

## **Constraints of small ruminant production among farming systems in periurban area of Ouagadougou, Burkina Faso (West Africa)**

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### **ABSTRACT**

*This study was undertaken to assess constraints in small ruminant production among farming management system using a structured questionnaire in two sites (Saaba and Saponé) located in the periurban area of Ouagadougou, Burkina Faso. Between March 2008 to February 2009, data were collected from eighty (80) small ruminant smallholder farmers practicing traditional raising system. Descriptive statistics such as mean, frequency and percentages were used. The main results revealed that smallholder farmers raise several animal species among which the small ruminants take major place in their livelihood. The impact of thefts (56.2%) proved to be the main reasons of the animal losses followed by predators (37.5%) and animal diseases (33.7%). To avoid the losses/or mortalities of animals bound to the identified constraints, the smallholder farmers combined the sales, the consumption, slaughtering and the treatment of sick animals. Respiratory affections (37.2%), diarrhoea (31.7%) and trypanosomosis (25.5%) are the main pathologies of the small ruminants in the periurban area of the study area.. The therapeutic methods used by smallholder farmers against these affections are the use of modern (100%) and traditional (23.7%) medicine. Otherwise, the survey revealed that the majority of smallholder farmers raise small ruminants to have a source of incomes at all times to improve their family living conditions.*

**Keywords:** Small ruminants, Farming system, Constraints, Periurban area of Ouagadougou, Burkina Faso.

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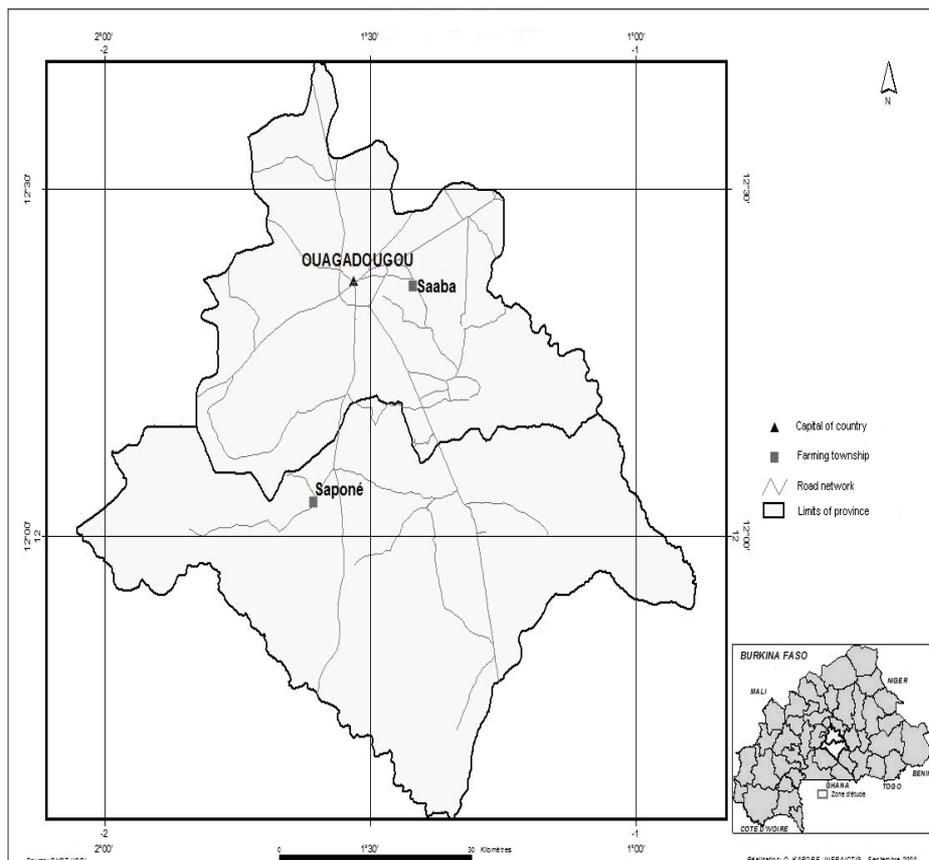
### **INTRODUCTION**

In Burkina Faso, livestock occupy an important place in the national economy because of its contribution to GDP (19%), to exportation (26%) and to employment (80%) of the active population in farming area [1]. After mining and cotton sectors, livestock exports constitute the third source of currencies for the state economy.

