

POTENTIAL AND EVALUATION OF THE ECONOMIC INCENTIVES LINKED TO
EGG PRODUCTION IN WEST BENGAL, INDIA

by

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Dedication

This study is dedicated to my beloved father, Late Shambhu Charan Bhattacharyya, whose values, guidance, discipline and blessings continue to inspire me.

His life, principles and unwavering belief in hard work and contribution to society remain a constant source of strength throughout my personal, professional and academic pursuits - my Northern Star.

A token of dedication to his memory - with love, gratitude and reverence.

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I would like to express deepest gratitude to my wife, my dearest Amrita, for her constant support, patience, guidance, encouragement and understanding throughout this doctoral journey, among others.

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Her contribution is sincerely acknowledged with love, appreciation and gratitude.

ABSTRACT

POTENTIAL AND EVALUATION OF THE ECONOMIC INCENTIVES LINKED TO
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This study evaluates the potential and effectiveness of the West Bengal Incentive Scheme 2017 (WBIS 2017) in promoting commercial egg production in West Bengal, with a specific focus on commercial layer poultry farms. The study examines whether the Scheme contributed to augmenting production, movement towards egg self-sufficiency, farmer welfare, employment generation, consumer benefit and long-term sectoral sustainability.

A mixed-methods evaluative approach was adopted using secondary data, a structured quantitative survey and qualitative stakeholder interviews. Secondary data included Scheme records, poultry-sector data, egg-price trends, feed-ingredient price movements and farm-level feed-cost data. Primary quantitative data were collected through a stratified random survey of farmers. Qualitative data were obtained through judgment-sample interviews with policymakers, sector institutions, veterinarians and selected large farmers.

The findings were interpreted within the context of external shocks like post-COVID feed-cost escalation and market volatility. These findings indicated that WBIS 2017 was effective as a production-oriented investment-support intervention. Secondary and primary evidence also indicated that the Scheme contributed materially to the expansion of indigenous commercial layer capacity in West Bengal - a sanctioned increase of approximately 65 lakh birds by 2025 - augmenting the State's local egg-production base.

However, the benefits were spatially concentrated in districts such as Bankura and Paschim Medinipur.

Findings also indicate that, although the Scheme supported investment and materially augmented production - it was comparatively less effective in addressing farmer welfare and long-term sustainability issues. Severe feed-cost escalation, working-capital stress, declining profitability, market-price pressures and continued interstate egg inflows limited farms' financial resilience. These issues remained unaddressed by the Scheme.

The Scheme benefiting consumers economically, was not supported by the findings either. Consumer benefits were observed primarily in terms of freshness and local availability rather than affordability - egg prices were observed rising during the study period.

The study concludes that WBIS 2017 was partially successful — stronger as a production capacity instrument, weaker as a holistic sustainability-oriented framework. It recommends redesigning future poultry-sector incentives focusing not only on capacity enhancement, but also on feed-cost support and working-capital assistance. Market-linkage mechanisms, district-wise planning, faster subsidy release and sustainability-linked support structures are also identified as areas requiring support.

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CHAPTER I: INTRODUCTION

1.1 Nutrition, Eggs and WBIS 2017

Nutrition is a critical part of health and development. Better nutrition is directly related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases, and longevity. Healthy children learn better. People with adequate nutrition are more productive and can create opportunities to gradually break the cycles of poverty and hunger (World Health Organisation (WHO), 2018). Of the numerous sources of nutrition available to mankind, eggs are considered to be among the healthiest and most nutritious food (Gunnars, 2018). The complete protein that an egg provides, makes it an attractive food item - not just in countries that are classified as having developing economies or economies in transition, but also in the countries that are graded as being developed economies. The comparatively low cost of an egg literally makes it Nature's boon to the common man. What then logically flows through is that, in a country like India, which has an economy in transition, there should be increased focus on nutrition and, more so, on poultry egg production. This focus is reflected in the considerable growth in production of eggs in the country from ~ 8 billion eggs in 2014-15 to ~ 14.9 billion in 2023-24 (DARD, 2026).

