LIVESTOCK FARMING IN THE SAQUENCIPÁ VALLEY, NEW KINGDOM OF GRANADA, COLOMBIA IN THE 16th AND 17th CENTURIES

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SUMMARY

This document brings together the results of research with the aim of analyzing the transformation of cattle ranching practices during the Colonial period in the specific context of the Saquencipá Valley on the Altiplano Cundiboyacense (High Plain) in Colombia, its relationship with land ownership and the impact that these had on the ecosystem, especially as regards soil deterioration. In order to reconstruct the farming practices used during the 16th and 17th centuries and their Iberian origins, colonial documents from the depths of the *Archivo General de la Nación* (Nation's General Archive) in Bogota, Colombia and the *Archivo General de Indias* (General Archive of the Indies) in Seville, Spain and along with the chronicles, geographic relationships and results from the history and archeology literature were exhaustively reviewed. Taking into account factors such as the link with agriculture, the mobility and number of head of cattle, and the natural control exerted by drought and predators, the high environmental impact attributed to colonial cattle ranching in the region is questioned.

Key words: Environmental history, colony, cattle ranching, soil deterioration.

INTRODUCTION

The lands of the Saquencipá Valley are located in what is currently the Department of Boyacá, Colombia (Figure 1) but which, during the 16th and 17th centuries, lay within the jurisdiction of Villa de Leyva in the Viceroyalty of New Granada. These lands were noteworthy for the quality of their wheat harvests. Grains, flours and biscuits travelled from there—both legally and illegally—to different regions of New Granada including productive regions in the surroundings of Santafé, Tunja and Pamplona. However, some

Bases de datos: http://polired.upm.es/index.php/pastos (España), AGRIS (Italia), CAB Abstracts (Reino Unido), CABI Full Text (Reino Unido), Catálogo LATINDEX (México), DIALNET (España), ICYT Ciencia y Tecnología (España)

of the visitors of the 18th and 19th centuries left a record of the apparent decline in the region that followed the solar eclipse of 1691 and highlighted the lack of agricultural productivity based on different types of land use they came across (Oviedo, 1930; Ancízar, 1983). Even today, differences in the morphology, climate and plant cover of the Saquencipá Valley relative to that of the rest of the Altiplano Cundiboyacense in which it is located disquiet those who visit it and have prompted research to find historical explanations for this panorama of deterioration, purportedly related to the adverse effects of agricultural activities during the Colonial period.

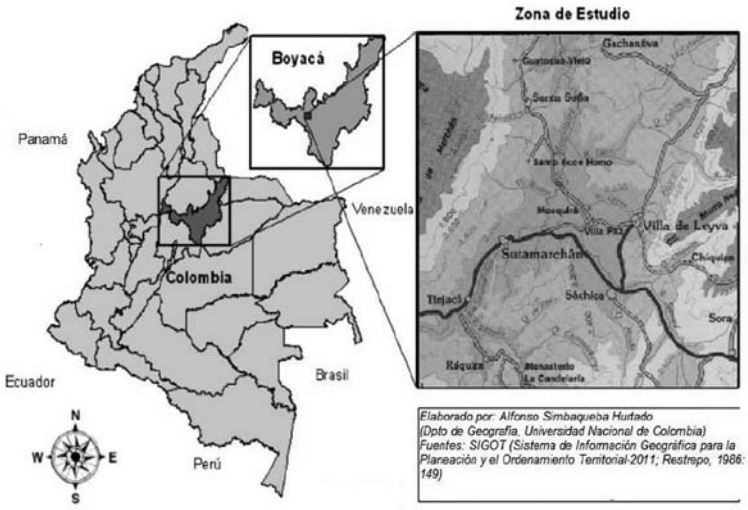

FIGURE 1

Saquencipá Valley, research area.

Valle de Saquencipá, área de investigación.

(By Alfonso Simbaqueba Hurtado)

In the Saquencipá Valley, the geographer Joaquín Molano (1990) was the first to carry out a historical reconstruction of the erosive processes that were observed in the 1980s. His analysis, based on field work and secondary sources, led him to conclude that Spanish colonial occupation was a fundamental, causal factor in the aridity and erosion that occurred in Villa de Leyva and its surroundings. According to Molano, the intensification of soil use, deforestation and the introduction of cattle ranching and wheat monoculture were what caused environmental deterioration in the region (Molano, 1990). A systematic review of the colonial documents and chronicles, and deeper inquiry into aspects such as the transformation of the agricultural activities of the indigenous people after the Conquest, the role of Villa de Leyva in supplying cereals to other

regions of New Granada, agricultural techniques and the way agricultural production was managed for each type of land use, however, suggest different conclusions.

In fact, archeological studies (Falchetti, 1975; Boada, 1991) posited that the severe erosion originated in the pre-Hispanic period rather than during colonial times. According to Falchetti (1975), during the 16th century the majority of the land was still fertile. The demand for wood for Spanish buildings and the cultivation of wheat did indeed contribute to the deterioration of the soil, but the latter was also associated with both the pre-Hispanic specialization in manufacturing pottery and open air firing that required large quantities of firewood (Falchetti, 1975). Boada (1991) also observes that soil deterioration might be rooted in pre-Hispanic practices. She especially points to the effects of changes in the settlement patterns and the intensification in pottery production in the 9th and 13th centuries C.E. Unable to do any agricultural work because of the previous damage done to the soil, people had to specialize in some kind of production to obtain food supplies from other regions, and chose pottery making. This hypothesis is open to future archeological and palynological research (Boada, 1991).

