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Innovations and economic viability of piggery as an agribusiness enterprise: A case study of farmer producer company in Punjab

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Abstract

Piggery has strong potential for diversifying income, expanding markets, and adding value in rural India. This case study looks at the economics and marketing strategies of the Farmway Farmer Producer Company Limited (FFPCL), a new model that combines breeding, finishing, processing, and direct marketing of pork and processed meat. A detailed cost analysis shows an annual net return of ₹12.53 lakh, which is about ₹3,627 per animal per month. Feed accounts for over 86% of the variable costs in a unit that operates with 22 sows and 2 boars for breeding and finishing. The Benefit-Cost Ratio (BCR) of 1.47 and a Return on Investment of 63.9% confirm strong financial viability. Adding value through on-farm processing of raw pork into sausages, pickles, and frozen cuts boosts profitability and helps reach premium markets such as hotels, retail outlets, and direct consumer sales. This study points out the potential of piggery for sustainable, farmer-led development in India, showcasing livestock-based FPCs as models for sustainable agricultural diversification. However, there is a need for specific policy support, modern slaughterhouse facilities, affordable credit, and research on natural preservatives to meet safety standards and access global pork markets. The study is grounded in value chain theory and transaction cost economics to explain how the FPC model reduces coordination costs and enables premium market access. Findings are specific to Punjab and should not be generalized to rural India without further comparative evidence.

Keywords: Piggery, farmer producer company, value addition, agribusiness innovation, economic analysis, Punjab

Introduction

Agricultural diversification through livestock farming is vital for improving rural livelihoods and securing income for small and marginal farmers in India. Among the different livestock options, pig farming has become popular as a profitable business due to its short production cycle, high reproduction rates, and rising demand for pork and processed products (Poulton, Dorward, & Kydd, 2010) ^[14]. However, the pig farming sector has faced challenges such as scattered production, limited access to quality inputs, poor marketing channels, and insufficient policy support (Suri, 2006) ^[17].

The rise of Farmer Producer Organizations (FPOs), especially under the structure of Farmer Producer Companies (FPCs), offers a new way to tackle these issues by bringing smallholder farmers together. These organizations enable economies of scale, improve access to credit, inputs, technology, and markets, and promote value addition through product diversification (Bali, 2021) ^[1]. The Farmway Farmer Producer Company Limited (FFPCL) in Punjab is a prime example of this innovation, as it combines pig production, processing, and marketing activities in one entity, thereby strengthening the entire pig farming supply chain.

Using a case study approach, this research examines the economics of the pig farming enterprise operated by FFPCL. It details production parameters, cost structures, marketing strategies, and efforts in product diversification.

The study also highlights operational challenges and policy gaps, including the need for natural preservatives in meat processing, the requirement for infrastructure such as slaughterhouses, and greater government support, all vital for expanding pig farming in India. These insights have broader implications for sustainable rural business development, income diversification, and agribusiness innovation in developing economies (World Bank, 2008; Ornberg, 2003) ^[22, 12].

This study is anchored in two complementary theoretical traditions. Value chain theory (Kaplinsky and Morris, 2001) ^[7] provides the framework for understanding how FFPCL creates and captures value across the pig farming supply chain, from input procurement and breeding through processing and marketing. Transaction cost economics (Williamson, 1979) ^[21] explains why the FPC organizational form is efficiency-enhancing: by internalizing transactions that would otherwise involve high search, negotiation, and enforcement costs for individual smallholders, FFPCL reduces market frictions and enables access to premium institutional buyers. Together, these frameworks predict that collective action through an integrated value chain should produce superior economic outcomes relative to atomized individual farming, a hypothesis this study empirically tests in the context of piggery in Punjab.

Therefore, the present study focuses on the commercial pig farming activities carried out by the FFPCL, with an emphasis on Punjab, where pig farming is an important way

for small and marginal farmers to diversify their livelihoods. The research includes various aspects such as the organizational setup of the FPC, production efficiency, input usage, marketing routes, product diversification into processed pork products, and the economic feasibility of these initiatives. By concentrating on this specific FPC, the study showcases how collective action by farmers can improve market access, secure better prices, and encourage innovation in farming practices related to piggery in Punjab. This localized perspective provides valuable insights that could help inform policy and support systems to replicate similar models in different areas. The study is aimed to guide policymakers, researchers, and practitioners on how collective farmer action, backed by the right ecosystems, can change traditional livestock sectors into vibrant commercial enterprises.