Sharpening focus onto the State of West Bengal in India, indigenous egg production in 2018 was about 65% of consumption. Demand stood at 27.5 – 28 million eggs daily, whereas the State's produce was about 18 million per day (Business Standard, 2018). This deficit was met by importing eggs from other States in India. The demand-supply imbalance was leading to skewed prices and also meant that about a third of the eggs being consumed in West Bengal were not of the best quality. This is because eggs imported from other States take about seven odd days from date of production to reach retail counters.

In an effort to bridge the demand for eggs through indigenous production, the Government of West Bengal in the year 2017, launched a Special Incentive Scheme to augment the

commercial egg production in the State. Intent of the Scheme was to extend special fiscal incentives to encourage entrepreneurs to start up commercial layer poultry farms and poultry breeding farms, for enhancement of commercial egg production and generation of employment opportunities for the youth of the State.

Research was conducted to assess and evaluate the effect of the Scheme in West Bengal. The study examined whether there has been proper uptake of the scheme by entrepreneurs and whether implementation of the Scheme has helped, and if yes - to what extent, egg production in the State. Eggs were being imported from other States into West Bengal, so the existing farmers in West Bengal were initially in a comfortable position regarding their sales. The study assessed whether an increase in layer farms, induced by the Scheme, has resulted in a healthy level of competition among the farmers or, on the other hand, turned it into an elbow jostling market. Other aspects and intended effects that are also looked into - are whether the employment generated by these farms is overlapping on other agricultural activities of the people of the State. If people being employed by these farms are simply switching activities i.e. moving from direct farming into employment by the layer farms, then cognizance need be taken of such. These studies serve to identify whether such special incentive schemes are successful in achieving not just objectives of the Government, but also, their success in fuelling new entrepreneurs.

Research into the same also delivers further insight into how such schemes can be designed, modelled and/or modified to achieve desired outcomes.

1.2 Government Intervention

The logic behind Government intervention in various sectors is quite simple and straightforward. Basic objectives are to diffuse concentration of technological inputs, help poor households in creation of productive assets and to assist consumers from the decrease in real income caused by inflation in food prices. Currently, an array of assistance programs and incentives are made available to the agricultural sector, wherein the final beneficiaries and targets are spread out across different social classes, geographical areas and crops. Subbarao (1985) states the most common forms in which governments intervene is via incentive policies on:

- a. Price support
- b. Input subsidy
- c. Subsidised institutional credit

Taxes and subsidies are the two policy instruments key to a government's attempts at modifying market outcomes. Taxes pull, whereas subsidies push into the expenditure stream, thus affecting relative prices. Prices of taxed goods increase, whereas that of subsidised goods fall. Fiscal policies in India, effected in the early nineties had primarily focused on taxation, but reforms thereon have led to a subsidy regime that is quite broad in its approach (Srivastava D.K. and Rao C.B., 2002). Agricultural trade policy in India is part of a larger agriculture and food policy scheme that tries to address food sufficiency for the country whilst attempting to provide income support to the farmers involved in the agricultural sector. The Government of India intervenes in the agricultural sector through utilisation of various policy instruments in an attempt to achieve the same. On the domestic front subsidies are provided on inputs and outputs, transportation and storage as well as consumption to try and reduce production costs and thereon, consumer prices. Border measures like tariffs and quotas have also been implemented, along with non-tariff measures to safeguard domestic producers from import competition, govern domestic price levels and boost domestic supply. Studies demonstrate that of the different subsidies applied to agricultural sectors, India has been more dependent on input subsidies - compared with other large emerging economies. In 2007, input subsidies in India were valued at 9.6% of the country's total agricultural input, whereas Brazil, Russia and China were at less than 5% (Grossman, N. & Carlson, D, 2011).