In the framework of this discussion, the present study examines the relationship between the agricultural practices implemented in the Saquencipá Valley during the 16th and 17th centuries, and their possible connection with soil deterioration. To this end, a first step was to reconstruct the agroecosystem that the Spaniards employed in the 16th century, and their introduction of new species of livestock. The cattle ranching practices of the Iberian Peninsula at the time of the Conquest and colonization of the Americas are analyzed, as well as the way these practices were implemented in the Tunja Province of New Granada, especially in the Saquencipá Valley. The information presented here enriches the debate on the relationship—generally considered a negative one—between the environment and cattle ranching. The allocation of common indigenous lands (*resguardos*[1]) on poor soil, large scale deforestation to make way for livestock, lax breeding of all types of livestock and the overpopulation of domesticated animals are discussed.

MATERIALS AND METHODS

Following comparative examples in the literature (Sluyter, 1997; Aguilar Robledo and Torres Montero, 2005), the research is based on an exhaustive review of a range of primary sources from the *Archivo General de la Nación* (General Archive of the Nation) in Bogota (AGN) and the *Archivo General de Indias* (General Archive of the Indies) in

1 Land that was allocated to the indigenous people at the end of the 16th century. In theory, they could not lease out or sell this land; it was for their joint use.

Seville, Spain (AGI). Documents such as the *visitas*[2], indigenous common land grants, land disputes, accounts, and official reports about supplies provided useful information about topics such as the introduction of domesticated animals and their fiscal importance, times of abundance and scarcity, the different degrees of economic dependence on cattle ranching, and the changing regulations governing it. Geographic reports and colonial chronicles were helpful in reconstructing the prevailing ecosystem conditions in the study region during the 16th century, the perception of these conditions by the European colonists, and the structure of their cultural and socioeconomic organization on these lands.

These primary sources were complemented by and discussed in light of the results of research in archeology, history and geography that made it possible to reconstruct the approximate location of settlements, land ownership, land use, plant cover, the introduction and proliferation of foreign species in the study region, and to identify similarities and differences with other places on the continent.

The analysis was complemented by field reconnaissance and mapping work. This allowed us to georeference the data mined from the archeological evidence and primary sources, and include them in a geographic information system (GIS). The main objective was to establish the approximate location of the indigenous common lands, private ranches, *resguardos*, *estancias*[3] and ecclesiastical lands in order to detect any relationship between the topography, climate and the hydrography along with the introduction and expansion of cattle ranching, and the speed and intensity of any soil deterioration. With historical GIS applications one does not expect exact results, especially considering the changes that have occurred in this vast cultural and natural landscape over the last 400 years. To suggest that there is a straightforward association between currently arid land and areas that were unproductive during the Colonial period would imply an underestimation of the recent actions that have contributed to the problem. On the other hand, the sources often refer to places with indigenous names that have left no trace on the current landscape, and therefore cannot be included in the map. Additionally, the sources mention areas that were measured in unstandardized units (*cabuyas*[4]) and defined with reference to neighboring properties which were also poorly delimited in

2 Formal inspections of indigenous villages and *resguardos* (see next footnote) carried out by an official, the Visitor, to set tribute taxes and record the size of the indigenous population, the state of people's health, and the condition of the land, as well as the relationship with the *encomendero*, the priest and the neighbors in the nearby towns and cities.

3 Land assigned to the Spanish. In general, the land was used for raising livestock.

4 A measure of length used in the 17th century that was made from a length of the fique agave (*Furcraea bedinghausii*) and kept in each town hall. Its length varied from region to region, but was approximately 80 cm (S.I.).

spatial terms. In spite of these limitations, it was possible to use the available data to prepare the figures that accompany the results presented here.

RESULTS AND DISCUSSION

The predominant view of environmental historiography has been that ruminants and ungulates in were absent from the Americas before the Conquest and that this created an intrinsic weakness in the continent when domesticated animals and cattle were introduced (Crosby, 1972; Crosby, 1999; Diamond, 1998). In the absence of previous adaptation or complementarity between the new fauna and the existing plant cover, soils and native fauna, the encounter is thought to have resulted in a series of adverse effects, including deforestation, disease propagation and soil deterioration. This view gives rise to the following questions: Is this a valid explanation for soil deterioration in the Saquencipá Valley? What was the ecosystem like when the Spaniards first arrived in the region in the 16th century?

From the end of the 12th century Spanish customs and, later, colonial rules (Gutiérrez, 1983) dictated that to found a new settlement (city, *villa* or *pueblo*) places should be chosen with herbaceous areas nearby to allow cattle to graze (Klein, 1979). Natural herbaceous formations and those created by pre-Hispanic societies offered ideal conditions for implementing cattle ranching (Aguilar Robledo, 1998), while forested or wooded areas were avoided because they required more time, labor and tools (Patiño, 1977). According to the literature, the latter were the conditions in the Saquencipá Valley where the town of Villa de Nuestra Señora de Leyva was founded in 1572.

The chronicle *Relación del Nuevo Reino de Granada*, written in 1571 by Friar Gaspar de Puerto Alegre, mentions oaks (*Quercus humboldtii*) as the most common tree in the region, though with smaller acorns than those of Spanish oaks. Also abundant in the surroundings of the Tinjacá Lagoon was alder (*Alnus acuminata*), which was good for construction (Tovar, 1988). Another chronicle, the 1610 *Relación de Tunja* (Patiño, 1983), confirms that the vegetation was of a type that could be included in Holdridge's Lower Montane Dry Forest. It included native plants (local names are given in parentheses) such as *Caesalpinia coriaria* (dividivi), *Sena viarium* (alcaparro), *Furcraea andina* (fique or cabuya), *Dodonea viscosa* (hayuelo), *Alnus acumminata* (aliso), *Ficus indica* (tuna), and *Furcraea bedinghausii* (fique or cabuya). The chronicler Zamora recorded these very plants as raw materials used by the indigenous people to make rope from the fibers of the *fique* plant, and soap from its flowers for instance. The *miel de muelle*, a sweet substance extracted from pepper tree (*Schinus molle*), was used to alleviate aches and chills (*achaques de frío*) or was added to *chicha*, a traditional beverage made from fermented maize. The buds of the pepper tree were also used for

cleaning teeth and to improve gum health. Natural dyes were extracted from the dividivi plant (black dye) and from the fruit, known as *tuna* (red dye) (Zamora, 1945).

