

Brief Theoretical Overview of the Goat (*Capra hircus* L. 1758) Indigenous of Ituri in the Democratic Republic of Congo and of Africa

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Abstract

Local goat farming (*Capra hircus* L. 1758) is of increasing economic interest in African households. It is an important and easily accessible source of animal protein and income for many poor families. It offers great development opportunities through its meat production, its hardiness and its good adaptation in all the edapho-eco-climatic conditions of Africa. This adaptation and modification that she experienced in this province during migration gave her a pure Iturian origin. The native Ituri goat is native to Ituri.

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As in Niger, pastoral society, the goat occupies a privileged place. Its endurance to the climate, its sobriety compared to sheep and cattle, its prolificacy, its aptitude for long walks give it the respect of the Tuareg man who makes him an animal of choice. For the province of Ituri, the goat is considered a savings bank for poor families because it is easily mobilized to solve certain difficulties of the family. She remains and will remain a reporting animal for vulnerable families. During the post-conflict period of 2003, the goat was a source of income and a welding animal for several families in that province; from goat, herds of cattle were restored just after the looting orchestrated by the succession of multiple wars in this country; all the cattle had been looted by the aggressors coming from neighboring countries.

1. Introduction

In Africa and worldwide, the goat has played a structural role in the social protection of the lives of the poor. In periurban and rural peripheral areas of the Democratic Republic of Congo, this protection is essential, since it intervenes in all stages of the life of the breeder (birth, growth, schooling, marriage, funerals, etc.) [1]. In 2010, [2] reported that goat herd productions play a very important socio-economic role in maintaining the fragile structure of a rural population that needs the resources to live, not to do not resort to rural exodus or immigration.

The economic importance of goats in tropical Iturian environments for the most disadvantaged populations is great; it plays a major role in the survival of households, especially for self-consumption, to meet certain household expenses and for certain customary rites (marriage, bereavement, baptism, etc.).

In the post-conflict period, the Ituri goat played an imperial role through its enormous contribution to the gradual and rapid rebuilding of cattle herds, food and improved well-being, including in the fight against poverty. Thus, although its farming system remains traditional with a low input, this branch of agriculture contributes largely to the family economy in rural areas in Africa in general.

Although its benefits are recognized, goats are among the ruminant species that have received the least attention by both developmental structures and research [3; 4]. The multiple attributes (deterioration of the environment) attributed to it in the literature have rarely been scientifically proven and sufficiently documented [5]. However, in the field, the goat is raised by a large population of various socio-economic strata. It therefore seems important to formally assess the role and place of this type of livestock in improving producers' incomes and livelihoods. In particular, the assessment of the contribution of this species in risk mitigation vis-à-vis external shocks to rural households, and its relationship with other animal species in the building of capital and income generation of the breeding will better identify the opportunities and limits of goats [6] in urban and peripheral rural areas.

In this publication, we want to give the Ituri goat a theory of its own according to its mode and context in which it is raised. This is how we talk about a brief theoretical overview of the Ituri goat.

2. Theory of the Ituri indigenous goat in the Democratic Republic of Congo and Africa

2.1. Zoological origin, history and domestication of the goat

According to [7,8] as well as several researchers, are unanimous that the goat was the first animal domesticated as cattle about ten thousand years ago. Originating from an area encompassing Iraq, Iran, Syria and the east of present-day Turkey, it played an important role in Europe both agronomically and socially and culturally during the Greco-Roman period. Middle Ages and the Renaissance [9]. The emergence of the goat races that we know today, from many selections from Asian, European, and African populations, dates back to the 18th century. The leader of this selection was Switzerland with the Alpine and Saanen races. Selected for their milk production, they are still exported worldwide today. Goat rearing, which was confined to traditional polyculture-polybreeding farms, was well developed [10].

Reference [11] adds that the first "cash" domesticated species were goat, sheep, pork and cattle, at about the same time, around 8500 BC in the Near East.

To ensure food security in the face of growing demography in a progressive manner, man has gradually been forced to resort to the domestication of certain animal species.

Even today in poor countries, domestic animals are the main source of animal protein [12], but animal protein food security is not achieved at all in the majority of Third World countries. Several FAO reports [14] show that more than $\frac{3}{4}$ of the population in poor countries suffer from protein malnutrition.

Several authors are unanimous that the current goat comes from the representative *Aegagrus* that exists to this day in the Asian jungle, but they are endangered as reported full of Fournier [15] in his book entitled "The breeding Goats ". The goat found in Africa is said to have come from several ancestors, according to the affirmation of some authors. At the same time, others think that the goat only has one common ancestor: *Aegagre*.

