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# Varieties and Physical Characteristics of Indigenous Cattle Breeds in Somalia: A Literature Review

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**ABSTRACT**

**The aim of this review was to find out the indigenous Somali cattle breeds in Mogadishu, Somalia and also what is the physical difference between them and what do other scholar wrote about them, this breeds have some unique characteristics and they have one thing in common which is important for pastoralist communities because pastoralists depend on these animals for their livelihood. This study found different types of indigenous breeds including Dawara, Surqo, Gassara, Saywal and Somali Boran those were originated in local community as well as other breeder were hybrid but all of them were resilient and sustainable for local pastoralists. The Somali cattle breeds occupy specific niches in terms of environment and diseases.**

**They have cultural importance with milk and meat; and play roles in local economies supporting their livelihoods. The Boran breed, said to have originated from the Boran clan in south Ethiopia, is exposed to high temperatures and infectious diseases. They are not only good for meat but also produce substantial amounts of milk. The Gassara breed is smaller than other breeds and has been described as being less productive but able to survive under harsh conditions because they easily adapt and store fat – valuable features during droughts when pastures disappear. Similarly, the Dawara breed plays an important role among some pastoral Somali communities and remains culturally valued by them even though its milk yields have been recorded as being lower than those of other breeds. Saywal cattle is a local variety of the Sahiwal which is both a milk and meat producing breed that originated in India as evidenced by the history of trade activities on the livestock heritages in the region.**

**The Surqo breed of cattle is a cross-breed between boran and dawara breeds hence their contribution to food security in certain regions of Somalia. Cattle hybrids, on the other hand, introduced in with the help of the Somali government through overseas artificial insemination have higher milk production but take time to adapt with the environment. Therefore, the protection of the genetic resources and unique characteristics of these locally developed breeds is of prerequisite importance to the livelihood of pastoralists and food security in Somalia.**

**The study recommends establishing artificial insemination centers in all region were dominate with cattle husbandry to produce hybrids that combine the hardiness of local cattle breeds those have desirable productivity characteristics. Additionally, development international collaboration Such as agencies those have skilled in livestock biotechnology and also ability to enhance the effectiveness of breeding programs of cattle. Also make Improve management practices, including the rotational grazing and the development of water resources for rural areas, together with training for pastoralists and agro-pastoralists on modern husbandry techniques, are also essential.**

***Keywords***- Physical, Characteristics, cattle, breeds, hybrids, Somalia**.**

## I. INTRODUCTION

The overall value of the Somali livestock is nearly 55776752 live animals; 7173988 camels (Arabian cams); 5319533 cattle; 30998566 goats; and 13685565 sheep [1]. The Somali cattle are of the African species known scientifically as Bos indicus classified also as Zebu. Several breeds in Somalia hold a Significance

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Importance as the native Somali cultures as they enhance their food production, raising of cattle and trade. Grazing livestock production is one of the major economic activities in terms of income, food security and employment for the pastoral and agro-pastoral people. Indigenous breeds of cattle that are found in Somalia are prized for their milk, meat and skins, are crucial sources of food and income for the households of the respective community groups. [2][3].

Somali cattle are not only means of survival but also have a great importance. However, the Livestock in question acts as capital assets and source of credit or insurance against economic risks for the communities, whereby they and their families are able to trade and invest. Exportation of livestock and livestock products is a main natural resource in Somalia that yields both the main export income and income source for many businesses where many families were reliant in livestock for income generating activities and the provision of employment [2][3]. In addition, due to their local origin, the breeds are easily adaptable to the extreme harshness of climate in Somalia. This flexibility has proved that despite the many problems of frequent droughts and resource limitations in the region, the Somali cattle will always provide a source of livelihood to the pastoralists [2][3].