At the national level, out of ruminant, small ruminant occupy the first place with approximately 19 500 000 individual animals raised under sedentary farming system by 82 % of smallholder farmers who essentially exploit natural grazing area [2]. These small ruminant populations are classified into three major breeds within the two species (sheep and goats): Sahelian, Mossi and Djallonké [3]. The major parts of these animals is raised in rural areas where they present an alternative against poverty by direct contribution of cash incomes in the markets and food insecurity to the households which use their meats as source of proteins. They also contribute to satisfy the needs of the populations of cities and villages in animal proteins towards the importance of their slaughter (73%) in slaughterhouses contrary the other animal species (27%) [2]. Besides, their short cycle of reproduction and their low food needs are so many factors which contribute to their exploitation in the rough climatic conditions by the smallholder farmers in rural areas of country. Unfortunately, the productions of these small ruminants are low all season of year because of various constraints bound to the raising practice of smallholder farmers.

In this context, the aim of the study is to identify the main constraints limiting small ruminant's production in periurban area of Ouagadougou in Burkina Faso in order to address improvement's strategies to deciders.

## MATERIALS AND METHODS



**Fig. 1: Map of two farming townships (Saaba and Saponé) in the periurban area of Ouagadougou in Burkina Faso, West Africa**

### 2.1- Study area

The study was conducted in two farming areas (Saaba in the province of Bazèga and Saponé in the province of Kadiogo) located in the periurban area of Ouagadougou (latitude from 11°3'N to

13°5'N) in Burkina Faso (Fig. 1). These two farming townships are respectively 40 km for Saponé and 6 km for Saaba from Ouagadougou, the main city of the country. The area has a tropical Sudan-Sahel climate characterized by a long dry season (October to May) and a short rainy season (June-September). Temperatures, ranging from 20°C to 42°C, with a minima of 20 ° C in January and maxima of 42 ° C in April-May. The average annual rainfall varies between 600 to 800 mm. The vegetation of area is a shrub savanna and clear forests materialized by one tree stratum (*Butyrospermum parkii*, *Parkia biglobosa*, *Lannea acida*, *Adansonia digitata*, *Tamarindus indica* and *Faidherbia albida*) and one herbaceous stratum (*Loudetia togoensis*, *Pennisetun pedicellatum*, *Andropogon gayanus* and *Andropogon pseudapricus*) (Kagoné, 2000), In the provinces of Bazèga and Kadiogo, the number of small ruminants is estimated at 370 584 and 484 763 animals respectively [4].

## 2.2- Assessment of small ruminant livestock and constraints

An exploratory survey based on structured questionnaires and visit of animal herd has been conducted on eighty smallholder farmers raising small ruminant in the townships of Saponé and Saaba, chosen on the basis of their nearness with the city of Ouagadougou. These smallholder farmers have been identified by livestock technicians at each area, taking into account their farming practices of small ruminants and their previous involvement in similar studies. These surveys were conducted from March 2008 to February 2009. The interviews were individually carried out at a place chosen by sampled smallholder farmer during one hour and follow-up of visit of the small ruminant herd. The managed content of structured questionnaire was administered to collect data on the farmer's profile, the number of raised domestic animal, the constraints of small ruminant livestock and the methods used to avoid these constraints.

## 2.3-Statistical Analysis

Descriptive statistics such as mean, frequency and percentage were used to analyse the data using Statview for Windows, version 4.57.

## RESULTS

All the smallholder farmers sampled are generally household heads with an average age of 44.4 ± 11.6 (25-76) years which belong to Mossi (73.3%) and Fulani (26.6%) ethnic groups. 30% of them can neither read nor write in any language while 70% are literate in Arabic (76.2%), French (14.3%) and Mossi (14.3%). All the respondents are mainly agro-pastoralists (93.3%) and male. Young farmers aged less than 30 years accounted for 13.3% of the respondents.

**Table 1: Raised domestic animals according smallholder farmers sampled in the two farming townships located in the periurban of Ouagadougou in Burkina Faso**

Animal species	Frequency (%)		Total
	Saaba	Saponé	Frequency (%)
Poultry (chickens and guinea fowls)	575 (27.1)	838 (50.6)	1413 (37.4)
Small ruminants (sheep and goats)	775 (36.6)	525 (31.7)	1300 (34.4)
Cows	517 (24.4)	94 (5.6)	611 (16.1)
Pigs	-	133 (8.0)	133 (3.5)
Donkeys	88 (4.1)	56 (3.3)	144 (3.8)
Horses	15 (0.7)	-	15 (0.3)
Ducks	18 (0.8)	-	18 (0.4)
Pigeons	112 (5.2)	10 (0.6)	122 (3.2)
Rabbits	17 (0.8)	-	17 (0.4)

