young people with a significant difference ($p = 0.05 = 0.05$).

Cross-border transhumant herders encountered in the Sub-Prefecture of Ouangolodougou and Kaouara were of Burkinabè and Nigerien origins with respective rates of 53.33% and 13.33%. Those met in Diawala, Niéllé and Toumoukro were of Malian nationality with a rate of 33.34%. The transhumants encountered in the Ouangolodougou Sub-Prefecture were significantly more numerous than those encountered in the others ($P = 0.005 < 0.05$).

Transhumants with 6 to 15 years of experience represented a rate of 68%. Those with more than 16 years of experience accounted for only 6.67%. However, breeders with years of experience between 0 and 5 years had a rate of 25.33%. Thus, breeders with years of experience between 6 and 15 years were significantly more numerous ($p = 0.004 < 0.05$).

The transhumants encountered were 98.33% illiterate compared to 2.67% of the literate transhumants. These scholars were met in the Sub-Prefecture of Niéllé and were Malians who had attended the Franco-Arab school (Table 2).

Table 2. Socio-demographic profile of breeders

		Ouangolodougou		Kaouara		Diawala		Niéllé		Toumoukro		Département		P-Value
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	
Age range (years)	18-40	26	34,67	6	8	3	4	6	8	10	13,33	51	68	0,006
	41-60	6	8	9	12	2	2,67	2	2,67	1	1	20	26,67	
	61 et +	0	0	3	4	1	1	0	0	0	0	4	5,33	
Nationality	Nigerian	10	13,33	0	0	0	0	0	0	0	0	10	13,33	0,005
	Ivorian	0	0	0	0	0	0	0	0	0	0	0	0	
	Burkinabe	22	29,33	18	24	0	0	0	0	0	0	40	53,33	
	Malian	0	0	0	0	6	8	8	10,67	11	14,67	25	33,34	
Literacy level	Letter	0	0	0	0	0	0	2	2,67	0	0	2	2,67	0,005
	Illiterate	32	42,67	18	24	6	8	6	8	11	14,67	73	97,33	
Years of experience	0-5	10	13,33	3	4	0	0	4	5,33	2	2,67	19	25,33	0,004
	6-15	22	29,33	12	16	6	8	4	5,33	7	9,33	51	68	
	16 et +	0	0	3	4	0	0	0	0	2	2,67	5	6,67	

3.1.3 HERD COMPOSITION

The breeds encountered in the field were mainly Zebu, Baoules, N'Damas, Goudalis and "Mere" or half-breeds. Of all the breeds encountered in our study area, 37.33% of breeders have the Zebu breed; 25.34% of these transhumants having the Mere breed; 10.67% of transhumant had the Goudali breed; 9.33% of breeders have the N'dama breed and finally, 17.33% of breeders have the Baoule breed. The Zebus were the best known in all the Sub-Prefectures with a significant difference ($p = 0.034 < 0.05$).

Among the herds encountered, we were able to observe 18.66% cows, 25.33% heifers, 17.33% bulls, 25.34% young bulls and the others (13.34%) calves (0-2 years). In general, calves from 0 to 2 years old were the rarest in the herds. However, it did not excite any significant difference between these values ($p = 0.58 > 0.05$) (Table 3).

3.1.4 ECONOMIC PROFILE OF FARMERS

Most of the actors interviewed were only managers (36%) who received a monthly salary. Co-owners (37.33%) who were only partial owners often received a salary. However, they had no decision to make regarding the herd he led in case of difficulties. Some actors interviewed were exclusive owners (26.67%) of the animals they grazed and better managed the herd. Sole proprietors and co-owners were encountered the most in these sub-prefectures except in Diawala where no sole proprietor was encountered. In terms of herd membership, those with the status of co-owners were significantly the most numerous with $p = 0.72 > 0.05$. Most of the transhumants encountered were pastoralists with a rate of 36% against 5.33% who were mainly farmers, with a significant difference ($p = 0.05 = 0.05$) (Table 4).