This Review also intends to record and discuss the on-body configuration of the indigenous Somali cattle breeds in Mogadishu, Somalia by concentrating on difference between as well as the things that another scholar confined down regarding them. Thus, it is crucial to have proper knowledge on the physical traits of Somalis' native cattle in order to develop a substantial basis for future breeding programs and tactics of skill improvement as well as conservation of livestock in Somalia's. also, importance to identification of species of livestock in Somalia as Abdi-Soojeede, (2022) [4], mention identification of common indigenous chickens in Somalia. Through these traits, the study may shed light to efforts to enhance the adaptability of Somali cattle breeds during the realization of climate shock and maintaining food security for pastoral and agro–pastoralist communities

## II. LITERATURE REVIEW

Consequently, Historically, 1981 world bank wrote the Breeding and Selection section in Somalia, which is comparatively new that time, first directed its production efforts before moving to support the producers [5]. Key government farms including Warmahan Ranch, Afgoi Dairy Farm, Hargeisa Dairy Farm, Assura Sheep Farm, and km 7 and Balad feedmill and feedlot still remain at least partially under developed and or have not become financially self-sustainable, and depending on development budgets [5]. These farm have offered few services to large number of private rearing of livestock, supplying breeding stock for cattle and feed, concentrates especially to poultry farmers within the Mogadishu region. Service extension activities of the Livestock Service with relatively new programme such as artificial insemination services and dairy and poultry extension at Qoryoley extend directions service to the private producers [5]. But for the last few decades southern Somalia has been plagued by recurrent security problems that culminated into the collapse of breeding and genetic improvement service in 1991. The absence of such services has been felt most keenly in rural areas, which has had to contend with recurrent drought and the unfavorable quality of livestock during some seasons. This decline has greatly affected the ability to produce livestock within these areas, hence the income earning opportunities of people that rely on livestock production.

In my research, find the necessity of founding organizations in Artificail Insemination (AI) or genetic improvement for developing more productive populations adapted to climate. These endeavours would not only enhance the standard of living of the rural population whose live from livestock, but also enhance the stability of the imbued subsector. It is also useful to put this situation in the context of other countries that have successfully maintained genetic improvement centers, for instance Kenya, Ethiopia, and Sudan in making the high-quality genetics and achieving better livestock production and yield. For instance, in Kenya, the AI services are common together with the support of the institutions such as Kenya Animal Genetic Resources Centre that produces semen to improve the native cattle [6]. Likewise, in the aspect of breeding and livestock Improvement, great achievements have been registered; the Ethiopian Institute of Agricultural Research (EIAR), is working on breed improvement to enable the rural dwellers overcome hardships brought by climatic change [7]. These models have important implications for Somalia where plans to develop similar centers would dramatically transform the livestock industry.

From the study, it was established that Somalia has only one species of cattle which is Bos indicus of the zebu breed. These include mainly the East African Shorthorn Zebu with distinguishing thoracic humps. Four main breeds are identified in Somalia: Gassara, Dawara, Saywal and Boran. Surqa can be produced out of the mating between the East African Shorthorn and the cervico-thoracic humped Ethiopian Boran breed.

Common in the region among the Boran in particular, this Boran breed is heat tolerant, resistant to ticks, hot weather and diseases. This breed fits well the environmental conditions of Somalia by being hardy to extremely hot and arid conditions making it very instrumental in livestock production. The Gassara breed is the much smaller compared to the other animals and it is mainly used for beef production. It is general and efficient in the production of meats but not so in other uses such as milk production or as draft power. The Saywal is mainly a dairy breed and as noted earlier, the animals are mainly red in color. Main reason being that

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this breed is encouraging source of milk in many Somali communities which in turn enhances food security among rural based communities. Dawara breed for Milk as well as meat production being rated amongst the breed that can be used for both purposes. It earns its adaptability in different uses as a key livestock breed in Somalia whereby the herders depend on the cattle for draught, and also for manure [8].

The Surqo cattle breed that derives from crossing between the East African Short Horn and the Ethiopian Boran is central to the pastoralism in Somalia. This breed is well suited to the regional climate and genetic variation has been identified here as a source of strength and yielder. From an academic perspective, Abdulcadir et al. (1990) observe that markers principally found in the Surqo zebu show the distinct characteristics that seem to correspond with the hydrological fluctuations in the area [9]. The Shahwal cattle or Saywal is one of the most important breeds in Somalia; they are well-adapted quite well and hardy under unfavourable ecological conditions. They are mainly found in the regions of Arid and semi-arid areas of Somalia where they; are of paramount importance to pastoral households [10]. This review focuses on the description, husbandry, and importance of Shahwal cattle concerning Somali agricultural and animal production.

