

Pathways to Sustainable Rural Prosperity and Genetic Diversity Preservation : A Study on Kadaknath Breed in Poultry

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Abstract: The Kadaknath chicken breed, indigenous to India, has garnered attention for its exceptional qualities such as superior meat quality, resistance to illness, and ability to thrive in various environmental conditions. This study aims to deliver an exhaustive analysis of Kadaknath chicken cultivation, covering its historical importance, biological traits, cultivation methods, economic advantages, and contribution to biodiversity preservation. Through a detailed examination of Kadaknath chicken farming, this document outlines the sustainable prospects it presents for enhancing rural livelihoods, fostering agricultural diversification, and safeguarding native genetic materials. The research underscores the necessity of endorsing and advancing Kadaknath chicken farming as an eco-friendly and feasible option for rural areas.

Keywords: Sustainability, Kadaknath Chicken, Conservation of Biodiversity, Economic Opportunities, Rural Development, Farming Practices, Genetic Diversity.

1. Background

The practice of Kadaknath farming, referred to locally as "Kali Masi" or "Karinkozhi," is an age-old tradition of cultivating a distinctive chicken breed known as Kadaknath. This breed is predominantly located in Madhya Pradesh, India, with smaller populations scattered across other Indian states. This breed is deeply ingrained in the historical and cultural fabric of the region, having been valued by local communities for generations.

Kadaknath chickens have become well-acclimatized to the specific environmental and climatic conditions prevalent in the tribal-centric districts of Jhabua, Alirajpur, and Dhar in Madhya Pradesh. The etymology of "Kadaknath" stems from the Hindi words "kadak" (firm) and "nath" (nose), symbolizing the breed's robust and resilient nature.

2. Historical Context and Genetic Attributes of Kadaknath

2.1 Origin and Geographical Spread

The lineage of the Kadaknath breed can be traced back to ancient times, primarily cultivated by local tribal societies in the area. This breed has played a pivotal role in local traditions, ritualistic practices, and indigenous culinary customs, cementing its status as an essential component of regional heritage.

Although initially confined to specific locales within Madhya Pradesh, the Kadaknath breed has witnessed a surge in popularity across the country in recent times. This increased interest has sparked efforts to introduce Kadaknath farming to new areas in India, fostering national-level recognition, conservation, and advocacy for the breed.

2.2 Genetic Traits and Environmental Versatility

Characterized by their unique genetic makeup, Kadaknath chickens display a notable black plumage, occasionally interspersed with white wing patches. This breed demonstrates remarkable resilience and is adept at thriving under various environmental conditions, including areas characterized by high humidity and temperatures.

Notably, Kadaknath chickens are inherently resistant to many common poultry diseases, enhancing their survivability rates. Their proficiency in foraging and adaptation to free-ranging farming practices aligns them well with sustainable, low-input, and organic agricultural methodologies.

Characteristics of Kadaknath Poultry Breed:

Meat	Black colour
Plumage	Blue-black
Internal organs	Black-hued
Body weight at 20 weeks	920 gm
Body weight of adult cockerel	1.5–2 kg
Body weight of adult hen	1–1.5 kg
Sexual maturity	At 180 days
Average annual egg production	105
Egg Weight at 40 weeks	49 gm
Fertility (%)	55 %
Hatchability FES (%)	52 %

(Source : GI Journal No. 104 March 2018)

Comparative value of the Kadaknath breed with other breeds:

The nutritional quality of Kadaknath Chicken was tested at ICAR-NRC Meat Hyderabad the report is enclosed in Fig. 1.

