

IMPACT ASSESSMENT OF SUBSIDY SUPPORT IN PIGGERY DEVELOPMENT PROGRAM IN BHUTAN

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ABSTRACT: *This research was undertaken to assess the impact of subsidy support in piggery development programs in Bhutan. Pig farming plays an important role in improving rural livelihoods, yet its growth is often constrained by limited capital, high costs and inadequate market access. Understanding the effectiveness of subsidy interventions is therefore essential for ensuring sustainable livestock development. The primary objective of the study was to evaluate the socio-economic impact of subsidy support especially materials for shed construction on piglet production, income generation, employment creation, asset accumulation and livelihood improvement among beneficiary farmers. Research areas were purposively selected for the study based on its potentiality and existing pig rearing areas. Selecting respondents who met predefined criteria of having received subsidy support and possessing current or recent experience in pig rearing was essential to ensure the validity and relevance of the findings. A structured questionnaire was administered through telephonic interviews. The questionnaire was pre-tested in one potential pig-rearing Dzongkhag, and necessary modifications were made prior to final data collection. A sample size of 127 beneficiaries was determined using Yamane's formula at 95% confidence level. The mean piglet production was 83.53 and 169.84 for before and after subsidy support. Piggery as main source of income was 22.83% (n=29) and 96.85% (n=123) for before and after subsidy support respectively. About 23.62% (n=30) of the respondents created an employment opportunity and at least 57 respondents purchased one or more assets. About 79.2% of the respondents' livelihood graduated from satisfactory to sufficient level and 100% from not enough to satisfactory level. Livelihood graduation means households moving to higher economic level through a sequenced set of interventions that build their income, assets and resilience over time. Data were collected from same respondents for both before and after subsidy support to measure the change. The study revealed that the majority 81.1% (n=103) were in the age group of 22-52 years indicating the viability of the pig farming activities. However, it was also found that, the support required on shed constructions was 35.43% (n=45), input supply of 27.56% (n=35) and marketing of 12.60% (n=16) among others. The feed price, animal restocking and marketing still remained as major problems among others. Descriptive and graphical analyses were performed using Statistical Package for Social Science (SPSS) version 23.0. These study findings suggest that subsidy support has had a positive contribution, and indicate that contributing with some form of cost-sharing mechanism could help ensure its sustainability.*

Keywords: Agricultural subsidy; Income; Livelihood improvement; Pig production; Rural livelihood.

1. INTRODUCTION

Agricultural subsidies are widely used policy instruments across the world to stimulate production, stabilize markets, and enhance food security. Major economies such as China, United States, and member states of the European Union allocate

substantial public resources to support their agricultural sectors (Bhandari 2023). These subsidies often aim to increase productivity, reduce poverty, and ensure macro- and micro-level food security. In India, for instance, input subsidies on fertilizers, electricity, and irrigation water constitute a

major share of agricultural support and have contributed significantly to food security outcomes (Acharya and Jogi 2004). Similarly, the Nepal government prioritizes agricultural subsidies to enhance production and rural livelihoods, allocating considerable annual budgets to the sector (Shrestha 2021).

Within the broader agricultural framework, livestock subsidies play a critical role in promoting sustainability and income diversification. Government support mechanisms such as subsidies on animal purchase, feed, insurance, and infrastructure have been widely implemented to stimulate livestock growth (Chandel et al. 2019; Isabella 2023). Pig production, in particular, has been recognized as an enterprise that enhances self-sufficiency, strengthens urban and rural food security, and increases household income (Chauhan et al. 2016). Investment-oriented subsidies are often justified as instruments to expand supply capacity, encourage commercialization, and reduce vulnerability among smallholders. For example, livestock insurance schemes in China operate under a cost-sharing model in which premium payments are shared between central government, local government, and farmers to enhance affordability and coverage (Chandel et al. 2019). Evidence further suggests that subsidies on inputs such as fertilizers and feed can significantly influence production levels, while their withdrawal may reduce output and increase consumer prices (Joy 2019; Chandel et al. 2019).

