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IMPACT OF GOVERNMENT POULTRY SUBSIDY SUPPORT ON POULTRY FARM PRODUCTIVITY IN SARPANG AND TSIRANG DISTRICTS OF BHUTAN

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ABSTRACT: *This study evaluated the association between government poultry subsidies programmes and farm productivity and socio-economic outcomes among poultry farmers in Sarpang and Tsirang districts of Bhutan. A cross-sectional study design was employed from 1 September to 30 December 2024, involving 79 randomly selected poultry farmers. Data on access to subsidies, including shed construction materials, poultry equipment, and layer day-old chicks, and subsequent changes in farm productivity and household socio-economic indicators were collected through structured face-to-face interviews using the Epicollect5 mobile data collection platform. Descriptive statistics and Chi-square test was used to assess differences in reported outcomes across categories. The 32% of respondents had commercial layer farm, followed by semi-commercial farms (24%) and subsistence farms (19%) and on the other hand, broiler farming scale was equally distributed between semi-commercial and commercial systems. Substantial percentages of the respondents were literate (72%) and all the respondents had the poultry farming experiences. A significant proportion of the respondents (77.22%) reported an increase in poultry farm productivity following receipt of subsidies, while some respondents (48.10%) indicated improvements in household socio-economic conditions. A chi-square was conducted to examine how the responds are distributed across all categories. The frequencies of reported socio-economic outcomes were not equally distributed across the multiple response categories, with livelihood differ significantly from an equal distribution across the 12 categories ($\chi 2=177.12$, $df=11$, $p<0.001$). Similarly, reported changes in farm productivity differed significantly among respondents ($\chi^2 = 128.6$, $df = 3$, $p < 0.001$). These findings indicate that access to government poultry subsidies is associated with improved perceived farm productivity and socio-economic benefits among poultry farmers in the study areas. Strengthening poultry training and monitoring strategies may enhance the effectiveness and sustainability of poultry subsidy programmes in Bhutan.*

Keywords: Bhutan**;** Commercial poultry farming; Farm productivity; Poultry subsidy; Rural livelihoods.

1. INTRODUCTION

Poultry farming has emerged as an important livestock sectors globally and plays a vital role in enhancing food and nutrition security, generating income and supporting rural livelihoods (FAO 2013). Poultry products such as eggs and chicken are important and reliable sources of high-quality protein and essential nutrients. Because of low capital requirements, short production cycles, and increasing demand, poultry farming offers considerable opportunities for farmers to improve household income and food security in rural communities (Wong et al. 2017).

In Bhutan, poultry farming is an important component of the agricultural sector and supports the rural livelihoods and national food security (Penjor and Chhetri 2019).

The government has promoted poultry development since the 1960s to enhance domestic egg and chicken production (Gaylal and Dorjee 2024; Nidup et al. 2005). The sector mainly focuses on layer, broiler and turkey production (Gaylal and Dorjee 2024). However, Bhutanese poultry farmers faces several challenges such as inadequate poultry infrastructure, limited access to poultry equipment, and disease outbreaks, which negatively affect the farm productivity and efficiency (World Bank 2017).

To address these constraints, the Bhutanese government initiated subsidy programmes aimed at increasing domestic poultry production. These subsidies include shed construction materials, equipment such as feeders and drinkers, and layer day old chicks (MoAF 2019). Previous studies have shown that such subsidies can improve farm productivity, profitability, and farmer participation in livestock production systems (Springmann and Freund 2024; Wang et al. 2019).

Despite significant government investment, there is limited empirical evidence on the farm-level impact of poultry subsidy programmes in Bhutan, particularly regarding productivity, income generation, and broader socio-economic outcomes. Therefore, this study aimed to evaluate the impact of poultry subsidy programmes in Sarpang and Tsirang districts.

Specifically, the study assesses farmers' access to subsidies, examines the effects on farm productivity and income generation, and evaluates associated socio-economic outcomes. Through empirical evidence from two major poultry-producing districts, the findings are expected to inform policymakers in designing effective and sustainable poultry subsidy programmes, thereby strengthening the poultry sector and enhancing food and nutrition security in Bhutan.

2. MATERIALS AND METHODS

2.1 Study design and area

The study was conducted in Sarpang and Tsirang districts of Bhutan from 1 September 2024 – 30 December 2024. These two districts were purposively selected because as they are among the leading poultry-producing regions in the country.

Sarpang district is located at an altitude ranging from 210-2600 masl, while Tsirang district lies between 500 and 1900 masl. The climate in both districts is characterized by hot and humid summer and cool, dry winter (National Statistics Bureau [NSB] 2021).