Particulars	Other breeds of poultry	Kadaknath Meat
Meat	170-200Rs/kg	500-600 Rs/kg
Egg	04-05 Rs/egg	08-10Rs/egg
Chicks	30-40 Rs/chick	80 Rs/chick
Protein	18-20%	24-25%
Fat	13-25%	0.73-1.03%
Cholesterol	218.12mg/100g of meat	184.75mg/100g of meat
Lenoleic acid	21%	21%

(Source: Kumar et al.,
2018)

3. *Techniques in Kadaknath Chicken*

3.1 Propagation and Breed Enhancement

The propagation of Kadaknath chickens necessitates the meticulous selection of superior breeders. Historically, tribal communities have employed a selection methodology centred on observable traits such as physique, plumage, meat texture, and immunity. In contemporary settings, breeding strategies have evolved to incorporate genetic analysis and the maintenance of lineage records, aiming to amplify the breed's favourable characteristics.

3.2 Nutritional Strategies

Inherent to their nature, Kadaknath chickens exhibit an exceptional ability to forage, favoring a varied diet that includes insects, grains, foliage, and scraps from the kitchen. This eclectic diet is pivotal to the distinctive taste and nutritional profile of their meat. For commercially raised birds, a supplemental diet enriched with proteins and vital nutrients is provided to foster their growth and physical development.

3.3 Shelter and Farm Management

Traditionally, Kadaknath chickens are accommodated in rudimentary, backyard settings that offer protection, predator deterrence, and proper air circulation. The breed's versatility enables it to prosper in diverse living conditions, notably in free-range environments that permit unrestricted access to outdoor spaces during daylight hours.

3.4 Health and Disease Prevention

Despite the Kadaknath breed's natural resilience to illness, implementing stringent biosecurity practices and vaccination schedules is crucial for mitigating the spread of infectious diseases. Regular health evaluations, farm cleanliness, and access to veterinary services are fundamental to maintaining flock health and vitality.

This entails a comprehensive understanding of breeding techniques, dietary management, housing arrangements, and disease prevention strategies, all of which contribute to the efficacy and sustainability of Kadaknath chicken production.

4. *Economic Benefits and Enhancement of Rural Life*

4.1 Consumer Demand and Economic Value

The distinctiveness of Kadaknath chicken, with its exceptional meat quality, flavor, and health advantages, has escalated its popularity across both local and international markets. Renowned for its lean meat, elevated protein content, and unique taste, Kadaknath chicken is also revered for its presumed medicinal attributes, enhancing its value in traditional health practices.

Such unique characteristics have carved out a niche market for Kadaknath chicken, with consumers ready to pay a premium. Its rarity and specialized demand further amplify its market price, providing farmers with the prospect of achieving enhanced financial outcomes compared to standard poultry breeds.

4.2 Enhancing Income and Creating Jobs

Kadaknath poultry cultivation stands as a significant source of income, particularly for rural farmers. Its compatibility with small-scale and backyard farming makes it an accessible venture for smallholder farmers, allowing them to integrate Kadaknath chickens into their existing farming operations.

The financial viability of Kadaknath farming stems from various aspects. The breed's natural foraging behaviour minimizes reliance on costly feeds, reducing operational costs. The high market price of Kadaknath meat ensures greater profit margins for producers. Additionally, the breed's robustness against diseases and lower mortality rates lead to heightened efficiency and fewer financial setbacks.

Beyond direct farming, Kadaknath cultivation also spurs job creation in rural locales, supporting related sectors such as feed production, hatcheries, transport, and sales, thus invigorating local economies.

4.3 Empowering Rural Communities

Kadaknath poultry farming is instrumental in bolstering the livelihoods of rural communities, especially among underprivileged and economically challenged groups. Its suitability for modest-scale farming enables individuals with limited resources to partake in poultry farming, diversifying their income streams.

In tribal regions and rural households, Kadaknath farming serves as a supplementary income source, reducing reliance on monoculture. The revenue from Kadaknath farming aids in elevating living conditions, enhancing access to education, healthcare, and other critical services, thereby contributing to holistic rural development.

Moreover, Kadaknath farming provides empowerment opportunities for rural women, offering avenues for entrepreneurship and financial independence. Women's significant involvement in

the care and management of Kadaknath chickens fosters their active participation in economic decisions and activities.