For a number of animal species, the absence of their wild ancestor in Africa undoubtedly proves their exogenous origin. This is particularly the case with Caprinae (sheep : *Ovis aries*, and goat : *Capra hircus*) [16], which is why in 2014, [8] specifies an Asian origin for the Iturian goat and just like all goat breeds found on the globe ; nevertheless, certain adaptations and modifications that it has undergone over time have conferred them on origins specific to their home environment. Below are some wild representations of the current goats.



Figure 1: Some wild representatives of the genus *Capra*: A: *C. ibex* ; B: *C. pyrenaica*; C: *C. falconeri* ; D: *C. hircus aegagrus* [17].

The first domesticated animal for almost 15,000 years is the dog. He is considered a protection animal and an auxiliary for hunting. But the first domesticated report animal is the goat. This means that she can live in captivity and reproduce. Goats accompanied the first breeders 10,000 years ago in their quest for new territories

[18]. The demographic and economic theories supposed that the breeding represented a significant gain compared to the hunting specifies an anonymous author [19]. Let us note in definitive on the iturian goat that the modifications following several adaptations and acclimatization which it underwent during migration, conferred on it an Iturian origin. The native goat from Ituri originates from Ituri. It is widespread throughout the Iturian region where its meat is consumed as a luxury meat.

2.2. History of goat migration from Asia to Ituri region, Democratic Republic of Congo

In Africa and around the world, goats have followed the same road as the Longhorn Hamitic cattle that arrived around 7,500 BC from Egypt from Asia. From Egypt, they followed two roads : one going south (east route of Africa) along the Nile to Kenya and Ethiopia. From Ethiopia, the goats crossed the Sudan to reach north-east of Ituri from the territory of Aru. From there, the goat spread throughout the present province to take up residence there, a land without tsetse (tsetse fly) which they found favorable for their development. Note that during migration, Africa was not yet shared, and was therefore not delimited. The goat species found in the Republic of Uganda are distant cousins of the current goat in Ituri province.

In western Africa, goats have migrated from Egypt and Morocco through West African countries to access hot environments in western Democratic Republic of Congo. In West Africa, we find their sisters such as goat Djallonke (Fouta Djallon), Mossi (Burkina and imported in Togo) and Sahelian (Sahelian region).

2.3. Classification of *Capra hircus* Linnaeus, 1758

The goat is a small herbivorous ruminant that can be found anywhere in the world. We meet the world north to the south and the world is to the west. In the Democratic Republic of Congo, she is brought up for her meat, which she provides with care without anxiety; its breeding for milk is not yet adopted in the Congolese region. The morphology is close to that of sheep, although it is more rustic than the latter.

Kingdom: Animalia (Animal);

Branching: Chordata (Chordates);

Class: Mamalia;

Placental Infra-class

Order of Artiodactyla (Cetartiodactyls);

Suborder of Ruminants

Infra-order Pecora

Family: Bovidae;

Sub-Family: Caprinae [20]

Genre: Capra;

Species: *Capra hircus* Linnaeus, 1758.

As noted above, the goat is an herbivore and ruminant mammal that belongs to the Bovidae Family and the subfamily Caprinae or Goat as confirmed by Musalizi [8].

2.4. Characteristics of the Ituri goat

The Ituri goat, like all other species of Capra, is a ruminant whose size and weight can vary greatly from one animal to another and depending on the availability of forage biomass in the region. According to Chartier [45], this weight also varies according to the physiological stages (gestation, lactation ...) and diet (a change in diet can vary the weight of a goat by 5 to 10 % in 2 or 3 days) [9].

Small herbivorous ruminant that can live more than twenty years. She has a long straight back and a deep breast, characteristic of a long race. Her dress is diverse. The goat of Ituri, gives birth to two kids per litter, except some natives who give 4 kids per litter. She has two teats to nurse her kids; the quadruple-sized female suckles in turn her cubs without the latter being harmed.

Known colloquially as "Mbuzi, in Swahili language," the goat has an often lean body with pointed bones, slender legs, and a short tail. His muzzle is long and sometimes hooked. She very often has a beard on her chin. When she wears horns, they are often pointed and sharp [21].

For the Ituri local goat, its coat, with hair, presents varied colors. Males of some natives weigh between 29 and 35 kg, 80 to 120 cm long, from the tip of the snout to the tail whereas females measure between 70 to 85 cm with a weight of 25 to 32 kg. This goat is a very hardy breed with a weight gain of between 60 and 90 g per day when it is subject to natural grassland conditions without a dietary supplement as a dietary or mineral supplement after grazing. They are not affected by the substantial climatic variations. It is of medium and often rapid growth rate. Kids have a mean birth weight of 1.4 to 2 kg. From birth to weaning, this Iturian goat shows a growth rate at least equal to any other breed of goat raised in the world. From weaning to adulthood, growth depends on the breeding conditions offered. Meanwhile, kids are catching up to remove the unevenness of live weight between single and twin births. In Africa and Europe, she has often been raised for a very long time for her milk, wool, meat, skin and leather, while in the Democratic Republic of Congo she is specially bred for her meat which she offers very the table of men. It is a small animal, with small horns facing backwards and others do not. Its gestation duration is 5 months and 3 days observed in our study farms and it reproduces twice during the year. At primiparity, she gives a little; from the second farrowing, the litter size is double, triple and even quadruple for some natives.

