

# LIVESTOCK PRODUCTION FOR SUSTAINABLE LEATHER INDUSTRY: An Environmental Perspective

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# 1. Preamble.....

- ❖ Leather's contribution to the realization of Kenya's Vision 2030 **cannot** be underestimated
- ❖ Leather—one of the most widely **traded** commodities worldwide
- ❖ Globally, demand for leather and leather products is growing faster than supply.

## 2. Introduction.

- Most livestock and livestock products are found in **arid and semi-arid lands** (rangelands)
- Rangelands, consisting almost entirely of land that is too dry or too steeply sloping to support crop production, account for one fifth of the earth's land surface, more than double the area that is cropped.
- Tapping the productivity of this vast area depends on **ruminant animals due to their ability on converting roughage to meat, milk, leather and wool.**
- Grazing in semi-arid regions is characterized by strong feedback mechanisms between economic and ecological factors (Beukes *et al.*, 2002).
- Economic yield is **directly linked to livestock number and hence to pasture condition** while **ecological resources are easily damaged by inappropriate use.**
- The **contraction** of rangeland areas, **increased populations of pastoralists**, the **improved veterinary services, watering mismanagement and the lack of viable marketing systems**, helped the rapid growth of animal numbers around the world (Widstrand, 1975) that led to increased **overgrazing and accelerated desertification.**

# Introduction Cont'd

- The present **conditions of the rangelands** are the result of a protracted evolution of plants and animals, which has also been **influenced by human activities** for thousands of years.
- Unfortunately the **impact of humans** and their livestock became **excessive and negative in the second half of the twentieth century**.
- The **removal of vegetation for wood** and **overgrazing** are the main causes of the deterioration. Certain improvements have actually been made in some of the rangelands, but these do not make up for the serious conditions that have developed in more extensive areas

# 3. Habitat needs of rangeland animals

- Feeds, water, cover, and space are the four basic habitat essentials required by all wildlife and livestock to survive, thrive, and reproduce.
- Different types of animals require different amounts of feed each day. As a general rule, ruminants such as cattle, and sheep will eat about 2.5% of their body weight per day (in dry weight of forage).
- Water requirements vary depending on the animal species and weather conditions. In general, sheep and goats require 3.8litres to 5.60litres of water once every two days; donkeys require 11.4 to 15.2litres of water every day; horses require 19-30.4litres of water once or twice a day; and cattle and bison require 30.4 to 38litres of water every one to two days. Rangeland animals meet their water requirement by drinking fresh water and obtaining water from forage

# 4. Limiting Habitat Factors

- These limiting factors are basic requirements that limit the (i) size, (ii) growth, and/or (iii) vigor of an animal population. Rangeland habitats can be influenced by human activities that either add or remove limiting factors.
- For example, when ranchers add water tanks to pastures they may remove a habitat limiting factor (i.e., access to water) for wild and domestic animals.
- On the other hand, building roads and housing subdivisions may create factors that limit access to food and cover.

# 5. Diet Selection

Animals that live on rangeland can be categorized based on their foraging patterns. For example, classification is first based on whether the animals eat plants, other animals, or both:

- **Herbivores** are animals that eat plants.
- **Grazers** – are animals, like **cattle**, elk and bison that eat mostly grasses.
- **Browsers** – include deer and **goats** that eat mostly shrubs. The leaves and small stems of woody plants are called “browse” so these animals are called browsers.
- **Intermediate Feeders** – eat a mix of grasses, forbs and shrubs depending on which is most nutritious at the time. **Sheep** and pronghorn antelope are basically opportunistic feeders that each eat grasses and forbs in the spring and summer and then switch to shrubs in the winter.
- **Carnivores** eat other animals including insects, birds, reptiles, or mammals.
- **Omnivores** are animals, including most humans, who eat a combination of animals and plants

# 6. Zebu cattle production and comparative figures

- The indigenous cattle population of Kenya is of the thoracic humped type, commonly referred to as the Small and Large East African Shorthorn Zebu (*Bos indicus*).
- This population is important for the subsistence and economic development of the country in that it **provides essential food products, draft power and manure, and sustains employment** and income for the majority of Kenyans living in rural areas.
- The **indigenous breeds constitute 77% of the total cattle population** (the rest being exotic breeds and their crosses) and are represented in virtually all agro-ecological zones (MoA 1993).
- **The highest concentration of these breeds is in the arid and semi-arid lands, which constitute approximately 80% of the Kenyan landmass.** These breeds are able to survive and reproduce under the harsh climatic, nutritional and management conditions that characterize the arid and semi-arid lands, and hence their popularity among resource poor farmers