2.2 Study design and sample size

A cross-sectional design was used to assess the impact of government poultry subsidy support on poultry development among farmers in the selected districts.

The study population comprised registered poultry farmers (both layer and broiler farms) in two districts. According to the National Poultry Development Centre (NPDC 2023), a total of 245 poultry farms were registered in the study areas. A complete list of documented poultry farms was obtained from NPDC records to be used as the sampling frame. The sample size was determined using a commonly applied guideline for studies with small finite populations, in which approximately 30% of the population is considered adequate for representation (Saunders et al. 2007). Based on this approach, a total of 79 farms were included in the study. Simple random sampling using the lottery method was used to select individual farms from sampling frame. The final sample consisted of 59

layer farms and 20 broiler farms, ensuring proportional representation of production systems within the study area. .

2.3 Data collection

Data were collected through face-to-face interviews using a structured questionnaire. The questionnaire captured information on respondent's demography (age, gender, education and family size), farming experience, farm characteristics including farming scale and production system. In addition, questionnaire included sections on access to poultry subsidies, types of subsidies received, household income generation, changes in farm productivity, and socio-economic outcomes. Data were recorded using the epicollect5 mobile data collection application to minimize data entry errors and improve data accuracy and consistency during fieldwork.

2.4 Data analysis

Data were exported to International Business Machine Statistical Package for Social Sciences (IBM SPSS) version 23.0 for analysis. Normality of the data was checked using the Shapiro–Wilk test. Descriptive statistics such as frequencies, percentage, and means and standard deviations were used to summarize respondents' characteristics such as age and poultry farming experiences o. A Chi-square test was used to examine the differences in the distribution of responses across categories (subsidy receipt) related to farm productivity (decreased, increased, remained same, don't know) and further, chi-square test was run across the frequencies of socio-economic outcomes frequencies (vehicle purchase, education expenses, housing construction and maintenance , road construction, , income generation, shed expansion, support livelihood, land acquisition, loan repayment, and farm sustenance).

2.6 Ethical considerations

Informed verbal consent was obtained from all respondents prior to data collection. Participant was voluntary, and confidentiality and anonymity of respondents were maintained through the study.

3. RESULTS AND DISCUSSION

3.1 Respondent characteristics

Among the total 79 respondents surveyed, more than half of the respondents (73%) were male, while the rest were female (Table 1). The higher proportion of male respondents suggests that poultry farming activities in the study are predominantly managed by men, which may reflect gender-based roles in agricultural labour and decision-making. Similarly findings were reported by Bukachi et al. (2023), who observed that gender roles within livestock systems influence labour allocation, management practices, and resource utilisation efficiency.

With respect to education status, only a small proportion was illiterate. Education level may influence household income generation, farm productivity, and profitability by improving farmers' managerial capacity and adoption of improved farming practices (Ezekiel et al. 2024). The average age of the respondents was 44.52 ± 12.61 years (min., 19; max., 73 years). Age has been reported to influence farming efficiency, labour capacity, and decision-making in livestock production systems. For example, Tong et al. (2024) reported that the age structure of the farming workforce is associated with farm efficiency and productivity. In addition, more than half of the respondents had more than 5 years of poultry farming experience, indicating that most participants possessed sufficient practical knowledge on poultry production practices. In addition, the mean household

size was 4.61 ± 1.95 members (min 2; max 13). Smallholder poultry farming systems are often dependent on family labour for routine farm operations, which is in consistent with Yekosabeth et al. (2022) findings. The observed household size may therefore contribute positively to farm labour and operational efficiency. Similarly, Kostov et al. (2018) demonstrated that participation of household members in farm activities can enhance farm profitability and productivity.

Table 1: Educational status and poultry farming experience of respondents.

Parameters	Respondents %
Education level	
Illiterate	28
Non-formal education	9
Primary education	34
Secondary education	24
Degree	5
Poultry farming experience (year)	
<1 year	6.33
1-≤5 years	35.44
6-≤10 years	27.85
>10years	30.38

3.2 Poultry management and scale of farming

The poultry farms surveyed in Sarpang and Tsirang districts were predominantly managed under a deep litter system within open-sided housing structures. Most sheds were constructed with a bricks wall approximately 0.5 m in height, while the upper sections were enclosed with wire mesh to facilitate ventilation. Roofing materials was predominantly consisted of corrugated galvanized iron (CGI) sheets. Commonly used poultry equipment included plastic feeders and drinkers, as well as iron or wooden nest boxes. The findings indicate a relatively uniform poultry housing and management system across the study area, suggesting consistency in basic poultry management practices among farmers. This observed housing design may also reflects adaption to the local climatic conditions, particularly the hot and humid environment prevalent in the region, where adequate ventilation is important for maintaining bird health and reducing heat stress.