With this background, the main objectives of the present study are listed as follows:

- 1) To examine the economics and marketing strategies of commercial pig farming as a business run by the Farmway Farmer Producer Company Limited (FFPCL) in Punjab.
- 2) To provide a detailed assessment of production factors, cost structures, and ways to add value within the piggery value chain supported by the FPC model.
- 3) To identify the challenges and policy gaps that impact the growth and sustainability of pig farming businesses in the area.

Literature review

Piggery is gaining recognition as a viable livestock business that can greatly support rural livelihoods and diversify incomes in India. Studies on piggery economics show its benefits like high reproduction rates, early maturity, and efficient feed conversion. These traits make pig farming appealing, especially for small and marginal farmers (Poulton, Dorward, & Kydd, 2010) ^[14]. Despite its promise, challenges persist, including fragmented production, poor access to quality inputs, and weak marketing. These issues hinder the growth of piggery businesses. (Birtal *et al.*, 2015) ^[2] demonstrated that livestock-based income diversification significantly reduces consumption poverty among smallholder households in India, with pigs among the highest-return species per unit of land. However, their study noted that returns are strongly contingent on market access and value chain integration, a constraint that remains binding for atomized producers. Comparative evidence from Southeast Asia (Lapar *et al.*, 2005; Delgado *et al.*, 2008) ^[9, 5] corroborates this pattern, showing that pig farmers integrated into formal value chains earn 25-40% higher net margins than those relying on spot markets, primarily by avoiding distress sales and capturing processing premiums. Similar findings have been reported in Northeast India, where pig enterprise generates positive returns but its profitability is significantly affected by feed costs, disease management, and marketing problems (Kumaresan *et al.*, 2009; Singh *et al.*, 2016) ^[8, 1]. These results suggest that market integration is an important determinant of economic viability of pig farming. In this context, Farmer Producer Organizations (FPOs) could be recognized as an institutional framework for overcoming the market-related constraints faced by the smallholder producers.

Furthermore, Farmer Producer Organizations (FPOs) have emerged as a way to solve market-related issues that smallholder farmers face. They do this by pooling resources and boosting bargaining power. FPOs help farmers access credit, technology, inputs, and markets. They also lower transaction costs and enable better participation in value chains (Bali, 2021) ^[1]. (Trebbin, 2014) ^[20] argued that working together in producer organizations boosts farmers' bargaining power, improves access to markets, and cuts transaction costs. Likewise, (Datta, 2012) ^[4] showed that group marketing can help overcome disadvantages of scale, improve pricing, and provide access to inputs and services that individual producers often cannot reach. These findings indicate that organizational changes may be just as vital as technological advances for improving farm profits. Evidence shows that FPOs significantly improve income, create jobs, and encourage better farming practices among their members (Asian Research Journal of Agriculture, 2024; NABARD, 2025).

Beyond collective marketing arrangements, agribusiness innovation in India has been driven by the rise of agri-startups and new business models that combine technology and entrepreneurship to tackle issues in production, processing, and marketing of livestock enterprises. Government initiatives and incubators have been key in promoting these innovations, particularly by supporting improvements at the farm level, enhancing livestock welfare, and adding value (Raj *et al.*, 2023) ^[16]. Innovations in the livestock sector, such as piggery, include product diversification, modern processing techniques, and new forms of collective farmer action (Ornberg, 2003; MANAGE Centre for Innovation and Agripreneurship, 2023) ^[12].

The literature shows that profitability in pig farming relies not just on biological benefits like rapid growth and efficient feed use, but also on market and institutional factors. Research on livestock diversification points out that pig farming could help reduce poverty. Studies from India and Southeast Asia reveal that being part of organized value chains plays a crucial role in economic success. Evidence regarding Farmer Producer Organizations (FPOs) suggests that working together can help overcome market problems by boosting bargaining power, lowering transaction costs, and improving access to inputs and services.

However, the present study intends to fill the gap in existing studies. There is limited detailed economic analysis specific to piggery within FPCs, particularly regarding cost structures, production metrics, and marketing strategies tied to processing and value addition. Additionally, issues related to policy support, infrastructure like slaughterhouses, and technology needs such as natural preservatives in meat processing remain largely unexamined. This study will provide empirical evidence from the Farmway Farmer Producer Company Limited (FFPCL) in Punjab to address these gaps and suggest strategies for scaling piggery agribusiness through collective farmer efforts.

