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Socio-economic characteristics of DAPSC/ST project beneficiaries and non-beneficiaries involved in backyard poultry farming in Uttar Pradesh and Uttarakhand

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Abstract

Backyard poultry farming is an important livelihood activity for rural households, particularly among socially disadvantaged communities, due to its low investment requirement and contribution to income, employment, and nutritional security. Under the Development Action Plan for Scheduled Castes (DAPSC) and Development Action Plan for Scheduled Tribes (DAPST), ICAR – Central Avian Research Institute (ICAR-CARI), Izatnagar, promoted improved backyard poultry farming in Uttar Pradesh and Uttarakhand through the distribution of improved poultry birds and related inputs. The present study was undertaken to analyse the socio-economic profile of beneficiary and non-beneficiary households engaged in backyard poultry farming. The study was conducted in Bareilly district of Uttar Pradesh and Udham Singh Nagar district of Uttarakhand. A total of 240 respondents comprising 120 beneficiaries and 120 non-beneficiaries were selected from eight villages. The findings revealed that the majority of household heads and women engaged in backyard poultry belonged to the middle-age category and were illiterate. Marginal landholdings dominated the sample, particularly among beneficiaries while a substantial proportion of non-beneficiaries were landless. Both beneficiary and non-beneficiary households were predominantly low livestock holders but beneficiary households exhibited a relatively lower livestock asset base compared to non-beneficiaries. Small family sizes (≤ 5 members) were the most common family category in both groups. The study concludes that DAPSC and DAPST interventions effectively targeted resource-poor and socially vulnerable households, thereby supporting the adoption and sustainability of improved backyard poultry farming as a livelihood enhancement strategy.

Keywords: Backyard poultry, DAPSC, DAPST, Socio-economic, CARINIRBHEEK, CARISHYAMA

Introduction

The poultry sector is one of the fastest-growing segments of Indian agriculture and plays a crucial role in ensuring food security, nutritional security, employment generation, and income enhancement. According to the 20th Livestock Census, India possesses a poultry population of 851.81 million birds, of which 317.07 million are reared under backyard production systems. The poultry industry has witnessed remarkable growth over the 11 years, with egg production increasing at a compound annual growth rate (CAGR) of 6.63 per cent and meat production growing at 4.61 per cent annually. According to BAHS 2025 ^[2], the country produced 149.11 billion eggs and 10.50 million tonnes of meat, with poultry contributing nearly 49 per cent of the total meat production. Despite this growth, per capita

availability of eggs (106 eggs/year) and meat (7.51 kg/year) remains below the dietary recommendations of the Indian Council of Medical Research (ICMR). Backyard poultry farming is an important livelihood activity for rural households, particularly among small and marginal farmers, landless labourers, women, and socially disadvantaged communities. The system requires low initial investment and provides supplementary income, quality animal protein, employment opportunities, and nutritional security. However, the productivity of indigenous poultry birds is relatively low due to slow growth, delayed sexual maturity, poor egg production, and low body weight. The average annual egg yield of indigenous backyard poultry was reported to be 117 eggs per layer compared to 208 eggs in improved backyard poultry varieties, highlighting a

substantial productivity gap. To address these limitations, several improved poultry varieties suitable for backyard rearing have been developed in India. Among them, CARINIRBHEEK and CARISHYAMA, developed by ICAR – Central Avian Research Institute (CARI), Izatnagar, have gained importance due to their superior growth performance, higher egg production, adaptability to diverse agro-climatic conditions, and resemblance to indigenous birds.

The Development Action Plan for Scheduled Castes (DAPSC) and Development Action Plan for Scheduled Tribes (DAPST) are Government of India initiatives aimed at the socio-economic development of Scheduled Caste and Scheduled Tribe communities. Recognizing the potential of improved backyard poultry in enhancing rural livelihoods, income generation, and nutritional security, ICAR - Central Avian Research Institute (ICAR-CARI) has adopted backyard poultry farming as a key intervention under these programmes in Uttar Pradesh and Uttarakhand. Under the intervention, selected beneficiaries are provided with improved poultry birds, supplementary feed, feeders, drinkers, night shelters, and basic training free of cost to promote sustainable livelihood opportunities and improve socio-economic conditions. Therefore, the present study was undertaken to analyse the socio-economic profile of

beneficiary and non-beneficiary households, as socio-economic characteristics influence the adoption, management, and outcomes of backyard poultry system.

