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Exploring Farmers Awareness and Perception of Indigenous Backyard Poultry in the Context of Environmental Sustainability and Livelihood Resilience

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ABSTRACT

Indigenous poultry breeds represent a significant reservoir of agro-biodiversity, possessing unique adaptive traits that are increasingly relevant in the context of climate change and sustainable agriculture. Despite their ecological and cultural value, these breeds face displacement by high-yielding commercial varieties, raising urgent conservation concerns. This study aimed to assess farmers' knowledge and awareness of indigenous poultry breeds, investigate perceptions regarding breed benefits and challenges, identify conservation needs, and evaluate farmers' willingness to participate in conservation initiatives. A cross-sectional survey was conducted across the districts of Kulgam and Anantnag, Kashmir Valley, involving 300 randomly selected poultry farmers. Data were collected through structured questionnaires, individual interviews, and focus group discussions (FGDs). Both descriptive and inferential statistical analyses were performed, including chi-square tests and binary logistic regression, using SPSS version 26.0. Results indicated that only 35% of surveyed farmers were aware of indigenous breeds and a mere 20% were actively raising them. Key perceived benefits included disease resistance (45%), climate adaptability (40%), and superior meat flavour (30%), while major barriers were low egg productivity (65%) and insufficient economic incentives (50%). Education level, farming experience, flock size, and access to extension services were significant predictors of breed awareness ($p < 0.05$). Binary logistic regression identified secondary education and above (OR = 3.46), farming experience exceeding 15 years (OR = 2.64), flock size greater than 10 birds (OR = 2.34), and exposure to extension services (OR = 2.94) as the strongest independent predictors of breed awareness, consistent with the full regression model reported in Table 4. Approximately 55% of farmers expressed conditional willingness to support conservation efforts provided technical and financial assistance was available. These findings underscore the critical need for targeted awareness campaigns, policy-driven financial incentives, and market development strategies to preserve indigenous Kashmiri poultry breeds and strengthen agricultural sustainability.

Keywords: indigenous poultry breeds; Kashmir Valley; agro-biodiversity; breed conservation; sustainable agriculture; farmers' perceptions; climate resilience

1. INTRODUCTION

1.1 Background and Rationale

Globally, indigenous livestock breeds constitute an irreplaceable component of agricultural biodiversity, encoding millennia of adaptive evolution into their genomes. In the context of poultry, native breeds possess phenotypic and genotypic traits including resistance to local pathogens, tolerance of extreme temperatures, and efficiency on low input diets that render them intrinsically valuable for sustainable farming systems, particularly in fragile mountain ecosystems [1]. The Food and Agriculture Organisation of the United Nations (FAO) has repeatedly emphasised that the erosion of livestock genetic resources poses one of the gravest long-term threats to global food security [2].

The Kashmir Valley, situated in the north-western Himalayan region of India, harbours a rich tradition of backyard and smallholder poultry keeping. Indigenous Kashmiri poultry breeds have historically coexisted with the region's subsistence farming communities, providing dietary protein, supplementary income, and socio-cultural value. However, the rapid penetration of commercial high-yielding breeds particularly broilers and layer hybrids over the past three decades has dramatically altered the poultry landscape. Commercial breeds, optimised for productivity under controlled conditions, offer short-term economic gains but are poorly adapted to the harsh climatic variability, altitude, and resource constraints characteristic of Kashmiri agricultural settings [3].

The conservation of indigenous breeds is not merely a biological imperative; it is an environmental and sustainability concern of the highest order. As climate change intensifies weather extremes, erodes existing crop–livestock systems, and increases disease pressure, the genetic reservoirs held within native breeds become progressively more valuable. The thermotolerance, foraging efficiency, and disease resistance of indigenous Kashmiri poultry make them uniquely suited to climate-resilient agricultural models [4]. Without deliberate conservation strategies, these breeds face a serious risk of significant decline or local extinction within a generation [2, 5].