***2.1. Sahiwal cattle breed (Saywal, Lo'gaduud)***

Sahiwal is a Zebu breed indigenous to the Punjab in Pakistan and India of heat tolerant, dual purposes which means it is especially used for milk and meat production. The acclimatization of Indian communities, especially in the large urban centres comprising Mogadishu, Kismayo, and Berbera, can be traced back to earlier occasions of trading on the Indian Ocean. Regarding the different products these traders brought to this part of the globe, some of them are; cattle such as the Sahiwal breed [11].

When Sahiwal breed was introduced, it possibly crossed with the local cattle like Dawara and Boran breeds to produce breed that could well suit the region's climatic conditions and practices prevalent in the area. This crossbred over time started to be referred to locally as Saywal or Lo'Gaduud, which in Somali means 'red cattle.' It also illuminates an aspect of external trade stimuli, consisting of those introduced by Indian traders within the context of Somali livestock. Today's Saywal cattle are part of the Somali pastoralism, harboring heat tolerance, the Sahiwal origin, but having other Somali like traits due to the matings [11].

Studies have indicated that Saywal or Lo'Gaduud cattle possess a good S and his trait on milk production prefer comparison with other indigenous cattle breeds. Sensitisation of Kenyan and Tanzanian Saanen with Sahiwal demonstrate higher and improved yields of milk [12]. Here is a table summarizing the general characteristics of the Sahiwal breed based on its typical traits and what the image suggests:

**Table 1: Sahiwal cattle breed (Saywal, Lo'gaduud)**

| Characteristic | Description |
|---|---|
| Origin | Punjab region (India/Pakistan)/ |
| Color | Reddish-brown, often with lighter shades on the underbelly and legs. |
| Size | Medium size; strong, well-built frame. |
| Hump | Distinctive small hump, typical of Zebu (Bos indicus) breeds. |
| Udder Size | Medium and well-formed, indicating high milk production capacity. |
| Milk Yield | Known for good milk production, averaging around 6 – 10 liters per day during lactation, depending on the conditions. |
| Heat Tolerance | Excellent heat tolerance; able to survive in hot and humid environments. |
| Disease Resistance | Highly resistant to common tropical diseases, especially tick-borne infections. |
| Temperament | Docile and easy to manage, some of them slightly aggressive. |
| Feed Efficiency | Can thrive on low-quality forage, making it adaptable to regions with poor grazing conditions like arid and semi-arid areas in East Africa. |
| Current Name in Somalia | In Somalia, after interbreeding, the breed is often referred to as Saywal or Lo'Gaduud (red cattle). |

**Figure 1. Sahiwal cattle breed (Saywal, Lo'gaduud)**

***2.2 Dawara (Dauara, Garre) Cattle Characteristics***

Dawara is another breed within the Somali Shorthorn Zebu sub type that can also be called as Dauara. It is mainly preserved by the Garre (Ghera) tribe that reside in the middle and the upper part of the River Shabelle in the southern part of Somalia. This breed is very important to the Garre people because it provides both the milk and meat and is adapted to the dry and semi dry climatic conditions of the North Eastern region of Kenya [13]. In terms of size, Dawara is small bovine, maximum weight of which varies between 280 to 320 kg. The coat colour is usually red or sandy red and the animal may have black spots. They have short thin and

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straight horns sometimes the horns are flaps or may not be present at all. Further, there is a small hump on the breed, the hump that is noticeably present in Zebu breeds and a specially declining croup with the rump being higher than the withers. Its physical characteristics of the Dawara cattle have played these roles to enable it survive in the harsh environment of the native region [13][2].