Materials and Methods

The study was carried out in Uttar Pradesh and Uttarakhand, where the DAPSC and DAPST projects have been implemented since 2019 and 2018, respectively. A multistage sampling procedure was adopted for the selection of the study area. Districts, blocks, and villages were purposively chosen based on the area of project interventions under DAPSC/ST programmes. Subsequently, respondents from the selected villages were randomly drawn from the project activity areas. From each selected village, 15 beneficiaries were randomly sampled from among the households that had received poultry-based support under the DAPSC/ST projects. These households constituted the treatment group. For comparison, an equal number of non-beneficiary households were randomly selected from nearby comparable villages. These households had not received any assistance under the project but were engaged in rearing indigenous poultry birds under backyard conditions. The non-beneficiary households formed the control group, resulting in a total sample of 120 beneficiaries and 120 non-beneficiaries.

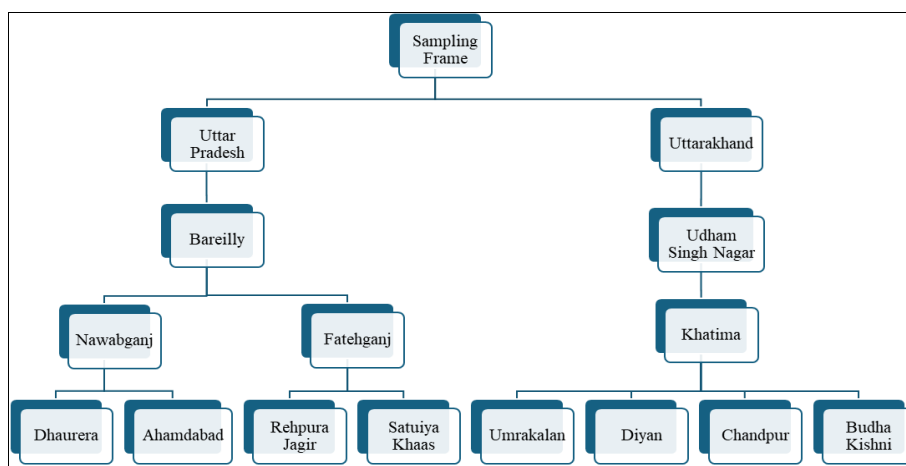


Fig 1: Sampling frame for data collection

The parameters considered to assess the socio-economic profile of backyard poultry rearers included the age and education of household head, age and education of woman primarily engaged in backyard poultry, land holding and adult cattle unit (measure of livestock possession) of

households and family size of households. Adult cattle unit was calculated using conversion factors as per Ramachandra *et al.* (2007) [7].

Results and Discussion

Table 1: Age-wise distribution of household heads and women primarily engaged in backyard poultry among beneficiary and non-beneficiary households

Variables	Categories	Criteria	Treatment		Control	
			n = 120		n = 120	
			Frequency	Percentage	Frequency	Percentage
Age of household head	Young	< 30 years	10	8.3	26	21.66
	Middle	30 – 50 years	74	61.6	56	46.66
	Old	>50 years	36	30	38	31.66
Age of women engaged in backyard poultry rearing	Young	< 30 years	4	3.33	18	15
	Middle	30 – 50 years	80	66.66	64	53.33
	Old	>50 years	36	30	38	31.66
Age of household head: $\chi^2 = 9.6575^{***}$						
Age of women engaged in backyard poultry rearing: $\chi^2 = 10.741^{***}$						

The age profile revealed that middle-aged individuals constituted the predominant group among both household heads and women engaged in backyard poultry rearing. Among household heads, the highest proportion belonged to the middle-age category, accounting for 61.60% in the treatment group and 46.66% in the control group. Similarly, middle-aged women represented the largest share of those involved in poultry management, comprising 66.66% and 53.33% in the treatment and control groups, respectively. The predominance of middle-aged household heads and women engaged in backyard poultry rearing reflects the active involvement of individuals in their productive years in livelihood-related activities. Middle-aged household heads are often responsible for major household decisions and resource allocation, while women in the same age group tend to play a central role in the routine care and management of poultry. The findings suggest that backyard poultry enterprises rely substantially on the labour, experience, and managerial abilities of this age group, emphasizing their importance in ensuring the continuity and sustainability of the enterprise. The relatively lower participation of younger women may be attributed to

migration for education or employment and changing occupational preferences, whereas the reduced involvement of older women could be due to age-related constraints. Overall, the results underscore the pivotal contribution of middle-aged women in sustaining backyard poultry production and supporting household livelihoods. The difference in age distribution of household heads ($\chi^2 = 9.6575$; $p < 0.001$) and women engaged in backyard poultry ($\chi^2 = 10.741$; $p < 0.001$) was highly significant, indicating a significantly higher proportion of middle-aged individuals among beneficiary households compared to non-beneficiary households.

