

Research

Assessment of the Livestock, Poultry and Fisheries Distribution, Management Practices and their Socio-Economic Significance in Raisen District of Madhya Pradesh State

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ABSTRACT

This study aimed to assess livestock, poultry, and fisheries distribution, management practices, and their socio-economic significance in rural regions of Raisen district of Madhya Pradesh state, through purposive sampling across 10 tehsils, covering 145 households and over 5,300 animals, including cattle, buffaloes, goats, poultry, and fish. Findings revealed dominance of traditional husbandry systems, with non-descript cattle, buffaloes, and goats forming over 70% of the livestock population. Natural mating prevailed due to poor access to artificial insemination in remote areas. Backyard poultry, mainly dual-purpose birds like Narmada Nidhi and Sonali, provided nutritional support and supplemental income to marginal farmers. Fisheries were underutilized, limited to small-scale pond-based systems. Housing was largely temporary (*kachcha*) with inadequate hygiene, while feeding relied on open grazing and purchased fodder, with minimal concentrate use. Veterinary coverage, vaccination, and deworming remained moderate. Socio-economic profiling showed small landholdings (1-3.27 acres), low income (₹14,000-63,700), and active gender participation in livestock care. Livelihood initiatives under NRLM's *Pashu Sakhi* program and state schemes such as the *Acharya Vidyasagar Gau Samvardhan Yojana*, *10+1 Goatery Unit Scheme*, *Dr. Ambedkar Kamdhenu Yojana*, and *Backyard Poultry Scheme* are supporting livestock development. However, gaps persist in breed improvement, feeding, housing, veterinary services, and aquaculture utilization. The study emphasizes the need for region-specific policies, infrastructure, breed conservation, and farmer-focused extension to boost productivity, rural income, and livestock diversity conservation in Raisen district.

Keywords: Breeding, Conservation, Livelihoods, Livestock, Non-descript breeds, Rural

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INTRODUCTION

The livestock, poultry, and fisheries sectors form the backbone of India's agrarian economy, ensuring nutritional security, income generation, and rural employment. Livestock plays a critical role in sustaining millions of marginal and landless farmers. India, with 535.78 million animals, accounts for over 17% of the world's livestock, making it the largest globally. The sector makes up 30.23% of agricultural GVA (Gross Value Added) and 5.50% of the national GVA. Poultry is equally significant, with 851.81 million birds (BAHS, 2024; Annual Report, 2024-25). India is second globally in fisheries, accounting for almost 8% of the world's total fish production in 2022 (175.45 lakh tons). This sector adds 1.09% to national GVA

and 6.72% to agricultural GVA, supporting over 28 million livelihoods (PIB, 2025; SOFIA, 2024). These activities are vital for inclusive growth, particularly for smallholders in rural and tribal areas, as they provide steady income and are less affected by land and climate variability (Sharma *et al.*, 2021b; Qureshi *et al.*, 2025). Despite this importance, challenges such as limited veterinary services, weak market linkages, and inadequate institutional support persist. Understanding socio-economic conditions and spatial distribution is therefore crucial for designing need-based interventions (Vandre *et al.*, 2021).

According to the 20th livestock census, Madhya Pradesh (MP) ranks third in India for livestock holdings, with 40.6 million animals, including 18.7 million cattle,

11.06 million goats, and 10.3 million buffaloes, ranking third, fifth, and fourth nationally, respectively. The state stands 15th in poultry population (BAHS, 2024) and, despite being landlocked, reported fish production of 3.23 lakh tonnes up to December 2024 (FWFDD, 2025). Raisen district, characterized by mixed farming and a predominantly rural population, offers an ideal setting to examine the interconnections between these sectors and rural livelihoods. This study aims to analyze the socio-economic profile and spatial distribution of households engaged in livestock, poultry, and fisheries to inform targeted development strategies.