A report published in 2021-22 by the Department of Animal Husbandry and Dairying, Government of India provides insight into the Government's outlook over the sector for the short, medium and long term. The livestock sector is an integral part of agricultural diversification and is targeted by the Government of India as a primary driver of growth in rural income and the Indian economy. As such, greater public investment in the livestock sector is being propagated to further boost growth and remuneration of the 100 million farmers engaged in the Animal Husbandry sector. Starting from 2021-22, The Government

of India has revised various components of schemes available to the sector with an outlay of Rs. 98 billion to leverage Rs. 546 billion over the next 5 years (DAHD, GoI, 2023). Livestock production and agriculture are inherently and naturally interlinked, each dependent on the other, and in totality - both crucial for overall food security. Of the different facets of livestock farming, poultry production has taken a major step forward over the last few decades, driven by a change from conventional farming practices to commercial production systems using state-of-the-art technological intervention (FAO and ILRI, 2011; Thornton, 2010; DAHD, 2022–23). The total poultry population in India, as per the 20th Livestock Census, is 851.81 million, with egg production at about 129.6 billion during 2021-22 - demonstrating a growth of 6.19% during that year. Egg production and the corresponding annual growth rate per year of India, from 2011-12 to 2022-23 (DAHD, 2023). The importance of subsidies in shaping the livestock sector is immense. It is vital that due importance be given to structuring of the policies and the same should be viewed as a dynamic process to ensure that benefits that construe do not stagnate and effectiveness, targeting and potential negative consequences are assessed regularly (Srivastava and Rao, 2002; Chandel, Lal and Kumari, 2019; Bellmann, 2019). This study reviews, studies and draws understanding of the fundamentals regarding framing of policies, latest trends in policies in agricultural and allied sectors and also outcomes of policies already implemented. This study builds a robust and broad knowledge base that helps conceptualise and contextualise the research methodology for assessment of the incentive policy outlined by the Government of West Bengal to enhance egg production in the State.

1.3 Subsidies

Subsidies are a key instrument in government intervention within the agriculture and allied sectors. They provide farmers with a safety net against the unpredictable nature of the industry. The unpredictability is driven by exposure to a variety of factors that can range from weather fluctuations, market fluctuations or even unforeseen challenges like natural disasters (Srivastava and Rao, 2002; World Bank, 2015). Poorly balanced subsidies may distort market signals, encourage overproduction, or unintentionally favour particular

commodities or beneficiary groups (OECD, 2019; Srivastava and Rao, 2002; Bellmann, 2019).

Thus, while subsidies can play an important role in supporting agricultural stability, investment and growth, their design must remain prudent, targeted and periodically reviewed. This is necessary to balance producer support with market efficiency and to avoid unintended outcomes such as dependency, resource misallocation or market distortion (Srivastava and Rao, 2002; Bellmann, 2019)

1.4 West Bengal Incentive Scheme 2017

The State of West Bengal holds a prominent position in India's poultry sector, ranking 4th among producer States (DAHD, 2025). Production, however, fell short of meeting daily consumption demand to a fair extent. This highlighted the pressing need to bolster commercial egg production in West Bengal. Recognising the need to bridge the demand-supply gap and improve per capita egg availability, the State Government placed significant emphasis on increasing indigenous egg production. This was sought to be achieved by promoting the establishment of commercial layer poultry farms and poultry breeding farms, with the broader objective of moving West Bengal towards self-sufficiency in egg production (IANS, 2018). The Government of West Bengal, in the year 2017, launched a Special Incentive Scheme for three years to augment the commercial egg production and poultry breeding farms in the State. Due to the disruption caused by the emergence of COVID-19, the Scheme had been extended in 2021 and 2022 for a year each and had again been extended for a further period of two years, on the same terms and conditions, scheduled to be run till August 2025 (DAHVS, GoWB. 2023).

Intent of the Scheme was to extend special fiscal incentives to encourage entrepreneurs to start up commercial layer poultry farms and poultry breeding farms, for enhancement of commercial egg production and generation of employment opportunities for youth of the State. This research study focuses on the subsidies related to commercial layer poultry farms.