By simple observation, we can see two types of goats in Ituri province.

2.4.1. Goat of the average size of Ituri

This medium-sized goat, also called the Iturian goat, is well adapted and naturally stabilized in the eco-climatic conditions of the region. It is a local breed very rustic format, which adapts to the difficult conditions of breeding. On the other hand, their hardiness gives them an exceptional advantage allowing them to adapt to the conditions of breeding and difficult climate [22]. This breed is found throughout the Iturian territory where it offers a satisfactory slaughter yield of $\pm 50\%$. These goat types are raised exclusively for meat and for commercial transactions. It is well adapted in the relatively temperate zone of the east of the country, benefiting from particular rainfall conditions (average of 114 mm / month, average 6 years) with temperatures, 23.4 ° C (average from 6 years), due to the elevation of the relief.

Although it is of average size, this research shows that its daily weight gain and slaughter yield are satisfactory under these natural farming conditions. The characteristics below determine the goat of the average size of Ituri:

Race : native of Ituri

Dresses : very varied colors (not standardized)

Format : medium

Size : 60 to 75 at the withers

Legs : long

Tail : long and thin

Thickness at the base of tail : average

Average weight of the male : 25 to 35 kg

Average weight of the female : 22 to 32 kg

Yield at slaughter (%): Male, 50.88 and female, 49.55.

Range size: 2 to 4

Other: hardy, resistant to prolonged drought.

Adaptation to the tropical climate dry and wet and resistance, it is of good position.

Good valuation of grassland resources available in its environment.

He is accused of being turbulent and capricious. She does not respect her fence, and does not stay there long. If she is not attached, she wants to escape; what sheep cannot do. She is unfamiliar with the human environment; it

can stop at the first sound that touches the ground.

In comparison, if it is necessary to consider the breeding conditions offered to it in relation to the percentage of slaughter yield provided, the Ituri goat has its zootechnical marvels which would mark its historical existence when it comes to collection in Africa.



Figure 1: Small Ituri Goats / Photo taken by Kabaka Joël.



Figure 2: The Bouc / Photo taken by Kabaka Joël.

2.4.2. Large goat

This large, often exogenous goat comes from neighboring Uganda of the Democratic Republic of Congo. It is often imported for butchery. It is a goat of a good size presenting a body conformation appreciable by the butchers and by the breeders; unfortunately, they are not often raised in Ituri. They are often characterized by:

Dress: very varied

Format: large

Legs: long

Tail: long and wide at the base.

Live weight: more than 40Kg

Yield at slaughter: male, 53% and female, 51.2%.

This category of goats has not been the subject of our study. Nevertheless some information that can complete the theory on the goat of Africa, were harvested there.

2.5. Production parameter

2.5.1. Weight at birth

The researches of [23] on goats in Maradi, obtained the average birth weight of 2.0 kg while an average of 2.05 ± 0.10 kg at birth was also obtained by Djibrillou [24]. On the other hand, a slightly low average of 1.7 kg at birth was obtained in 2006 [25] in the same region of Maradi. In the Sahel, the Arabian and Moorish goats weigh 2.5 to 3 kg at birth; the Djallonke goat weighs 1.2 to 1.5 kg at birth; the Rwanda-Burundi goat, 1.5 to 2.5 kg at birth [25].

The Dividich [26]. associates low birth weight with low body reserves; while information obtained from Memento de l'Agronome states that birth weight would depend on the genotype, calving, feeding and physiological status of the mother; on the other hand, for alpine goats birth weights are higher, they reach an average of 3,9Kg, but this weight is very variable, in particular according to the sex and the size of the litter [25].

Weight at birth would increase with the age of the goat and decrease with litter size.

2.5.2. Weight at different ages

Several factors affect the weight of the animal from birth to adulthood. These are the type and rank of birth, sex and diet. In kids, the GMQ would be 50 to 100g / day before weaning and 30 to 75g after weaning in Sudan after Wilson [27].

The GMQ is a measure of the weight performance of animals [8]. The bigger it is, the better the animals are efficient. However, regardless of the value of the GMQ, weight in adulthood is very much related to the genetic type. Indeed, for example the goats of Fouta Djallon weigh 18 to 20 kg at maturity, the Fulani goats weigh 25 to 35 kg [25].