Variation in production scale was observed across the poultry farming systems in the study areas. Among layer farms, commercial production systems accounted for 32% of respondents, followed by semi-commercial farming (24%) and subsistence farming (19%). In contrast, broiler production was equally distributed between semi-commercial and commercial systems, each representing 50% of broiler farmers, indicating a comparatively stronger market-oriented structure within broiler production. Poultry production systems were classified according to the criteria of the National Poultry Development Centre (2024) as subsistence farms (≤500 birds), semi-commercial farms (501 ≤ 1000 birds), and commercial poultry farms (> 1001 birds). Overall, the distribution of farming systems suggests a gradual transition from subsistence-based poultry production toward semi-commercial and commercial enterprise development. This trend may reflect increasing market participation and growing recognition of poultry farming as a potential income-generating activity in the study areas, which is in consistent with previous study (FAO, 2024).

3.3 Socio-economic benefits and productivity effects of poultry subsidy

The majority of the respondents (81%) reported receiving poultry subsidies in the form of , wire mesh, CGI sheet, poultry equipment and layer day old chicks, whereas a few respondents (19%) reported receiving

only day chicks as continued subsidy support. Layer day-old chicks were supplied at subsidized rates through government hatcheries, including the National Poultry Development Centre (NPDC), the Regional Pig and Poultry Breeding Centre (RPPBC), and the Regional Poultry Breeding Centre (RPBC). In 2025, the subsidized price of layer day-old chick was Nu. 39 per chick for flock sizes of up to 1000 birds and Nu. 45 per chick for flock sizes above 1000 birds, compared with an estimated production cost of Nu. 65 per chick (Ministry of Agriculture and Livestock [MoAL] 2025). The provision of subsidized inputs likely reduced production costs and improved farmers' capacity to invest in poultry production. Similarly findings were reported by Wang et al. (2019), who demonstrated that agricultural subsidies can reduce production costs and enhance farm invest capacity.

Figure 1 illustrates the socio-economic benefits reported by poultry farmers following receipt of poultry subsidy support. Approximately, half of the respondent (48.10%) reported improvements in their livelihood, indicating that the subsidy programmes contribute positively to household socio-economic well-being. The chi-square test revealed significant variation in the distribution of reported socio-economic outcomes across categories, including vehicle purchase, education expenditure, house construction and maintenance, road construction, income generation, shed expansion, livelihood support, land acquisition, loan repayment, and farm sustenance ($\chi^2 = 177.12$, $df = 11$, $p < 0.001$). These findings indicate that the socio-economic benefits associated with poultry subsidies were not uniformly distributed among respondents.

Moreover, some respondents (13.92%) reported reinvesting farm income into the expansion of poultry shed, thereby increasing production capacity. A few respondents stated that income was allocated to shed maintenance, loan repayment, land acquisition, vehicle purchase, house construction, road access development, and children's education. These findings suggest that poultry subsidy support is not only used for immediate household consumption but is also reinvested in farm development and household assets accumulation.

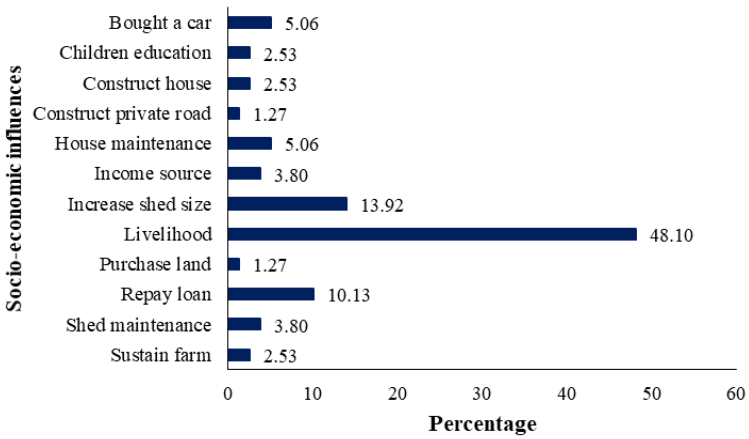

Figure 1: Socio-economic benefits derived from poultry subsidy support programmes among respondents.