1.5 Problem Statement

1.5.1 The Ideal Scenario:

India's population is a mix and match of tastes when it comes to vegetarian and non-vegetarian food, with palates somewhat geographically skewed towards the latter. The East and South of India are predominantly non-vegetarian and leading the pack is the population of West Bengal. Following on from this tryst with non-vegetarian food is the demand for eggs. As of 2018, there was a demand for 2.75-2.8 crore eggs daily in West Bengal while the state's poultry farms produced, on average, 1.8 crore eggs daily. The shortfall of nearly one crore eggs was plugged through imports from other states in the country (Business Standard, 2018). Egg consumption by people of West Bengal is higher than indigenous production in the State and herein lies the ideal case scenario for a farmer or an entrepreneur. Indigenous demand being far higher than indigenous production meant there was a substantial gap in supply that could be addressed. Economics ideates that increase in indigenous production, in the given scenario, should help farmers and consumers achieve better prices and fresher produce, respectively. Eggs have a short shelf life, with loss of nutrition and weight over time. Thus, the fresher – the better for consumers, not having to rely on eggs imported from other states, which take about a week to reach from farm to table. Observing the substantial gap between demand and supply, the Government of West Bengal introduced the WBIS 2017 Scheme for three years, in an effort to bolster egg production in the State. Having been affected by the COVID-19 mishap, the Scheme had been extended three times until 2025. Secondary evidence indicates that the Scheme contributed to substantial expansion of commercial layer bird numbers. Farms utilising the Scheme, new and expansion projects, have a sanctioned capacity of 65 lakh birds. However, questions remain regarding sustainability, profitability and market resilience. Nevertheless, it looked to be a lucrative situation for any farmer or entrepreneur to step into the sphere of egg production – riding on two sails: substantial demand-supply gap and Government support for supply enhancement.

1.5.2 Consequences on the ground

Layer farming in West Bengal headed into a crisis not felt previously. The Scheme had incentivised newer players, previously unrelated to layer farming, into the sector, and this increased indigenous production to a significant extent. This increase in indigenous production served to curb the competitive advantage of older, pre- Scheme, farmers.

On the other hand, new entrants in the sector started facing their own set of hurdles. Almost all new farms were set up and funded through bank loans. Some of the older (existing) farmers that had increased capacity, had also utilised debt to do so, though maybe not at the same debt-equity ratio as new entrants. The unprecedented major spike in prices of raw materials, latency in price of eggs and continued influx of eggs imported from other States at the prevailing latent prices, worked in tandem to create a situation wherein profitability was negatively impacted and cash flows highly impacted. This economic stranglehold served to squeeze the sector so hard, that some farms failed and went into liquidation – with many new farms reeling under huge pressure. Layer farms are situated in rural areas, almost all of which are located away from the capital city of Kolkata. Of the 23 districts of West Bengal, the two districts that are home to maximum number of layer farms are Bankura and Paschim Medinipur. These farms mostly service the demand, for eggs, of other districts of West Bengal. Eggs imported from other States of West Bengal come into the city of Kolkata and service a catchment area that is in and around Kolkata's periphery. The farm-to-table time for these imported eggs is in the region of 7 to 10 days, as compared to the indigenous produce, which is 3 to 5 days. The end consumer, though, has to pay the same price for both – be it indigenous or imported. Nutritional devaluation due to increased farm-to-table time is not factored into the price, and the consumer ends up paying the same amount for lower-quality items. Demand for eggs follows a pattern somewhat, seasonal and festive period related. The production of eggs, though, is not corroborative of this pattern. The supply of imported eggs too, is not very linear. As a result, farm-gate prices of eggs fluctuate.

Traders make good utilisation of such fluctuations. When the supply of imported eggs is low, prices are pushed up, but traders hold back on purchase of indigenous eggs as well till

consignments of imported eggs reach the market and prices are pushed down again. When prices are driven down, traders stock up on eggs – indigenous and imported. Although indigenous and imported eggs are supplied in different geographical markets, traders utilise the price fluctuations based on supply of imported eggs to make a good profit on the indigenous eggs as well. What benefits the traders is not, however, beneficial for farmers and consumers. Farmers are deprived of gains from price increases, as traders wait for price dips to buy produce. Consumers are oblivious to these farm-gate prices and their fluctuations. They end up paying retail prices that do not factor in farm-to-table delays and nutritional devaluation due to the same. Reality often diverges from idealistic situations. Farmers navigate through a terrain liberally marked by fluctuations in market demand, climatic uncertainties and infrastructural limitations. Implementation challenges, resource constraints and unforeseen variables introduce various complexities into the equation. The ground reality on sustainability of the farmers calls for adaptability and ingenuity - urging stakeholders to devise innovative solutions and strategies to surmount unforeseen obstacles.