Methodology

Research Design: This study adopts a single instrumental case study design (Yin, 2018; Stake, 1995) ^[23, 1], appropriate when the goal is to use a specific case as a vehicle for understanding a broader phenomenon. The FFPCL is

selected as an instrumental case because it represents a purposive best-practice example of an integrated pig farming FPC in India, enabling examination of how collective action and value chain integration generate economic outcomes that may be replicable in analogous agro-climatic and institutional settings. A single case design is justified by the rarity of fully integrated piggery FPCs with processing units and institutional market linkages in India at this stage of sector development. The study is not intended to be statistically representative of all FPCs but to generate transferable analytical insights (Lincoln and Guba, 1985).

Data Collection: Primary data were collected through structured interviews with FFPCL management, the farm manager, and a purposive sample of ten member farmers during [period of data collection]. Farm-level financial records, feed purchase logs, production registers, and sales invoices for the reference year [year] were obtained directly from FFPCL and cross-verified against interview responses. Secondary data sources include the Punjab State Livestock Census (2019), NABARD FPO promotion guidelines, National Livestock Mission scheme documents, and relevant academic literature. Data triangulation across these sources was used to validate self-reported financial figures and improve internal validity (Creswell, 2014).

Analytical Framework: The economic analysis follows a cost-benefit accounting framework (Gittinger, 1982) ^[6] applied at the enterprise level. The principal indicators computed are: (i) Total Cost of Production (fixed + variable); (ii) Gross Income; (iii) Net Return; (iv) Benefit-Cost Ratio ($BCR = \text{Gross Income} / \text{Total Cost}$); (v) Return on Investment ($ROI = \text{Net Return} / \text{Total Capital Investment}$); (vi) Payback Period; and (vii) Feed cost as a percentage of total variable cost. A sensitivity analysis was conducted by modelling three feed price scenarios (baseline, +10%, +20%, +30%) to assess the robustness of net returns to the dominant cost driver. The value addition premium is calculated as the percentage price differential between processed products (sausages, pickles) and raw pork. All monetary values are in Indian Rupees (INR) at constant prices for the reference year.

Limitations: As a single-case study, findings reflect the specific organizational, institutional, and agro-economic conditions of FFPCL in Punjab and cannot be statistically generalized to all piggery FPCs in India. Financial data are self-reported by FFPCL and, while triangulated, may be subject to recall or presentation bias. The analysis does not account for intra-year price volatility in either input or output markets, nor for the imputed labour cost of unpaid family labour which may understate true costs for member farmers. Future research employing multi-case comparative designs across states would significantly strengthen the generalizability of findings.

Overview of Farmway Farmer Producer Company Limited (FFPCL)

The Farmway Farmer Producer Company Limited (FFPCL) was founded to empower pig farmers in Punjab by pooling their resources and skills to run pig farming as a profitable business. FFPCL is based on the idea of Farmer Producer Organizations (FPOs) registered with NABARD. These are membership groups that aim to boost farmers' bargaining

power, improve access to inputs, credit, technology, and markets, and encourage value addition and sustainable rural livelihoods.

FFPCL was created to tackle the scattered nature of pig farming in Punjab. Small and marginal farmers often work alone, facing challenges in market access and bargaining power. By bringing farmers together under the FPC structure, FFPCL helps achieve economies of scale. This leads to cost reductions in purchasing inputs, coordinated production methods, and smoother marketing efforts. This collective approach helps overcome individual challenges related to capital, technology use, and infrastructure.

FFPCL operates as a registered company under the relevant cooperatives and corporate laws for Farmer Producer Companies in India. It has a formal governing body made up of elected farmer representatives who handle strategic decisions, operational management, and financial oversight. The organization includes various units focusing on breeding, production management, feed supply, veterinary care, and processing/value addition of pork products.

In the pig farming business, FFPCL plays a vital role by combining production, processing, and marketing activities. The company manages breeding-cum-finisher farms, mainly raising the Large White Yorkshire (LWY) breed known for its high fecundity and efficient feed conversion. It also raises other crossbreeds like LandraceLWY and DurocLWY. Furthermore, FFPCL runs value addition units that produce sausages, pickles, and other processed pork products. This improves product diversity and market competitiveness.

By centralizing the supply chain and improving coordination among member farmers, FFPCL not only enhances product quality and consistency but also creates direct market connections with hotels, retailers, and consumers through platforms like kisanmelas and farm gate sales. Its role includes advocating for policy support, infrastructure development, like slaughterhouses, and research collaborations. These elements are essential for expanding pig farming in Punjab.