Table 3. Breeds and herd composition

Parameters	Ouangolodougou		Kaouara		Diawala		Niéllé		Toumoukro		Département		P-Value	
	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%		
Breeds	Zebu	14	18,67	3	4	1	1	3	4	7	9,33	28	37,33	0,034
	Goudali	4	5,33	3	4	0	0	1	1,33	0	0	8	10,67	
	N'dama	4	5,33	0	0	2	2,67	1	1,33	0	0	7	9,33	
	Mere	4	5,33	8	10,67	2	2,67	2	2,67	3	4	19	25,34	
	Baoule	6	8	4	5,33	1	1,33	1	1,33	1	1,33	13	17,33	
	Bulls	5	6,67	3	4	1	1,33	2	2,67	2	2,67	13	17,33	
Composition of the herd	Cows	3	4	4	5,33	2	2,67	3	4	2	2,67	14	18,66	0,58
	Heifers	9	12	5	6,67	1	1,33	1	1,33	3	4	19	25,33	
	Young bulls	10	13,33	4	5,33	2	2,67	1	1,33	2	2,67	19	25,34	
	Calves	5	6,67	2	2,67	0	0	1	1,33	2	2,67	10	13,34	

Table 4. Economic profile of breeders

		Ouangolo		Kouara		Diawala		Niéllé		Toumoukro		Département		P-value
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	
Main activity	Breeders	8	10,67	6	8	4	7,33	5	6,67	4	7,33	27	36	0,025
	Farmers	0	0	0	0	0	0	3	4	1	1,33	4	5,33	
Status of breeders	Agro-pastoralists	12	16	6	8	4	7,33	3	4	2	2,67	27	36	0,723
	Tradespeople	7	9,33	5	6,66	0	0	2	2,67	3	4	17	22,67	
	Managers	7	9,33	9	12	2	2,67	3	4	6	8	27	36	
	Co-owners	15	20	4	5,33	4	5,33	3	4	2	2,67	28	37,33	
	Exclusive owners	10	13,33	5	6,67	0	0	2	2,67	3	4	20	26,67	

3.2 TRANSHUMANCE CONDITIONS

3.2.1 DISTANCES TRAVELED

The breeders met in the Department estimated that the average distance traveled per day depended either on the season or on the availability of feed. As a result, transhumants who traveled 5 to 10 km per day on average had a rate of 30.67% against 69.33% for those who traveled a distance of between 11 and 21 km. In the various sub-prefectures, the distance between 11 km and 21 km was the most practiced by breeders. The number of days taken by the transhumants before returning to Ivorian territory depended on their point of departure. Hence 40% walked on average 1 to 3 days and 60% walked 4 to 7 days. There is no significant difference between the travel times of transhumant herders ($P > 0.05$) (Table 5).

3.2.2 TRANSHUMANCE CALENDAR

The transhumants encountered in the Department were all unanimous that the month of November found them on Ivorian territory. On the other hand, the return depended on each person, with a rate of 45.33% returning to their area from the month of May against 54.67% who started in the month of June (Fig. 3). These movements were made during the dry season and 24% of these transhumant migrants returned during the rainy season in August. Thus, the transhumance calendar is composed of two distinct periods. The great transhumance (November to May) and the small transhumance (June to November).

3.2.3 PATHS TAKEN

The transhumants coming from Mali entered through three villages. Some entered through Pogo which is located 3 km from Zegoua and 6 km from Kapaga (Malian villages). On the other hand, others entered through Fatogomakaha, a village located 12 km from Kadiolo (Mali). The rest of them returned through the village of Ouarga (Siakavogo/Toumoukro) but went to the Department of Ferkessedougou.

Those from Burkina-Faso entered through Kadar and Tango-tango. These Ivorian villages border the villages of Dakôrô and Folonzo (Burkina-Faso). However, 52% of the negotiated leads used were known to everyone compared to 48% of the leads they sought by information (Fig. 4).

The breeders met came from Mali, Burkina-Faso and Niger. They often retreated to classified forests in the department of Ouangolodougou.