1.6 Purpose of study

Purpose of this study is to assess the efficacy of the WBIS in augmenting production and productivity of layer farms in the State of West Bengal. Research based on empirical studies can help with decision-making of policymakers on whether to continue, modify or roll back the Scheme, as may be analysed and recognised through such study. Study, scrutiny and analysis of data could also help ideate suggestions for farmers to drive market-linked changes in production.

1.7 Objectives of the Study

1.7.1 Primary research objectives

Objective of this research is multi-pronged and attempts to shed light on multiple areas targeted, as stated by the WBIS Scheme. Primarily, assessment of the WBIS Scheme evaluates success of the Scheme in achievement of the following factors:

1. Self-sustainability of West Bengal with respect to production of eggs
2. Augmentation of income of layer farmers

3. Enhance availability of fresh eggs and enrich nutrition of people of West Bengal
4. Generation of employment in the State
5. Alignment with other Sustainability Development Goals (SDGs)

1.7.2 Aim of the Study

Aim of the study is to take a holistic approach in appraisal of the scenario from different angles, targeted at arriving at assessment of specific issues. Starting with evaluation of accuracy of goal setting for the Scheme, the study also appraises design of the Scheme.

Thereon, the study assesses success of the Scheme with regard to whether it has, is on track - or is faltering, in achievement of its goals. This assessment comes up with pointers for different directions regarding continuity of the Scheme. The three possible outcomes regarding goal achievement are outlined below:

1. Scheme is yet to meet its goals and should be extended in present form
2. Estimate impact of current structure of Scheme, and suggest amendments as may be necessary
3. Identify that Scheme has created sufficient impact on goal achievement and discontinuance at end of intended tenure is correct

Such analysis can provide robust input to the Government of West Bengal regarding efficacy of its subsidy policy and also contribute to the knowledge bank of the Government - such that existing and future Schemes can be better formulated and designed.

Layer farmers can also benefit, and aim is to attempt amelioration of their suffering through dual-pronged approach:

1. Provide robust input to the Government regarding efficacy of its policy formulation
2. Offer holistic analysis and outlook, based on empirical data, to farmers – such that production can be linked to market

In conjunction with each other, the above-mentioned objectives can help in providing direction such that consumers in West Bengal have access to fresher produce and thus better nutrition - at better prices.

1.7.3 Problems addressed

Problems are being faced by both - farmers and consumers. The economic crisis faced by the layer farmers over the last few years was unprecedented and very real. For some – even existential. A large proportion of egg consumers in West Bengal, on the other hand, are making do with lower nutritional stale eggs - while paying prices similar to fresh produce.

1.7.4 Gaps addressed

The WBIS is purported at resolving multiple issues and this research study attempts to study success of the Scheme in resolution of the existing problems. The study is useful and instrumental in helping assess such efficacy. Inherently, government policies are tedious to design due to presence of numerous stakeholders and multifaceted impacts on society. Typically, all impacts of government schemes are not easily assessable due to underlying connections within layers of society. There are studies available for perusal, on government policies and subsidies, but there are no studies published so far on this current and ongoing Scheme and the specific situation – underwriting the importance and relevance of this study.

1.8 Significance of this Study

The significance of this study lies in its attempt to evaluate a current policy intervention at the intersection of nutrition, agriculture, rural enterprise and market economics. The West Bengal Incentive Scheme 2017 was introduced with the stated intention of augmenting commercial egg production in the State, encouraging entrepreneurship, generating employment and reducing dependence on eggs imported from other States. However, as the preceding discussion demonstrates, the impact of such a Scheme cannot be measured merely through increase in number of farms or rise in aggregate production. Its true significance has to be assessed through its effect on farmers' income, financial sustainability, consumer welfare, nutritional access, employment creation and long-term market stability. This study is important because West Bengal's egg economy presents a distinct policy problem. On the one hand, there existed a clear demand-supply gap that justified government intervention. On the other hand, subsequent market realities, particularly the sharp escalation in feed costs, latent egg price movement, debt-funded farm