Having said that, presumably in the early 16th century there were no lush forests in the region, but rather nuclei of native species with low regeneration capacity (Therrien, 1991), in addition to the herbaceous and shrubby vegetation with xerophytic plants. Pottery production from pre-Hispanic times with open-air firing required a good deal of firewood (Falchetti, 1975). Hayuelos (*Dodonaea viscosa*), oak (*Quercus humboldtii*), frailejones (*Espeletia* spp.) and small shrubs proved to be very useful (Therrien, 1991). To prepare areas for agriculture and gain ground against the Andean forests, the pre-Hispanic inhabitants used fire (Márquez, 2001; Patiño, 1965; Patiño, 1997). Right before the rainy season, the understory and largest trees that might crush the surrounding vegetation were cut, and the fire set upwind of the burning area in order to speed up the process (Patiño, 1965).

On the Cundiboyacense High Plain, tree felling and burning led to the exuberant vegetation (which had a slow recovery capacity owing to the high elevation) giving way to pastures, making burning less and less necessary (Fals Borda, 2006). In the Saquencipá Valley, aridity became an additional factor that prevented the arboreal vegetation from recovering and favored the propagation of xerophytic plants. The early predominance of cacti in the region is supported by references to the use of *cochinilla* (*Dactylopius coccus*), an insect that lives in the *tuna* fruit of the *Opuntia* cactus and from which purple and red pigments were extracted to dye the chiefs' garments in pre-Hispanic times (Molano, 1990), and a variety of textiles during the Colonial period (Pérez Arbeláez, 1990). The chronicler, Friar Pedro Simón stated that the lands of Tunja, which included the Villa and the surrounding indigenous villages, were mountains covered in grass all year round (Original in Spanish: *"las sierras de pasto todo el año"*) (Simón, 1981) and that the Saquencipá Valley was surrounded by steep, bare gullies (*"escarpadas y peladas breñas"*) (Simón, 1981). Abundant deer continually interacted with this herbaceous vegetation that was predominant in the Valley. Rodríguez Freyle said that in the times when the Spanish arrived, deer were so abundant that they moved in herds as if they were sheep, eating the inhabitants' crops and livelihood ("*eran tan abundantes que andaban en manadas como si fueran ovejas, y les comían sus labranzas y sustentos*"), but could not be hunted without the permission of the *cacique*, the head of the indigenous people (Rodríguez Freyle, 1979).

On one hand, the description may have been somewhat exaggerated to exonerate the Spanish and their cattle from the destruction of the crops of the indigenous peoples, or to emphasize the pre-Hispanic origin of the problem. On the other hand though, it gives evidence of the abundance of deer which may have contributed to the reduction in plant cover.

The abundance of deer in Tunja Province is confirmed in the *Epítome de la Conquista*, written around 1550. This chronicle mentions that the meat eaten there by the Indians is venison, with such an abundance of deer as to be sufficient to keep them as [we keep] cattle here ("*las carnes que comen los indios en aquesta tierra son benados de que ai infinidad en tanta abundancia que los vasta a mantener como acá los ganados*") (Tovar, 1988). By the middle of the 18th century, the multitude of deer encountered by the Spanish was such that, in spite of the increased pressure of hunting with shotguns that began decades before (Zamora, 1945), it is said that of these wild animals, native to these lands, those most esteemed and of greatest utility are the deer, of which the mountains and plains of the cold lands are full ("*de los animales silvestres montaraces, propios de estas tierras, los más estimados y de gran utilidad son los venados, de que están llenos los montes y sabanas de tierra fría*") (Oviedo, 1930).

In short, it seems that the Spanish settled in an area of the Valley where grasses used to be eaten by wild ruminants and ungulates, and that these animals were often hunted. In this context, to what extent did the introduced livestock species spread, and what might the impact of grazing have been on such processes as the decrease in forested areas, soil deterioration and loss of crops? In Tunja Province, the environmental context was suitable for breeding domesticated animals, and these quickly multiplied as highlighted in an anonymous report from 1560:

> This city [Tunja] is the largest in this district […]. The Spanish breed all genera of livestock in great abundance, cows, mares, goats, sheep, and their multiplicity has been such that they now damage natural crops and it would be convenient to remedy this. "*Esta ciudad [Tunja] es la mayor deste destrito (…). Crían los españoles todo género de ganados en gran abundancia, vacas, yeguas, cabras, ovejas, assi que ha sido tanto el multiplico que ya hacen daño en las labranzas de los naturales y conbiene poner remedio en ello*" (Tovar, 1988)

Only two decades after the city's foundation (1539), the introduced animals had successfully reproduced and raising livestock had become an activity of great importance. According to Zamora, the main reasons for such prosperity were the nutritiousness and saltiness of the pastures of Tunja Province ("*lo pingüe, y salitroso de sus pastos*") (Zamora, 1945), and the animals' importance as a source of food, a means of transportation, raw material for making candles, soaps and leather goods, as well as their cultural significance in culinary customs and bull fighting (Zamora, 1945; Oviedo, 1930). The time and money required to import the animals and then maintain them, together with the pastoral mentality of the Spanish and the economic and cultural importance of cattle raising, led the colonists to use quality land to breed the animals (Patiño, 1997; Melville, 1999).