Overall, FFPCL represents an innovative business model where collective farmer action, supported by a structured organization and integrated value chains, fosters economic viability and sustainability for commercial pig farming in the region.

Production parameters at pig farms in Punjab

The piggery unit operates under the Farmway Farmer Producer Company Limited (FFPCL) in Punjab. It functions as a breeding and finishing unit, raising pigs from birth to market age. The enterprise keeps 22 breedable sows and one breeding boar, which ensures a steady supply of piglets for fattening and sale. The farm primarily raises the Large White Yorkshire (LWY) breed. This breed is known for its high fertility, fast weight gain, efficient feed use, shorter generation times, smaller space needs, and a high dressing percentage of 70 to 80%. The farm also maintains crossbreeds like Landrace × LWY and Duroc × LWY to enhance adaptability and meat quality. The production traits are listed in Table 1. The reproductive efficiency of two farrowings each year, with an average interval of 146 days, supports quicker turnover and a reliable supply of finishers for sale.

Initial capital investment

Starting a large pig farm in Punjab with a 22+2 unit involves considerable startup costs. The biggest expense is building the sheds, followed by buying pigs and equipment (Table 2). Establishing the piggery under Farmway Farmer Producer Company Limited (FFPCL) required a total initial investment of ₹19.60 lakh. This included purchasing animals at different ages, which cost ₹3.11 lakh in total. Infrastructure costs were significant, totaling ₹9.78 lakh for constructing a covered shed at ₹265 per square foot. Additionally, ₹3.61 lakh went towards essential equipment such as nipple drinkers, weighing scales, heating systems, foggers, and a utility vehicle to ensure proper management and animal care. This capital investment laid the groundwork for efficient breeding, rearing, and value-added processing operations.

Annual costs and returns

The detailed cost structure for the 22+2 pig unit is provided in Table 4. Feed makes up over 86% of total variable costs, showing its key role in profitability. A detailed cost-benefit analysis of the FFPCL piggery enterprise indicates strong economic viability. The total annual operating cost reaches ₹26.62 lakh, with variable costs making up most of this at ₹24.60 lakh. Feed expenses alone account for more than 86% of variable costs, emphasizing the feed-heavy nature of pig rearing. Fixed costs, including depreciation and interest on investments and infrastructure, are relatively low at ₹44,605 a year. The enterprise generates an annual gross income of ₹39.16 lakh, leading to a net return of ₹12.53 lakh each year. On a per-animal basis, the monthly gross income is ₹12,851, resulting in a net return of ₹3,627 after covering a monthly per-animal cost of ₹9,223. The monthly overall net return for the enterprise is ₹1.04 lakh. Moreover, feed remains the largest operational cost and a key factor in profitability. A combination of green fodder, concentrates, and additives is provided based on the age of the pigs (Table 3).

These figures highlight the financial sustainability of a well-run, value-added piggery model under a Farmer Producer Company. Profitability is further improved by value addition, effective herd management, and direct marketing strategies used by FFPCL.

Economic viability and insights

The financial analysis shows that FFPCL's piggery model is profitable, generating annual net returns of ₹12.53 lakh, with an average of ₹3,627 per animal each month. Profitability improves through farm-based value addition, including sausages, raw meat, pickles, and frozen meat sold via hotel contracts, kisanmelas, and farm-gate channels. Beyond net income, the Benefit-Cost Ratio (BCR) of 1.47 (Gross Income Rs.39.16 lakh / Total Cost Rs.26.62 lakh) confirms that for every rupee invested in operations, the enterprise generates Rs.1.47 in gross revenue, a strong viability signal for smallholder investment. The Return on Investment (ROI) on the initial capital outlay of Rs.19.60 lakh is 63.9% annually (Net Return Rs.12.53 lakh / Total Investment Rs.19.60 lakh), indicating a payback period of approximately 19 months under current operating conditions. A sensitivity analysis reveals that net returns remain positive even at a 20% increase in feed costs

(estimated net return ~Rs.7.47 lakh), but a 30% feed cost rise would reduce annual net returns to approximately Rs.5.41 lakh, compressing BCR to 1.20. This underscores the critical importance of feed cost management and supply chain stability. Authors should insert a sensitivity analysis table (Table 5) here showing net return, BCR, and ROI under baseline, +10%, +20%, and +30% feed cost scenarios. The average selling prices from the value-addition unit are:

1. Raw meat - ₹200/kg
2. Sausages - ₹440/kg
3. Pickles - ₹450/kg

By combining breeding, finishing, and processing, and using the combined strength of the Farmer Producer Company structure, FFPCL reduces costs, improves market access, and adds value, making piggery a sustainable and competitive agribusiness in Punjab. The value addition premium is substantial: sausages at Rs.440/kg represent a 120% price premium over raw meat at Rs.200/kg, while pickles at Rs.450/kg yield a 125% premium. This confirms that the processing unit is not marginal to profitability but central to it.