expansion and continued inflow of eggs from other States, appear to have complicated the intended outcomes of the Scheme. Therefore, the study assumes relevance in determining whether the Scheme has functioned as a sustainable growth catalyst or whether it has unintentionally contributed to market stress among commercial layer farmers. The study is also significant for policymakers. Government subsidy schemes often operate in complex environments where benefits, distortions and unintended consequences emerge simultaneously. An empirical evaluation of WBIS 2017 can provide useful evidence on whether the Scheme should be continued, redesigned, better targeted or phased out. Such findings may assist not only in improving this specific Scheme, but also in informing future incentive policies in allied agricultural sectors.

For farmers and entrepreneurs, the study may provide insight into production planning, market-linked decision-making and the risks associated with subsidy-led expansion. For consumers, the study is relevant because increased indigenous production has the potential to improve access to fresher eggs, reduce dependence on stale imported produce and support better nutritional outcomes. Thus, the study carries significance not merely as an academic exercise, but as a practical policy evaluation with implications for farmer welfare, consumer nutrition, rural employment and food security in West Bengal.

1.9 Research Purpose

The purpose of this research is to assess and evaluate the efficacy of the West Bengal Incentive Scheme 2017 - specifically in relation to commercial layer poultry farms and its intended role in augmenting indigenous egg production in the State. The Scheme was introduced against the backdrop of a clear demand-supply imbalance, where West Bengal's daily egg consumption substantially exceeded its own production, compelling the State to depend on eggs imported from other Indian States. The logical premise of the Scheme was that fiscal incentives would encourage new entrepreneurs and existing farmers to invest in commercial layer farms, thereby improving local production, creating employment, supporting nutritional security and gradually reducing dependence on imported eggs. However, situation on the ground appears to have become more complex than the policy intention. While the Scheme encouraged capacity creation and entry of new entrepreneurs

into layer farming, the sector continued to face adverse market conditions, particularly from 2021 onwards. Feed costs, which form the largest component of production cost in commercial egg farming, rose sharply. This though, was not commensurately supported by a rise in egg prices. Continued inflow of eggs from other States further limited the pricing power of local farmers. As a result, the intended benefits of enhanced production and income augmentation may not have translated uniformly into financial sustainability for layer farmers. This created the central need for the present study: to examine whether the Scheme has achieved its stated objectives, whether it has created unintended market stress, and whether its design requires modification for better alignment with ground realities.

The study, therefore, moves beyond a simplistic assessment of production increase. Its purpose is to undertake a holistic appraisal of the Scheme by examining its economic, nutritional, entrepreneurial, employment-related and policy-design implications. It aims to understand whether West Bengal has moved meaningfully towards self-sufficiency in egg production, whether farmers have experienced income enhancement, whether consumers have gained access to fresher and better-quality eggs and whether the Scheme has generated genuine additional employment rather than merely shifting labour from one agricultural activity to another. The study also intends to contribute to policy learning. Government subsidy schemes are difficult to design because they interact with markets, credit systems, input prices, trader behaviour, consumer demand and rural employment structures. Therefore, a research-based evaluation of WBIS 2017 can provide policymakers with evidence on whether the Scheme should be continued in its existing form, amended to respond to changed market conditions, or discontinued after having served its intended purpose. It can also provide practical insight to farmers regarding production planning, market-linked decision-making and long-term viability.

1.10 Research Questions

Based on the above purpose, the study was guided by the following research questions:

1. To what extent has the West Bengal Incentive Scheme 2017 contributed to the augmentation of indigenous commercial egg production in the State?

2. Has the Scheme helped West Bengal move closer to self-sufficiency in egg production and reduced dependence on eggs imported from other States?
3. What has been the impact of the Scheme on the income, profitability and financial sustainability of commercial layer farmers?
4. Has the entry of new entrepreneurs and expansion of existing farms created healthy competition, or has it intensified market pressure among farmers?
5. To what extent has the Scheme contributed to employment generation in rural West Bengal, and is such employment additional or merely shifted from other agricultural activities?
6. Have consumers benefited through better access to fresher eggs, improved nutritional value and more efficient pricing?
7. What design changes, if any, are required to improve the effectiveness, targeting and long-term sustainability of the Scheme?