MATERIALS AND METHODS

This study examined the distribution and management practices of livestock, poultry, and fisheries, and the socio-economic profiles of rural households in Raisen district, Madhya Pradesh. Based on the 20th Livestock Census, Raisen hosts 7.37 lakh livestock, comprising 4.54 lakh cattle and 1.39 lakh buffaloes, along with a poultry population of about 1.25 lakh (Table 1). To assess ownership patterns, distribution, and management practices, as well as to evaluate the role of these sectors in sustaining rural livelihoods, data were collected using purposive sampling through structured interviews.

Table 1: Species-wise Population of Livestock and Poultry in Raisen District, MP. (Based on 20th Livestock Census, 2019)

Livestock Species	Population	Rank in State Among All 51 Districts*
Crossbred Cattle	121109	3 rd
Indigenous Cattle	333320	25 th
Total Cattle	454429	14 th
Buffalo	138604	33 rd
Sheep	1339	31 st
Goat	141671	35 th
Pig	585	43 rd
Horse	183	29 th
Donkey	85	28 th
Total	736896	31 st
Poultry	125327	32 nd
Stray Animal	16136	21 st
Stray Dog	11772	40 th

*In 2019, the total no. of Districts in MP was 51.

RESULTS AND DISCUSSIONS

Topography and Climate Conditions

Raisen district is situated in central MP, covering an area of 8,395 km² between latitudes 22°47' to 23°33' N and longitudes 77°21' to 78°49' E. The district comprises six subdivisions and ten tehsils, including the recent additions of Deori and Sultanpur, along with seven development blocks (NICR, 2025). Tehsil-wise geographic details and elevations are presented in Table 2. Situated on the Tropic of Cancer, Raisen experiences a subtropical climate with four distinct seasons: cold period from December to February, hot

season from March to mid-June, monsoon from mid-June to September, and a post-monsoon transition (DEPR, 2021). Summer temperatures reach around 45°C in May, while January is the coldest month with lows of 2-3°C. Average annual rainfall is 1207.3 mm, with 92.2% occurring during the monsoon, especially in July and August, often leading to floods (IMD, 2024). Humidity is highest in August and lowest in April. Wind speed is maximum in June and minimum in December, with an annual average of 5.9 km per hour. Major rivers such as Barna, Betwa, and Narmada support agriculture, biodiversity, and tropical dry deciduous forests (DGWIB, 2013).

Table 2: Tehsil-wise area, coordinates, and elevation details of Raisen district, MP.

Tehsil	Area (km ²)*	Latitude (N)#	Longitude (E) #	Height (MSL in meter) #
Raisen	1359.39	23.3306	77.7839	444
Goharganj	1757.19	23.0937	77.7278	462

Gairatganj	918.76	23.4120	78.2276	521
Begamganj	907.46	23.6008	78.3427	517
Silwani	1285.81	23.3016	78.4444	366
Bareli	644.74	22.9368	78.1404	323
Badi	782.31	23.4242	77.7138	337
Udaipura	810.35	23.0754	78.5136	328
Deori [†]	-	23.1244	78.6898	343
Sultanpur [†]	-	23.1352	77.9353	364

*DGWIB 2013; #https://indiampia.com; @Area information for these tehsils is not available in the public domain, as they have been recently designated

Distribution and Breeding Tract of Livestock, Poultry and Fisheries in the Region

This study examined the demographic distribution and breeding tract of 5,361 animals across rural areas of various tehsils in Raisen district, MP. (Fig. 1). The survey included 3,823 livestock comprising cattle, buffaloes, and goats, along with 1,538 poultry birds, providing a comprehensive view of local husbandry practices. Traditional systems found to be dominated, with natural breeding as the primary method due to limited

veterinary services and inadequate access to artificial insemination in remote villages (Fig. 2). Consequently, non-descript cattle form 72% of the surveyed cattle population, while indigenous breeds such as Sahiwal and Malvi represent 20%, and exotic Jersey cattle account for 8%, mostly in peri urban commercial units. Female cattle (1,269) significantly outnumber males (456), highlighting the focus on milk production rather than draught purposes (Table 3).