Marketing strategies and product diversification

Farmway Farmer Producer Company Limited (FFPCL) uses strategic marketing to boost the competitiveness and market reach of both fresh pork and processed pig products. By utilizing the collective strength and resources of its member farmers, the FPC helps overcome common challenges faced by individual pig farmers, such as limited market access, price swings, and lack of value addition.

Marketing Channels for Pork and Processed Products

FFPCL follows a multi-channel marketing strategy to maximize sales and market coverage. Fresh pork and processed products like sausages and pickles are sold through various outlets, including:

1. Direct Farm Sales: Selling directly from the farm gate lets FFPCL control pricing and ensure product quality.
2. KisanMelas: Participation in agricultural fairs opens access to a wide customer base, including local consumers and traders.
3. Retail Distribution: Supplying products to retailers helps establish broader market availability.
4. Institutional Buyers: Contracts with five-star hotels and catering services create premium demand and stable sales. This connection allows the FPC to get better prices and build a reputation for quality.

These varied channels reduce reliance on any single outlet and show the FPC's ability to capture different market segments, boosting overall revenue.

Role of FPC in value addition and market access

The FPC plays a key role in adding value by processing raw pork into high-value products like sausages, pickles, and frozen meat. This processing unit, equipped with specialized machinery costing around ₹1,14,850, enables the FPC to diversify its product range and enter premium markets. Value addition extends the shelf life and appeal of pork products, catering to consumer convenience and changing tastes. Additionally, the collective structure of FFPCL allows member farmers to benefit from economies of scale

in purchasing inputs, sharing processing facilities, ensuring quality control, and coordinating marketing efforts. This organizational strength improves access to credit, technology, and market information, which would be challenging for individual farmers to achieve on their own. The FPC acts as an aggregator and marketer, effectively connecting farm production with consumer markets and institutional buyers.

Pricing Structure and Product Portfolio

FFPCL's product lineup includes

- **Raw Meat:** Priced at an average of ₹200 per kilogram, offering high-quality fresh pork.
- **Sausages:** Sold for ₹440 per kilogram, sausages appeal to consumers looking for ready-to-cook processed pork.
- **Pickles:** Available at ₹450 per kilogram, pickles cater to a niche market with unique tastes and preservation methods.

These price points reflect the added value from processing and quality control, leading to improved profitability for the producers.

In summary, FFPCL's marketing strategy combines direct sales, retail, institutional contracts, and participation in public fairs to increase market access. The FPC's role in value addition and coordinated marketing efforts raises farmer incomes by supporting diversification into processed meat products with appealing pricing, strengthening the economic sustainability of piggy as an agribusiness in Punjab.

Challenges and policy implications

The Farmway Farmer Producer Company Limited (FFPCL) piggy enterprise in Punjab shows promising economic potential but faces several operational and systemic challenges that must be addressed to sustain and grow its agribusiness model.

Operational Challenges. A key issue is the ongoing fragmentation of pig farming, where many farmers operate on a small scale. This situation limits the benefits of economies of scale and makes it difficult to maintain consistent quality across member farms. The high cost of feed remains a significant expense, making profitability sensitive to changes in feed prices. Additionally, inadequate infrastructure, particularly the lack of modern, hygienic slaughterhouses, limits timely processing and market access. This restriction affects product quality and expansion possibilities. The limited availability of modern technologies for natural preservatives and value-added processing also hampers product diversification and extending shelf-life.