The Dawara cattle are not high producers of milk as such but they offer sustainable milk production in typical climatic conditions of southern Somalia. The breed gives moderate amount of milk which is just enough for the pastoralists who use them and ongoing crossbreeding exercises are aimed at increasing production without compromising on the animals' resilience. As far as meat yielding ability is concerned Dawara is a small breed still because of its great adaptability and resistant nature towards diseases and unfavorable conditions it has its utility for the pastoralist people who depend on animal for their livelihood. By its movement for long distances in the search of grazing and water it best suits the nomadic/transhumance livestock keeping system that the Garre people practice today. For the Garre or Ghera tribe, the Dawara breed is more than a source of food and income; it holds significant cultural importance. The breed's resilience to the harsh conditions of Somalia ensures the survival of pastoral livelihoods, which are central to the socio-economic structure of the region [13][2].

**Table 2: Characteristics of the Dawara (Dauara, Garre) Cattle Breed**

| Characteristic | Description |
|---|---|
| **Breed Classification** | Small East African Zebu, sub-group Somali Short horned Zebu |
| **Primary Keepers** | Garre or Ghera tribe, in the middle and upper river Shabelle area, southern Somalia |
| **Size** | Small breed, with a maximum weight between 280–320 kg |
| **Color** | Red or sandy red, sometimes with patches of black |
| **Horns** | Short and thin, sometimes loose or absent |
| **Hump** | Small, typical of Zebu cattle |
| **Back** | Back slopes sharply upward, making the rump higher than the withers |
| **Milk Yield** | Moderate; not as high as crossbreeds, but sufficient for pastoral needs |
| **Adaptation** | Excellent heat tolerance, disease resistance, and ability to survive on low-quality forage in arid conditions |
| **Cultural Importance** | Central to the livelihood of the Garre tribe, offering both economic and cultural value |

**Figure 2. Dawara (Dauara, Garre) Cattle Breed**

### *2.3. Characteristics of Gasara Cattle*

The Gasara cattle breed which is also called locally as Abgal, Abgal Aria, and Aria but called in Italian as 'razzetta delle dune' which translates to 'little race of the dunes'. This breed is mainly located in the northern regions of the country and belongs to clans and regions including the Mudugh, Nogal, Mjiertein, Abgal and Aria. The Gasara cattle is considered relevant in these communities as they supply both milk and meat in rather extreme conditions of arid climate of the region present in the country [13]. Morphologically, Gasara cattle are small in build and rested by an average maximum body weight of between 250-300 kg. The body build is slender and often a low, sloping croup is observed, while the coat varies between lead-gray and dark-grey or simply dark-red with undesired colouring of white on the face. The horns are short and slim whereas polled reported on occasion. The breed has a dorsal hump as is characteristic of Zebu but the flap and scrotum are not as pendulous as seen in other Zebu breeds. In a subtype known as the Gasara, the Magal variety is one of the know varieties.

The Gasara breed is therefore well suited to hot and dry conditions of the Somali environment making it a suitable animal for pastoral people. The said type of cattle is very hardy, very adaptable even to poor pasturage and will cover many miles in their search for pasture and water. However, despite being small sized Gasara cattle have moderate milk production. It is a vital part of the economy and social organizations because apart from being the food and source of income they mostly represent wealth. It has been evidenced that Gasara cattle are of remarkable cultural and economic value to the Somali clans that rear them [2]. Hence, they are suitable for the nomadic and semi-nomadic pastoral production systems that are practiced in central and northern regions of Somalia. The breed is relevant to the sustenance of the pastoralist societies as cultural importance as a symbol of prestige to householders, hence preserves it worth as a milk and meat producing animal [14].

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**Table 3: Characteristics of Gasara Cattle Breed**

| Characteristic | Description |
|---|---|
| **Breed Classification** | Small East African Zebu, sub-group Somali Shorthorned Zebu |
| **Primary Keepers** | Mudugh, Nogal, Mjiertein, Abgal, and Aria clans |
| **Size** | Small breed, with a maximum weight between 250–300 kg |
| **Color** | Lead-grey, dark grey, dark red, pied, or fawn, often with a white face |
| **Horns** | Short and thin; polled animals (hornless) have also been reported |
| **Hump** | Pronounced, typical of Zebu breeds |
| **Dewlap and Sheath** | Less developed compared to other Zebu breeds |
| **Milk Yield** | Moderate; well adapted to provide milk under harsh conditions |
| **Adaptation** | Highly adapted to arid and semi-arid conditions; resilient and capable of surviving on poor-quality forage |
| **Cultural Importance** | Central to the livelihoods of pastoralist clans in central and northern Somalia; valued as a source of income and social status |