According to several authors, the delimitation of the *ejidos*[5] and the award of *estancias de ganado* (cattle ranches) in the high plains of the New Granada often became agents of damage for the crops of the indigenous people. Animals were said to invade their corn fields and displace the indigenous people toward steep areas with lower crop yields and that were more prone to erosion (Patiño, 1965; Patiño, 1969; Molano, 1990; Boada, 1991; Orbell, 1995; Langebaek, 2001). In the Saquencipá Valley however, this is unclear. One piece of evidence comes from the visit of Juan de Valcárcel in 1636. He records the problems faced by the Suta Indians caused by the livestock (especially cows and mares) of their *encomendero*[6], Pedro Merchán de Velasco, invading, eating and trampling their crops. According to this priest, the animals had easy access because the land did not lend itself to the construction of fences or other types of defense because it was flat and open everywhere, with no resistance to said livestock ("*la tierra no es dispuesta para hacer talanqueras ni otras defensas por ser rasa y abierta por todas partes, no tienen resistencia al dicho ganado*") (AGN, VB, T.14, f.757r.). This reference would allude to the relatively flat relief of the indigenous lands.

Further evidence comes from the indigenous land title documents in the region. Although there is mention of situations of land on slopes being assigned to indigenous people, in a number of cases, witnesses consulted during the process and the topographical description and the *vista de ojos* (the area that fell in the line of sight of the topographer) have allowed us to detect indigenous lands on flat areas and, in some cases, in fertile river valleys and ravines (Figure 2). One case that is notable for having one of the best locations was that of Turca and Gachantivá, indigenous towns with land bordering the river that is good for crops because it is irrigated when the Cane River rises ("*tierras que caen en las vegas del río son buenas para labor porque se anegan con las crecientes del río de Cane*"). This favored their keeping more than forty pairs of oxen ("*más de cuarenta yuntas de bueyes*") and producing wheat, corn, anis and squash, but, paradoxically, left their crops vulnerable to trampling by the livestock that drank in the salty pastures (AGN, VS, T.2, f.553r., 559v., 553v.).

5 Communal land under the perpetual stewardship of rural inhabitants for agricultural activities.

6 Title given to the Spaniard who was in charge of both receiving tribute taxes from the group of indigenous people under his purview, and who was responsible for guaranteeing their evangelization.

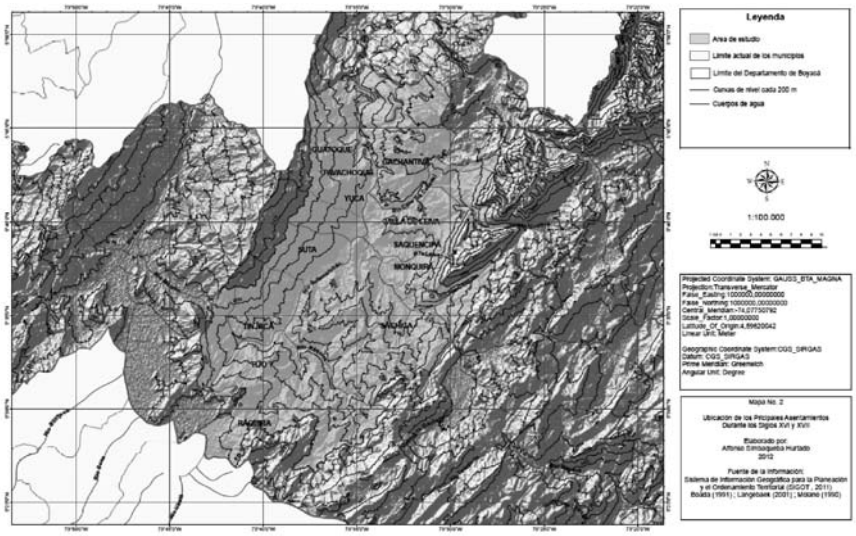

FIGURE 2

Location of settlements and villages, 16th and 17th centuries.

Ubicación de los asentamientos y aldeas, siglos 16 y 17.

(By Alfonso Simbaqueba Hurtado)

In any case, domesticated animals and livestock practices generated a good deal of conflict among the farmers, regardless of whether they were indigenous, mestizo, or Spanish. For example, the traditional privilege of the *la derrota de las mieses* (defeat of the crops) in which cattle were allowed to graze on the remaining stubble after the harvest, became a regular occurrence where there were no ravines, regardless of season and resulted in the livestock becoming invasive and destroying permanent crops. On the peninsula, the privileges of the livestock farmers, especially those who raised sheep and herded their animals in la Mesta, were increased under the reign of Ferdinand and Isabella. With the aim of increasing wool production and export, agricultural improvement projects were forbidden in Granada and the import of wheat was authorized to avoid plowing the grasslands in the Kingdom of Castilla and Aragón. Royal pastures were leased, fences eliminated, the felling of small trees was authorized to feed the sheep when grass was scarce, and testimonies were required to certify the use of the land for purposes included in the list of "five forbidden things", i.e., land where livestock was not allowed free access: pastures, wheat fields, vineyards, orchards and hay meadows ("*dehesas, trigales, viñedos, huertas o prados de guadaña*") (Klein, 1979).