Despite these potential benefits, concerns remain regarding the efficiency, equity, and sustainability of subsidy programs. Studies have reported issues such as political influence, inadequate targeting, bureaucratic complexity, and limited access for small and

marginalized farmers (Shrestha 2021). In some contexts, subsidies have acted more as short-term stimuli rather than long-term solutions to structural financial barriers (Valkengoed and Werff 2022). The average subsidy rate in many countries remains below 50%, with support often concentrated in specific areas such as fertilizers, irrigation, seed, credit, and infrastructure (Bhandari 2023; Malo 2023). These mixed outcomes highlight the importance of critically evaluating subsidy interventions, particularly in livestock subsectors such as piggery, where production systems are highly sensitive to feed costs, disease risks, and market fluctuations.

In the South Asian and Himalayan context, pig farming has been identified as a viable pathway for rural poverty alleviation and livelihood transformation. In Nepal, a 50% premium subsidy on field crops and livestock insurance has been adopted to protect farmers against production risks (Shrestha et al. 2014) and reported pig farming is a potential enterprise for major change in livelihood of rural population (Shrestha and Lamsal 2014). In Bhutan, the government follows a 70:30 cost-sharing ratio (Government: Farmer) in providing subsidy support to agricultural producers (DoL 2019; Choden et al. 2017). Pig production in Bhutan is particularly significant due to strong domestic demand for pork and the enterprise's suitability for smallholder systems. Recognizing this potential, subsidy support schemes have been implemented since the 9th Five Year Plan (FYP), with intensified interventions in piggery-potential areas during the 12th FYP under the Stimulus Plan Package. Farmers were assisted in infrastructure development and input supply to establish Contract Piglet Breeder and fattening farms during the initial three years of the 12th FYP.

Subsequently, the Big Ticket Initiatives (BTI) under the Department of Livestock further promoted the establishment of breeding and fattening farms across the country.

Although substantial public investment has been directed toward piggery development, there is limited empirical evidence assessing how these subsidy programs have contributed to farmers' livelihoods and the broader national economy. Specifically, there is a knowledge gap regarding the extent to which subsidy support has enhanced piglet production, income generation, employment creation, asset accumulation, and overall livelihood improvement among beneficiary households. Moreover, systematic evaluation of the effectiveness and sustainability of these interventions remains scarce.

Therefore, this study aims to evaluate the effectiveness of subsidy support programs in the piggery sector, assess their socio-economic impacts on rural communities, and generate evidence to inform future policy design and cost-sharing mechanisms. By situating the analysis within global, regional, and national contexts, the study seeks to contribute to informed decision-making for more targeted, equitable, and sustainable livestock subsidy strategies in Bhutan.

2. MATERIALS AND METHODS

2.1 Study area

This study was carried out in piggery potential Dzongkhags namely; Chukha, Dagana, Pemagatshel, Samdrup Jongkhar,

Samtse, Sarpang, Tsirang, Wangdi and Zhemgang (Figure 1).

2.2 Sampling and sample size

The identification and selection of potential Geogs and villages within the Dzongkhag (District) was on the basis of pig population and farms as adopted (Payeng et al. 2013). Purposive sampling was employed to specifically target farmers benefitted through subsidy support programs to ensure the validity and relevance of the findings. About 127 households (samples) was derived for the proposed study using Yamane's formula as adopted (Okeoma and Amadi 2021).

The Yamane's formula:

$$n = \frac{N}{1+Ne^2}$$

Where n = sample size, N = population size and margin of error (e) = 0.05 with 95 % confidence level

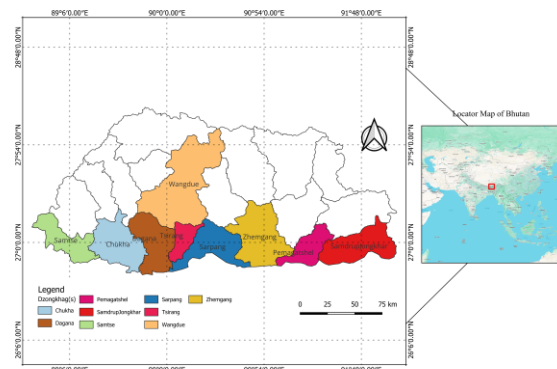


Figure 1: Map of study area.

2.3 Data collection

The data collection was carried out from November, 2024 to March, 2025 using a structured questionnaire as adopted (Penjor et al. 2018) and through telephonic call interview. The pre-test were done to ensure all information required are captured and rectified wherever necessary. Missing

information, addition and deletion based on pre-test are all incorporated prior to final data collection to ensure data validity and relevance of the findings. Data collection accounted for subsidies received, level of subsidies for both fattening and breeding farms, production and economic performance and sustainability of the subsidies support as adopted (Chatellier and Colson 2020).