Weights in the province of Ituri show that it varies on average from 15.87 ± 0.618 Kg for single births and 15.16 ± 0.773 Kg for double births in males while in females $14, 81 \pm 0.644$ Kg at single births and 13.99 ± 0.732 Kg for doubles.

Mean live weights in adults in the same province are 35.44 kg in males and 31.62 kg in females. In Tunisia, Gaddour and Najari [28] obtain in goats of local breeds a weight of 31.4 kg without precision of the sex. The mean live weight of females at birth for a mother is 32.31 kg of live weight in Ituri province.

2.6. Current situation of goat farming in the Democratic Republic of Congo and exclusively in Ituri province

The general trend of livestock production is declining in the Democratic Republic of Congo with, for example, a decrease of nearly 50% in cattle, 30% in goat and 65% in pigs from 1990 to 2001. Goat numbers in the DRC went from 3,836,800 in 1991 to 4,067,104 in 2001, an increase of 3%, due to the increase in agricultural holdings [12], and the [14] estimated this number at 4,100,000 in 2013.

In 1988-90, goats were the largest population in the Democratic Republic of Congo (formerly Zaire). For this purpose, they were valued at 10 036 700 [29]. This decline in the province of Ituri intensified until the beginning of 2002 and 2003, the years that marked the end of the conflicts and the beginning of the peace and reconstruction of the province. We believe that with the degradation of the goat rearing sector and all other speculations, the contribution of livestock to the Gross Domestic Product (GDP) relative to the entire agricultural sector is low. This contribution in figures is not evaluated in this research. This weakness is attributed among others:

- the resignation of the State in the management of the traditional sector which constitutes a base of agricultural production, with consequences, no popularization, degradation of the infrastructures of breeding (case of INERA-Nioka in Mahagi) and roads demotivation of unpaid health workers;
- massive imports at low prices of subsidized products that have changed eating habits in major urban centers [12];
- the weakness of purchasing power that does not allow access to livestock products;
- the decrease in livestock numbers due to armed conflicts and population displacements;
- prices of high livestock inputs;
- the closure of the broodstock selection and dissemination centers (INERA-Nioka in Mahagi).

The situation mentioned above has had an increased influence on the consumption of animal products in the province of Ituri and the Democratic Republic of Congo in general.

Consumption of animal protein from farmed meat has risen from 1.82g / d / capita, a contribution of 2.2% to 0.79g / d / capita in 2001 corresponding to 1.3%. Overall, the consumption of animal products from all sources of animal protein also seems very low, it is 4kg of meat / year instead of 24kg recommended by FAO. The consumption of animal proteins in the DRC is therefore decreasing with an average rate of 28% over a period of 10 years. These data show that food insecurity in the DRC is worsening from year to year due to low animal production. The DRC has not achieved food self-sufficiency. The level of input use has fallen sharply. Increasingly, there is a sharp deterioration of basic infrastructure (dipping tanks, pastures, veterinary clinics, etc.) and a severe scarcity of livestock and veterinary inputs [12], although the Association Coopérative des Eleveurs de l'Ituri (ACOOPELI) / Cooperative Association of Breeders of Ituri is the potential supplier, it raises the question of the availability and the quantity of material wanted by the breeders of the region of study. The goat population is not known although it is farmed throughout the province. No special goat census has been conducted by the Skill Department to enumerate goats raised in this area. In this section, no estimates are available to support this theory, however, observations made during surveys in this research estimate that goats

occupy a second place after poultry; it is present in almost all peri-urban and rural outlying families of Ituri.

In Ituri province, the predominant breeds in the iturian goat herds remain the meat breeders; obviously, they are raised there for meat. Milk goats are by far evoked in Congolese culture.

2.7. Different calling dialects of the goat in Ituri

Ituri province has several tribes spread over the whole area, each of which is associated with or from a specific locality or group.

As a result, the goat has a characteristic name for each dialect of Ituri. In the lines below, we have listed a few names according to the results of the survey for some indigenous and non-native tribes, including:

b. Swahili (Kiswahili)

- Mbuzi : Goat (general calling)
- Dume (Bebelu, swahili facile de l'Ituri) : billy goat (Male)
- Dike : goat (Female)

a. Alur (Kilulu)

- Dyegi : Goat (general calling)
- Nyok Dyel : billy goat
- Vong'Dyel : Goat (Female)

d. Shi (Kishi)

- Mpene : Goat (general calling)
- Chihebe : billy goat
- Musahene : Goat (female)

c. Ngiti (Ndruna)

- Ndri : Goat (general calling)
- Indri akpa : Bouc
- Indri va : Chèvre

f. Hema sud (kihema)

- Embuzi : Goat (general calling)
- Empaya : billy goat
- Erusi : goat (Female)

e. Fuliiru (Kifuliiru)

