

Impact analysis of Broiler Farming on production and prosperity

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Abstract

Broiler industry remains an untapped goldmine of entrepreneurial potential in India. This study delves into the production efficiency, income growth, and employment opportunities generated by broiler farming in Madhya Pradesh. Fifty broiler farms across the Gwalior district were identified. From this list, 30 farms that had been in continuous operation for at least one year and maintained proper records were selected. These farms were categorized into three groups: small farms (fewer than 1,999 birds), medium farms (2,000 to 4,999 birds), and large farms (5,000 birds or more birds). The data were collected and analyzed at Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj (Uttar Pradesh), covering the period of 2020-21. This study revealed key performance metrics for broiler farming, with the average feed conversion ratio at 1.80, a livability rate of 95.33 per cent, and an average market weight of 2.39 kg achieved in 43.07 days. The total cost per bird averaged Rs 162.49, while gross and net returns per bird were Rs 185.66 and Rs 23.18, respectively, resulting in a benefit-cost ratio (BCR) of 1.14. Labor costs amounted to Rs 5.62 per bird per 56-day production cycle, translating to an expenditure of Rs 55,638 per farm on labor. This investment supported the employment of 3.43 workers per farm. Statistical analysis using ANOVA highlighted a significant correlation between income and farm size, as well as between BCR and farm size.

Keywords: Broiler poultry, Economic analysis, Feed conversion ratio, Impact analysis, Livability

Highlights

- An average FCR 1.80, a livability rate of 95.33 per cent and a market weight of 2.39 kg were found
- The average total cost per bird was 162.49, and total farm cost of Rs. 1,608,651 on average farm of 3313.33 birds
- Gross returns received Rs.185.27 per bird and translating to Rs. 1,778,592 per farm on average farm of 3313.33 birds
- The B: C ratio per farm was found as 1.14. The average wage for one man-day was Rs.342.22
- Each production cycle generated 191.88 man-days, with an average of 3.43 workers per farm

INTRODUCTION

Livestock sector has gotten one of the quickest developing fragments in Indian agribusiness as of late, and inside livestock sector, the poultry production in India keeps on displaying overwhelming development in spite of a few difficulties experienced throughout the years. Poultry is one of the quickest developing fragments of the farming area in India with around 8 per cent, development rate per annum (Singh *et al.*, 2020; Toor and Goel, 2022). There is high potential in poultry farming for livelihood and nutritional support for rural people (Dwivedi *et al.*, 2020). In India, the total poultry population is 851.81 million, in that the backyard poultry is 317.07 million and poultry for egg production is 103.93 billion in 2018-19 (BAHS,

2019). The growth in backyard poultry is found very high in relation to that of commercial poultry. The current per capita availability (2018-19) is around 79 eggs per year (BAHS, 2019). The poultry meat production is estimated to be 4.06 million tones which is around 50 per cent, of total meat production, (BAHS, 2019). The rapid growth and transformation of the livestock sector present tremendous opportunities for agricultural development, poverty alleviation, enhanced food security, and better human nutrition. This sector also has the potential to empower rural women and youth, optimize the use of natural resources, and bolster household resilience against climate shocks. There are plenty of facts to express the role of poultry husbandry in uplifting nutritional

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support and reducing the livelihood insecurity (Frands, 2004; Otte, 2006; Ahuja and Sen, 2007). India's poultry industry, vast in scale, combines price competitiveness with entrepreneurial drive, positioning the country to make a significant impact on the global chicken meat market, especially in exports to Gulf nations (Hellin *et al.*, 2015).

Among all livestock farming practices, poultry farming offers the highest return on investment, making strategic planning crucial to maximize benefits for farmers and attract young, unemployed individuals to this viable livelihood. Poultry sector has carved out a distinct place within the livestock sector, boasting an impressive average annual growth rate of 9 per cent, from 2001 to 2019 (BAHS, 2019).