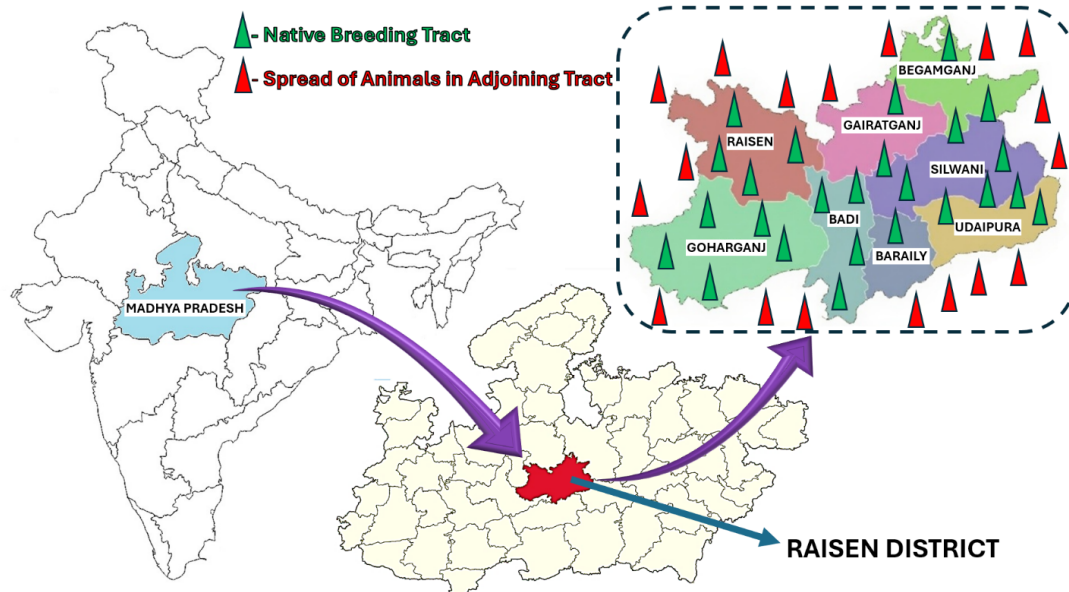


Fig. 1: Breeding tract of livestock encompassing various tehsils of Raisen district, MP.

Raisen ranks 14th in cattle population among all the districts of MP. (Table 1). A substantial share of its surveyed cattle in this study was non-descript, consistent with national and state patterns where about 52% of India's cattle and 76% of those in MP are genetically uncharacterized (BAHS, 2022). Although the state recognizes breeds such as Malvi, Nimari, Kenkatha, and Gaolao, large populations of non-descript cattle persist, especially in Narmadapuram and Mahakaushal regions (Sharma *et al.*, 2021a; Barwar *et al.*, 2023a; Barwar *et al.*, 2023b). Despite their numerical dominance, non-descript cattle contribute only 9.51% to national milk production, largely due

to a lack of genetic improvement programs. Genetic characterization is essential for developing effective breeding and conservation strategies (Sharma *et al.*, 2021a). Although crossbreeding with taurine breeds has been used to boost milk production in indigenous cattle (Kumar *et al.*, 2024), indigenous animals are highly valuable for sustainable livestock systems due to their adaptability, disease resistance, and suitability for low-input management. Thus, conserving and improving these genetic resources is critical.