- Imbène : Goat (general calling)
- I'kihèbè : billy goat
- I'shashi : goat (Female)

h. Lendu (Kilendu, même appellation en Hema nord)

- N'dri : Goat (general calling)

g. Nande (kinande)

- E'Mbene : Goat (general calling)

j. Lugbara (Kilugbara)

- Ndri : Goat (general calling)
- Ndri ago : goat (Female)
- Ndri kari : goat (Female)

i. Bira (Kibira)

- Mémé : Goat (general calling)
- Mpaya : billy goat
- Siké : goat (Female)

l. Lese (Kilese)

- Mémé : Goat (general calling)
- Mémé akpi ou Akpogul : goat (Female)
- Mémé robho : goat (Female)

k. Kakwa

- Kine : Goat (general calling)
- Kinel o : billy goat
- Kine na : goat (Female)

2.8. Productions and roles of farmed goats

Goat biodiversity is a source of products for human consumption. These products are valuable protein resources and raw materials for crafts. These productions support the needs of the farmer while providing cash income. The goat is also a factor of production, it makes better use of plant resources that cannot be used by humans, and to take advantage of rangeland with low agricultural value, it can access land where other animals cannot (sheep and cattle). It also improves culture systems by their droppings it gives every hour.

It also plays an important role in the livestock economy. It is also a guarantee of security that makes it possible to cope with bad years, and the current account of operations in normal times. Finally, the goat is a social asset, an indisputable source of prestige and sacrifices, allowing and symbolizing access to a certain social status, especially marriage [11].

Tudorascu Radu and Petrescu [44] also felt that animals play a magnificent role in the life of man.

2.8.1. Goat, production tool

The breeders draw from the goat they raise a very wide range of products that can be classified in two categories according to Dehoux [11]:

- Renewable products, supplied by the animal throughout its life: milk (especially for the production of cheese in other countries), wool (in the Agora goat) ... Manure used as fuel, dung dried can be burned to cook meals. They are also used as fertilizer. Manure is a valuable fertilizer and amendment for crops; In Ituri for example, through the various conferences and training sessions held following this research on the theme, the goat and its potential, we recommended the use of organic fertilizers instead of chemical fertilizers because of their harmful effects on the microbial life of the soil.
- end products, the obtaining of which requires the death of the animal: meat, leather. Human nutrition is heavily protein deficient in many Third World countries. Goat products, especially milk that can be consumed in cheese form and meat help to balance daily rations.

But the consumption of products of animal origin is of paramount importance because these products have significant taste ratios in African kitchens. In the case of artisans, skins are very useful raw materials for making clothes, tents and various utensils [29].

The products of goat origin are of various uses: certain products (brain, urine, bone, offal...) have therapeutic

properties and are used in the preparation of medicinal liqueurs or ointments [11].

2.8.2. Goat, valorizer

The goat plays a very important role in the transformation of plant products into animal products; it is the only one to valorize spaces that man could not exploit directly by agriculture. The land inaccessible by man for agriculture, but the goat is able to access it to shoot grass: vaporizing role of space. In addition, it is a source of manure and values crop residues by consuming them; the goat consumes the grass that man cannot, it turns it into meat for the sake of man.

2.8.3. Goat, social, religious and cultural value

The goat species is a source of prestige but also a source of power. The goat is a way of improving one's social status (marriage, funerals). The ritual and religious sacrifices are very practiced. Finally, very strong emotional ties bind the breeder to his goat.

The very old people could make sacrifices of animals or others to find solutions to multiple difficulties family or individual, or even community.

The site on Islam talks about the importance of making the sacrifices of animals to get some dimension. In the following lines, we discuss a theory related to the sacrifices of animals and goats in particular. "Treat your patients with alms". "Almsgiving is an effective remedy. It cures diseases and alleviates suffering. "The alms erase the sin like the water extinguishes the fire". However, the goat is used in the Muslim sacrifice for God to grant at their request [30].

Moreover, among Christians, about the paschal lamb or any other Israelite sacrifice, our contemporaries are increasingly asking the question. It must first be remembered that the ancients ate little meat, only on certain occasions, especially at (religious) feasts, and therefore in connection with sacrifices [31]. The goat, which is probably the oldest domestic animal of the Southeast Bantu as well as the Bantu of Central Africa, constitutes a real sacrificial reserve among the Thonga. The bloody sacrifice of the goat is the obligatory operator of the ritual of rupture imposed, in a particularly dramatic form, on the future wife [32]; then, in September 2012 [33], Murielle Mignon adds that the bull is not the only animal to be sacrificed during the ceremony. Before being put to death, a goat is sprinkled with flour and then slaughtered by its owner, and the blood will be poured into the mud pool.