In this regulatory and historical context, how did the colonial authorities react to the conflicts between crop and livestock farmers? From Víctor Manuel Patiño (1965), we learn that permanent fences to protect the wheat and corn fields were banned and fencing was only allowed around permanent crops or woody crops such as vineyards and olive groves brought into the region at the end of the 17th century. Nonetheless, in practice, living fences of *cambronera* (*Lycium* spp.), brambles, prickly pear cactus and, in Villa de Leyva, *cabuya* (fique plants) were often used, and in a very few cases the fences that had been built by the indigenous people were kept. This was not just a colonial practice. Even in Castilla, the rules protected wheat fields, vineyards and orchards, and allowed for the construction of fences.

In the Americas, once again, rules of this kind sought to guarantee the food supply and tribute payments. On a visit in 1571, led by Juan López de Cepeda, the Indians of Monquirá made mention of their being forced to build pens made of adobe (*bahareque*) for their *encomendero*, although this low grade precaution did not prevent damage to the crops (AGN, VB, T.5, f.374v.). During the 1636 visit the conflicts between the Suta Indians and their *encomendero*, Pedro Merchán, caused by his livestock invading their crops made the need for livestock owners to enclose their animals and build trenches to protect the crops patently obvious and was recorded in writing; these measures were set during the presidency of Antonio González, from 1590 to 1597 (AGN, VB, T.14, f.819r.). Contempt for the preventive measures that had been ordered resulted in the free movement of livestock, however, the accused *encomendero* was required to pay a fine and hire herdsmen. At the same time, the indigenous inhabitants were ordered to build a trench and a fence (AGN, VB, T.14, f.840).

In Tunja Province, other types of regulations aimed at controlling cattle raising activities were set when its capital city was founded. The city of Tunja was founded on August 6, 1539 and the Minutes of its Town Council meeting on the 14th of August in 1539 includes the precise delimitation of the pasture for the neighbors' horses on the Paipa road, separate from the land where space for orchards would be granted (Ortega Ricaurte, 1941). To determine sanctions, resolve conflicts and regulate pasture use, cattle branding had been required by the City of Tunja since 1541, as recorded in the minutes of the Town Council for February 4th, and March 26 and 29, in which brands were assigned to several neighbors (Ortega Ricaurte, 1941), and from then on and for decades afterwards, a person was appointed to be responsible for the branding irons used to mark the cattle bred by the indigenous people (AGI, Santafé, 66, Nº95, f.1r.).

Other measures perpetuated the Spanish Mesta custom of holding an annual meeting to deal with stray animals (Klein, 1979). In the New Kingdom, the Tunja Town Council minutes of July 1564 included in its determinations that cattle be confined at night so that it could not damage natural crops or those of the neighbours, otherwise the owners

would face a fine. Every year after San Laureano Day—July 4th in the Calendar of Saints (*santoral*)—any unmarked animals grazing in vacant lots or on the *ejidos* were to be collected and appropriated as strays, and then sold to cover city expenses. Owing to the inconvenience of having livestock in the wetland preserve of the city, only those on land neighboring the wetland were allowed to take their animals there, and those who were not on neighboring land could only do so for a period no longer than ten days. The *ejido* was set up to be used exclusively for domestic cattle, plow oxen and horses for service that had been broken, while other livestock (cows, mares, sheep, goats and pigs) were not allowed to graze there (Rojas, 1962). Specifically, it was ordered:

> that, because of the many cattle that wander the ejidos, stripping the land to the point where no forage is left for the horses nor to sustain them such that they damage the crops of the natives and the crops of Spanish that sustain this city and to remedy this we command that no neighbor may have in the region of the *ejidos* of this city more than 400 head of sheep and goats[…] and four head of cattle, or he will face a fine of ten pesos of good gold […] "*que ¿por cuanto los muchos ganados que andan en los ejidos esquilman tanto la tierra que no se puede hallar yerba para los caballos ni sustentarse los mismos en tanta manera que dañan a los naturales sus labranzas y las sementeras de los españoles con que se sustenta esta ciudad y para remedio de esto mandamos que ningún vecino pueda tener en comarca de los ejidos de esta ciudad más de 400 cabezas de ovejas y cabras […] y cuatro reses vacunas y no más, so pena de diez pesos de buen oro […]"* (Rojas, 1962).

Limiting the number of livestock head was thus a measure that guaranteed the protection of the crops and the availability of grasses and, in consequence, the survival of the activity of raising livestock itself. Even if these measures were ignored, their existence reflects the concern of the colonial authorities that neither agriculture nor future supplies for other activities (construction, raising livestock, mining…) be affected.

Moreover, in the expansion of raising livestock, the indigenous people were not only passive observers affected by the invasive animals that belonged to their Spanish neighbors. Patiño (1969) and Villamarín (1975), for example, affirm that well into the colonial period the Indians did not have any horses, and raised the animals that they did have on a very small scale. However, colonial documents indicate that, on the contrary, economic organization and the process of enculturation and *mestizaje* (i.e., the mixing of the indigenous and Spanish peoples) contributed to the rapid adoption of raising livestock by the indigenous people, and the proliferation of the domesticated animals that they had in their possession. In this regard, during the late 16th and early 17th centuries, there were several references to the number of oxen, horses, sheep and chickens owned

by the Indians of the Saquencipá Valley. Stallions and mares were often used to process the wheat when oxen were scarce (AGI, Santafé, 56A, Nº17 (3), f.11r.) or to take flour to Honda and Mariquita and, in some cases, were rented to neighbors in Santafé, Tunja and Vélez (AGN, VB, T.10, f.492r.; T.18, f.530). The visit of the magistrate Luis Henríquez in 1600 collected testimonies highlighting that, although the Indians of Sáchica planted wheat, corn, potatoes and figs, and sold flour in Tunja and Santafé, they also specialized in making halters and girths, many were muleteers, who rented mares and raised sheep and goats for their livelihood (AGN, VB, T.18, f.528r., 530r., 536r., 570).