**Figure 3. Gasara Cattle Breed**

### *2.4. Characteristics of Somali Boran Cattle*

The Somali Boran is bred under the Large East African Zebu and is found in Gedo, Lower Jubba Middle Juba, north western and eastern parts of Somalia. This breed is well known for its large size, though the withers measurements of an adult male is ranged at 117 – 147 cm while that of the female cattle is ranged at 114 – 127 cm. The weight of the adult males varies between 500-850kgs, while that of the adult females is between 380-450kgs [13]. At the physical level the Somali Boran is described as having a white coat with black extremities, although a few markings of color might be present. Its design is characterized by miniature horns while part of the owners recorded low rates of hornless among the breed. Another peculiar characteristic is the hump which is musculo – fatty developed in the thoracic region. This hump combined with the short length of neck makes the breed to have a stocky appearance.

The top line of the Somali Boran drops abruptly from the withers and slopes upward gradually towards the hind legs which are thick and muscular. For some reason the upper thighs are most often muscular and well-shaped and also provide great muscular mass to the animal. The breed has a long tail which is set low; the dewlap and the sheath promise a lot of muscle mass as well. Altogether, the Somali Boran cattle can be important for the size and general appearance, as well as for the possibility to adapt to the condition of land and climate in Somalia as a key representative of the cattle of the local agro -pastoralist communities and residential cities. Due to their hardy nature to adapt to different weather conditions they are vital asset for farmers and shepherds in the region [14][2].

**Table 4: Characteristics of Somali Boran Cattle Breed**

| Characteristic | Description |
|---|---|
| Breed Classification | Large East African Zebu |
| Geographic Distribution | Gedo, Lower Jubba, Middle Juba, northwestern Somalia, and eastern Somalia |
| Mature Height | 117–147 cm for adult males, 114–127 cm for adult females |
| Mature Weight | 500–850 kg for adult males, 380–450 kg for adult females |
| Coat Color | Predominantly white with black points; some may be pigmented |
| Horns | Small horns may be present; a portion of the population is naturally polled |
| Hump | Well-developed, musculo-fatty, located thoracically |
| Neck | Short neck |
| Topline | Rises to the hindquarters; wide and well-muscled |
| Upper Thigh | Thick and rounded |
| Tail | Long and set low |
| Dewlap and Sheath | Well developed |

**Figure 4. Somali Boran Cattle**

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### *2.5. Characteristics of Surqo Cattle*

The Surqo cattle breed is also referred as Tuni, Surco, Macien, Serenele and Serenli and mainly confined in central Somalia but can be seen in Lower Shabelle, Bay, and Lower Jubba regions. However, the Surqo, which was earlier found in northeastern Kenya, has apparently become extinct, and is thus currently mainly distributed in Somalia [13]. This breed is relatively large with relatively short legs, and can be compared with the Surqo breed, which is, for instance, similar in size to the Somali Boran. The coat colours of Surqo cattle may be white, light brown and dark mahogany. Among the distinctive characteristics of this breed has the moderate thoracic to cervico-thoracic hump that further adds to the distinctive appearance. The Surqo breed as is a multipurpose breed, and its primary use is for both meat and milk production and therefore is very vital to the agricultural sector. Due to its large and powerful structure it is best suited to numerous herding and farming functions in the areas in which it resides [13].