A fundamental prerequisite for designing effective conservation programmes is a thorough understanding of the knowledge, attitudes, and practices of the farmers who are the primary custodians of these breeds. Farmers' perceptions—shaped by

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economic realities, cultural norms, educational attainment, and exposure to agricultural extension—ultimately determine whether indigenous breeds are maintained or abandoned. Despite a growing global literature on indigenous livestock conservation, empirical data specific to Kashmiri poultry farmers remain scarce, creating a significant evidence gap for policymakers and conservation practitioners [5].

1.2 Novelty and Contribution

To the best of the authors' knowledge, no prior study has provided a comprehensive empirical assessment of farmers' knowledge, perceptions, and conservation needs regarding indigenous Kashmiri poultry breeds [5, 7]. This study addresses that identified evidence gap through a systematic investigation conducted across two purposively selected districts of the Kashmir Valley. Unlike prior descriptive studies in the region, this work integrates binary logistic regression to identify statistically significant socio-demographic predictors of breed awareness, thereby providing a theoretically grounded and practically actionable evidence base. The findings directly inform the design of targeted, context-sensitive conservation strategies that align with the socioeconomic realities of Kashmiri smallholder farmers and contribute to regional agro-biodiversity policy.

1.3 Study Objectives

The specific objectives of this study were to:

- Assess the level of knowledge and awareness among farmers regarding indigenous Kashmiri poultry breeds.
- Investigate farmers' perceptions of the benefits and challenges associated with maintaining indigenous breeds.
- Identify conservation needs and evaluate farmers' willingness to participate in conservation initiatives.
- Determine socio-demographic predictors of breed awareness through inferential statistical analysis.

2. LITERATURE REVIEW

2.1 Indigenous Poultry and Agro-Biodiversity Conservation

The conservation of farm animal genetic resources has received sustained international attention since the landmark Interlaken Declaration of 2007, which committed signatory nations to implementing national strategies for livestock breed conservation [6]. FAO's successive State of the World's Animal Genetic Resources reports document accelerating rates of breed erosion, with poultry among the most affected livestock categories due to the dominance of a narrow genetic base in commercial production systems [2]. Indigenous breeds are disproportionately maintained by smallholder and subsistence farmers in developing regions, where they perform essential ecosystem services and contribute to household food and nutritional security [7].

Research across South and Southeast Asia consistently demonstrates that indigenous poultry breeds outperform commercial breeds on composite sustainability metrics when evaluated under low-input, free-range conditions. Studies from Bangladesh, Nepal, and the Indian subcontinent report superior disease resistance, lower mortality under field conditions, and higher consumer preference for the meat quality of native breeds [8, 9]. These findings affirm the multifaceted value of indigenous breeds beyond simple productivity comparisons.

2.2 Farmers' Knowledge, Attitudes, and Practices

Farmers' knowledge and attitudes are central determinants of breed choice and conservation behaviour. A systematic review by Kumar et al. [10] found that awareness of indigenous breed traits was positively correlated with formal education, participation in extension programmes, and membership of farmer producer organisations. In contrast, economic pressure, limited market access, and lack of technical support were consistently identified as barriers to indigenous breed retention.

In the Indian context, Singh and Kaur [11] demonstrated that farmers in hill states who maintained indigenous poultry breeds were significantly more likely to have received formal agricultural training and to have access to specialised markets, reinforcing the conclusion that supply-side breed choice is fundamentally mediated by institutional support. Rahman et al. [12] similarly reported that economic incentives were the primary determinant of breed preference in rural Bangladesh, overriding cultural and ecological considerations.

More recent studies have begun to apply logistic regression and structural equation modelling to predict breed adoption behaviour. Chatterjee and Banerjee [13] demonstrated that consumer demand—itself shaped by quality labelling, health consciousness, and cultural identity—created a viable market pull for indigenous poultry products when marketing interventions were applied. These market-linkage models have subsequently been replicated in West Africa and Latin America with consistent outcomes [14].