2.8.4. Goat, peasant bank : socio-economic importance

The raising of goats reassures a monetary income. They have an important role in the household economy. Very often in traditional societies (in the rural peripheries) which are not monetarized and therefore, they use the barter which is a very widespread operation (meat against cereals, meat against the cassava ...) to satisfy the need of their instinct. The goat is a heritage of the Iturian breeder. Dowry, inheritance, gifts and gifts are all exchanges of social importance.

Throughout the world, the goat has played a social and economic role for poor families. This is why in some skies it is called, the cow of poor families or a piggy bank.

The succession of different wars in Ituri has orchestrated the decline of large livestock, and given their late breeding cycles, some pastoralists now prefer goat breeding which can quickly restore the pocket of peri-urban poor families and rural peripherals. In this context, Nsabiyumva [35] reports that the number of goats appears to be increasing in line with the decline of livestock.

2.9. Goat and its diet

Goat feeding in Africa as well as in the Democratic Republic of Congo in particular is based on natural rangelands. Types of forage that are often grazed include permanent grassland species with unimproved native flora, and temporary grass, legume or mixed grassland.

2.10. Constraint to its development

Animal breeding programs exist in the country, particularly at the level of large private producers. In the past, the Zairian government also had breeder selection and dissemination stations; unfortunately today, these stations are totally abandoned due to the aging of the human resources, the infrastructures, the lack of international bilateral and multilateral cooperation. The Congolese state was primarily responsible for goal setting and breeding objectives for farm animals, but today, following the destruction of the state's basic infrastructure, private companies are guiding themselves genetic improvement of their livestock according to their interests [12].

Several factors have been listed by the FAO and CRGAA [12] to be at the root of the failures of livestock development in the Democratic Republic of Congo.

Some of these factors are also observed in Ituri province, which are accused of being a barrier to the development of goat farming in the region, including :

- Lack of coherent policy at the institutional level with regard to livestock farming;
- Human resources demotivated by a derisory remuneration;
- Funding of state structures and insufficient research;
- Administrative structures not adapted to the realities of the country;
- Lack of continuity in the administration of livestock programs at the state level;
- almost total lack of technology in the management of animal genetic resources;
- Abandonment and looting of goat resources in training at the Nioka zootechnical research station within the National Institute for Agronomic Research and Studies (INERA) in Mahagi territory;
- The actors in the farm are occupied by United Nations agencies and agencies;
- No extension and awareness raising access to the importance of agriculture;
- On the other hand, the insecurity of the country completely discourages local and international investors.

Livestock development also requires respect or observance of animal rights. The social demand for respect for the "rights" of animals can be broken down into five freedoms generally accepted as satisfying their well-being if they are granted to them.

- To eat and to drink to satiety, not to suffer from bad nutrition;
- Have appropriate and comfortable shelters;
- Do not suffer from diseases or injuries;
- To suffer neither fear nor anxiety;
- Have the opportunity to express the normal behavior of the species.

Some useful recommendations from the European Union concerning goats, Adopted by the Standing Committee at its 25th meeting on 6 November 1992 [36].

2.11. Type of livestock in Ituri

2.11.1. Traditional breeding

The goat rearing in periurban and peripheral rural areas of the Democratic Republic of Congo is that traditional type described as extensive. It is characterized by neither dietary supplement nor mineral and by the absence of health monitoring, poor housing conditions; therefore, this breeding often leads to a low productive and reproductive performance.

The semi-modern breeding observed in the province, is held by some projects that fight against poverty among the locally vulnerable population. Some of these projects use the native breeds of the province and others use hybrids from the cross between the South African Bouer breed and the Ugandan natives.

Whatever the preference of the breeds chosen, the local ones give a better productivity and reproductivity on natural pastures with few inputs (products and veterinary material). They remain a well-liked, affordable and readily available source of meat for peri-urban populations and rural peripheries of Ituri.

Goats, to some extent, occupy the entire territory of the province and are reared in the traditional way. Breeders are content to feed them on natural pastures, despite their poor quality; goats manage to cover their food needs.

2.11.2. Modern breeding

Is there a modern breeding of goats on the provincial territory of Ituri?

One of the hindrances of development of goat farming in the region is the lack of decision-makers for the improvement of sectors. As already mentioned in the previous lines, Ituri offers a very favorable environment for agriculture and particularly for breeding domestic animals. Efforts are not made to improve this sector, so livestock farming remains traditional in the country.

2.12. Goat and the environment

2.12.1. Public health problem

Livestock carry a number of health risks such as injuries, asthma and zoonosis and various environmental and public health problems. The potential effects of animal wastes on the environment are among these concerns, as are the loss of biological diversity, the risks associated with the importation of animals and animal products, and the safety of food products [37].