Kadaknath poultry farming presents substantial economic prospects, with its market appeal translating into significant income and employment opportunities. It plays a pivotal role in improving the quality of life in rural areas, especially among marginalized groups, advocating for Kadaknath farming not only as a means for economic gain but also as a catalyst for rural development and empowerment.

5. *The Environmental Impact and Sustainability of Kadaknath Chicken Farming*

5.1 Agroecological Advantages

Kadaknath chicken farming is distinguished by its agroecological benefits, underscoring its role in fostering environmental sustainability. This breed's capacity to adjust to a wide range of environmental conditions negates the necessity for intensive climate control measures, thereby reducing the emission of greenhouse gases. Kadaknath chickens, being proficient foragers, can derive a substantial part of their diet from the environment, diminishing dependence on processed feeds.

Their compatibility with free-range or semi-free-range farming enhances the use of pastureland, alleviating the demand for arable land dedicated to feed production. This practice encourages the adoption of sustainable land use strategies, aiding in the conservation of natural habitats and the protection of biodiversity.

Moreover, the natural foraging habits of Kadaknath chickens aid in controlling pests within agricultural landscapes. Their diet includes various insects and weeds, decreasing the reliance on chemical pest control methods. This approach to pest management is aligned with eco-friendly farming techniques, reducing environmental pollutants and safeguarding ecosystem health.

5.2 Minimization of Environmental Impact

Kadaknath farming exhibits a lower environmental footprint compared to traditional poultry farming methods. The breed's minimal requirements for synthetic additives, such as antibiotics or artificial growth enhancers, and its lower demands for artificial lighting, contribute to a significant reduction in environmental contamination and the risk of developing antibiotic resistance.

Additionally, the inherent slower growth rate of Kadaknath chickens implies less intensive resource needs, thereby easing the strain on vital environmental resources like water, land, and energy throughout their growth cycle. Consequently, Kadaknath farming emerges as a more ecologically considerate choice, prioritizing efficient resource use and waste reduction.

5.3 Adaptability to Climate Change

The inherent resilience of Kadaknath chickens to varying climatic conditions makes them an ideal choice for areas susceptible to extreme weather. Their ability to thrive in warmer climates minimizes the incidences of heat-induced stress and associated health complications, ensuring continuous production in the face of climatic adversities and enhancing the community's resilience to climate change.

Kadaknath farming also contributes to climate mitigation efforts through the promotion of carbon sequestration. The natural grazing and foraging behaviour of these chickens encourage vegetative growth, facilitating carbon dioxide absorption and storage in vegetation. This characteristic supports sustainable land management initiatives and is instrumental in the global agenda to curb greenhouse gas emissions.

Kadaknath chicken farming aligns with principles of environmental stewardship, offering multiple ecological benefits. From promoting agroecological practices and reducing the ecological footprint to enhancing resilience against climate change, Kadaknath farming stands as a beacon of sustainable agriculture. It exemplifies a model that not only secures food production but also commits to the preservation of our planet's ecological balance, contributing positively to biodiversity conservation and environmental sustainability within the agricultural domain.

6. *Overcoming Obstacles and Charting the Path Forward for Kadaknath Chicken Farming*

6.1 Enhancing Market Presence and Supply Chain Efficiency

A notable obstacle for Kadaknath poultry producers is the underdeveloped marketing infrastructure and fragmented supply chains. To tap into the breed's niche market effectively, strategic marketing efforts are necessary to elevate the profile of Kadaknath chicken within and beyond Indian borders. Initiatives to forge market linkages, brand development, and consumer education about Kadaknath's unique benefits are imperative for market expansion and demand augmentation.

Streamlining supply chain operations is critical to ensuring the widespread availability of Kadaknath meat. Addressing logistical challenges, improving cold chain management, and standardizing packaging are essential measures to uphold meat quality and extend its shelf life during transit.

6.2 Fostering Institutional Support and Advocating for Supportive Policies

The advancement of Kadaknath farming hinges on robust institutional backing and a conducive policy landscape. The establishment of dedicated research and development centres focusing on breed enhancement, disease control, and farmer education is pivotal. Such entities can spearhead the dissemination of innovative practices, extend advisory services, and facilitate the sharing of insights among the farming community.