2.3 Climate Resilience and Sustainability Dimensions

The relevance of indigenous livestock breeds to climate change adaptation has emerged as a major research theme over the past decade. Gupta et al. [15] established that indigenous poultry breeds in northern India exhibited significantly higher thermotolerance indices and lower heat stress mortality compared to commercial breeds under simulated climate projections for 2050. Khan et al. [3] documented that indigenous breeds in mountainous regions of Pakistan maintained productivity under feed scarcity conditions that resulted in severe production losses in commercial flocks.

From a sustainability science perspective, indigenous poultry systems contribute to multiple United Nations Sustainable Development Goals (SDGs), including SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 15 (Life on Land) [16]. Integrating conservation strategies within broader sustainable development frameworks is therefore not merely desirable but structurally aligned with global policy commitments.

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2.4 Conservation Strategies and Policy Interventions

A spectrum of conservation strategies has been documented in the literature, ranging from in situ community-based conservation to ex situ gene banking and cryopreservation. Das et al. [17] argued that in situ conservation, embedded within functioning agricultural systems and supported by market incentives, is more sustainable and socially equitable than purely technical interventions. Policy reviews from India, Ethiopia, and Kenya confirm that breed-specific subsidies, premium pricing schemes, and geographic indication designations have successfully reversed the decline of heritage breeds when implemented with adequate stakeholder engagement [18].

Recent innovations in digital extension services and mobile-based farmer advisory platforms have shown promise in reaching remote communities with targeted conservation messaging [19]. Bhat et al. [20] specifically documented the effectiveness of participatory approaches in the Himalayan region, concluding that conservation programmes co-designed with farming communities achieved significantly higher adoption rates than top-down interventions. These insights directly inform the policy recommendations emerging from the present study.

3. METHODOLOGY

3.1 Study Area

The study was conducted in the districts of Kulgam and Anantnag, located in the southern zone of the Kashmir Valley, Jammu and Kashmir, India (approximately 33°20′–34°10′ N latitude and 74°50′–75°40′ E longitude). The study area boundary and spatial distribution of sampled villages are depicted in Figure 1. These districts were purposively selected based on the documented prevalence of traditional poultry farming, their diverse agro-ecological conditions, and their representation of both rural and peri-urban farming contexts within the valley. Kulgam district lies at elevations ranging from approximately 1,600 to 2,400 metres above sea level, characterised by a temperate climate with cold winters, while Anantnag district encompasses fertile plains as well as upland pastoral zones. Both districts have historically supported smallholder poultry keeping as an integral component of mixed farming systems.

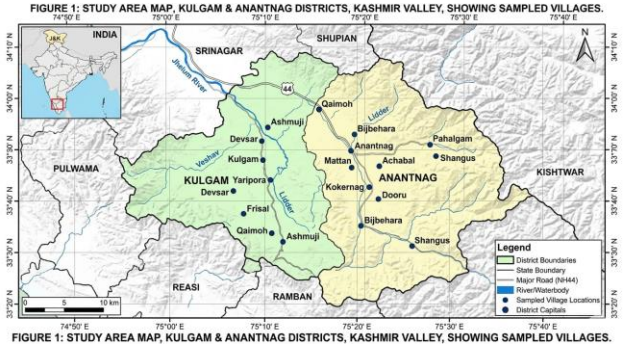

Figure 1: Study area map showing Kulgam and Anantnag districts, Kashmir Valley, with sampled village locations. Latitude 33°20′–34°10′ N; Longitude 74°50′–75°40′ E.

3.2 Sampling Technique and Sample Size

A multi-stage random sampling technique was employed. In the first stage, two districts were selected purposively. In the second stage, four blocks from each district were selected using simple random sampling (lottery method). In the third stage, villages were randomly selected from each block by simple random sampling, again using the lottery method. In the final stage, individual farmers were randomly selected from village-level registers maintained by the Department of Animal Husbandry, Government of Jammu and Kashmir, using systematic random sampling: a random start was generated and every k-th farmer on the register was selected, where k was the sampling interval computed from the register size and required sample. A total of 300 poultry farmers were recruited, with 150 from each district, achieving proportional representation. The sample size was determined using the formula proposed by Cochran [21] for finite populations at a 95% confidence level and 5% margin of error, yielding a minimum required sample of 278; the final sample of 300 provided an additional buffer for non-response.