Table 5. Distances traveled

		Ouanagolodougou		Kaouara		Diawala		Niéllé		Toumoukro		Département		P-value
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	
Distances traveled (Km)	[5-10]	11	14,67	4	5,33	2	2,67	2	2,67	4	5,33	23	30,67	0,27
	[11-21]	21	28	14	18,67	4	5,33	6	8	7	9,33	52	69,33	
Duration (days)	[1-3]	12	16	7	9,33	5	6,67	3	4	3	4	30	40	0,80
	[4-7]	20	26,67	11	14,67	1	1,33	5	6,67	8	10,66	45	60	

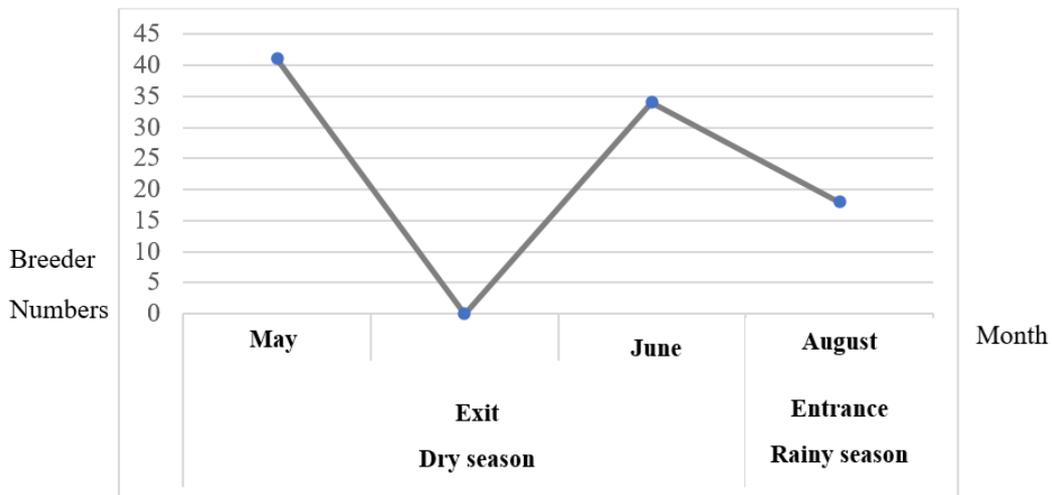


Fig. 2. Period of movement of transhumant herders

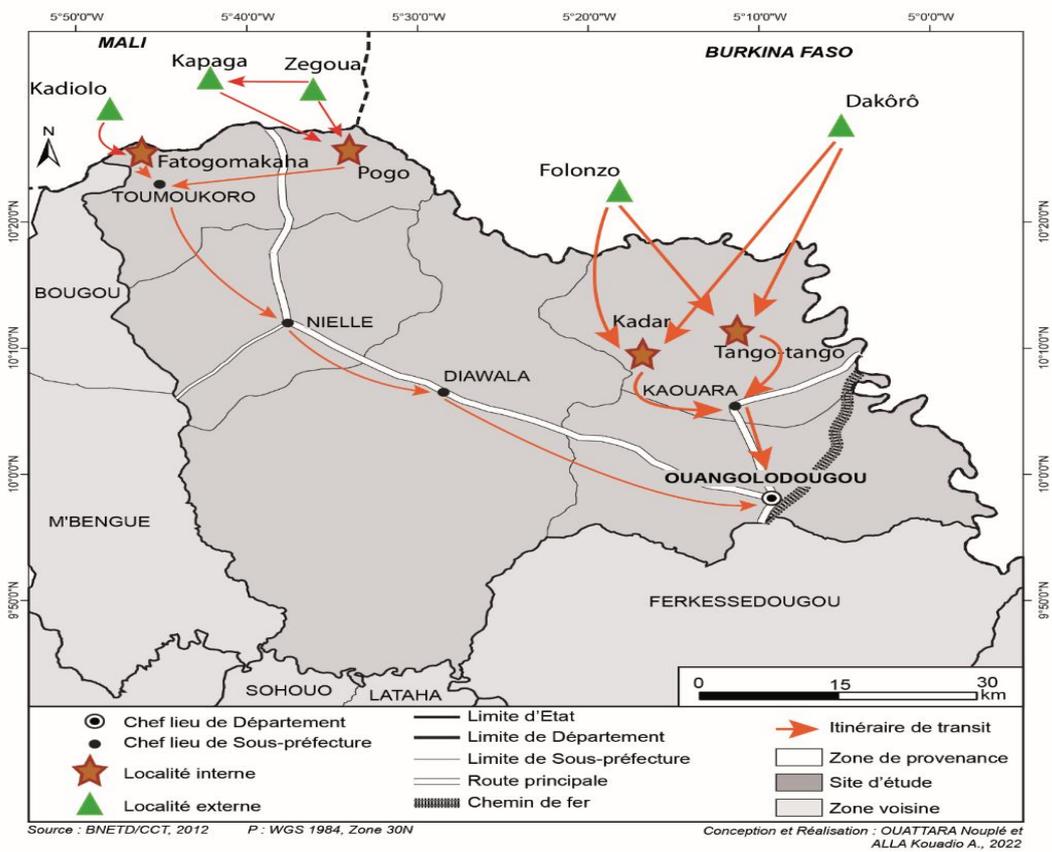


Fig. 3. Paths taken

3.3 FACTORS INFLUENCING TRANSHUMANCE

3.3.1 CAUSES OF TRANSHUMANCE

The causes of transhumant movement encountered during the dry season can be summed up in three. Thus, 7% of these breeders traveled to vary the diet of their herd, 52% for the lack of pasture and 41% for the lack of watering points for the animals. However, of the 75 herders