In 2019, the poultry reached 851.81 million, reflecting a 16.8 per cent, increase from the previous census in 2012. Backyard poultry surged dramatically by 45.8 per cent, totaling 317.07 million, while commercial poultry grew by 4.5 per cent, reaching 534.74 million. Tamil Nadu, Andhra Pradesh, Telangana, and West Bengal emerged as the leading states in poultry production. Madhya Pradesh ranks 15th nationwide, with a poultry population of 6.66 million birds. In Gwalior alone, the number of poultry birds rose from 49,930 in 2012 to 129,798 in 2019 thus, positioning the district as 30th in the state. This represents an impressive growth rate of 159.95 per cent, over seven years, according to the 20th Livestock Census.

The broiler industry in India thrives due to its adaptability to diverse farm climates and fewer climate restrictions (Singh *et al.*, 2010). With a chicken population of 729 million, where 30 per cent, are layers and 40 per cent, are broilers, small and medium farmers often engage in contract farming with large integrators. Additionally, there are large number of farmers are involved in backyard poultry in India (Gaware *et al.*, 2021). In 2017-18, out of total 3.8 MMT poultry meat production, Maharashtra has been the leader with 15 per cent share. Other lead states in poultry meat are

Tamil Nadu followed by Haryana, then West Bengal. Despite this, India's poultry meat exports remain minimal due to shortage of processing, small-scale production units, and limited branding. Currently, India exports small quantities of freeze-dried broiler meat and cut-up parts to different countries of Asia (USDA FAS, 2016; Nanda *et al.*, 2022).

There is a pressing need to enhance the productivity of poultry to meet the growing demand for animal protein driven by the rising human population. India is home to a diverse range of poultry breeds with significant potential to contribute to both food security and poverty alleviation, particularly benefiting the 30.3 million poor families in rural areas engaged in poultry (Roy *et al.*, 2018).

MATERIALS AND METHODS

This study aimed to assess the impact of broiler farming on income and employment generation to foster rural prosperity. Madhya Pradesh was chosen for its significant poultry presence, ranking 15th in India with a growth rate of 39.94 per cent, from 2012 to 2019. Within the state, Gwalior district was selected for its notable poultry numbers, ranking 30th in Madhya Pradesh in 2019, and experiencing a remarkable growth rate of 159.95 per cent in the same period.

To conduct the study, 50 broiler farms in the district were explored. This list was organized by the number of birds per farm. On the basis of regular production for last year, a list of 30 farms was prepared. These farms were categorized into three groups based on bird numbers: small farms which had fewer than 1, 999 birds), medium farms which had numbering from 2,000 to 4,999 and large farms with birds numbering from 5,000 or more. After that, a sample of 5 poultry farms were chosen from each category randomly. The study was done at Animal Husbandry department in SHUATS, Prayagraj, (Uttar Pradesh) covering the period 2020-21. The sample farms were categorized into three size groups as mentioned in Table 1. Data collection involved visits to farms in the Gwalior district, where poultry entrepreneurs were interviewed using a structured questionnaire. This questionnaire gathered information on agro-economics of farmers, farm size, occupational status, and educational background. To analyze production and economic performance, important parameters were evaluated of birds. The study also employed ANOVA to assess the relationships among variables. This comprehensive approach aimed to evaluate the financial viability and performance of poultry enterprises.

Table 1. The classification of selected broiler farms according to the number of broilers in Gwalior

Designated size of farm	Number of broilers	Number of farms
Small	≤1999	5
Medium	Between 2000-4999	5
Large	≥5000	5
Total		15

Table 2. The average number of broilers under different farm-size groups in Gwalior

Farm size group	Farms		Birds		Mean $\pm$ S.D.
	Number	% to total	Number	% to total birds	
Small farms (≤ 1999 birds)	05	33.33	8500	17.10	1700 $\pm$ 158.11
Medium farms (Between 2000 to 4999 birds)	05	33.33	12200	24.55	2400 $\pm$ 378.15
Large farms (≥ 5000 birds)	05	33.33	29000	58.35	5800 $\pm$ 1303.84
Total farms	15	100	49700	100	(3300)

Table 3. Mean feed conversion ratio, livability percentage, body weight and age at marketing and of broilers in Gwalior