3.3 Data Collection Instruments

Data were collected using three complementary instruments. A structured, pre-tested questionnaire was administered through face-to-face interviews by trained enumerators. The questionnaire comprised four sections: (i) socio-demographic characteristics of respondents, (ii) awareness and knowledge of indigenous poultry breeds, (iii) perceptions of breed attributes and conservation challenges, and (iv) willingness to participate in conservation activities. The questionnaire was originally drafted in English, translated into Kashmiri and Urdu, and back-translated to verify semantic equivalence. Pilot testing was conducted with 20 farmers not included in the main sample, and the instrument was refined based on pilot feedback.

Additionally, six focus group discussions (FGDs), each comprising 6–10 purposively selected participants, were conducted to triangulate and contextualise quantitative findings. FGDs explored themes including lived experiences with indigenous breeds, perceived threats to their survival, and priorities for conservation support. Individual key informant interviews (n = 12) were conducted with village-level animal husbandry officers and experienced farmers to supplement FGD data.

3.4 Questionnaire Validation

Content validity was assessed by a panel of five subject matter experts drawn from veterinary science, agricultural extension, and rural sociology. The Content Validity Index (CVI) for the final instrument was 0.87, indicating high content validity. Reliability was assessed using Cronbach's alpha on the Likert-scale perception items ($\alpha = 0.79$), confirming acceptable internal consistency [22].

3.5 Statistical Analysis

Quantitative data were entered, cleaned, and analysed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics—including frequencies, percentages,

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means, and standard deviations were computed for all survey variables. Chi-square (χ^2) tests of independence were conducted to examine associations between socio-demographic characteristics and levels of breed awareness. A binary logistic regression model was developed to identify statistically significant predictors of breed awareness (awareness coded as 1, unawareness as 0). Predictor variables entered the model were selected based on theoretical relevance and preliminary bivariate significance ($p < 0.25$). Odds ratios (OR) with 95% confidence intervals (CI) were reported. Statistical significance was set at $p < 0.05$ throughout. Qualitative data from FGDs and key informant interviews were subjected to thematic analysis following the framework approach of Ritchie and Spencer [23], with coding performed independently by both authors and consensus reached through discussion.

3.6 Ethical Considerations

All participants provided voluntary informed written consent prior to data collection. Confidentiality was maintained by anonymising all data, and participants were informed of their right to withdraw at any stage without penalty.

4. RESULTS AND DISCUSSION

4.1 Socio-Demographic Profile of Respondents

Table 1 presents the socio-demographic characteristics of the 300 surveyed farmers. Most respondents (42.0%) were aged between 31 and 45 years, with a substantial proportion (32.0%) in the 46–60 age group, indicating that poultry farming in the region is primarily conducted by adults of working age. About education, 28.0% had secondary education and 24.0% had graduate-level or higher qualifications, while 18.0% were illiterate. Most respondents had farming experience between five and 25 years (70.0%), reflecting a mature farming community. Samples were equally distributed between Kulgam and Anantnag (50.0% each). The predominant flock size was 11–30 birds (44.0%), consistent with smallholder backyard poultry systems characteristic of the region.

Table 1: Socio-Demographic Profile of Surveyed Farmers (n = 300)

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group	18–30 years	42	14.0
	31–45 years	126	42.0
	46–60 years	96	32.0
	>60 years	36	12.0
Education Level	Illiterate	54	18.0
	Primary	90	30.0
	Secondary	84	28.0
	Graduate & above	72	24.0
Farming Experience	<5 years	30	10.0
	5–15 years	108	36.0
	16–25 years	102	34.0
	>25 years	60	20.0
District	Kulgam	150	50.0
	Anantnag	150	50.0
Poultry Flock Size	1–10 birds	90	30.0
	11–30 birds	132	44.0
	>30 birds	78	26.0