Among 1,293 buffaloes surveyed in this study, 69% were non-descript, followed by Murrah at 25% and Bhadawari at 6%. Female buffaloes (923) outnumbered

males (370), indicating dairy as the primary objective (Table 3). Raisen ranks 33rd among all the districts of MP for buffalo Population (Table 1). Nationally, buffaloes contribute 44.81% of milk output with a population of 109.85 million (BAHS, 2022). Known as Black Gold for their fat-rich milk and resilience, buffaloes are vital to Indian agriculture (Vandre *et al.*, 2022). However, only 21 breeds are officially recognized, and MP has just one registered breed, Bhadawari. The high share of non-descript buffaloes in this study reflects the state trend where more than 90% are uncharacterized as reported in the 20th livestock census.

Raisen ranks 35th in goat population among all districts of MP (Table 1). Of the 805 goats surveyed, 76% were non-descript, while Jamunapari accounted for 16% and crossbred made up 8%, indicating a growing interest in genetic upgrading. Female goats (512) slightly outnumbered males (293), which aligns with meat and milk production priorities (Table 3). Goats are highly preferred by pastoralists, landless farmers, and marginal households due to their adaptability and economic significance in resource-constrained environments (Vyas *et al.*, 2022; Khan *et al.*, 2023). India hosts the second-largest goat population in the world, with 41 recognized breeds (NBAGR, 2025). Typically maintained with few elite bucks, goats supply meat, milk, skin, and fiber while requiring minimal inputs, making them ideal for smallholder systems (Khan *et al.*, 2024b). They are considered the most economically significant ruminant after cattle and buffalo (Khan *et al.*, 2022; Khan *et al.*, 2024a).

Poultry and fish products are crucial for household food security in economically stressed regions (Mishra

et al., 2023). India is the fourth largest poultry meat producer globally, generating 3.8 million tonnes of broiler meat annually, reflecting its expanding role in rural economies. According to the 20th livestock census, the total number of poultry birds in MP was 66.59 lakhs with Raisen ranking 32nd among all districts (Table 3). In this study, poultry farming was found to be widespread in rural Raisen, with both indigenous and improved breeds present. Of the 1,538 birds observed, both indigenous and improved breeds such as BV 300 layers (40%), Sonali (26%), and Narmada Nidhi or Kadaknath (22%) were found in backyard and semi commercial systems (Table 4, Fig. 3). Backyard poultry was found to be dominated by Kakrel chickens (88% of backyard birds). In contrast, the fisheries sector is underdeveloped, with fish farming observed in only 4% of surveyed areas, primarily culturing Indian major carps like Rohu, Catla, and Mrigal (Fig. 4).

Soil Conditions and Availability of Feed and Fodder Resources

Natural pastures serve as the primary feed source for livestock in India; however, their productivity declines significantly during autumn and winter, necessitating hand feeding for up to six months (Vyas *et al.*, 2024). In this study, six major soil types were identified in Raisen, each with distinct agricultural potential. Kalmat, a black loamy soil, is highly suitable for cereals like wheat, gram, and lentils. Bhanwar, a transitional mix of Kalmat and Soyar, also supports cultivation, while Soyar, found on hill slopes, is shallow and pebbly. Siari, a sandy soil, is ideal for rice under irrigation, whereas Bharwa, another sandy and shallow soil, sustains only low-yielding crops. The most fertile type, Kachar or





Fig. 2: Pictorial representation of the livestock population and management practices surveyed across different tehsils of Raisen district, MP.

Chap, along streambeds, supports wheat, jowar, and vegetables. Livestock feeding is largely found to be dependent on open grazing, supplemented by seasonal grasses and limited green fodder cultivation.

Table 3: Species, breed, age and sex-wise distribution of surveyed livestock population in the Raisen district.

Species	Breed	0-1 yr		1-3 yr		>3 yr	
		Male	Female	Male	Female	Male	Female
Cattle	Non-descript	49	84	84	188	167	670
	Sahiwal	8	16	16	32	32	69
	Malvi	8	13	15	30	34	72
	Jersey	5	8	11	22	27	65
Buffalo	Non-descript	34	67	84	202	135	370
	Murrah	11	21	28	71	50	142
	Bhadawari	4	6	9	15	15	29
Goat	Non-descript	60	96	72	144	84	156
	Jamunapari	14	17	17	28	21	32
	Crossbred	7	11	8	13	10	15

Table 4: Breed/Strain-wise distribution of surveyed poultry in the Raisen district.