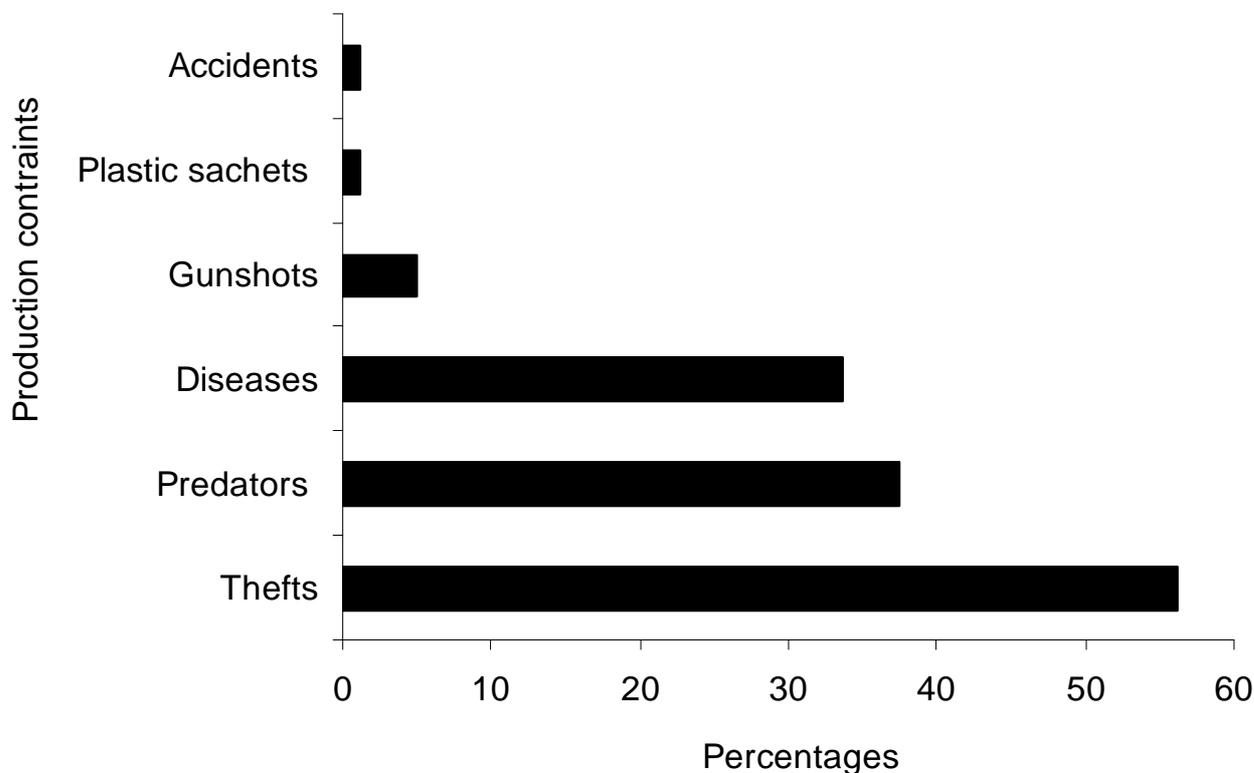
The results obtained in our study area revealed that poultry and small ruminants constitute the largest numbers raised by smallholder farmers, representing respectively 37.4% and 34.4% of all domestic animal species (table 1).

By farming township, the strength of small ruminants was more important in Saaba (36.6%) than in Saponé (31.7%). Other domestic animals such as poultry, cattle, pigs, donkeys, horses, ducks, pigeons and rabbits were also raised in relatively high number, between 0.8% to 27.1% in Saaba and 0.6% to 50.6% in Saponé.

In the two studies areas, small ruminants kept under traditional management system in which small ruminants are released for day-time grazing and are housed the night in a basic infrastructure made with the local material. Every season, animals are raised and complemented by some farmers (53.3%) or only during the dry season by others (46.6%). They drink to the level of dams (44.6%), boreholes (33.3%) or well (16.6%).

In addition, the study revealed that 98% of respondents practice small ruminant livestock to obtain cash income, 1% for food and 1% for reproduction. 94% of farmers operating small ruminant manure in their fields, especially in their gardening plots to increase plant production.

Fig.2 presents the main constraints of small ruminant production in the two farming townships of the study area where thefts are the main constraint of small ruminant production (56.2%). This constraint is followed by animal diseases in Saponé (21.2%) and predators in Saaba (20%).



**Fig.2: Main constraints of small ruminants' production on farming systems in the two farming townships area of Ouagadougou periurban area**

Control measures used to avoid these production constraints of small ruminant are sales (26%) or the combined actions such as the treatment of diseases/consumption/sales (44%) and treatment of diseases/consumption (30%).