met who practiced cross-border transhumance in the dry season, only 24% moved at times during the rainy season. They did this to avoid damage to the countryside due to the high number of their animals (Fig. 5). There is no difference between these values ($p>0.05$).

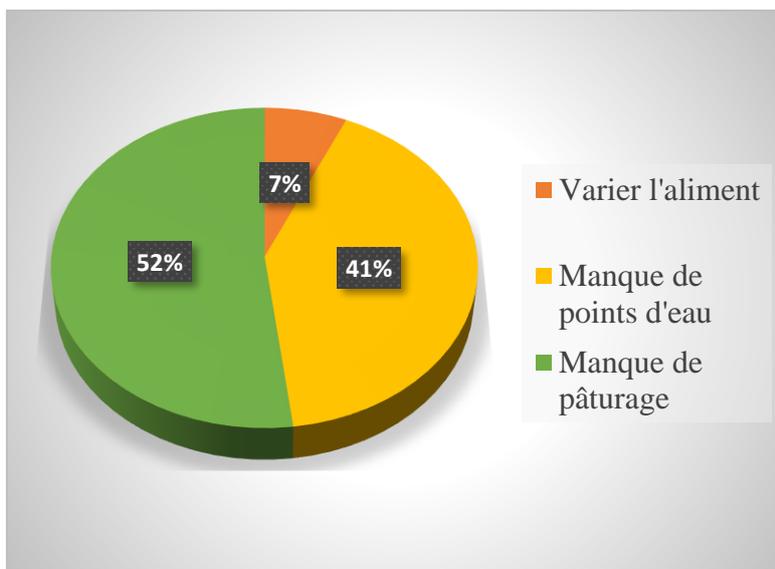


Fig. 4. Reasons for mobility

3.3.2 CONSTRAINTS RELATED TO TRANSHUMANCE

In terms of the constraints of cross-border transhumance (Fig. 6), the various observations listed by these herders can be summed up in four points. The lack of marked trails was cited by 32% of the breeders met. The lack of rest area was mentioned by 25.33% against 13.33% who mentioned the lack of pasture. Finally, the breeders who reported the harassment of the agents (water and forest and veterinarian) and the conflicts were estimated at 5.33% and 12% respectively. There is no difference between these values ($p > 0.05$).