Parameters	Farm size group			Overall
	Small farms (Mean $\pm$ S.D.)	Medium farms (Mean $\pm$ S.D.)	Large farms (Mean $\pm$ S.D.)	
Feed conversion ratio	1.86 $\pm$ 0.02	1.79 $\pm$ 0.03	1.74 $\pm$ 0.04	1.80
Livability percent	95.05 $\pm$ 0.02	95.46 $\pm$ 0.21	95.48 $\pm$ 0.19	95.33
Body weight at marketing (kg)	2.46 $\pm$ 0.09	2.36 $\pm$ 0.05	2.34 $\pm$ 0.05	2.39
Age at marketing (Days)	44.0 $\pm$ 0.71	43.2 $\pm$ 0.45	42.4 $\pm$ 0.55	43.07

Table 4. Investment on fixed assets in Gwalior

Parameters	Farm size group			Overall
	Small farms (Mean $\pm$ S.D.)	Medium farms (Mean $\pm$ S.D.)	Large farms (Mean $\pm$ S.D.)	
On broiler house (Rs)	158300 $\pm$ 43294.92 (86.98)	235600 $\pm$ 40234.31 (88.21)	530080 $\pm$ 109510.40 (88.77)	307993.33 (88.32)
On equipment (Rs)	23696 $\pm$ 3315.88 (13.02)	31493.8 $\pm$ 6645.52 (11.79)	67020 $\pm$ 21792.59 (11.23)	40736.6 (11.68)
Total (Rs)	181996	267093.8	597100	348729.39

Note: Figures within the parentheses indicate percentage to total.

RESULTS

Number of birds per farm: Table 2 provides insights into number of farms and birds in each farm across different size categories in the Gwalior district. Each category- small, medium, and large- comprised five farms. The mean birds per farm was as follows: small farms had an average of 1,700 $\pm$ 158.11 birds, medium farms had 2,400 $\pm$ 378.15 birds, then large farms had 5,800 $\pm$ 1,303.84 birds.

Feed Conversion Ratio (FCR): The mean feed conversion ratios (FCR) for small farms was found as 1.86 $\pm$ 0.02 for medium farms as 1.79 $\pm$ 0.03 and for large farms as 1.74 $\pm$ 0.04 and on average farm as 1.80 (Table 3).

Livability parameter: The livability percentages was found as 95.05 $\pm$ 0.02 per cent, 95.46 $\pm$ 0.21 per cent, 95.48 $\pm$ 0.19 per cent and 95.33 per cent respectively for low scale, mid-size, large scale and overall farms (Table 3).

Weight parameter: The average marketing weights of broilers was found as 2.46 $\pm$ 0.09 kg, 2.36 $\pm$ 0.05 kg, and 2.34 $\pm$ 0.05 kg and 2.39 kg respectively for low scale, mid-size, large scale and overall farms (Table 3).

Age at marketing age: The average age at marketing is found as 44.0 $\pm$ 0.71 days, 43.2 $\pm$ 0.45 days, 42.4 $\pm$ 0.55 days and 43.07 days respectively for low scale, mid-size and large scale and overall farms (Table 3). After marketing, broiler farms undergo cleaning and disinfection to prepare for the next production cycle. The complete cycle lasts 56 days, consisting of a growth period of 43.4 days and an additional 12.6 days for preparation and cleaning. Economic evaluations are based on this total 56-day production.

Economic evaluation

Expenditure on fixed assets: To determine the investment in fixed assets, the costs associated with constructing broiler sheds and purchasing equipment were analyzed. As shown in Table 4, expenditure in

making of sheds of broilers was the predominant expense for low scale, mid-size and large scale farms, it has accounted for 86.98 per cent, 88.21 per cent, and 88.27 per cent of total costs respectively. This was followed by equipment investments, which comprised 13.02 per cent, 11.79 per cent, and 11.23 per cent of the costs for low scale, mid-size and large scale farms, respectively.

Cost analysis

Broilers: The breakdown of the cost per bird and its components is detailed in Tables 5 and 6 and illustrated in Fig. 1. The average cost per bird was Rs.171.28±7.57 for small farms, Rs.160.56±3.62 for medium farms, and Rs.155.62±4.46 for large size farms, with an overall of Rs.162.49 across all farms. On average, variable costs accounted for 97.73 per cent of the total expense, while fixed costs made up 2.27 per cent. Among the variable costs, feed expenses dominated at 61.12 per cent, followed by chick costs at 26.93 per cent and labor wages at 3.46 per cent. These three components together represented 91.51 per cent of the total expense of broiler farming.