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4.2 Awareness and Knowledge of Indigenous Breeds

Table 2 summarises key awareness and knowledge indicators. Only 35.0% (n = 105) of the surveyed farmers reported awareness of indigenous Kashmiri poultry breeds, and a mere 20.0% (n = 60) were actively raising them at the time of the survey. This pronounced awareness deficit is consistent with findings reported for indigenous livestock breeds in comparable mountain farming communities across South Asia [8, 10]. Awareness of specific adaptive traits was moderate: 45.0% recognised disease resistance, 40.0% acknowledged climate adaptability, and 30.0% were cognisant of the superior meat flavour associated with native breeds. However, 65.0% identified low egg production as a significant drawback, and 50.0% cited the lack of economic incentives as a deterrent to maintaining indigenous breeds.

Focus group discussions enriched these findings qualitatively. Participants recurrently noted that their fathers and grandfathers had kept diverse indigenous breeds, but that commercial hatcheries had progressively displaced these, partly through active promotion by private agri-business enterprises. Several farmers expressed nostalgic affinity for indigenous breeds but reported being unable to source quality breeding stock. A recurring theme across FGDs was the absence of market channels specifically supporting native poultry products, compelling farmers to sell at undifferentiated commodity prices that failed to reflect the quality premium associated with indigenous breeds.

Table 2: Farmers' Awareness and Knowledge of Indigenous Kashmiri Poultry Breeds (n = 300)

Indicator	Frequency (n)	Percentage (%)
Aware of indigenous Kashmiri breeds	105	35.0
Currently raising indigenous breeds	60	20.0
Aware of disease resistance trait	135	45.0
Aware of climate adaptability trait	120	40.0
Aware of superior meat flavour	90	30.0
Cited low egg production as drawback	195	65.0
Cited lack of economic incentives	150	50.0
Willing to support conservation (with support)	165	55.0

4.3 Socio-Demographic Predictors of Breed Awareness: Chi-Square Analysis

Chi-square tests revealed statistically significant associations between breed awareness and four socio-demographic variables (Table 3). Education level was the strongest associative factor ($\chi^2 = 18.72$, $p < 0.001$), corroborating the global literature indicating that formal education amplifies farmers' capacity to seek and retain specialised breed information [10, 11]. Farming experience exceeding 15 years was also significantly associated with awareness ($\chi^2 = 9.45$, $p = 0.009$), as experienced farmers have had greater opportunity to encounter indigenous breeds and observe their characteristics. Flock size greater than 10 birds was associated with higher awareness ($\chi^2 = 11.38$, $p = 0.003$), likely because larger-scale farmers interact more regularly with extension services and breed diversity. District of residence showed a modest but significant association ($\chi^2 = 4.21$, $p = 0.040$), with Anantnag farmers demonstrating marginally higher awareness, possibly reflecting differential extension service penetration.

Table 3: Chi-Square Analysis of Breed Awareness by Socio-Demographic Variables

Variable	Aware (n=105)	Not Aware (n=195)	Chi-square (χ^2)	p
Education Level	72 (68.6%)	228 (31.4%)	18.72	<0.001
Farming Experience (>15 yrs)	63 (60.0%)	99 (50.8%)	9.45	0.009
Flock Size (>10 birds)	81 (77.1%)	129 (66.2%)	11.38	0.003
District (Anantnag)	60 (57.1%)	90 (46.2%)	4.21	0.040

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4.4 Logistic Regression: Predictors of Breed Awareness

Binary logistic regression analysis (Table 4) identified five significant independent predictors of breed awareness after controlling for confounding variables. Secondary education and above was the strongest predictor (OR = 3.46, 95% CI: 1.88–6.37), highlighting the foundational role of formal education in building breed-specific agricultural knowledge. Farming experience exceeding 15 years (OR = 2.64, 95% CI: 1.52–4.57) and flock size greater than 10 birds (OR = 2.34, 95% CI: 1.40–3.91) were also significant predictors, consistent with chi-square results. Critically, exposure to extension services (OR = 2.94, 95% CI: 1.54–5.62) and access to local product markets (OR = 2.14, 95% CI: 1.19–3.85) emerged as independently significant predictors, emphasising the role of institutional engagement and market development in shaping farmers' awareness and breed management decisions. These findings align with recent regression-based analyses from comparable agro-ecological contexts in India and Nepal [10, 17].