Similar findings were reported by Alimudeen *et al.* (2020)^[1], Mishra *et al.* (2020)^[6] and Kumar *et al.* (2023)^[4] in a study conducted in Perambalur district of Tamilnadu, Korapur district of Odisha and Bidar district of Karnataka, respectively wherein majority of desi bird farmers belonged to the middle-age category. These results were not in favour with Balamurguan *et al.* (2017) and Sangamitra *et al.* (2021)^[8] who reported that majority of the respondents engaged in backyard poultry rearing belonged to old age group.

Table 2: Education-wise distribution of household heads and women engaged in backyard poultry in beneficiary and non-beneficiary households

Variables	Categories	Criteria	Treatment		Control	
			n = 120		n = 120	
			Frequency	Percentage	Frequency	Percentage
Education of household head	Illiterate	0	46	38.33	62	51.66
	Primary/Middle	$\leq 7^{\text{th}}$ std	42	35	31	25.83
	Sec/Sr. Sec	$8^{\text{th}} - 12^{\text{th}}$ std	26	21.66	25	20.83
	Degree	$\geq 12^{\text{th}}$ std	6	5	2	1.66
Education of women engaged in backyard poultry	Illiterate	0	71	59.16	78	65
	Primary/Middle	$\leq 7^{\text{th}}$ std	28	23.33	27	22.5
	Sec/Sr. Sec	$8^{\text{th}} - 12^{\text{th}}$ std	16	13.33	11	9.16
	Degree	$\geq 12^{\text{th}}$ std	5	4.16	4	3.33
Education of household head: Fisher's Exact p-value = 0.1096						
Education of women household head: Fisher's Exact p-value = 0.7118						

The educational profile revealed that illiteracy was the predominant category among both household heads and women engaged in backyard poultry rearing. Among household heads, the highest proportion of illiterates was observed in the control group (51.66%), followed by the treatment group (38.33%). Similarly, illiteracy among women engaged in backyard poultry rearing was considerably high, accounting for 65% and 59.16% in the control and treatment groups, respectively. Despite lower levels of formal education, women actively participated in the management of backyard poultry enterprises, suggesting that the backyard poultry relies more on practical knowledge and experience than on formal schooling. However, the low educational attainment, especially among women, highlights the need for targeted capacity-building programmes, training, and extension support to enhance their technical knowledge and improve the efficiency and sustainability of backyard poultry production. The predominance of illiteracy observed among the backyard

poultry rearers in the present study is in conformity with the findings of Mandal *et al.* (2006)^[5], who reported that 47.50% of backyard poultry farmers were illiterate. No significant difference was observed in the education level of household heads (Fisher's Exact $p = 0.1096$) and women engaged in backyard poultry rearing (Fisher's Exact $p = 0.7118$).

Similarly, Kumar *et al.* (2023)^[4] observed that 44.70% of the farmers lacked formal education. However, the findings differ from those of Alimudeen *et al.* (2020)^[1] who reported that a majority of the respondents (40.00%) had attained primary education, while only 20% were illiterate. Likewise, Mishra *et al.* (2020)^[6] found that 49.38% of the farmers had completed primary education. These variations in educational status across studies may be attributed to differences in the socio-economic background of respondents, regional disparities in educational opportunities, and the demographic characteristics of the study areas.

Table 3: Landholding pattern of beneficiary and non-beneficiary households

Variables	Categories	Criteria	Treatment		Control	
			n = 120		n = 120	
			Frequency	Percentage	Frequency	Percentage
Landholding	Landless	0	18	15	50	41.66
	Marginal	Below 1 ha	101	84.16	63	52.5
	Small	2.5 - 5	1	0.008	7	5.83
Landholding of households: Fisher's Exact p-value = < 0.01						

The landholding pattern showed that marginal farmers dominated both groups. In the treatment group, 84.16% of beneficiaries possessed marginal landholdings of less than one hectare, while 15.00% were landless. Only 0.83% of beneficiaries belonged to the small farmer category. In contrast, the control group consisted of 52.50% marginal farmers, 41.66% landless households, and 5.83% small farmers. The higher proportion of marginal farmers among beneficiaries indicates that the programme effectively targeted resource-poor households. The substantial proportion of landless households in the control group further reflects their relatively weaker asset base. The

landholding pattern showed a highly significant difference between beneficiary and non-beneficiary households (Fisher's Exact $p < 0.01$). The findings of the present study corroborate those of Mandal *et al.* (2006) [5] and Kumar *et al.* (2023) [4], who reported that a majority of backyard poultry farmers were marginal farmers. In contrast, Alimudeen *et al.* (2020) [1] found that 46.67% of the backyard poultry farmers were landless. Such differences may be due to regional variations in land ownership patterns and the socio-economic background of the sampled households.