2.4 Data analysis

The data set was analyzed using SPSS version 23.0. Descriptive statistics (mean, standard deviation and percentage was used for quantitative variables. Microsoft Excel program was used to prepare graphs.

3 RESULTS AND DISCUSSION

3.1 Profile of Respondents

The respondents comprised of 81.9 % (n=104) male and 18.1% (n=23) female. The youngest respondent was 22 years and oldest was 73 years old with the mean age of 43.29 ± 10.92 . Majority of the respondents was primary level/Non-formal Education (NFE) (45.7%, n=58) followed by high school level (40.9%, n=52), illiterate (10.2%, n=13) and least for graduate level (3.1%, n=4) as shown in Figure 2. Youth engagement in piggery farming despite their young age and education qualification clearly indicate having interest in taking up piggery

activities and its sustainability is ensured. The minimum experience in pig farming was one year and maximum was 30 years with mean experiences of 7.48 ± 4.5 years. Overall, the data showed that respondents as Head of Households was 63% (N= 80) and 37% (N=47) are family members other than the household heads which clearly indicate the piggery activities are influenced by household heads ensuring its sustainability.

3.2 Farm type

Prior to subsidy support, the fattening farm was higher with 59.1% followed by 19.7% owning both fattening and breeding farms and the least owned was 4.7% of breeding farms across all study areas. With the implementation of subsidy support, farmers owning both breeding and fattening farms increased to 72.4% (N=92) followed by fattening farms of 19.7% (N=25) with breeding farms of 7.9 % (N=10) as shown in Figure 3. The study showed that, subsidy support has a positive impact on the farm distribution and its production type. Farmers moving from fattening farms to breeding farms clearly indicate their advance in farming capacity maximizing domestic production to curb import of the pig and pork products. Similarly, it was reported that, the spatial distribution of pig production was strongly impacted by the pig subsidy policy (Zhao et al. 2024).

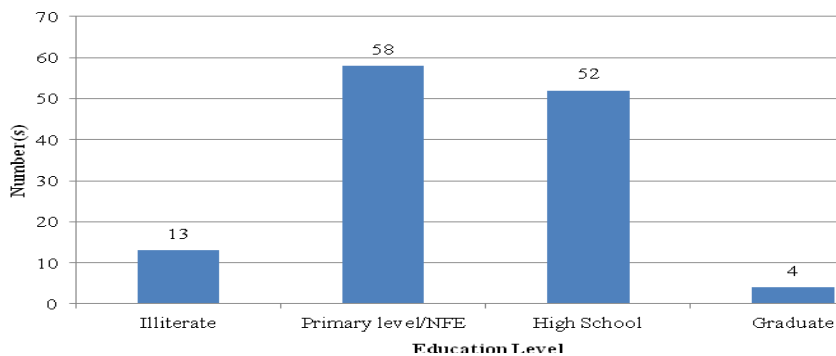


Figure 2: Education level of respondents in numbers.

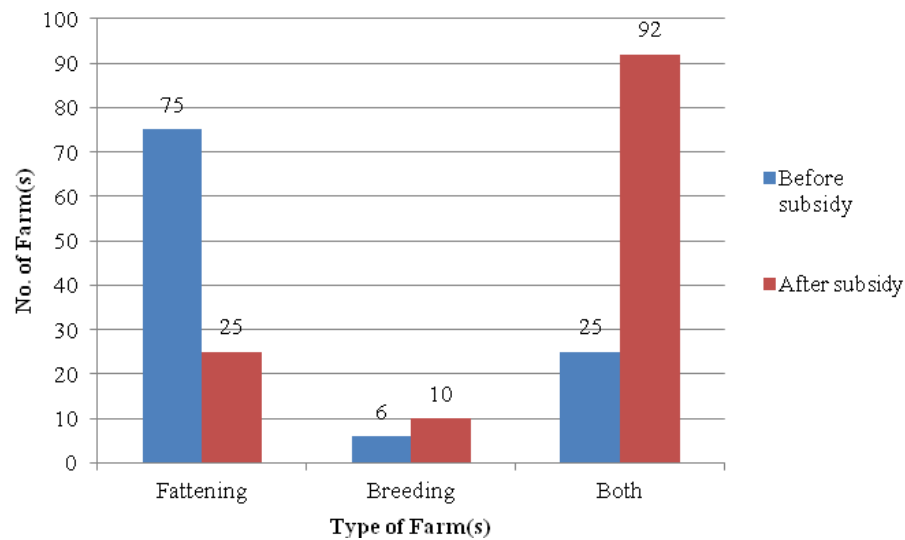


Figure 3: Showing different types of pig farming.