Table 5. Total cost of different farm sizes (Rs. / bird) in Gwalior

Components	Farm size group			All farms
	Small Farm (Mean ±S.D.)	Medium Farm (Mean ±S.D.)	Large Farm (Mean ±S.D.)	
Total cost	171.28±4.21	160.56±3.62	155.62±4.46	162.49

Table 6. Breakup of different components of per bird cost (Rs.) on different farm sizes in Gwalior

Components	Farm size group			All farms
	Small farms	Medium farms	Large farms	
Fixed cost				
Rental value of land	0.63 (0.37)	0.84 (0.52)	0.37 (0.24)	0.61 (0.37)
Depreciation of building	0.71 (0.42)	0.74 (0.46)	0.70 (0.45)	0.72 (0.44)
Depreciation of equipment	0.43 (0.25)	0.40 (0.25)	0.35 (0.23)	0.39 (0.24)
Interest on non-recurring cost	1.97 (1.15)	2.01 (1.25)	1.89 (1.22)	1.96 (1.20)
Total non-recurring cost	3.75 (2.19)	3.99 (2.48)	3.32 (2.13)	3.69 (2.27)
Recurring cost				
Cost of day-old chick	45.07 (26.31)	44.25 (27.56)	41.96 (26.96)	43.76 (26.93)
Feeds	105.25 (61.45)	95.90 (59.73)	96.85 (62.23)	99.33 (61.12)
Medicine and Vaccines	2.26 (1.32)	2.68 (1.67)	2.31 (1.48)	2.42 (1.49)
Labour	6.82 (3.98)	5.08 (3.68)	4.96 (3.18)	5.62 (3.46)
Miscellaneous cost	5.10 (2.97)	5.82 (3.62)	3.47 (2.23)	4.80 (2.95)
Interest on working capital	3.03 (1.77)	2.83 (1.76)	2.75 (1.77)	2.87 (1.77)
Total recurring cost	167.53 (97.81)	156.57 (97.51)	152.30 (96.92)	158.80 (97.73)
Total Cost	171.28 (100)	160.56 (100)	155.62 (100)	162.49 (100)

Note: Figures within the parentheses indicate percentage to total.

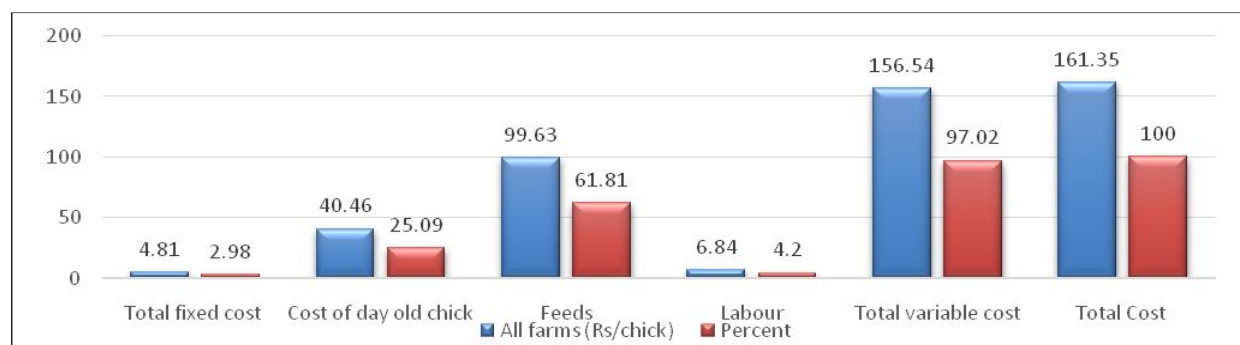


Fig. 1. Expenditure on different items per chick

Returns analysis

Total returns: Table 7 illustrates the returns from various sources, showing that the primary income came from the sale of birds, averaging Rs.183.79 per broiler, which constitutes 99.99 per cent of total returns. The manure sale contributed Rs.1.44 (0.77%), and the gunny bags selling added Rs.0.43 (0.23%).