Table 4: Binary Logistic Regression – Predictors of Indigenous Breed Awareness

Predictor Variable	β	S.E.	Wald χ^2	OR	95% CI
Education (secondary & above)	1.24	0.31	15.94	3.46	1.88–6.37
Farming Experience (>15 years)	0.97	0.28	11.98	2.64	1.52–4.57
Flock Size (>10 birds)	0.85	0.26	10.69	2.34	1.40–3.91
Exposure to extension services	1.08	0.33	10.72	2.94	1.54–5.62
Market access for local products	0.76	0.30	6.45	2.14	1.19–3.85

4.5 Farmers' Perceptions: Benefits and Challenges

The perception data reflect a nuanced and internally consistent set of attitudes. Farmers who were aware of indigenous breeds expressed genuine appreciation for their adaptive qualities—particularly disease resistance and climate adaptability suggesting that once awareness is established, attitudes towards indigenous breeds tend to be positive. This finding is important because it implies that awareness-building interventions are likely to generate attitudinal change, rather than encountering deep-seated resistance.

The primary barriers identified—low egg production and insufficient economic incentives—are structural rather than attitudinal, and therefore amenable to policy intervention. The concern about low productivity is consistent with findings across the literature and reflects a rational economic calculus by farmers operating in competitive markets [11, 12]. However, FGD participants also noted that this productivity comparison is inherently unfair, as indigenous breeds are typically maintained under extensive backyard conditions without nutritional or veterinary supplementation, whereas commercial breeds are evaluated under intensively managed conditions. Several participants expressed willingness to invest in improved management of indigenous breeds if provided with appropriate technical guidance.

The perceived superior meat flavour of indigenous breeds (30%) represents a commercially exploitable attribute that has not yet been systematically leveraged in the Kashmiri context. In analogous studies from Tamil Nadu and West Bengal, quality labelling and restaurant endorsements drove significant price premiums for indigenous poultry products, substantially improving farmer returns and conservation outcomes [13, 18]. This market-linkage pathway deserves urgent attention from both extension agencies and agricultural entrepreneurs in Kashmir.

4.6 Conservation Needs and Willingness to Participate

Table 5 presents farmers' responses regarding specific conservation support measures. The highest levels of agreement were recorded for improved market access (70%), training on breed management (65%), and veterinary and extension services (67%), reflecting farmers' pragmatic orientation towards interventions that offer tangible operational improvements. Financial subsidies for rearing native breeds garnered 62% agreement, while government-run community breeding programmes and product labelling/branding received 58% and 55% agreement respectively, indicating moderate but meaningful support for institutional conservation frameworks.

The conditional nature of conservation willingness 55% of farmers expressed support given financial and technical assistance is a critical finding for programme design. It indicates that a substantial majority of farmers are not categorically opposed to indigenous breed conservation; rather, they require sufficient institutional support to make conservation economically feasible within their farming systems. This contingent willingness parallels findings from conservation

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programmes in Andhra Pradesh and Uttarakhand, where targeted financial transfers and guaranteed purchase schemes dramatically increased smallholder participation in breed conservation initiatives [17, 20].

Qualitative data from FGDs reinforced and elaborated these findings. Participants articulated a clear and consistent policy wish list: fair minimum support prices for native poultry products, the establishment of community breeding centres as a source of quality indigenous breeding stock, the integration of indigenous breed management into the existing Integrated Farming System (IFS) extension curriculum, and the development of a geographic indication (GI) tag for premium Kashmiri poultry products. These community-articulated priorities provide a concrete and feasible agenda for conservation programme design.