Animal waste represents a potential for pollution of water and air. Biodegradation of animal waste also gives off foul-smelling gases [38]. Odors from intensive livestock operations can cause nausea, headaches, breathing difficulties, sleep disturbances, loss of appetite, and irritation of the eyes, ears, and throat.

2.12.2. Goat, an enhancer of plant biodiversity

Because of their physical impact and their choice of food, farm animals have a decisive influence on the evolution of flora and fodder resources, which can promote development or, conversely, the degradation of part of the vegetation cover, and therefore, damage the soil condition [6]. If trampling cattle clogs the soil, it causes positive effects on it. To break an encrusted soil and to transform dead plants into useful litter, few forces or means are as well adapted as the trampling of a domestic or wild flock [39]. Trampling causes herb layering in moist soils (the case of bourgou or *Echinochloa stagnina*). The “bourgoutières” extend and shrink according to the floods but also depending on the presence of livestock. Annual grasses produce seeds filled with tiny spines (eg *Cenchrus biflorus* or cram-cram in French) that cling to the fur of animals that spread or disseminate them on a larger scale (zoochory effect). On the ligneous side, the picking of leaves and pods plays an essential role in the feeding of animals in the Sahelian and Sudanian zones. Conversely, this form of grazing activates the vegetative cycle or intervenes as an indispensable phase. The case of *Faidherbia albida* is well known. However, it should be added that of *Balanites aegyptiaca* (desert date) in arid environment, *Prosopis africana* in Sudanian zone, then *Azelia africana* further south. As long as the cutting by the shepherds or grazing remains light and regular, the concerned fodder trees give back abundant and lush leaves [6].

Many authors have considered the passage of the seeds of certain ligneous substances in the digestive tract of animals as a possible means of hastening and / or improving the germination of the species considered [44]. This is the case for *Acacia senegal* and *Faidherbia albida*, many of which indicate that seed germination of these species occurs after ingestion and defecation by various herbivores. Animals therefore play an important role in the spread of tree species and it is the combination of the woody cover factor (which provides the diaspores with favorable conditions for their emergence and the growth of seedlings) and the anthropogenic factor, which ensures regeneration. woody species [40]. Man by his action is both a factor of degradation (cutting firewood, overgrazing, making utensils, making pickings) and a motor regeneration through his flock that ensures the dissemination of species and by management actions. The beneficial action of grazing, especially in the initial phase of plants, invites us to correct the schematic curve of the relationships between forage and livestock [41]. At first, it is not regressive, but positive, even if the total biomass of the vegetation begins to decrease. It is afterwards that the representativity of the good forage species will decrease under the effect of an irregular grazing [42].

2.12.3. Goat, destroyer of cultures

Several crop destruction damages are recorded in periurban and peripheral rural areas orchestrated by goats. They are the first animals accused of being the destroyers of crop fields.

2.13. Behavior of goats vis-à-vis of others

2.13.1. Communication between individuals

The goat is a gregarious animal. It lives in groups, from 4 to 150 individuals in the wild according to the environment and the availability of resources, whose social structure is very well established and stable over the years. Relationships and communication between individuals are dependent on many signals. Olfaction is an essential sense for reproduction and mother - kid relationship. Indeed, the goat effect is mainly due to olfactory signals (urine and secretions of the sebaceous glands of the horns and the tail). The relationship between a mother and her baby is established via smells between two and four hours of life (the first maternal behaviors can be put in place from the first five minutes). Olfactory pollution (handling of kids, for example) can lead to rejection of the kid by its mother [9].

They often emit sounds in response to a congener and to humans. They warn of a perceived danger, which can be a man, by sounds such as grunts. They can flee or turn around and face danger. If they are not disturbed, they spend a lot of time exploring. In enclosures and buildings, they can be easily disturbed for example by shadows, reflections and loud noises. They live in social groups, composed mostly of members of the same family and normally seek isolation only at the time of the birth. Forced isolation can have serious consequences, even fatal ones, because of a refusal to eat [36]. The table below illustrates some elements of the behavior of the goat.

Table 1: Illustrative elements of behavior of goats

Antagonist	With contact	bite
		Cabre followed by a head shot
		Bucking
	Without contact	rush
		Threat position
		Hunt
Agonist=Affiliative	With contact	Avoidance
		Mutual grooming
		Licking the base of the udder
	Without contact	Rest side by side
		Sniffing

Source: [9]

2.13.2. *Psychic relationship between the goat and his breeder*

The goat - human relationship is influenced by the behavior of the breeder (especially during the postnatal and juvenile periods) and the genetics of the animals (some trait traits being heritable) [43]. This relationship can lead to very strong links between goats and their rancher, especially in small flocks [9]. A good relationship between the farmer and his flock (regular and calm handling, absence of cries or blows) improves the performances of the animals, notably thanks to the increase of the well-being [11].