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Comparable findings have been reported by FAO (2010), which highlighted the role of poultry farming in poverty reduction and livelihood improvement in developing countries. Similarly, Wang et al. (2019) reported that income levels among subsidy recipients were significantly higher than those of non-recipients, highlighting the role of subsidies in enhancing household income and economic stability. The ability of farmers to reinvest income into farm expansion, household assets, and education further reflects the broader socio-economic implications of poultry subsidy programmes. These results indicate that government-supported poultry farming may contribute to improved livelihoods and support rural development in the study area.

There was a strong association between poultry subsidy receipt and farm productivity ($\chi^2 = 128.6$, $df = 3$, $p < 0.001$). More than half of the respondents (77.22%) reported an increase in poultry farm productivity following receipt of subsidy support, while some respondents (11.39%) indicated no change, and a few respondents (1.27%) reported a decline in productivity (Figure 2). Similar findings have been reported by Wang et al. (2019), who demonstrated that subsidies can enhance farm productivity and profitability. However, productivity outcomes may also be influenced by additional factors such as the timely supply of day-old chicks, disease incidence, feed availability, and farm management practices (Lhendup et al. 2024). Overall, the findings suggest that poultry subsidy support is associated with improved perceived farm productivity and efficiency in the study areas.

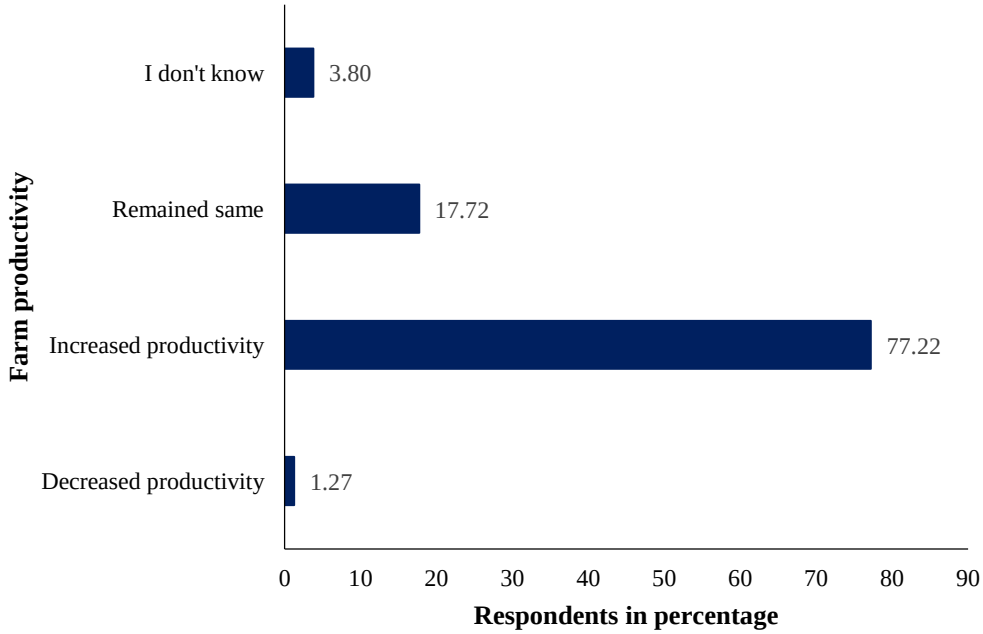

Figure 2: Influence of poultry subsidy support on farm productivity among respondents.

4. CONCLUSION AND RECOMMENDATIONS

The study evaluated the socio-economic benefits and farm productivity effects of government poultry support subsidy programmes among poultry farmers in Sarpang and Tsirang districts of Bhutan. The findings indicated that poultry subsidy programmes, including the provision of construction materials, poultry equipment, and day-old chicks, were positively associated with improvements in poultry farming practices and farm productivity. Subsidy support contributed to improved poultry management, expansion of poultry production systems, and enhancement of rural livelihoods. The perceived socio-economic benefits included poultry farm expansion, household asset accumulation, loan repayment, and investment in children's education. These findings highlight the broader developmental role of poultry subsidy interventions in supporting rural livelihoods and strengthening rural economies. Based on the findings, policy recommendations include strengthening targeted farmer training in programmes on poultry management, biosecurity, record keeping, and farm economics for poultry farmers. In addition, establishing a robust monitoring and evaluation system is recommended to assess the effectiveness and efficiency of subsidy programmes in improving farm productivity and livelihood outcomes. Future research should focus on longitudinal and quantitative approaches to better evaluate the long-term impacts of subsidy support on farm productivity, household income, and sustainability and cost-effectiveness of poultry subsidy support programmes in Bhutan.

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