Since 1587 the Suta Indians had complained frequently because they had been stripped of their land and the place they were assigned did not allow them to keep their livestock (Colmenares, 1997). The visit to Suta in 1636, produced several testimonies and petitions that emphasize livestock activities of the indigenous people of this *resguardo*. The *teniente de corregimiento* (assistant to the Spanish mayor) stated that although corn, wheat, potatoes and fruit and unspecified vegetables were grown, the main activity was that of raising sheep, goats, chickens and, in greater numbers, horses and oxen that they rented to their neighbors, mainly in Vélez. Both the *protector de naturales* (the official responsible for the legal representation of the indigenous people) and the main Indians interrogated in the secret inquiry agreed with this testimony, though the number of animals reported was not unanimous, with figures of 300 to 400 oxen and 400 to 500 horses (AGN, VB, T.10, f.487v., 549r. and 622). These numbers demonstrate the importance of livestock to the indigenous people in the region, though not all the animals counted were there all the time because of the practice of renting them out[7].

Although to a lesser degree than in Sáchica and Suta, it is possible to find noteworthy data for other *resguardos*. Also remarkable was that the *cacique* of Tinjacá had, in 1607, one *estancia de ganado mayor* (large-animal ranch) and four ranches with smaller livestock (Ayape, 1965), and the testament of the Indian Esteban Castro, of Ráquira, who in 1658 said he had six pairs of oxen, 25 mares and 300 sheep (Orbell, 1995). These records provide evidence that for many indigenous people raising livestock, even the large animals, was a privileged and lucrative economic activity that required pastures to be delimited and generated conflicts with farmers, regardless of ethnic origin.

Along with the cattle and horses, other species did well in Tunja Province. The spread of chickens resulted from their attractiveness (owing to their feathers or their clucking), or because of the obligation of the indigenous people to supply the markets of

7 Although in the document there is only a textual reference to renting horses, oxen were also used as beasts of burden, and in numbers that exceeded the *fanegadas* (capacity of the surface area) where they were raised by the Indians themselves. This suggests that these animals also were hired to do agricultural work in neighboring areas or other resguardos.

the Spanish towns and ensure that the parish priest was provided with chickens or eggs[8] (AGN, VB, T.5, f.408v.; T.7, f.591r.; T.14, f.910v.; T.18, f.834v., tribute fixed during the visit of 1571 and 1572). This was a transference of the Iberian tradition of paying tribute in chickens to the landlord or priest depending on the region (Carmona Ruíz, 1998). Poultry were fed whole corn and barley (Tovar, 1988) and raised in the open so they could also eat insects, thus requiring little investment in their maintenance. This way, the protein needs of not only the indigenous people were met, but also those of the *mestizos* and whites who had fewer resources. Although the proliferation of poultry was evident from the mid-16th century, the most striking numerical data is recorded in the tax appraisal imposed by Juan de Valcárcel in 1636, listed in Table 1.

TABLE 1

Tribute fixed by Juan de Valcárcel during his visit to the towns of Tunja Province in 1635 and 1636.

Tributo fijado por Juan de Valcárcel en su visita a las ciudades de la provincia de Tunja en 1635 y 1636.

Town	***Encomendero****	**Number of Indians taxed**	**Total number of barnyard fowl****
Suta	Martín Niño	47	611
Suta	Pedro Merchán de Velasco	100	1 300
Monquirá	Luis Cárdenas	53	689
Monquirá	María de la Peña	8	104
Saquencipá-Monquirá	Félix de la Serna Mujica	68	884
Sáchica	Juan Pérez de Salazar	142	1 846
Chíquiza	Pedro Merchán de Velasco	65	845
Ráquira	Eugenia Alfonso de los Ángeles	45	585
Tinjacá	Juan de Avendaño Maldonado	246	3 198
Yuca	Juan Téllez de Mayorga	30	390
Iguaque	Pedro Venegas Torrijos	91	1 183

Source: Prepared by the author based on data from AGN, VB, T.11, f. 1-341.

** Spaniard who was in charge of a group of indigenous.*

*** Approximate number obtained by multiplying the number of Indians taxed by the twelve hens and one rooster that each was required to have at their home. In the region, this number initially rose to a total of 11.635 barnyard fowl, not counting their offspring or the birds destined for sale or food.*

These approximate data reflect the favorable reception by the Indians of poultry and its spread, not only as a result of tax requirements, but also because of the low cost of

8 By 1583, when Juan Prieto de Orellana collected data on the tariffs that were charged in practice, the indigenous people reported that they paid three hens and forty eggs to the *doctrinero* (priest) each week (AGI, Santafé, 56A, Nº17 (3), f.15v.).

maintaining them, their rapid reproduction rate and the incorporation of their meat and eggs into the diet of the locals.

Although the accounting records of the 17th century indicate that paying tribute with chickens was only constant in Suta, Sáchica and Chíquiza, interest in raising them did not disappear. In the mid-18th century, Basilio Vicente de Oviedo observed that there was no neighbor's house, Spanish or Indian, where chickens were not raised in abundance, and commonly traded by the poor, in particular by the Indians ("*no hay casa de vecino, sea español o de indio, en que no se críen con abundancia, y es el común trato y agencia de los pobres, en particular de los indios*") (Oviedo, 1930).

In the Saquencipá Valley, in addition to barnyard fowl, other domesticated species multiplied in only a few decades. Goats were important for making *cordobán*[9] (the leather that was made from their skin), as well as for milk and dried meat. They reproduced quickly even in arid regions where there was little forage, feeding on waste and thorns (Tovar, 1988). However, their presence in the region is not emphasized in the colonial documents examined, which may indicate that raising them there was of less importance than their abundance would indicate for the "lands of Chita, Chitagolo and Zativa" (Zamora, 1945).