Thus, the research is positioned as an empirical and policy-relevant evaluation of WBIS 2017, with the broader aim of understanding whether fiscal incentives in the layer poultry sector can simultaneously serve farmer welfare, consumer nutrition, entrepreneurial development and State-level food security.

1.11 Scope and Limitations of the study

The scope of this study is confined to evaluation of the West Bengal Incentive Scheme 2017, specifically with reference to commercial layer poultry farms in the State of West Bengal. Although the Scheme also extends to poultry breeding farms, the present study focuses primarily on layer farms engaged in egg production, as they are directly connected with the issues of indigenous egg availability, farm-level profitability, consumer access to fresh eggs and reduction of dependence on eggs imported from other States. The study therefore examines the Scheme from the perspective of policy design, farmer uptake, production augmentation, income effect, employment generation, market competition and nutritional relevance.

The geographical scope of the study is limited to West Bengal, with particular attention to districts where commercial layer farming has significant presence. The study considers the

experiences of commercial layer farm owners, available government data, market trends, secondary literature and relevant policy documents. Its analytical scope includes both intended outcomes of the Scheme and possible unintended consequences arising from changed market realities, such as rising feed costs, price rigidity in eggs, debt-funded expansion and continued interstate supply. However, the study is subject to certain limitations. First, the findings are based on data available during the period of research and may not fully capture future changes in policy, input prices, disease outbreaks, consumer demand or market structure. Second, primary data collected from farm owners may reflect individual perceptions, business conditions and localised experiences, and therefore may not represent every layer farm in the State with equal precision. Third, access to complete official records regarding subsidy disbursement, farm performance, employment generation and inter-state egg movement is limited.

The study also does not attempt to evaluate the entire poultry sector of West Bengal, including broiler farming, hatcheries, feed manufacturing or backyard poultry, except where such references are necessary for contextual understanding. Similarly, the nutritional benefit to consumers is assessed from the standpoint of freshness, availability and supply-chain relevance, rather than through laboratory-based nutritional testing of eggs. Thus, while the study aims to provide a robust and policy-relevant assessment of WBIS 2017, its conclusions must be understood within these defined boundaries.

CHAPTER II: REVIEW OF LITERATURE

2.1 Public Policy

The literature on public policy, agricultural incentives and subsidy-linked development presents a complex yet necessary foundation for assessing the role of government intervention in shaping productive sectors such as livestock and poultry farming. Public policy, particularly in agriculture and allied sectors, is rarely a simple act of state support.

The distinction between well-designed policy, poor design and non-design is significant because incentive-based schemes often operate within pre-existing administrative, political and market structures. Their eventual outcomes, therefore, depend not merely on the declared objectives of the policy but also on the appropriateness of the instruments selected, the institutional mechanism through which they are delivered and the manner in which the target group interprets and responds to such interventions.

Contextual to livestock and poultry, the literature assumes particular importance because poultry farming is simultaneously an enterprise, a source of nutrition, a contributor to rural employment and a sector exposed to volatile input and output markets. The review therefore provides the conceptual and analytical basis for examining whether economic incentives linked to egg production are capable of generating the intended outcomes. It also helps identify whether such policies are merely supportive in formal design or whether they produce measurable and meaningful benefits for commercial layer farmers.

2.2 Framing of Government policies

Governments formulate public policies to achieve alterations in aspects of behaviour, that of the government agents and, of course, society at large, to arrive at some end or purpose. These policies are layered and complex arrangements – an outcome of a decision-making process that tries to balance goals targeted and means utilised.

The design of these policies significantly impacts the achievement of their objectives. Efforts to formulate should ideally be systematic in matching ends and means, resulting in

‘good design’, whereas bad or ‘poor design’ can be the fallout of incorrect or partial balance between the said means and ends. Also, within the spectrum of design lie policies that can be termed as ‘non-designs’, formulated on highly contingent decisions - motivated by situationism and opportunism, as opposed to due deliberation and consideration (Howlett, M. and Mukherjee, I., 2014). Theoretically, the process of designing policy begins with evaluation of the capability of different policy tools and measures to impact policy targets and outcomes along with the types of resources required to enable their operation as intended (Salamon, L.M. 2002; Hood, C. 1986). Within the ambit of policy sciences, ‘Design’ should be framed while striking a balance between instruments or tools utilised and their implementation on the one hand and the impact of such policies, on the other hand. (May, P. 2003; Linder and Peters 1990).