3.3 Shed type

Farmers have been rearing pigs in different types of sheds including the tethering system at large. Majority of the farmers (42.5 %) reared pigs in concrete floor with wood/bamboo fence followed by traditional type of sheds made of stone, wood and bamboo (33.1 %) and the hygienic sheds of 9.4% before the subsidy scheme. However, it was found that, 100% of the respondents reared their pigs in hygienic shed with concreted floor and wall upon the received of the subsidy support (Table 1). The subsidy has played a vital role in transforming the pig sheds which in turn has curbed skin disease incidences, addressed animals' welfare issues and helped improving overall productions. These hygienic sheds would last for next 5 to 10 years and any minor maintenance works is not an issue.

3.4 Production and income generation

The piglets and pork production before and after subsidy support clearly indicates that there is a positive impact (Table 2). The study (Chen 2024) revealed that, well-targeted subsidy support significantly

enhanced the effectiveness and sustainability of livestock production and helped farmers invest in advanced technologies.

The study found that, only about 22.83% (n= 29) of the household's main source of income was from pig prior to subsidy and it has increased to 96.85% (n=123) with the subsidy support which is increased by 74.02%. The subsidy support has played a vital role in farmers' income generation and productivity of farms (Table 3). In contrast, the study (Mohammed 2024) reported that, there was an increased costs and decreased profitability initially but has spurred innovation and efficiency improvements.

3.5 Assets purchased through subsidy support

Out of 127 respondents interviewed, about 57 respondents purchased one or more assets through piggery activity. The maximum respondents purchased vehicle with 14.2% (n=18), followed by vehicle and land of 8.7% (n= 11) and credit payment of 7.9% (n=10) among others (Figure 4).

Table 1: Type of pig shed owned by the beneficiaries.

Particulars (Percentage)	Before subsidy support	After subsidy support
Improved hygienic sheds	9.4	100
Concrete floor with wood/bamboo fence	42.5	0
Traditional/local sheds	33.1	0

Table 2: Information on piglets and pork production.

Particulars	Before subsidy support	After subsidy support
Min. piglet production (Nos.)	10	20
Max. piglet production (Nos.)	840	1400
Mean piglet production (Nos.)	83.53	169.84
Mean pork production (Kgs)	1325.06	3074.82

All assets purchased by farmers were from the sole income generated from piggyery farming. The vehicle has helped every owner in day to day farm operation (animal feed transportation, marketing of farm products) and other household related chores.

3.6 Family livelihood

About 79.2% of the respondents' livelihood graduated from satisfactory to sufficient level and 100% from not enough to satisfactory level (Table 4). Livelihood graduation here refers to as those households moved to next higher level through a sequenced set of interventions that build their income, assets and resilience over time.

Data were collected from same respondents for both before and after subsidy support to compare the difference. The study (Nayak 2020) reported that, the subsidy and related schemes aimed at poverty alleviation and enhance interest among small and marginal farmers for taking up livestock farming in generating income. Similar study (Musa and Dahiru 2025) reported that, it has helped beneficiaries in removing financial constraints and accessing to improved inputs and technology. There was a strong relationship between government agricultural subsidy and productivity on poverty reduction and should consider agricultural as poverty reduction policy (Ismail and Zaria 2023).

Table 3: Income generated from sale of piglets and pork (Nu. in million).

Particular	Before subsidy support	After subsidy support
Min. income from sale of piglets	0.021	0.056
Max. income from sale of piglets	5.8	15
Mean income from sale of piglets	0.48	1.47
Min. income from sale of pork	0.025	0.05
Max. income from sale of pork	4.8	20.25
Mean income from sale of pork	0.33	1.38



Figure 4: Assets purchased before and after subsidy support.

Table 4: Livelihood of farmers before and after subsidy support.