Table 4: Adult cattle unit distribution of beneficiary and non-beneficiary households

Variables	Categories	Criteria	Treatment		Control	
			n = 120		n = 120	
			Frequency	Percentage	Frequency	Percentage
Adult Cattle Unit (ACU)	Low livestock possession	≤ 1.5	104	86.66	96	80
	Medium livestock possession	$>1.5 - 3$	11	9.16	18	15
	High livestock possession	>3	5	4.16	6	5
$\chi^2 = 2.1006$						

Adult Cattle Units compares livestock possession between 120 beneficiary and 120 non-beneficiary households across three categories. In the low livestock possession category ($ACU \leq 1.5$), the majority of both groups fall here — 104 households (86.66%) in the treatment group and 96 households (80%) in the control group — indicating that most sampled households are resource-poor. In the medium livestock possession category ($ACU > 1.5-3$), the control group has a slightly higher share (18 households, 15%) compared to the treatment group (11 households, 9.16%), suggesting non-beneficiaries are relatively better-off in livestock holdings. In the high livestock possession category

($ACU > 3$), both groups have very few households — 5 (4.16%) in treatment and 6 (5%) in control — showing negligible difference. Overall, the table reveals that both groups are dominated by low livestock holders and the slightly better livestock distribution in the control group suggests that beneficiary households had minimal livestock asset base, which is one of the criteria in selection of beneficiaries in welfare or agricultural intervention programs. There is no significant difference in adult cattle unit possession between beneficiary and non-beneficiary households ($\chi^2 = 2.1006$).

Table 5: Family size distribution of beneficiary and non-beneficiary households

Variables	Categories	Criteria	Treatment		Control	
			n = 120		n = 120	
			Frequency	Percentage	Frequency	Percentage
Family size	Small	≤ 5	76	63.33	65	54
	Large	>5	44	36.66	55	46
$\chi^2 = 1.7193$						

Family size analysis revealed that small families (≤ 5 members) were predominant in both groups. In the treatment group, 63.33% of households had small family sizes, whereas 36.66% had more than five members. Similarly, 54.00% of control households belonged to the small family category and 46.00% had large family sizes. The predominance of nuclear families may facilitate better allocation of household resources and management of backyard poultry system. The distribution of family size revealed no significant difference between beneficiary and

non-beneficiary households ($\chi^2 = 1.7193$). These findings are in consonance with results of Mandal *et al.* (2006) [5], Alimudeen *et al.* (2020) [1], Mishra *et al.* (2020) [6], Sangamitra *et al.* (2021) [8] and Kumar *et al.* (2023) [4]. Overall, the socio-economic profile indicates that the sampled households were largely characterized by middle-aged household heads with low levels of education, marginal landholdings, low level of livestock possession and small family sizes. The treatment households exhibited relatively better socio-economic conditions than the control

households in terms of educational attainment and land ownership. These characteristics are important determinants of adoption and successful management of improved backyard poultry technologies and may influence the effectiveness of developmental interventions aimed at enhancing rural livelihoods.

Conclusion

The socio-economic profile of the sample households revealed that backyard poultry farming was predominantly practiced by middle-aged respondents in both treatment and control groups. A high incidence of illiteracy was observed among the households, although the educational status of beneficiaries was relatively better than that of non-beneficiaries. Marginal landholdings constituted the dominant category among the sample households, indicating the resource-constrained nature of the farming households. Small family size was more prevalent in both groups, with a comparatively higher proportion among beneficiary households. Overall, the findings suggested that the DAPSC and DAPST programmes successfully reached economically and socially vulnerable households, particularly marginal farmers, and provided a suitable platform for promoting improved backyard poultry farming as a livelihood enhancement strategy. It is because the selection process is rigorous and beneficiaries belonging to BPL category with poor resource base are given preference for providing support under the DAPSC/ST projects. The socio-economic characteristics observed in the study indicate favourable conditions for the adoption and sustainability of improved poultry interventions among rural SC and ST households.

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