B:C ratio: Table 8 presents the net income per broiler and B:C ratios. The net returns were highest for large farms at Rs.28.22 per bird, followed by medium farms at Rs.23.86 and small farms at Rs.17.46, with an average of Rs.23.18. The overall benefit-cost ratio for overall farms was 1.15.

Table 7. Gross returns from different sources per broiler (Rs. / bird) in Gwalior

Components	Farm size group			All farms
	Small farms (Mean±S.D.)	Medium farms (Mean±S.D.)	Large farms (Mean±S.D.)	
Sale of broiler	187.03±3.75 (99.13)	182.46±3.76 (99.06)	181.88±4.94 (99.14)	183.79 (98.99)
Sale of manure	1.32±0.41 (0.65)	1.52±0.48 (0.71)	1.48±0.35 (0.64)	1.44 (0.77)
Sale of gunny bags	0.38±0.02 (0.22)	0.44±0.06 (0.23)	0.48±0.05 (0.22)	0.43 (0.23)
Total Returns	188.73 (100)	184.42 (100)	183.84 (100)	185.66 (100)

Note: Figures within the parentheses indicate percentage to the total.

Table 8. Net returns, benefit-cost ratio in broiler farms in Gwalior (Rs. / bird)

Components	Farm size group			All farms
	Small farms (Mean±S.D.)	Medium farms (Mean±S.D.)	Large farms (Mean±S.D.)	
Total cost	171.28±4.21	160.56±3.62	155.62±4.46	162.49
Gross returns	188.73±3.50	184.42±3.77	183.84±5.11	185.66
Net returns	17.46±5.02	23.86±6.07	28.22±5.88	23.18
Benefit-cost ratio	1.10±0.03	1.15±0.04	1.18±0.04	1.14

Table 9. Total cost, gross return and net return per farm in broiler business

Days require for production cycle	Labour cost Per bird (Rs.)	Average birds/farm, no's	Total money spent on labour per farm,(Rs.)	Total cost per bird, including labour cost (Rs.)	Total cost per farm, (Rs.)	Gross income generated per Bird, (Rs.)	Gross income generated per farm, (Rs.)	Net income generated per Bird, (Rs.)	Net income generated per farm, (Rs.)
56	5.62	3313.33	55638	162.49	1608651	185.27	1778592	23.92	229632

Table 10. The result of analysis tests involving the performance of the farms, FCR and BCR with farm size in Gwalior

Analysis Test	Test between	F-test	Value of test done
ANOVA	Income and Farm Size	13.792	P<0.005
ANOVA	FCR and Farm Size	1.306	P=0.307 (P>0.005)
ANOVA	BCR and Farm Size	27.781	P=0.000
ANOVA	Cost and Farm Size	12.855	P<0.005
ANOVA	Net Return and Farm Size	12.669	P<0.005

Employment and returns: The analysis of data reveals that broilers typically reach the market in 56 days, with an average of 9,900 birds per farm. The average total expense per broiler bird is Rs.162.49, resulting in a total farm cost of Rs. 1,608,651. Gross returns are Rs.185.27 per bird, translating to Rs. 1,778,592 per farm. Net returns are Rs.23.18 per bird, amounting to Rs. 229,482 per farm. Labor costs are Rs.5.62 per broiler over the 56-day period, totaling Rs. 55,638 per farm. The average cost for one man-day is Rs.342.22 for an

8-hour shift. Each production cycle generates employment of 191.88 days, with an average of 3.43 workers per farm. This substantial employment generation underscores the economic significance of broiler farming (Table 9).

Analysis of ANOVA: The analysis employed ANOVA to examine various factors related to farm size in the Gwalior

district, including Income, Feed Conversion (FCR), Benefit-Cost Ratio (BCR), Costs, and Net Returns across small farms as ≥1,999 birds, medium as 2000-4999 broilers and large sized units as ≤5,000 birds (Table 10). The analysis revealed a positive linking of income and farm size, as well as between birds' number and BCR, showing as larger farms tend to see increased income and improved benefit-cost ratios. Conversely, no significant relationship was found between feed conversion ratio and birds' numbers in farm.