Access to financial and regulatory support continues to impede scaling FFPCL's piggy enterprise. The National Livestock Mission (NLM) provides capital assistance up to 50% of the project cost for eligible piggy projects under the Entrepreneurship Development Programme, subject to prescribed ceilings for breeding and commercial piggy units. However, despite the accessibility of these provisions, Farmer Producer Companies are often constrained in availing the full benefits due to substantial initial investment requirements, procedural complexities, collateral requirements and delays in fund disbursement. Consequently, there is the gap between financial support

available under government schemes and the capital required for setting up modern slaughtering, processing, cold-chain and value addition infrastructure. In addition, expansion into premium domestic and export markets requires compliance with stringent food safety regulations. Processed pork products such as sausages, pickled meat, and frozen meat must conform to the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011, including prescribed requirements for approved food additives, microbiological standards, hygienic processing, packaging, labelling, and temperature-controlled storage and transportation. FSSAI standards require chilled meat products to be stored and transported at or below 4°C and frozen meat products at or below 18°C, while processed meat products must comply with specified microbiological and food additive limits. Compliance with these standards is essential for improving shelf life, ensuring product safety, and enhancing the potential of FFPCL to access higher-value institutional and export markets.

Government support is essential to overcome these limitations. Increasing capital subsidies and credit options, especially for piggy enterprises organized as FPCs, can enable necessary investments in infrastructure and technology (National Livestock Mission, 2025) ^[11]. It is crucial to develop modern slaughterhouses that meet food safety standards, strategically placed near farming clusters to support hygienic processing, compliance, and market growth (Ministry of Food Processing Industries, 2009). Moreover, research and development efforts should focus on natural preservatives and new meat processing techniques to improve product shelf-life and meet export quality requirements (Sajad *et al.*, 2023; PMC, 2021) ^[18]. Training initiatives through extension services can enhance farm management, operational efficiency, and compliance with quality standards. Finally, building strong market connections with institutional buyers, retailers, and exporters, supported by appropriate policy frameworks, would enable FPCs like FFPCL to access premium markets and increase farmer incomes (Bali, 2021) ^[1].

Recommendations

1. Provide integrated subsidy and credit schemes to support capital investments in breeding, housing, and processing infrastructure.
2. Establish and modernize slaughterhouse infrastructure with support from the government and public-private partnerships (Ministry of Food Processing Industries, 2009).
3. Supply funding and technical support for R&D in natural preservatives and processing technologies to improve product quality and shelf-life (PMC, 2021).
4. Strengthen training and extension services for piggy farmers and FPC management to promote better operational practices.
5. Facilitate policies for market infrastructure development to connect FPCs directly with various buyers and export channels.
6. Recognize piggy as a crucial sector deserving dedicated policy incentives to support sustainable growth and improve rural livelihoods.

By addressing these challenges with coordinated policy and ecosystem support, piggy enterprises under the Farmer

Producer Company model like FFPCL can become scalable, innovative agribusinesses, making significant contributions to rural incomes, agricultural diversity, and export potential.

Table 1: Production traits of pig farms in Punjab (22+2 unit)

S. No.	Production parameters	Average values
1	Average litter size at birth (No.)	10-12
2	Mortality at birth (%)	10-12
3	Average birth weight of piglet (g)	1000-1400
4	Weaning age (days)	21-35
5	Average litter weight at pre-weaning (kg)	5
6	Average litter weight at post-weaning (kg)	20-22
7a	Average maturity age - Boar (months)	8
7b	Average maturity age - Sow (months)	8
8a	Average weight at breeding - Boar (kg)	85-90
8b	Average weight at breeding - Sow (kg)	85-90
9a	Male piglet ratio (%)	51
9b	Female piglet ratio (%)	49
10	Number of farrowing per year	2
11	Farrowing interval (days)	145-147
12	Average saleable age of finisher (months)	9-10
13	Weight at saleable age of finisher (kg)	100-120

Table 2: Average initial capital investment on pig farms in Punjab (22+2 unit)

Sr. no.	Particulars	Amount (₹)
1a	Sows (@ ₹2,250 at 2-month age)	2,88,333
1b	Boar	22,333
1c	Total cost of pigs	3,10,667
2	Cost of covered shed (@ ₹265/sq.ft)	9,77,920
3	Equipment (nipple drinkers, weighing scale, vehicle, foggers, heating)	3,60,602
4	Total Initial Investment	19,59,855

Table 3: Estimated proportion of feed used by pig farmers

Category	Green (%)	Energy (%)	Protein (%)	Fibre (%)	Additives (%)
Weaner	15	30	35	10	5
Grower	25	25	30	15	5
Finisher	25	35	20	10	5
Adult (sow/boar)	35	20	25	15	5