Sheep did well on the Altiplano Cundiboyacense and, although the situation in New Granada is not comparable to the importance they attained in Mexico and Quito (Patiño, 1969), their increase was favored by the climate, the herbaceous vegetation of the region, and the desire of the indigenous people to pay tribute in blankets. According to Basilio Vicente de Oviedo,

> Countless sheep are bred in the cold lands, particularly in the jurisdictions of Santafé and Tunja […] All of the fields are populated in these sheep lands, with herds in the thousands. The Indians, in particular those of the towns in the jurisdiction of Tunja, have very many, and with their wool make great quantities of cloth, some of which they call ponchos, others shirts, and still others blankets, that is their trade and business for everything and for paying their high taxes "*El ganado ovejuno no tiene número el que se cría en las tierras frías, particularmente en las jurisdicciones de Santafé y Tunja […] Todos los campos están poblados en dichas tierras de ovejas, las manadas a miles. Los indios, en particular de los pueblos de la jurisdicción de Tunja, tienen muchísimas, y con sus lanas fabrican cantidades de mantas que llaman, unas ruanas, otras camisetas, otras frazadas, que es su trato y comercio para todo y para pagar sus crecidos tributos"* (Oviedo, 1930)

9 According to the *Relación de Tunja* de 1610, the city tanned 4.000 hides each year (Patiño, 1983); the number of animals slaughtered gives an idea of how many goats there were in the province.

Although the author offers no numerical data, nor does he mention any towns for their outstanding production, it is possible to establish that wool production was important in Tunja and its surroundings. In the report or description of 1610, reference was made to eight mills and five beaters[10] (Patiño, 1969) and, owing to transportation difficulties and the quality of the raw material mentioned by Oviedo, it is logical to think that to obtain the wool sheep were raised in the areas close to the city such as Villa de Leyva and its surroundings. However, as noted by Zamora, even in the cold lands, the location of which he does not specify, haciendas with 2.000 to 3.000 head could be found and, in the "sheep farms that were called de Suesca there were more than forty thousand" ("*Ovejeras que llaman de Suesca pasaban de quarenta mil*") (Zamora, 1945), a number that could indicate that sheep were raised in the Saquencipá Valley in much fewer numbers than in other locations on the Altiplano Cundiboyacense.

In fact, during the visit in 1583 of Juan Prieto de Orellana (AGI, Santafé, 56A, Nº17 (3), f.10v-16v.), the captain of the Suta Indians complained about the lack of wool for making *mantas* (cloth) that the Indians used to pay tribute even though their *encomendero* was required to provide it, an affirmation that allows one to suppose that for his subjects raising sheep was less important than raising horses or oxen, noted above. In the 1636 visit this fact was expressed in the petition of the Monquirá and Cucaita Indians to use cash to make the payment that was set in *mantas* by the tax rate, given that their work on the *estancias* and on their own lands, and taking care of their livestock left them no time to weave. They had no sheep, because there weren't any, as the land was not suitable for raising them, and when there were some, most that were raised, died (*por "no haber, como no hay, ovejas por no ser la tierra aparejada para ello y si algunas hay y se crían se mueren las más*"; AGN, VB, T.11, f.83v.). For the region and the study period, no other references to the scarcity of sheep were found, but rather their mention in the descriptions of the *estancias* and *resguardos* in Tinjacá, Ráquira and Sáchica, allow for the conclusion that this was not a general problem.

Along with birds, goats and sheep, pigs were also being raised; especially for making ham in Tunja (López de Velasco, 1971; Zamora, 1945; Patiño, 1969). According to Fernández de Oviedo, more than three hundred head were taken to the Altiplano, all females and pregnant ("*mas de tresçientas cabezas, todas hembras y preñadas*"; Fernández de Oviedo y Valdés, 1852). Although that number may be an exaggeration, sources concur in that from the time Tunja was founded in 1539 the pigs that accompanied the conquerors multiplied quickly (Simón, 1981) and created problems for

10 According to the 22nd edition of the dictionary published by the Real Academia de la Lengua Española obraje is the place where the cloth is worked ("*lugar donde se labran los paños*") and the batán is a machine, generally hydraulic, made of thick wood mallets, moved by an axis to beat, degrease and felt the cloth (*"máquina generalmente hidráulica, compuesta de gruesos mazos de madera, movidos por un eje, para golpear, desengrasar y enfurtir los paños").*

crop farmers and those rearing livestock. There is record of this even in the minutes of the Town Council meeting held on August 14th, 1539, cited previously: when the pasture area was delimited for horses, the warning was issued that no person should dare to allow any of his pigs to walk in the specified place or cross the boundaries ("*ninguna persona sea osado de consentir que ningunos puercos suyos anden en el dicho lugar y término*") (Ortega Ricaurte, 1941), and as a fine, the payment of two pesos of good gold per head was set. On December 27, 1540 the Town Council broadened the measure and forbade pigs from drinking in the fountain of the city and from walking in its plaza and streets, setting a fine of four silver royals per head (Ortega Ricaurte, 1941). In the mid-18th century, Oviedo called attention to the way in which the pigs brought to the New Kingdom, had multiplied in such a way that there was no place or location that was not full of pigs ("*se ha multiplicado en tanta manera que no hay parte o lugar que no esté lleno de puercos*") (Oviedo, 1930). Their reproduction was favored by the dietary demand of the Spanish population and the fact that the animals could be maintained on waste and abundant corn. When left free to roam they did more damage to crops and ditches than other species did (Patiño, 1969), owing to their tendency to dig along walls, around trees and planted areas.