Advocacy for policies that valorise the distinctive aspects of Kadaknath farming, alongside financial incentives and support mechanisms for farmers, is crucial for nurturing sectoral growth. Engagements with governmental bodies, policy makers, and agricultural authorities are vital to sculpt an empowering framework for Kadaknath poultry farming, smoothing out regulatory pathways.

6.3 Prioritizing Research and Innovation

Ongoing research and innovation are vital to maximizing the potential of Kadaknath farming. Research agendas could encompass genetic enhancement initiatives to bolster favorable characteristics, investigations into the breed's nutritional needs, eco-friendly breeding methodologies, and comprehensive disease management protocols.

Exploring avenues for value addition in Kadaknath products, including processed goods, feather products, and other by-products, could open new revenue channels and boost the economic footprint of Kadaknath farming. Additionally, documenting and integrating traditional farming wisdom with contemporary agricultural practices is essential for sustaining the breed's legacy and enhancing farm productivity.

Moreover, fostering collaborations between the scientific community, local farmers, and indigenous populations will encourage a reciprocal exchange of knowledge, marrying traditional insights with scientific advancements to enrich the Kadaknath farming narrative.

The trajectory of Kadaknath chicken farming is contingent upon overcoming marketing and logistical hurdles, enhancing institutional and policy support, and committing to research and development. Through concerted efforts to address these challenges and leverage opportunities for innovation, Kadaknath farming can achieve sustainable growth, contributing significantly to rural development, biodiversity preservation, and the diversification of agriculture.

7. Conclusion

7.1 Key Insights

Kadaknath poultry farming emerges as a beacon of sustainability and economic opportunity within the poultry sector, underscored by its rich historical roots, distinctive genetic makeup, and adaptable cultivation methods. This breed's capacity to command market demand and premium pricing positions it as a lucrative venture for farmers, especially within rural contexts.

Kadaknath farming is instrumental in enhancing rural livelihoods, empowering women, and facilitating broad-based economic growth.

Significantly, Kadaknath farming underscores the imperative of biodiversity preservation and the safeguarding of genetic assets. Its indigenous origins and versatility in adapting to varied environmental conditions underscore its value as a critical genetic resource warranting concerted conservation efforts. The endorsement and cultivation of Kadaknath contribute to the safeguarding of native genetic pools and the advancement of sustainable agricultural paradigms.

Additionally, the environmental stewardship exhibited by Kadaknath farming, through its ecological advantages, minimized ecological footprint, and climate adaptability, mirrors the principles of sustainable agriculture. The breed's efficient foraging, natural pest control capabilities, and minimal resource demands contribute to ecological balance, while its resilience to climatic variances offers a buffer against the impacts of climate change.

7.2 Strategic Recommendations

To realize the full spectrum of benefits offered by Kadaknath farming, a series of strategic initiatives are recommended:

1. Enhance marketing frameworks and streamline supply chains to broaden consumer access and ensure consistent supply of Kadaknath meat across diverse markets.
2. Craft supportive policy environments and bolster institutional backing to celebrate and nurture Kadaknath's unique farming attributes. This includes the establishment of research centres, provision of farmer training, and financial incentives.
3. Propel research and innovation efforts aimed at refining breeding techniques, augmenting disease resistance, and uncovering new avenues for product value addition.
4. Facilitate the exchange of knowledge and collaborative endeavours among researchers, agricultural practitioners, and indigenous communities to meld traditional insights with contemporary farming innovations.
5. Amplify consumer awareness regarding the health and nutritional merits of Kadaknath meat, thus driving increased demand.

Implementing these measures can elevate Kadaknath farming to unprecedented levels, marking it as a cornerstone for sustainable rural development, biodiversity conservation, and environmental integrity. This endeavour not only promises to reshape the poultry industry landscape but also heralds a new era of agricultural diversity, genetic preservation, and the promotion of resilient, sustainable farming ecosystems.

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