Challenges: Key challenges in the poultry industry are inadequate machines and equipment for production and processing, and diseases such as Salmonella and Avian Influenza, along with other communicable illnesses, pose significant economic risks to farmers (Mandal *et al.*, 2006).

Government support: Recognizing the vital role of poultry in enhancing farmers' livelihoods, the Central Government has introduced several schemes to support the industry across all states:

Animal Husbandry Infrastructure Development Fund (AHIDF): Announced under the Atma Nirbhar Bharat Abhiyan in 2020 with an allocation of Rs. 15,000 crores, AHIDF aims to provide protein-enriched food and combat malnutrition. This fund supports the technologically advanced poultry farms, including layer farms, broiler breeder farms, and hatcheries with controlled environments, and setting up of plants.

Eligible persons or units include Farmers Organizations (FOs), private companies, individual entrepreneurs, Section 8 companies, and other small units. They can access 90 per cent loan financing with a 3 per cent interest subvention and a 25 per cent credit guarantee for MSME projects.

National Livestock Mission: This initiative provides a 50 per cent subsidy, up to Rs.25 lakhs, for establishing parent farms, rural hatcheries, and brooder cum mother units. This support is aimed at producing hatching eggs and rearing chicks up to four weeks.

DISCUSSION

Overall, the average number of broilers per farm was 3313.33 and ranging from 1,500 birds on small farms to 8,000 birds on large farms.

Feed Conversion Ratio (FCR): There is notably lower than the FCR values reported by other researchers (Rajendran, 1998; Shaikh and Zala, 2011), who recorded ratios of 2.07 and 1.97, respectively. The improved FCR in this study may be attributed to advances in breeding, feed quality, and healthcare. FCR of 1.69 was found with a basal diet plus a 2 per cent commercial herbal growth promoter (Borgohain *et al.*, 2017) and while FCRs of 1.58, 1.54, and 1.48 were observed during summer, rainy, and winter seasons, respectively (Gupta *et al.*, 2023). FCR values in these studies are similar, they are generally lower compared to those in the current research.

Livability percentage: The mean livability percentages figures surpass the livability rates reported (Rajendran, 1998), who found rates of 92.91 per cent

and 93.26 per cent for small and large farms, respectively. The higher livability in our study likely reflects improved management practices. Livability percentages of 94.42 per cent, 94.54 per cent, and 94.72 per cent for small, medium, and large farms were reported (Shaikh and Zala, 2011), which are closely aligned with findings of current research. Additionally, livability rates of 95.13 per cent (Ross), 95.64 per cent (Lohmann), and 92.94 per cent (Hubbard) were observed in another, which are consistent with the results of this study (Al-Dawood and Al-Atiyat, 2022).

Weight at marketing: Notably, the data reveals a gradual decrease in body weight with increasing farm size. This study's weight figures surpass those reported by others (Rajendran, 1998; Shaikh and Zala, 2011). For comparison, an average marketing weight of 2.72 kg in major U.S. markets was found (Maharjan *et al.*, 2021). The observed improvement in body weight in this study can likely be attributed to advancements in feed quality, feeding practices, healthcare, and the breeding and strain of broilers.

Age at marketing: The average age at marketing for broilers is lower than the age at marketing (Rajendran, 1998; Saravanan, 1998), but aligns closely with others (Shaikh and Zala, 2011), who recorded ages of 42.57 days, 42.38 days, and 42.05 days for small, medium, and large farms, respectively. After marketing, broiler farms undergo cleaning and disinfection to prepare for the next production cycle. The complete cycle lasts 56 days, consisting of a growth period of 43.4 days and an additional 12.6 days for preparation and cleaning. Economic evaluations are based on this total 56 day production period.

Economic analysis

Investment on fixed assets: The construction of broiler sheds was the predominant expense followed by expenditure on equipment.