Table 4: Annual cost structure and returns - 22+2 pig farm

Particulars	Amount (₹)
A. Fixed Costs	44,605
Interest on investment (10% p.a.)	65,118
Interest on building (5% p.a.)	21,669
Depreciation on equipment (10% p.a.)	12,020
B. Variable Costs	24,60,362
Feed cost	21,27,095
Labour cost	1,77,000
Veterinary expenses	42,667
Miscellaneous (electricity, diesel, disinfectants, etc.)	41,667
C. Total cost/year	26,62,157
Total cost/month	2,21,846
Total cost/animal/month	9,223
D. Gross income/year	39,15,865
Gross income/animal/month	12,851
E. Net return/year	12,53,708
Net return/month	1,04,476
Net return/animal/month	3,627

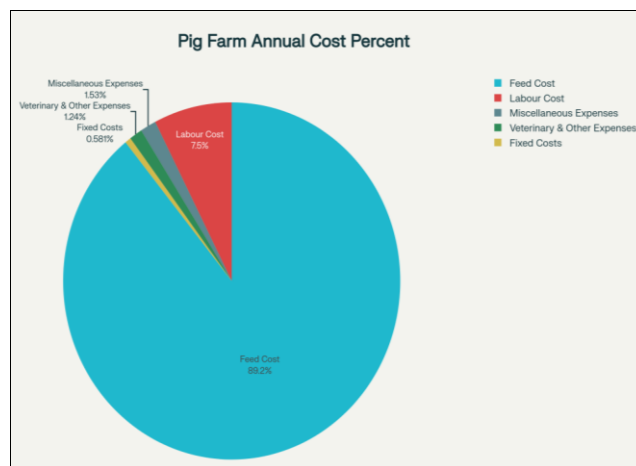


Fig 1: Annual percentage share of various variable cost and fixed cost incurred on a pig farm

Conclusion

The case study of the Farmway Farmer Producer Company Limited (FFPCL) in Punjab shows that collective action through the Farmer Producer Company model can turn piggery into a profitable, scalable, and market-oriented agribusiness. By integrating breeding, finishing, and value-added processes into a single organization, FFPCL has overcome many challenges faced by small and marginal pig farmers, such as market access, price volatility, and infrastructure issues. These findings make three contributions to the agricultural economics literature. First, they provide rare quantitative enterprise-level evidence for value chain theory as applied to livestock FPCs in India, confirming that vertical integration of breeding, processing, and marketing generates a BCR of 1.47 - consistent with the value capture predictions of Kaplinsky and Morris (2001) [7]. Second, they extend Birtal *et al.* (2015) [2] by showing that livestock income diversification benefits are significantly enhanced when collective organizational structures enable value addition, rather than limiting analysis to production-stage income only. Third, the transaction cost lens (Williamson, 1979) [21] is validated by the institutional buyer relationships FFPCL has established, which atomized individual farmers would be unable to access given information asymmetries and contracting risks in spot pork markets. Importantly, these conclusions are specific to Punjab and to the FFPCL model; replication in other states would require comparable institutional support, cold chain infrastructure, and proximity to premium urban markets.

The economic analysis of the 22+2 pig unit confirms the financial viability of commercial pig farming, with an annual net return of ₹12.53 lakh, or ₹3,627 per animal each month, after covering all fixed and variable costs. Feed remains the largest cost, emphasizing the need for efficient feed sourcing and formulation for profitability. The addition of on-farm processing facilities for products like sausages, pickles, and frozen cuts provides significant value, improves product shelf-life, and opens access to premium markets, especially hotels, retailers, and direct consumers.

FFPCL's achievement relies not just on technological innovation but also on organizational innovation that uses the cooperative strength of farmers to achieve economies of

scale, enhance bargaining power, ensure production quality, and diversify product offerings. This combination of collective enterprise and agribusiness innovation has created new income streams, boosted market competitiveness, and set the stage for entry into high-demand domestic and export markets.

Regarding rural development, this model significantly aids income diversification by reducing dependence on crop farming, spreading financial risk, and creating year-round jobs in breeding, feeding, processing, and marketing. The piggery value chain under FFPCCL supports farmer livelihoods and strengthens local agribusiness trade, potentially boosting regional economic growth and food system resilience.

In summary, the experience of FFPCCL demonstrates how structured farmer-led value chains, backed by targeted policy measures, infrastructure investments, and market support, can transform traditional livestock farming into a competitive and sustainable agribusiness. Expanding such models to other regions could significantly enhance rural incomes, foster entrepreneurship, and strengthen India's position in the global pork and processed meat market.