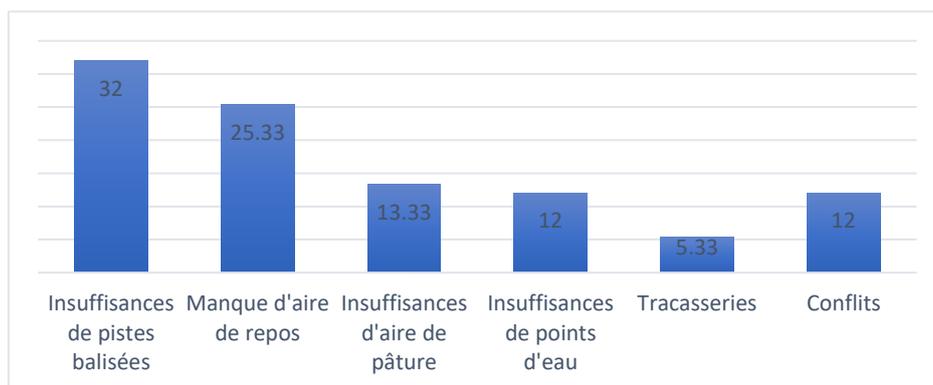


Fig. 5. Constraints of transhumance

3.3.3 CONSEQUENCES OF TRANSHUMANCE

During our research, the consequences observed were more negative than positive. As a negative consequence, there were cases of respiratory diseases mentioned by 8% and 12% had noticed fatigue on the animals. In addition, cases of conflicts between transhumant and farmer were mentioned by 41% against 11% who mentioned cases of conflict between transhumant and pastoralists. Also, 7% maintained that incidents such as muggings or thefts happened from time to time. In the end, 21% had mentioned conflicts over water points. The positive consequences observed are at the economic level where 42% of transhumant people sold and bought animals during their journey. According to our observations, we could say that transhumance allowed the fertilization of the soils during their displacement and reinforced the quality of the fallow field plots (Fig. 7). There is no difference between these values ($p > 0.05$).

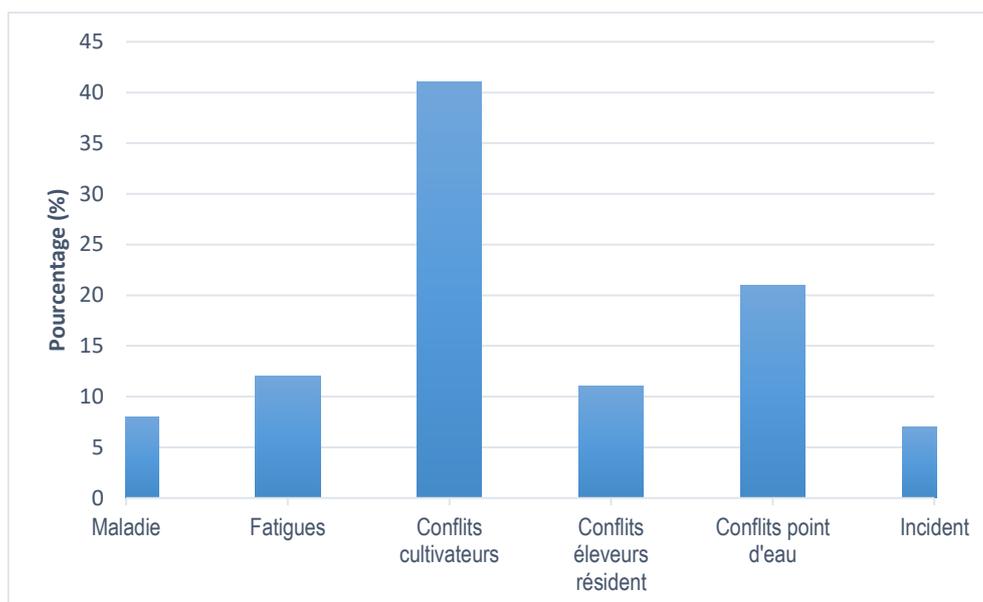


Fig. 6. Consequences of transhumance

3.4 DISCUSSION

The transhumants interviewed in the department of Ouangolodougou are Fulani men because they are experienced. This activity is practiced by men because of its difficulty and its long-distance mobility which is done from one country to another. Our results corroborate those of some authors [4]. According to these authors, the lack of labor obliges the owners to leave the management of their herd to the Fulani who have a habit and more experience in the field. The majority of people encountered in our study area are young malians, burkinabès and nigériens. According to tradition, only the youngest members of the family are responsible for grazing the animals. They accompany their elders for a while in order to better master the practice of this activity. Thus, our results are consistent with those of some authors [5] who state that transhumant herders abandon transhumance when they become too old to move.

Zebus, N'damas, Meres, Goudali and Baoules are the breeds encountered in the department. Given its mobility, young animals are the most numerous in the composition of the herds encountered. These breeds are chosen based on zootechnical parameters such as trypanotolerance, their ability to adapt to the environment and to walk over long distances. Some authors [6] in their research in Niger indicates that for an improvement of the breeding in the Sahelian countries, the breeders adopted the breeds Zebus Peulh, the N'dama, and the Baoule for a crossbreeding. The actors met are managers, co-owners and exclusive owners. These actors were either herd owners or herders to whom other herders entrust their herd in exchange for a salary or an animal. Thus, reference [7] indicates that transhumance includes the use of resources used simultaneously by a variety of actors.