Cost appraisal of raising broiler birds: The total cost per broiler is higher compared to other authors (Rajendran *et al.*, 2008; Singh *et al.*, 2010; Shaikh and Zala, 2011; Balamurugan and Manoharan, 2014). Notably, the average total cost per broiler was highest in small farms and decreased with increasing farm size, indicating economies of scale. Among the variable costs, feed expenses dominated followed by chick costs and labor wages. These findings align with researcher (Singh *et al.*, 2010), where feed and chick costs were also major contributors to variable costs, constituting 82.99 per cent. However, the current study differs from

other researchers (Rajendran *et al.*, 2008; Shaikh and Zala, 2011) in that labor wages emerged as the third major cost component, whereas depreciation on buildings was previously noted as a significant expense.

Returns from broiler farms

Gross returns: The receipts from the sale of broilers, constitutes highest in total returns followed by the sale of manure and the sale of empty gunny bags. These findings align with researchers (Singh *et al.*, 2010; Shaikh and Zala, 2011; Balamurugan and Manoharan, 2014) regarding income from broiler sales. However, there is a discrepancy in other income sources; in this study, the sale of manure emerged as the second major income source, contrary to previous reports where the sale of empty gunny bags was noted as a significant income contributor. The data also reveal that gross returns per broiler tend to decrease with increasing farm size, likely due to lower body weights and reduced ages at marketing in medium and large farms compared to small farms. These results are consistent with the findings of researchers (Singh *et al.*, 2010; Shaikh and Zala, 2011; Balamurugan and Manoharan, 2014).

Net returns and benefit-cost ratio: The increasing trend in net returns with larger farm sizes is attributed to economies of scale. These findings align with that of others (Singh *et al.*, 2010; Shaikh and Zala, 2011; Balamurugan and Manoharan, 2014). Notably, the B:C ratio improved with increasing farm size, indicating greater economic viability for larger operations.

Higher employment and income from broiler business: Our analysis reveals that broilers typically reach the market in 56 days, average total cost per bird is Rs.162.49, gross returns are Rs.185.27 per bird, and net returns are Rs.23.18 per bird. Each production cycle generates 191.88 man-days of employment, with an average of 3.43 workers per farm.

It is found that depending on the farm size, broiler farming can be a main source of family income or can provide subsidiary income and gainful employment to farmers throughout the year (Dwivedi, *et al.*, 2020). This substantial employment generation underscores the economic significance of broiler farming.

ANOVA table for analysis: The analysis revealed a significant relationship between income and farm size, as well as between BCR and farm size, indicating that larger farms tend to see increased income and improved benefit-cost ratios. Conversely, no significant relationship was found between FCR and farm size.

Challenges: Various challenges such as infrastructure, lacking suitable treatments for diseases. Various other constraints are lack of financial support and high cost of inputs/chicks (Mandal *et al.*, 2006), lack of technical know-how (Deka, 2013) and lack of deworming and vaccination of the birds (Khandait *et al.*, 2011). The absence of standardized practices further contributes to suboptimal outcomes in the industry.

Government support: To further support the poultry industry and enhance farmers' livelihood the assistance to farmers is provided through schemes of Animal Husbandry Infrastructure Development Fund (AHIDF) and National Livestock Mission (NLM). Well-designed extension programs are needed that provide awareness to farmers on the basis of their socio-economic status and also provide them market support for increase in their income on sustainable basis (Singh *et al.*, 2020).

Market support is very important for regular selling of produce at reasonable prices. Second important is post production infrastructure in locality for enhancing sale price of produce. Without adequate infrastructure, farmers face distress sale. The successful cases of broiler farming should be promoted through print and electronic media for higher adoption in rural areas and become the important support for farmers' income. Diversified enterprises at farmers' fields reduce their dependence on one and provide sustainable income to family along with higher nutrition support and good health.

Conflict of interest: The author declares no conflicts of interest pertaining to this research study.

Author's contribution: PPS: Engaged in conducting the research work data collection, analysis and preparing original draft; VK: Involved in conceptualization, data curation and Economic analysis; RJ: Involved in draft correction and final editing; GJ: Involved in conceptualization and supervision; N: Overall supervision of the research work. All authors have contributed equally to this piece of research work.

Data availability statement: All the data supporting the research findings have been presented in this paper. The corresponding author is willing to provide the raw data upon reasonable request.

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