The main diseases observed in small ruminants and treated by smallholder farmers in our study are reported in table 2. Respiratory infections (37.2%), diarrhea (31.7%) and trypanosomiasis (25.5%) are small ruminant diseases identified as the most common in both area of Saaba and Saponé.

**Table 2: Major diseases of small ruminants according smallholder farmers in the areas of study**

Diseases	Frequency (%)*		
	Saaba	Saponé	Total
Respiratory infections	31 (38.7)	17 (34.7)	48 (37.2)
Diarrhea	27 (33.7)	14 (28.6)	41(31.7)
Trypanosomiasis	16 (20.0)	17 (34.7)	33 (25.5)
Foot-and-mouth disease	4 (5.0)	-	4 (3.1)
Dermatosis	2 (2.5)	1 (2.0)	3 (2.3)

*\* A farmer can cite several diseases of small ruminants*

All diseases of small ruminants identified are treated by modern methods (100%) with veterinary officers and by traditional veterinary medicine (23.7%) among veterinary healers in the two farming areas. Traditional medicinal practices were more important in Saponé (20%) than in Saaba (3.7%).

## DISCUSSION

In the two farming townships, the results reveal that majority of smallholder farmers surveyed were relatively older, likely due to the fact that young people always migrate to the city of Ouagadougou in seek of more lucrative jobs. The small ruminants raising was practiced in all sampled households and the total small ruminants (sheep and goat) were estimated at 17 in average per investigated smallholder farmer. This number is quite below the averaged 32 small ruminants per smallholder farmer in the Sahelian area of Burkina Faso [5].

In our study, small ruminant herds are mainly focused on market-oriented to satisfy the important protein requirement of the citizen of Ouagadougou in order to obtain cash incomes and on self-consumption at the household level. This is in line with Sangaré [6] who argued that small ruminants raising has a considerable role in the family income in rural areas in West Africa. It must be the reason why many projects promote this type of breeding which could contribute to improve farmer's livelihood in the study area [7]. Unfortunately, all small ruminants of two townships farming of our study depend on natural pastures which are poor quality, specifically in dry season, critical period of livestock food in Burkina Faso [8]. All period of the year, animals always graze around the concessions, and along settlements and in nearby fallows, thus compromising their safety. This situation could explain the observed percentages of constraints during the survey. To secure their food and income, smallholder farmers tend to diversify the raised animal species. As principal constraints of this form of raising, interviewed people cite the thefts of animals, which in turn are intrinsically linked to the proximity of the multiple markets of Ouagadougou city where slaughtering of small ruminants is higher in number as compare to cows. The first position of thefts observed in our case are different from similar studies carried out on small ruminant production in Kenya [9] and Delta State of Nigeria [10] and on poultry production in Cameroon and Nigeria [11]. For those studies, the diseases are cited as main constraints of the breeding.

In our case, smallholder farmers cure animal diseases using modern and traditional veterinary medicines. Some respondents recognized a weak uses of traditional veterinary medicines. This might be due to the induced high cost of conventional drug products and therapeutic acts as argued by Kaboré *et al.* [12]. In all cases, this traduces the interest given to animal health, the only way to avoid undesirable consequences such as total loss of the livestock or alternatively wait for a longer period before the cattle will be reconstituted.

For the respondent of study, respiratory infections were the main diseases of small ruminant including probably pasteurellosis which is main cause of small ruminant mortality in Burkina Faso [2]. According to Mucuthi and Munei [9] citing Kimaru (1993), helminths can be predisposing factors to respiratory affections. Consequently, the high percentage of the respiratory affections in the study could be caused by helminths which provoke generally diarrhoea to the infested animal.

Respondents also cited accidents as another constraint to the breeding practices. This is mostly caused by toxic plants of substances ingested by the animal during the grazing. Conflict for resource use between breeders and farmers, generally occurring during rainy seasons is finally cited as constraint through the gunshots reported in the study. This conflict calls for the establishment of a pastoral zone for animals. In fact, unused space is lacking because of the rapid urban expansion in periurban area of Ouagadougou. Apart from the above cited constraints, the other ones could be avoided by the appropriate improvement of infrastructure and diet.

## CONCLUSION

The study has disclosed the important role of the small ruminants breeding system in the household livelihood. However, the production has remained traditional, mainly based on the use of the natural pasture and crop residues to feed animals, thus negatively affecting their quality and quantity performance. This is aggravated by diverse constraints such as thefts, diseases, predators, etc. Therefore, there is an important need to improve the small ruminant production system improving local farming practices to their easy adoption for increasing animal production and improving incomes farmers' livelihoods.

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