Livelihood level	Before subsidy support	After subsidy support
Not enough	6	0
Satisfactory	95	6
Sufficient	15	120

3.7. Employment generation and payment

The piggery activities have generated a job opportunity for both youths and others. It was found that, only 3.9% (n=5) employed in farm activities prior to subsidy support and it has increased to 23.6% (n=30). Prior to subsidy support program, only 5 farms owners recruited one employee each to operate the farms whereas after implementation of subsidy support program, about 30 farms owners employed 1 to 2 youths creating a conducive environment for our enthusiastic youth groups to engage in pig farming, running meat shop and as Meat Van drivers. Youth employment has considerably increased after the subsidy support through recruitment of minimum labour of one to a maximum of four labour on a salary basis. The monthly salary helped our youth keep engaged in productive way and has a greater financial benefit (Table 5).

Table 5: Salary for employment before and after subsidy support (In thousands).

Salary level	Before subsidy support	After subsidy support
Min. salary	8000	10000
Max. salary	15000	12000
Mean salary	11500	11000

3.8 Major problems in Pig farming

Majority of respondents (63%) reported feed as main issues followed by market (11%) and restocking of animals (8.7 %) among others prior to subsidy support. About 54.3% of respondents reported feed as major issues followed by diseases (29.1%) and restocking of animals (12.6%) among others post subsidy support. The feed was a main issue for both before and after subsidy

support due to high price and its affordability. The concerned authority needs to talk with feed company to negotiate feed price or feed support for one production cycle and marketing supports at output level would at least address the present issues.

3.9 Government support and areas of intervention

Out of 127 respondents, the study showed that, support required on sheds construction was 35.43% (n=45) followed by input supply (animals) was 27.56% (n= 35) and marketing support was 12.60% (n=16) among others. Farmers also expressed the need for support on loan (9.4%), health and support (11%), policy support of 2.4 % and a technical support/training requirement of at least 1.6% for the success of the piggery farming. Similarly, the study (Dangi 2024) reported that, the government provides an 80% subsidy on the insurance premium to motivate farmers. It was also suggested to increase sum insured amount, premium, subsidy and claims to motivate famers in helping them to enhance productivity and reduce the poverty (Dangi 2024). It was reported that, crop sector accounted for 99% while the livestock sector accounted only 1% of the total subsidy allocation (Lal 2020) and in livestock setor, veterinary and health services had the highest share with lowest in livestock insurance component (Lal 2020). Similarly, the study (Nayak 2020) revealed that, restructuring livestock processes and policy interventions are required to increase the farmers' income. It was reported that, the subsidy on various components was provided to beneficiaries for a succesful and sustainability of agricultural farming (Bayram et al. 2022). Similar study (Chand 2019) reported that subsidy support both in input and output prices was found to be an important policy instruments to create a

table and remunerative economic environment for agricultural commodities.

4. Sustainability of the pig farming

The present study showed that, majority of respondents (n = 103) are in the age from 22- 52 years which comprised of 81.1 % indicating there is a viability of the pig farming. Only 18.88% (n=24) respondents were in the age above 53 years including a 73 years old man. In terms of pig rearing status and continuation of pig farming activities, all respondents (100%) wished to invest further and continue farm activities. Moreover, it was found that, majority (69.3%) wished to continue pig farming activities for more than 10 years followed by 18.1% for at least 5 years and 12.6% for next 10 years which indicates the sustainability of farm is not an issue. In addition, majority (42.5%) of respondents' main source of income is from pig farming alone, expressed as profitable business (35.4%) followed by source of livelihood (7.1%) and children education (2.4%) among others which give plus point for sustainability of the pig farming activities.

5. CONCLUSION

Subsidy support provided by the government during 12th FYP through various projects through Contract Piglet Breeder and Big Ticket Initiatives has yielded a positive results in pig production. The subsidy program has enabled pig farmers to establish more fattening and breeding farms to scale up both pork and piglet production in the country. It has also helped in improving the livelihood of farmers especially in rural areas. Through this subsidy program, it has also generated employment opportunity for our rural youth. Overall, the increased household income has helped our farmers in reducing financial burden, improving living standard and

meeting nutritional status of family members. This study suggests that farmers require government interventions and support to upgrade piggy farming from subsistence to commercial level. In addition, the viability of the farm and its sustainability is not a concern for next 20-30 years.

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