# Zebu Cattle Production Cont'd

- Like the majority of indigenous African animal genetic resources, the Kenyan **zebu breeds** are **currently at risk of extinction**.
- Several factors underlie this trend, some of which are driven by the lack of economic competitiveness of the Kenyan zebu breeds, e.g. **indiscriminate cross-breeding, replacement with exotic breeds, uncontrolled introgression and interbreeding, and the absence of breed development programmes**
- Rege (1999) gave examples of indigenous African cattle that are endangered due to the impact of upgrading with exotic breeds and deliberate neglect.
- NB: Considering their importance and endangered status, immediate steps must be taken to conserve these indigenous breeds for use by both present and future generations (FAO/UNEP 1995).

# Zebu Cattle Production Cont'd

## Zebu cattle breeds of eastern Africa:

- According to Rege (1999), the zebu is represented by some 75 breeds in Africa, making it the largest single cattle type.
- Approximately 61 of these zebu breeds are found in eastern Africa and neighbouring countries in southern-central Africa, while the rest are found in West Africa.
- Faulkner and Epstein (1957) coined the term 'East African Zebu', to embrace the substantial variation in the morphology of the shorthorn zebu of eastern and southern Africa.
- For reasons of simplicity, East African Zebu cattle breeds have been divided into two groups, those found only in Kenya (Kenyan zebu cattle) and those found in the other East African countries (East African Zebu cattle).

# Zebu Cattle production

- The term 'East African Zebu' is used to describe all the 'Shorthorn Zebu' of eastern and southern Africa (Rege and Tawah 1999).
- Based on their body sizes, the East African Zebu cattle can be divided into two subgroups, the 'Small' and the 'Large'.
- The term 'Small East African Zebu' was suggested to portray the **small frame of** these animals and to avoid confusion with other types of East African cattle (Mason and Maule 1960).
- The **Small East African Zebu** are the majority, being represented by **49 breeds**. The **Large East African Zebu** is represented by **13 breeds**, which are restricted to the relatively drier parts of Sudan, Eritrea, Ethiopia, Somalia, Kenya, Tanzania and Uganda.
- NB: The isolations imposed by tribal boundaries, **whether physical and/or cultural, and those due to ecological restrictions** are partially responsible for the genetic differentiation leading to the existence of different breeds and strains (Rege and Tawah 1999).

# Zebu Cattle Production Cont'd

## **Kenyan zebu cattle:**

- In Kenya, all indigenous cattle are of the shorthorn, thoracic humped zebu type and are found **throughout the country**.
- Their wide distribution over **diverse ecological zones implies that over the years, they have developed adaptive characteristics** because of natural selection under **different environmental conditions**

# Zebu Cattle Production Cont'd

The various **breeds/strains** are often named after the tribes that breed them:

-**Boran in north-east Kenya**, and improved Kenyan Boran in commercial ranches in central Kenya

-**Kikuyu or Highland Zebu, in central Kenya**

- **Lowland or Coastal Zebu**, in south-west and south-east Kenya, incorporating the Taita/Taveta, Giriama, Duruma and Kamba Zebus

-**Maasai Zebu**, in southern Kenya extending to north-east Tanzania, an area dominated by the Maasai

-**Winam or Kavirondo Zebu**, in western Kenya in the lowlands of the Lake Victoria Basin, an area inhabited by the Luo and Luhya ethnic groups

# Zebu Cattle Production

- **Nandi Zebu**, in western Kenya, a few kilometres north east of Lake Victoria, an area inhabited by the Nandi
  - **Teso Zebu**, in western Kenya among the Teso ethnic group
  - **Turkana Zebu**, in north-western Kenya
  - **Kamasia/Samburu Zebu**, in northern Kenya among the Samburu ethnic group
  - **Watende Zebu**, south of Lake Victoria, inhabited by the Watende/Kuria ethnic groups.
- ❖ The **breed and the gender** of the animal have an **effect on type and weight of the hide**. Terry et al. (1990) found the effect that the breed type had on the **weight of the hide and the strength of the hide** (Terry, 1990)(Mies et al., 1992)

Year	Population of cattle(millions)	Reference materials
1983	10.87	Animal feed resources for small-scale livestock producers - Proceedings of the second PANESA workshop, held in Nairobi, Kenya, 11-15 November 1985
2021	21.2	State Department of Livestock Production (SDLP) Kenya, 2021
NB: Is the increase in line with expectation?		