Breed	BV 300	Sonali	Narmada Nidhi	Kadaknath	Kakrel (Cockerel)	Others*	Total
Total	615	338	231	169	78	107	1538

*Birds were of mixed or indigenous types, not segregated by breed during survey.

Socio-economic status of farmers

In this study, rural farmers in Raisen district of MP were found to operate on a small scale, with average landholdings ranging from 1 to 4.5 acres and limited irrigation facilities (Table 5). Annual household income varied between ₹11,000 and ₹72,000, indicating a strong dependence on subsistence farming. Most

households comprised 5–7 members with basic literacy levels. Both men and women actively engaged in animal husbandry, with 1–3 members per household involved, underscoring its importance as a supplementary source of income. Overall, the data highlights a consistent trend of small landholdings and dependence on integrated farming systems across different tehsils of the district.



Fig. 3: Pictorial representation of the poultry population, including white color BV300, colored Sonali, and dark-colored Narmada Nidhi birds, along with the management practices surveyed across different tehsils of Raisen district, MP.



Fig. 4: Pictorial representation of the fisheries population and aquaculture management practices surveyed across different tehsils of Raisen district, MP.

Table 5: Overview of socio-economic status of surveyed households across various tehsils in Raisen district.

Attribute	Raisen	Gairatganj	Begumganj	Silwani	Udaipura	Badi	Bareli	Deori	Sultanpur	Goharganj	Overall
Agriculture holding (Acre)	1 - 4.5	1 - 4	1 - 3.5	1 - 3	1 - 2.8	1 - 2.5	1 - 3.2	1 - 2.7	1 - 3.5	1 - 3	1 - 3.27
Irrigated land (Acre)	1 - 3.5	1 - 3	1 - 2.7	1 - 2.5	1 - 2.2	1 - 2	1 - 2.8	1 - 2.3	1 - 3	1 - 2.7	1 - 2.65
Annual Income (₹)	18000-72000	17000-68000	14000-62000	13000-60000	12000-58000	11000-57000	14000-63000	13000-59000	16000-67000	15000-64000	₹14000-63700
Family members (No.)	4 - 6	4 - 6	5 - 7	6 - 7	6 - 8	5 - 6	5 - 7	6 - 7	5 - 6	5 - 7	5.4 - 6.6
Male family members (No.)	2 - 3	2 - 3	2 - 3	2 - 4	3 - 4	2 - 3	2 - 3	3 - 4	2 - 3	2 - 3	2.4 - 3.2
Female family members (No.)	2 - 3	2 - 3	3 - 4	3 - 4	3 - 4	2 - 3	3 - 4	3 - 4	2 - 3	3 - 4	2.5 - 3.5
Literate members (No.)	4 - 5	4 - 5	3 - 4	2 - 4	2 - 4	3 - 4	3 - 4	2 - 4	3 - 5	3 - 4	3 - 4.2
Male members engaged in animal husbandry (No.)	1 - 2	1 - 2	1 - 2	2 - 3	2 - 3	1 - 2	1 - 2	2 - 3	1 - 2	1 - 2	1.5 - 2.3
Female members engaged in animal husbandry (No.)	1 - 2	1 - 2	1 - 2	2 - 3	2 - 3	1 - 2	2 - 3	2 - 3	1 - 2	2 - 3	1.6 - 2.4
No. of houses covered (No.)	20	15	10	15	15	15	15	15	10	15	145

Housing, feeding, and management practices

The survey indicates that most livestock and poultry are housed in traditional *kachcha* structures within residential premises, reflecting resource constraints (Table 6). Hygiene remains a concern, as over half of these units were unclean. Feeding practices largely depend on purchased fodder and raw feed, with minimal use of concentrates. Livestock are primarily stall-fed, whereas poultry generally scavenge for food.