**Table 5: Characteristics of Surqo Cattle Breed**

| Characteristic | Description |
|---|---|
| Common Names | Tuni, Surco, Macien, Serenele, Serenli |
| Breed Classification | Zenga breed |
| Geographic Distribution | Central Somalia, Lower Shabelle, Bay, and Lower Jubba |
| Comparison | Similar size to Somali Boran; large body and short legs |
| Coat Color | White, light brown, and dark mahogany |
| Hump | Moderate thoracic to cervico-thoracic hump |
| Primary Use | Mainly used for meat and milk |

**Figure 5. Surqo Cattle Breeds**

### *2.6. Characteristics Hybrid cattle*

Hybrid was begun with Artificial Insemination Service, which began in 1976, works with 20 employees including technician, veterinarian, inseminator and other related post. The service obtains fresh semen from bulls originated at Afgoi Dairy Farm and Warmahan, where Friesian, Sahiwal and crossbreed bulls are reared [5]. It has been proposed to establish a station for the production of liquified nitrogen for use in deep-frozen semen storage. By 1978, about 3 500 doses of semen were disbursed to government operated farms, and 1200 doses to private cattle owners who are normally known as “pastrolists” who herd their cows near the artificial insemination center during their pastorial movements. In all these center and farms were lost after collapse of central government [5]. The raised hybrid cattle at these farms, especially those produced by local and exotic breed crosses were spread over the southern parts of Somalia. These hybrids were especially valued as their productivity by the production of milk had improved. However, although they were relatively productive in terms of milk production, the they did not fare well in terms of the local environment adaption as the native breeds.

Somalia and particularly the Afgoi breeding program are home to a range of hybrid cattle that owe a diverse Sort of characteristics where animals are endowed with adaptability to the difficult climate of this country together with attractive levels of milk production. Most of these crosses involve the exotic breeds such as Friesian, which are high yielders but low on the adaptive capacity to harsh environment and local breeds such as the Somali Boran and Sahiwal. Due to deficiency of public infrastructure, it is necessary to create new AI or genetic improvement centers to obtain climate adapted and high productive livestock. Such initiatives would not only assist in ensuring the strengthening of local herder’s livelihood capabilities, but would greatly enhance the standards of living among local herders.

**Table 6: Physical Characteristics of Hybrid Cattle in Somalia**

| Trait | Description |
|---|---|
| Body Size | Medium to large; hybrids show a mix of size traits. |
| Coat Color | Varied; common colors include white, light brown, and black. |
| Hump | Presence of Lack of fatty hump, not like Zebu breeds. |
| Milk Production | Higher than local breeds due to the exotic genetic input, particularly Friesian or Sahiwal traits. |
| Adaptability | Moderate; better than pure exotic breeds but less adaptive than indigenous Somali breeds. |
| Horn Status | Varies; hybrids may have horns or be polled (hornless). |

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**Figure 6. Hybrid cattle in Somalia**

## III. DISCUSSION

The understanding of different types of Somali cattle including Saywal (Sahiwal), Dawara, Gasara, Somali Boran, and Surqo helps in understanding the impact of trade, as well as local environment on livestock lineage. They have unique characteristics that fit the drought-prone and semi-arid climatic conditions of the Somalia's environment, important for resource base that supports pastoralism. Nowadays, the Sahiwal has been adjusted to the East African environment and due to that the Saywal or Lo 'Gaduud breed is known locally. According to Kahi at al, 2006, the breed is ideal for milk production thus important for the pastoralism [12]. The presence of Historical Indian traders amply underlines the influence of cross border trade on the local agriculture through the introduction of such a breed as the Sahiwal. Like the original breed, Saywal cattle are used to produce both milk and meat while being suited to local conditions.

The Dawara cattle breeds are an integral part of Somali's culture as well as economy. That though the Dawaras are compact in size and produce comparatively less milk than hybrids or exotic breeds, due to their ability to sustain in hot climate their value cannot be ruled out. These cattle are valued by the local communities since they are disease immune and can adapt to hard conditions. The genus hence has a social importance to the Garre tribe apart from an economic value since it represented wealth [13]. The relative small size and average milk yield in the Gasara breed is well compensated by high fitness to work in the extreme production environments. The Gasara, locally Italian name referred to as razzetta delle dune or the little race of the dunes, is inherent in the steroid pastoral regimes of central and northern regions of Somalia. Its fat preservation means in its hump is very useful in survival during drought season in the area and due to its hardy nature it is well suited for the pastoralist systems (ILRI & Terra Nuova, 2008).