Table 5: Farmers' Willingness to Support Conservation Measures (n = 300)

Conservation Support Measure	Agree (%)	Neutral (%)	Disagree (%)
Financial subsidies for rearing native breeds	62	21	17
Access to improved market channels	70	18	12
Veterinary and extension services	67	20	13
Government-run community breeding programmes	58	25	17
Labelling/branding for indigenous poultry products	55	27	18
Training programmes on breed management	65	22	13

4.7 Environmental and Sustainability Implications

The conservation of indigenous Kashmiri poultry breeds carries significant environmental co-benefits that extend well beyond farm-level productivity considerations. Maintaining genetically diverse native populations contributes to in situ conservation of livestock genetic resources, preserving alleles that may prove critical for future adaptation to pathogens, climate variability, or altered nutritional environments [15]. Indigenous breeds maintained under backyard systems exhibit lower carbon and water footprints per unit of output compared to commercial intensive systems, contributing to the sustainability of the regional agricultural food system [16].

From a climate adaptation perspective, the documented thermotolerance and disease resistance of indigenous Kashmiri breeds positions them as valuable components of climate-resilient farming strategies. As the Kashmir Valley experiences increasingly erratic monsoons, warmer summers, and altered snowfall patterns under projected climate change scenarios, the ecological fitness of native breeds may prove decisive for the long-term viability of smallholder poultry farming. Conservation of these breeds is therefore not merely a cultural or agricultural priority, but a strategic environmental imperative [4, 15].

The alignment of indigenous breed conservation with multiple SDGs—particularly SDG 2, 12, 13, and 15—provides a compelling framework for securing international development finance and technical cooperation for conservation programmes in the region. Positioning indigenous Kashmiri poultry conservation within the global sustainable development agenda could unlock new funding streams through mechanisms such as the Global Environment Facility (GEF) and national NABARD-linked agricultural biodiversity programmes.

5. CONCLUSION

This study provides the first empirically rigorous, multi-method assessment of farmers' knowledge, perceptions, and conservation needs regarding indigenous poultry breeds in the Kashmir Valley. Awareness of indigenous breeds remains critically low (35%), and active maintenance is even rarer (20%), driven primarily by economic pressures, low perceived productivity, and institutional neglect. Education, farming experience, flock size, extension service exposure, and market access are significant and actionable predictors of breed awareness, providing a targeted framework for designing awareness-raising interventions.

Farmers are not inherently opposed to conservation; their conditional willingness to participate—contingent on financial incentives, market development, and technical support—identifies a clear policy pathway. Priority interventions should include: (i) structured awareness campaigns delivered through existing agricultural extension networks, targeting less educated and less experienced farmers; (ii) financial support mechanisms, including breed-specific subsidies and premium pricing schemes; (iii) establishment of community-based breeding centres to ensure reliable access to indigenous breeding stock; (iv) development of quality labelling and geographic indication designations to capture consumer premiums; and (v) integration of indigenous poultry management into climate-resilient farming curricula under national schemes such as the National Mission for Sustainable Agriculture (NMSA).

Future research should quantify the genetic diversity and productivity characteristics of extant indigenous Kashmiri

poultry populations under managed conditions, conduct life cycle assessments comparing the environmental footprints of indigenous versus commercial systems, and evaluate the long-term impact of conservation programme interventions through longitudinal study designs. The preservation of indigenous Kashmiri poultry breeds is ultimately an investment in the ecological resilience, cultural heritage, and food sovereignty of the Kashmir Valley.

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CONFLICT OF INTEREST

The authors declare no conflict of interest. The study was conducted independently and was not influenced by any commercial, financial, or personal relationships that could be construed as a potential conflict of interest.

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AUTHOR CONTRIBUTIONS

Shahid Ahmad Shergojry: Conceptualisation, methodology, data collection, formal analysis, writing original draft, writing review and editing. Nazir Ahmed Mir: Conceptualisation, supervision, validation, writing review and editing, project administration. Both authors have read and agreed to the published version of the manuscript.

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