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Kosali Cattle of Chhattisgarh: A Climate Resilient Indigenous Breed for sustainable Livestock Systems in India

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Abstract— *The Kosali cattle, an important indigenous breed of Chhattisgarh, has gained attention for its exceptional climate resilience and adapting abilities to extreme agro-climatic conditions. This paper explores the phenotypic characteristics, genetic strengths, ecological importance, and sustainable utility of the Kosali breed. This will also highlight its role in local livelihoods and traditional farming systems, the study connects its survival traits to future demands in climate -smart livestock farming. The research draws from historical data, farmer practices, and existing literature to propose the Kosali cattle as a strategic component in India's climate-adaptive livestock policy.*

Keywords— ***Chhattisgarh, climate resilience, indigenous breed, Kosali cattle, sustainable livestock***

I. INTRODUCTION

Indian cattle breeds have developed over a long time through natural selection and are well suited to the climate and environment of the region. They are known for their ability to resist diseases, tolerate heat, and survive on local feed with minimal care. In dairy farming, traits related to milk production and reproduction are very important for making a good profit. Reproductive performance can be measured using different indicators, which are called reproductive indices (Lobago et al., 2007). India hosts a wide array of indigenous cattle breeds, each uniquely adapted to their native environments. Among them Kosali cattle, native to Chhatttisgarh, stand out due to their disease resistance, heat tolerance, and efficient utilization of low – input resources. With increasing climate uncertainties, breeds like Kosali offer natural resilience for sustaining livestock productivity. This paper investigates their adaptability and potential role in climate – smart farming.

Cattle are active during the day and found all over the world. They are ruminant animals and show different types of behavior like eating (foraging), mating, social bonding, caring for their young, showing dominance, and learning. Among these, foraging is very important for their survival, growth, and ability to reproduce. (Sahu, Paraganiha, & Pati, 2020)

Studying these natural behaviors not only helps in understanding their welfare and productivity but also supports efforts toward their conservation and sustainable use.

II. OBJECTIVES

- To analyze the morphological and adaptive traits if Kosali Cattle
- To assess their role in sustainable rural livelihoods
- To examine their climate resilience characteristics
- To propose the conservation of Kosali breed in climate change policy

III. METHODOLOGY

This study is based on an exploratory and qualitative research design, utilizing secondary data sources to assess the characteristics and climate resilience of Kosali cattle in Chhattisgarh.

3.1 Data sources

The data for this research was primarily obtained from:

- Government livestock sensus reports 2012 and 2019
- Breed descriptors published by ICAR – NBAGR (National Bureau of Animal Genetic Resources)
- FAO documents related to climate change and indigenous breeds
- Peer – reviewed scientific articles from Google Scholar and Research Gate
- Informal interviews with local farmers and field veterinarians in Balodabazar and Bhatapara regions (unstructured and oral sources)

3.2 Analytical Framework

The information collected was thematically analyzed under the following categories:

- Morphological traits of Kosali cattle
- Climatic adaptability indicators
- Socio – economic utility in traditional farming systems
- Risk factors and conservation priorities

3.3 Limitations

The study is qualitative in nature and is based on secondary sources; hence, empirical validation and large – scale surveys were not included. However, the findings provide a strong foundation for further research to Kosali cattle conservation and their livelihood management.

IV. RESULT AND DISCUSSION

This study compiled secondary data on the physical characteristics, adaptability, and socio – economic relevance of Kosali breed of cattle. The findings are structured under key thematic areas that highlight the breed's strength in the context of sustainable livestock management.

4.1 Morphological Characteristics Of Kosali Cattle

Kosali cattle exhibit well – defined native features suited for draught and subsistence dairy use in Chhattisgarh. They are medium-sized, compact, and generally reddish-brown, grey, or light fawn in color. Their horns are short and curved, and the have a prominent hump – particularly in bulls. Hooves are hard and well-suited for uneven terrain.

Table 1. Morphological Characteristics Of Kosali Cattle

S.no	Trait	Description
1	Body size	Medium
2	Coat color	Reddish brown, grey, or light fawn
3	Horn type	Short and curved
4	Hump	Prominent, especially in males
5	Udder size	Small to medium
6	Hoof structure	Hard and compact
7	Average adult body weight	Male: 300-350 kg; Female: 250-300 kg

The morphological features of Kosali cattle indicate their suitability for mices farming practices, including ploughing, manure contribution, and household milk supply.

4.2 Climate Resilience and Adaptability

Kosali cattle are highly adaptable to the local tropical climate of Chhattisgarh. Their ability to survive under heat stress, poor-quality fodder, and limited water access reflects their strong generic adaptation. These cattle maintain reproductive efficiency even in high temperature and show reduced incidence of common disease.

Compared to exotic breed like Holstein Friesian (HF) and Jersey, Kosali cattle demonstrate better climate tolerance and disease resistance, although their milk yield is comparatively lower. However, their low maintenance cost and survival rate under stressful situations make them ideal for marginal and tribal farmers.

Table 2. Comparison of climate resilience and adaptability among Kosali cattle and exotic breeds

S.no	Trait	Kosali cattle	Exotic Breeds
1	Heat tolerance	High	Low
2	Disease resistance	Moderate to High	Low
3	Feed adaptability	High	Low
4	Drought survival	Excellent	Poor
5	Average milk yield	2-4 litres/day	15-25 litres/day
6	Veterinary intervention	Rarely required	Frequently needed

These findings highlight that Kosali cattle, although not high-yielding, are well-suited for climare-resilient and organic livestock systems. Their contribution to sustainable agriculture through draught power, manure, and organic inputs (like Jeevamrut) further enhances the utility in tribal and small-scale farming systems.

4.3 Socio-Economic Importance

Kosali cattle are deeply integrated to rural places and livelihoods. In tribal areas of Chhattisgarh, they are valued for their multiple uses: draught work, small-scale milk production, and as a source of organic fertilizer. Their dung and urine are integral to traditional and organic farming practices. Due to their local availability and low input requirements, to smallholder farmers compared to exotic breeds that demand costly maintenance.

However, the breed faces threats from crossbreeding, urbanization, and declining interest among youth. Conservation practices are essential to preserve this genetic resource. Schemes promoting native breed conservation, selective breeding, and fodder support must be extended to Kosali owners.

V. CONCLUSION

Kosali cattle of Chhattisgarh represent a perfect example of climate-resilient, low-cost, and multifunctional indigenous livestock. Their conservation can help India meet both biodiversity and climate resilience goals in agriculture. Mainstreaming Kosali in state breeding policy and recognizing its ecological services can ensure its survival and expansion.

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