Vaccination coverage is moderate. Similar management patterns have been reported by Vandrey *et al.* (2021), and Sharma *et al.* (2021b). Although water availability is generally adequate, artificial insemination services are lacking in interior areas, resulting in a dependence on natural service. These findings align with earlier reports, confirming that natural breeding continues to dominate livestock reproduction in rural systems (Ahirwar *et al.*, 2010; Ali *et al.*, 2019).

Table 6: Overview of livestock and poultry housing, feeding, and health management practices in surveyed villages across various tehsils of Raisen district.

Attributes		Livestock (%)	Poultry (%)
Housing type	Open	25	60
	Closed	75	40
Type of construction	<i>Kachcha</i>	80	90
	Pucca	20	10
Location of the shed	Part of residence	70	85
	Separate	30	15
Flooring type	<i>Kachcha</i>	85	95
	Pucca	15	5
Hygiene status	Clean	45	40
	Not clean	55	60
Provision for drainage	Yes	10	5
	No	90	95
Feeding method	Stall feeding (cut-and-carry)	60	—
	Grazing (hours per day)	40 (6–8 hrs)	—
	Scavenging	—	70
	Supplemental feeding	—	30
Type of feed	Homegrown fodder	20	—
	Purchased fodder	80	—
Use of concentrate feed		35	20
Cleaning of utensils before feeding/milking		95	80
Water adequacy		75	65
Vaccination coverage		70	50
Deworming practices		65	40
Litter management (deep litter system)		—	25

Survey insights on government-led livestock and poultry development initiatives

The survey found several initiatives under the National Rural Livelihoods Mission (NRLM) that are actively strengthening livestock-based livelihoods in Raisen district. Women farmers were trained as *Pashu Sakhis*, who acted as local livestock resource persons, facilitating vaccination and deworming drives, advising on housing and disease prevention, and ensuring timely veterinary care. In goat-rearing villages, health interventions had covered over 5,000 animals.

Establishment of Milk Pooling Points to streamline milk collection and marketing has been targeted in the dairy potential area. Poultry-based livelihoods were supported through initiatives like the *Vandevi Mahila Farmer Producer Company* in Silwani block, managing 20,000 BV300 birds, along with 30 poultry sheds constructed under MGNREGA for Self Help Group (SHG) women rearing Sonali birds. The *Unnat Pashu Palan Prashikshan* program further built scientific knowledge at the village level. Complementing NRLM efforts, state schemes such as the *Acharya Vidyasagar Gau Samvardhan Yojana*, the *10+1 Goatery Unit Scheme*,

and the *Dr. Ambedkar Kamdhenu Yojana* promoted indigenous cattle conservation, goat rearing, and dairy development. Backyard poultry programs also supplied improved birds and training.

CONCLUSION

This study underscores the vital role of livestock, poultry, and fisheries in the rural economy of Raisen district, Madhya Pradesh. The prevalence of non-descript livestock highlights valuable, resilient genetic resources well-suited for low-input systems. However, their sustainability is at risk due to poor documentation, limited scientific interventions, and inadequate veterinary support. The poultry sector shows potential for sustainable livelihoods, while the fisheries sector needs more promotion and support. Encouragingly, government programs like the National Rural Livelihoods Mission (NRLM) are already addressing these issues by enhancing animal health, boosting productivity, and diversifying incomes. Initiatives like the *Pashu Sakhi* program are empowering women, while establishing milk pooling points, goatery, and backyard poultry units has increased rural self-reliance. Moving forward, the integration of conservation strategies, breed improvement programs, and farmer-focused extension services with institutional support is required to preserve indigenous biodiversity, strengthen rural incomes, and build a resilient and inclusive livestock sector.

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