The distance covered varies according to the availability of pastures on the tracks taken. Herders cover several kilometers a week. They return through the nearest border villages and patrol either slowly or quickly depending on their needs in the area. Thus, some authors [8] stipulate that transhumant people travel several tens of kilometers in search of pasture to increase the productivity of their herd. As far as the transhumance calendar is concerned, it is made up of two main periods. The first and long period (from November to May) takes the form of an incessant back and forth between the pastures. These movements are caused by difficult climatic conditions, in particular rainfall and specific deficits in these countries. The return to the departure areas takes place from June to November, which is the small transhumance for other breeders. Herders claim that there are no suitable tracks dedicated to transhumance. They exploit the existing tracks since the 1970s which have been redeveloped where you can have water points and fresh pastures. Our statements are identical with those of some authors [9], which state that all herders are looking for diversified pastures for an increase in the productivity of their herd. Our study area is both a reception area and a departure area. The transhumant people encountered were Malians, Burkinabes and often Nigeriens. Because these countries are cross-border to our study area. For reference [10], transhumance refers to the mobility of actors from a starting point to a reception point. Reference [11] in their study in Benin state that in order to develop transhumant routes so as to be a reference, the infrastructures must be known and available in the reception areas.

In addition, the route of the transhumant depends on pastures and tracks conducive to the activity. At times, herders use other unauthorized or unmarked corridors to meet the needs of the herds. In general, herders move in search of water points and pastures to make up for the food shortage in their herds. Transhumance is a way to take advantage of the complementarity of animal fodder and water resources during the dry season. And other breeders think that the feed of the herd should be varied. Reference [8] affirms that grazing represents the main diet of herds. However, the climate in Mali, being continental intertropical, is characterized by a long dry season, which means that fodder availability is not complete in all areas. All of these factors are reasons for moving to these countries.

The tracks used by transhumance do not fully respect the characteristics of transhumance tracks. At times, transhumant people take clandestine tracks to meet their needs. Technically, transhumant herders are forced to resign themselves to classified forests due to the lack of availability of rest areas. As part of the cross-border transhumance, rest areas, grazing areas, transhumance and passage tracks are important elements that promote easy access. Thus, Gado et al. [12] confirms our remarks. For these authors, the transhumant route takes into account the existence and quality of pastures, the availability of drinking water and the presence or absence of crop fields.

In terms of consequences, transhumance has an impact on the health and production of livestock since the herd remains mobile in search of a balanced diet. Feed is one of the limiting factors in livestock production and one of the sources of expenditure. The distance traveled for grazing depends on the season. Transhumance has a complex effect on animal health risks. Our results go hand in hand with that of Akaffou [13] who mentions that the mode of feeding practiced by all breeders is grazing and this, throughout the year. However, it has been revealed that the amount of production depends on all these factors acting on their health. In addition, Daouda and Mamadou [14], affirm that transhumance has affected the social fabric by the multiplication not only of social conflicts but also the proliferation of animal diseases during their displacement. Conflicts exist between cultivators-breeders in the rainy season due to animal damage in the fields. There are conflicts between transhumant and resident herders and also conflicts over water points. In this activity, the land is the natural support for all the pastoral resources sought by the breeders. Thus our results are in agreement with those of certain authors [3] who specify that the insertion of transhumant herds in reception areas is the source of multiple conflicts between transhumant herders and sedentary populations.

4 CONCLUSION

Cross-border transhumance is a cattle breeding strategy. In the department of Ouangolodougou, it is practiced by different actors over a determined period in search of water points and grazing areas. Transhumance is done through a grouped mobility of several herds under the care of drivers also called herdsman. These trips are made sometimes on tracks and often in corridors. During these movements, the transhumance are subjected to deplorable conditions such as insecurity, lack of rest areas, lack of regulatory transhumance documents, etc.

For a good organization and management of transhumance in the Ouangolodougou area, it is necessary to slow down and then control all the movements of transhumance in order to harmonize and equip the transhumance tracks.

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