Moreover, in order to develop a positive relationship between man and animal:

1. the animal should be handled with care and other contacts should be established at an early age.
2. The farmer should be experienced in the handling and delivery of goats and understand their behavior.
3. Goats should be handled with calm as they are more likely to be guided or driven in this way rather than in a state of excitement. When animals are moved, their gregarious trends should be exploited. Goats should preferably be led from the front but can be carried from behind, as long as they are careful. Movements that may frighten, injure or agitate animals should be avoided. Goats should not be raised by the head, horns, legs, tail or fleece. Instruments such as sticks should only be used to guide animals and should not be used if they cause unnecessary pain or suffering to animals [36].

2.14. *Right of the goat and the man in their synergy*

2.14.1. *Duty of the goat towards the breeder*

Already, one billion people in the world live in absolute poverty and 800 million suffer from malnutrition, many in rural areas, but more and more in cities where the lack of animal products causes deficiencies in essential amino acids, in particular, trace elements and vitamins [11].

Observations on the use of goats in livestock production to combat malnutrition show that it is able to meet the needs of actors' households. Thus, goat farming plays a crucial role in the development of a productive and sustainable agriculture because:

- It ensures the maintenance of soil fertility by manure;
- it diversifies the sources of income and;
- It provides jobs.

Its major role is to contribute to human nutrition by giving it high-value proteins [11]. The Permanent Commission of the European Union had already published since 1992 some elements concerning the protection of goats. These elements reinforce the right of goats raised by individuals [36]. In addition :

1. There should be a sufficient number of livestock staff with adequate theoretical and practical

knowledge of goats and the rearing system used to:

- Recognize whether the animals are healthy or not;
- Understand the meaning of behavioral changes;
- Appreciate the extent to which the environment is suitable for the health and welfare of animals.

2. The breeder must be competent and should be experienced in all areas of goat breeding, including goat handling, parturition, milking, foot care, mowing and grooming where necessary, and to the extent permitted by domestic law, vaccination, injection and oral administration of drugs. When a breeder with a small number of goats does not have the required experience or equipment, he must ensure that he can consult an expert or have access to such equipment to solve the problem in an adequate way any problem encountered.

3. Each breed of goat has its own characteristics and the breeder should be aware of the special requirements of the animals for which it is responsible. Goats have a natural tendency to graze and move foraging and these factors must be taken into consideration in selecting an appropriate environment.

4. Goats should always be treated as separate individuals, even when they live in large herds. When goats have to be reared separately, they need more frequent contact with and monitoring by the farmer. When forming new groups, care must be taken to avoid fighting and stress [36].

2.14.2. The duty of the breeder towards the goat

The breeder towards the goat must:

- Ensure a healthy diet and a preferential habitat;
- Protect the goat against diseases, parasitosis and big cats;
- Maintain the genetic performance or simply improve it for the perpetuity of the speculative species (exploitation) in order to perpetuate the viability of the exploitation (of the farm).

NB: The right of the goat is the duty of the breeder and the human right is the duty of the goat, so both ensure a life of complementarity.

2.15. Goat breeding development strategy in Ituri

The specific objective of this part is to put in place an essential proposal that can serve as a guideline for the development of the livestock sector in Ituri. The state has a key role to play in establishing a stable, reassuring and encouraging general framework that secures farmers and their goats. Farmers must be secure in order to attract domestic and foreign investment in this part of the Democratic Republic of Congo.

2.15.1. Investments in the livestock sector

The Iturian breeding environment needs private or public investment for its development. To do this, we first think of securing this environment and changing the mentality of the local population to promote this sector.

If the economic development of Ituri province is to be farmed, it is necessary to think of the introduction of stable genetic material that offers a better yield of animal production. It is highly desirable that the Ituri Cooperative Association of Livestock Breeders (ACOOPELI) and other NGOs who support ranchers in Ituri province be financially and materially supported by the government or other the Democratic Republic of Congo to promote and enhance this livestock sector.

2.15.2. Agricultural credit

The granting of agricultural credit to pastoralists would be an appropriate measure for the development of the livestock sector in the Democratic Republic of Congo and Ituri in particular. With the dream of macroeconomic stability advocated by Matata Ponyo Mapon, in the Democratic Republic of Congo, we thought that we should be an integral part of the entire project or breeding action; Unfortunately, this macroeconomic action has not benefited farmers and the livestock sector has remained unproductive.

2.15.3. Agricultural extension

The field of extension is a most effective way to accept the discoveries of breeds judged successful from the formation of agronomic research centers. Unfortunately, a sector that is not effective at present due to lack of funding. Several researches are rotting in research centers for lack of funding for their pragmatic development.

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