In synthesis, it is possible to state that in the region of the Saquencipá Valley, the practice of raising large and small species of livestock flourished, with particular emphasis on bovine, equine, ovine, and porcine livestock along with barnyard fowl, although on a smaller scale than in other regions of the Altiplano of modern day Colombia. In spite of the impact that raising domesticated animals had on the ecosystem and the economy by affecting crops, measures were taken so that their expansion would not put the production and supply of food or raw materials in danger; however, in practice, these were ignored or not enforced on land belonging to indigenous people and by Spaniards who depended on animal husbandry.

The question then becomes, to what degree did the implementation of raising livestock in the 16th and 17th centuries in the region generate or accelerate the processes of deforestation and soil deterioration?

Trampling by ungulates and ruminants was not new to the land used as pastures in the Saquencipá Valley, and the region was not without a millennia-long adaptation between this type of animal and the herbaceous vegetation, a condition that has been considered a Eurasian advantage (Crosby, 1972; Diamond, 1998). The abundance of deer in the region, which continued until well into the 18th century, is an indication of this.

In any case, raising livestock in the region was of secondary importance compared to agriculture. Although on different visits the Indians were reported to be raising a variety of domesticated animals and some *estancias* were granted to the neighbors of

Tunja and Villa de Leyva, the main activity of the inhabitants of the region was growing wheat. On land that belonged to the Sáchica and Suta Indians, raising horses and cattle was of greater importance and the livestock was rented out to other regions or used in agricultural work. For the period studied and even currently, the number of head of livestock in the Saquencipá Valley was far below the number that the land located in the Bogotá savanna or the Ubaté-Chiquinquirá Valley could support; lands notable for their deep, fertile soils.

In spite of being invasive species, the domesticated animals that were brought to the region did not reproduce in an uncontrolled manner. Rather, they were faced with natural controls that regulated their populations. For the Huasteca Potosina in Mexico, Miguel Aguilar demonstrated how herd growth was regulated by natural factors such as attacks by wild predators, the proliferation of insects and meteorological phenomena (Aguilar Robledo, 1998). In the New Kingdom of Granada and particularly in the Tunja Province, horses and cattle were reported to fall prey to bears, *gatos bermejos* (feline predators, possibly jaguars), birds of prey, and the parasitic *niguas* (chiggers; *Tunga penetrans*) (Patiño, 1983; Oviedo, 1930; Zamora, 1945). Barnyard fowl was devoured by some type of fox, not specified in the literature, and by the common opossum (*Didelphis marsupialis*).[11]

CONCLUSIONS

In the middle of the 16th century, specific areas of the region of the Saquencipá Valley close to the steepest slopes but far from the rivers became eroded owing to the biophysical conditions of the sites, such as geological origin, wind and rain patterns, and this may have been accelerated by the loss of plant cover that accompanied the farming and artisan activities of pre-Hispanic times. However, the majority of the valley was notable for its fertility and deterioration was localized and prevented neither settlements from being established nor agriculture. Rather, it offered suitable conditions for obtaining food and raw materials for populating the area and those of other regions in the New Kingdom of Granada.

The introduction of domesticated animals and livestock species undeniably modified the ecosystem. Continuous trampling, the spread of disease, the consumption of grass and the demand for cleared areas indeed occurred. In the study region however, cattle ranching was less important than in other areas of the High Plain, such as the Bogotá Savannah and the Ubaté Valley. Even with the biophysical conditions, which could be considered more fragile in Saquencipá, resilience did not decrease and natural

11 A marsupial that inhabits some parts of the Colombian Andes and often feeds on barnyard fowl.

mechanisms exerted control on the proliferation of these species, such as attack by predators and parasites, or the decrease in food and water availability owing to drought. Colonial society also managed to adapt to this new situation and designed or modified the regulation of cattle ranching by periodically rounding up ownerless cattle, the design and registry of branding irons, the delimitation and implementation of restrictions on the use of *ejidos*, the construction of fences, ditches and corrals or hiring out the animals to distant regions.

As a consequence, the adverse effects of cattle ranching on the ecosystem and particularly on the soil were reduced and most likely were less severe than the effects that other economic activities would have had in the region during the Colonial period; especially mining and construction, which have yet to be studied in depth. The deterioration of the soil that cattle ranching—as it was done then—could cause, did not become a threat to the recovery capacity of the ecosystem. The descriptions indicate that agricultural production was constant and there were no substantial changes in the quality of the land during the study period.

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GANADERÍA EN EL VALLE DE SAQUENCIPÁ, NUEVO REINO DE GRANADA, SIGLOS XVI Y XVII

RESUMEN

El presente documento reúne los resultados de una investigación que tuvo como objetivo analizar la transformación en las prácticas ganaderas durante el periodo colonial, su relación con la tenencia de la tierra y el impacto que estas tuvieron en el ecosistema manifestado en la degradación de suelos, en el contexto específico del Valle de Saquencipá en el altiplano cundiboyacense de la actual Colombia. A través de la revisión exhaustiva de documentos coloniales en los fondos del Archivo General de la Nación en Bogotá y al Archivo General de Indias en Sevilla, de las crónicas y relaciones geográficas y de los resultados arrojados por investigaciones desde la historia y la arqueología, se reconstruyen las prácticas ganaderas durante los siglos XVI y XVII y sus antecedentes ibéricos. Teniendo en cuenta factores como la complementariedad con la agricultura, la movilidad del ganado, el número de cabezas y el control natural de las sequías o los depredadores, se cuestiona el alto impacto ambiental que se le ha atribuido a la actividad ganadera colonial en la región.

Palabras clave: Historia ambiental, colonia, ganadería, degradación de suelos.