Somali Boran cattle are large, heavy and prolific good in milk, this making them one of the most important breeds of cattle in the area. It also has large musculo-fatty hump ad massive body frame which makes it endued with potential of meat and milk production. According to Muigai et al. (2016), because the Somali Boran animal can withstand the various climatic conditions in the country then it becomes even more useful to the pastoralists in Somalia. They say that it can adapt to different environments which proves how useful the breed is in different areas. Surqo cattle or Tuni or Serenli are closely related with the Somali Boran in body size and usage both for milk production and draft purpose, and for beef production. With the moderate hump and its large size, Surqo is well adapted to the terrains of Lower Shabelle, Bay and Lower Jubba. The absence of this breed in northeastern Kenya needs conservation to protect endangered genetically valuable livestock (Muigai et al., 2016).

Since the 1970s artificial insemination programs have been introduced in Somalia in order to cross the local and exotic breeds such as Friesian and Sahiwal. Most of these hybrids were discovered with an aim of increasing milk yield [5]. However, the hybrids were not as productive as the local breeds such as the Dawara or Gasara in correcting the environment of Somalia. These hybrid breeds had higher milk yields than the indigenous Zebu but generally would be little able to withstand the harsh conditions of the range lands that dominated pastoral nomadism in Somalia. The failure of these artificial insemination centres also threatened genetic advancement in the future, which warranted efforts to revive programmes to breed improved adapted high yielding varieties of livestock for climate (Muigai et al., 2016)

## IV. CONCLUSION AND RECOMMENDATION

Therefore, such contrast invites breeders to consider it more carefully while developing plans aimed at improving these breeds' productivity on one hand, and making them conform to the modern environment on the other hand. Local Somali breeds such as Dawara, Gasara and Somali Boran have adapted to the regional vagaries and challenges of the Somali environment by providing local pastoralist communities sustainable genetics and reproductions. This means that although hybrid cattle produce higher yields, they show realities of long-term cultivation sustainability in the regions characterized by dry land aridity. This study indicates that future livestock improvement efforts should focus more on selection techniques that will improve production efficiency without necessarily reducing the hardy nature of animals that are needed for survival in such unfavourable environments. Bringing back programs like artificial insemination centers may go a long way in improving the livelihoods of Somali pastoralists and thereby sustaining our tough folded cattle breeds that produces improved types of milk and meat. These measures should be complemented with the conservation schemes meant for indigenous breeds preserved with the purpose

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of sustained contribution to the local economies as well the cultural heritage.

In view of these challenges, a strategic breeding program for extension of performance and adaptability to climate change for Somali cattle is essential [15]. That is why the choice of the perspective breeds with a high level of production traits, from which the perspectives with high milk yield, good quality of meat is selected, and the breeds with resistant to unfavorable conditions including droughts, etc. This process entails rigorous phenotypically and genetically examination of native breeds to achieve propagation of only quality breeds. These selected breeds should then be distributed to the pastoral communities in order to advantage equitable and improvement genetic pools.

Artificial insemination center thereby will help in speeding up the propagation of the desirable trait. They can specialize in developing new generations of crossbreed cattle, based on local adapted breeds and superior production traits of other commercial breeds, or developing a sustainable livestock genetic industry. Technical support will be obtained from collaborating agencies and countries that have evolved in biotechnology in livestock breeding and genetic improvement. It is hereby argued that such partnerships can bring in knowledge in artificial insemination, transfer of embryos, as well as genomic selection, which are fundamental in enhancing the genetic improvement of cattle in Somali.

Therefore, better management practices to be employed includes: a) Restriction of stocking densities b) Crop vegetation: practice-which entails in growing of fodder c) Water development for the purpose of supporting the livestock during periods of drought. Pastoralist training of better and efficient modern practices in husbandry could improve production with little impact on the environment. Other necessary investment includes veterinary where diseases which causes high fatalities on cattle are always expected during specific weathers. These recommendations, coupled with the conservation of indigenous genetic resources, will contribute towards the permanence of the animal genetic resources upon which the Somali livestock sector relies, that is basic food needs and opportunities for rural development.

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