References

1. Bali A. Towards ecosystem support for strengthening Farmer Producer Organisations. AESA Blog. 2021;(154). <https://aesanetwork.org/blog-154-towards-ecosystem-support-for-strengthening-farmer-producer-organisations/>
2. BIRTHAL PS, NEGI DS, KUMAR S, AGGARWAL S. Is smallholder livestock production associated with higher household incomes? Empirical evidence from India. SpringerPlus. 2015;4(1):498. doi:10.1186/s40064-015-1290-1.
3. Braverman A, Guasch JL, Miller C. Access to formal credit by small-scale farmers. Washington (DC): World Bank; 1991. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/147161468739367111/access-to-formal-credit-by-small-scale-farmers>
4. Datta SK. Emerging dynamics of producer companies in India. Agricultural Economics Research Review. 2012;25:59-72.
5. Delgado C, Narrod C, Tiongco M. Determinants and implications of the growing scale of livestock farms in four fast-growing developing countries. Washington (DC): International Food Policy Research Institute; 2008.
6. Gittinger JP. Economic analysis of agricultural projects. 2nd ed. Baltimore: Johns Hopkins University Press for the World Bank; 1982.
7. Kaplinsky R, Morris M. A handbook for value chain research. Brighton: Institute of Development Studies, University of Sussex; 2001. <http://www.inti.gob.ar/productividad/pdf/Kaplinsky-Morris.pdf>
8. Kumaresan A, Bujarbaruah KM, Pathak KA, Chhetri B, Ahmed SK, Haque N. Performance of pigs reared under traditional tribal low-input production system and chemical composition of non-conventional tropical plants used as pig feed. Livestock Science. 2009;119(1-3):251-258.
9. Lapa ML, Toan NN, Staal S, Minot N. Market participation of smallholder livestock producers in Southeast Asia. Agricultural Economics. 2005.
10. National Bank for Agriculture and Rural Development. Case studies on Farmer Producer Organizations. Mumbai: National Bank for Agriculture and Rural Development; 2025. <https://www.nabard.org>
11. National Livestock Mission. Promotion of Piggery Entrepreneur Scheme. 2025. <https://nlm.udyamimitra.in/Home/SchemePage>
12. Ornberg L. Farmers' choice: Contract farming, agricultural change and modernisation in Northern Thailand. Paper presented at: 3rd International Convention of Asia Scholars; 2003; Singapore. <https://www.researchgate.net/publication/>
13. Application of natural preservatives for meat and meat products. Pharmaceuticals. 2021;14(10):959. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8535775/>
14. Poulton C, Dorward A, Kydd J. The future of small farms: New directions for services, institutions, and intermediation. World Development. 2010;38(10):1413-1428. doi:10.1016/j.worlddev.2009.06.009.
15. Press Information Bureau. Scheme for modernization of abattoirs approved. Ministry of Food Processing Industries, Government of India; 2009. <https://www.pib.gov.in/newsite/erelcontent.aspx?relid=48099>
16. Raj S, Atmakuri Y, Kale AR, Praveen HJ, Kumar S, Abraham A. Case studies on agri-startups in India: Inspiration from Mann Ki Baat, innovations and impact. Journal of Agricultural Extension Management. 2023;24(1):51.
17. Suri KC. Political economy of agrarian distress. Economic and Political Weekly. 2006;41(16):1523-1529. doi:10.2307/4418109.
18. Sajad MSPZ, Rasheed R, Ganesan B. Formulation of natural preservative for nutrition addition and longer storage of chicken meat. International Journal of Creative Research Thoughts. 2023;11(6):220-229. https://ijcrt.org/papers/IJCRT_306137.pdf
19. TraceX Technologies. Importance of FPO in agriculture. 2024. <https://tracextech.com/blog/importance-of-fpo-in-agriculture/>
20. Trebbin A. Linking small farmers to modern retail through value chains: Evidence from India. Food Policy. 2014;45:35-44. doi:10.1016/j.foodpol.2013.12.010.
21. Williamson OE. Transaction-cost economics: The governance of contractual relations. Journal of Law and Economics. 1979;22(2):233-261. doi:10.1086/466942.
22. World Bank. World Development Report 2008: Agriculture for development. Washington (DC): World Bank; 2008. doi:10.1596/978-0-8213-6807-7.
23. Yin RK. Case study research and applications: Design and methods. 6th ed. Thousand Oaks (CA): SAGE Publications; 2018.