Year (hides and skins)	Total (millions)	Remarks
2005	9.022	Ref: Leather Development Council (2008-2013 strategic plan)
2006	9.165	-do-
2007	6.270	-do-
2008	6.180	-do-
2009	7.780	-do-
2021	4.6	Ref: SDLP, 2021.
NB: Why the downward		

# 7. Trans-border trade on leather

## Somalia - Kenya Cross-Borders Trade

- **Informal cross-border trade** is an important feature of trade in the Horn of Africa. In many instances the value of informal cross-border trade exceeds the value of official trade. For example, official annual exports of cattle from Ethiopia, home to the largest cattle inventory in Africa, are less than 2,000 heads, when more than 25 times this amount are typically exported across borders.
- Officially recorded information suggests that trade is underperforming as a driver of growth, job creation and poverty reduction in the Horn of Africa.
- Informal cross-border trade between Ethiopia and Kenya is substantial and vital for both countries.
- Ethiopia's main exports include **livestock, livestock products and cereals**. On the other hand, Kenya's exports to Ethiopia are manufactured products including processed food. Ethiopia represents more than 25 percent of total trade between the two countries.
- In 2001 more than 58,000 head of cattle were traded to Nairobi with a market value of about \$11 million. **More than 70% of livestock trade in Moyale markets originate in Ethiopia.**
- Ethiopia is a **key source of cattle for Kenya (WB, 2021)**

# Trans-border trade on leather Cont'd

## Somalia - Kenya Cross-Borders Trade

- There is a significant cross-border trade in livestock (cattle, camel, goats and sheep) and agricultural commodities between Somalia and Kenya. Though the volume of cattle traded varies depending on the **availability of pasture and water**, it is estimated that around 65,000 cattle per year enters Kenya markets from Somalia (WB, 2021)

# Trans-border trade on leather Cont'd

## Impact of Cross-Border Trade:

- Cross-border trade is an **important part of the economies** of Horn of Africa (HoA) countries. In the Horn of Africa, it is estimated that cross-border trade supports about 17 million people including pastoralists, agro-pastoralists, small and medium local traders, cross-border traders, brokers, butchers, trekkers and others.
- Cross-border trade constitutes a vital **source of livelihood** for the poor, in particular for low-income and low-skilled traders in border districts (UNCTAD, 2019).
- **Insecurity** is one of the major risks facing cross-border traders in the Horn of Africa. The main source of business insecurity in the region includes **ethnic conflict, war, highway robbery, confiscation and business rivalry**. There are regular border and ethnic conflicts within the market catchment area in Southern and southeastern Ethiopia, northern Kenya and northern and south eastern Somalia(WB, 2021)

# 8. Challenges FACING ZEBU CATTLE

Kenyan zebu breeds are currently at risk of extinction. Several factors underlie this trend, some of which are driven by the lack of economic competitiveness of the Kenyan zebu breeds. Some of these factors include:

- (I) Indiscriminate cross-breeding,
- (II) Replacement with exotic breeds,
- (III) Uncontrolled introgression (back-crossing)
- (IV) Interbreeding (closely related)
- (V) Absence of breed development programmes
- (VI) An increase in size of the human population that has led to a reduction in the amount of land available for livestock grazing,
- (VII) Neglect of traditional livestock production systems,
- (VIII) Famine and civil conflict, and
- (ix ) Cattle rustling and
- (X) Livestock disease epidemics.

(Rege et al. 2001)

## 9. Research Gaps that require attention in improving leather industry:

- ❖ To what extent has **shrinkage of pastures** influence quality of hides and skins in leather industry in Kenya?
- ❖ To what extent has **global warming and climate change** influence the quality of hides and skins in leather industry in Kenya?
- ❖ To what extent has **ecological or regional characteristics** influence quality of hides and skins in leather industry in Kenya?
- ❖ To what extent has the concept of **cross-breeding** of animals influence quality of hides and skins in leather industry in Kenya?
- ❖ To what extent has **inbreeding** of animals influence quality of hides and skins in leather industry in Kenya?
- ❖ To what extent has the **cross-border trade** influenced the quality of leather in Kenya?

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