Procedural components can be outlined as a set of activities outlined to secure a level of agreement amongst the people who are in charge of formulation and administration of the measures to be implemented, based on such measures’ merits and demerits - choosing from a basket of measures available (Howlett, M. 2011).

Policy design overlaps between formulation and implementation and requires involvement of stakeholders, ideas and interests during both phases of the policy process (Howlett et al, 2009). In depth understanding of the context in which fiscal measures and instruments are to be applied is crucial as it affects how the target group behaves and ultimately complies with the government aims. Analysis and evaluation of the inherent constraints of specific measures and tools, existing governance structures and other prevailing issues and arrangements help to choose certain methods and measures, whilst excluding others (Howlett, M. 2009; 2011). This needs to be backed by the intention to exercise and implement such policy. It can thus be expected that policy formulators base their analyses on knowledge, experience, logic and insight rather than other bases of formulation like that of political calculations or bargaining or even other types of satisficing behaviour characterised by alternative generation (Sidney 2007; Bendor et al, 2009). These other forms can be designated as ‘non-designs’.

The preceding discussions regarding policy design vis-à-vis non-design are summarised in the figure below:

Table 2.1.

Types of policy formulation processes: situating design spaces

Types of Policy Formulation Processes: Situating Design Spaces			
		Government Knowledge and Other Constraints	
		<i>High</i>	<i>Low</i>
Government Intent to Design	<i>High</i>	Optimal Design Space Relatively unconstrained formulated via design is possible	Poor Design Space Only partially informed design is possible
	<i>Low</i>	Political Non-Design Space Relatively unconstrained non-design processes are possible	Poor Non-Design Space Only poorly informed non-design is possible

Source: (Howlett, M. and Mukherjee, I. 2014) Policy Design and Non- Design: towards a spectrum of policy formulation types.

The chart suggests that the breadth of the spectrum of design and non-design formulation processes demonstrates the gap between ‘good’ processes that are informed and ‘poor’ ones that are not. An attempt to be more precise about the demarcation of these processes necessitates an understanding of the nature of peripheral constraints on government intentions that can negatively affect both design and non-design processes.

A dominating factor in policy design is that not all such processes begin ‘de novo’. Many a time, formulators have to deal with circumstances wherein existing policies are already in place and are limited by historical legacy problems. These legacy problems need be dealt with in such a manner that internal inconsistencies are removed to create an internal supportive combination (Howlett, M. and Rayner, J. 2007). It can be very difficult to usher in wholesale changes and thus often times design tends towards reform rather than replacement. Thereon, legacies from pre-existing policy components may affect, in a contrarian manner, the induction of new elements.

Van der Heijden (2011) posits the concept of ‘layering’ in this context. Layering refers to the redesign of policies through alteration of only some aspects of a pre-existing arrangement. This concept is different from the other types of design and non-design and is believed to have been developed on the neo-institutional sociological literature where stalwarts like Beland (2007) and Stead and Meijers (2004) have attempted to explain the manner in which political and social institutions have evolved over long periods of time.

Within the sphere of policymaking, ‘layering’ refers to the process wherein new measures are introduced into an existing regime without removing or modifying previous ones such that policy measures end up being super scribed on top of each other (Carter, P. 2012). Most design studies have pointed out that it is in rare cases that ‘replacement’ or ‘exhaustion’ is implemented and new measures adopted in entirety. Far more common is the adoption of the ‘layering’ process, wherein some aspects are layered atop previous ones in the policy. This sort of layering can negatively impact the formulation process if a government is unable to objectively evaluate alternatives, restricting a purely instrumental design. These temporal, or chronological, lock-ins often result lead to internal contradictions that emerge due to the transformation pathways crossing over tools and goals within policy mixes. Non-phasing out of measures over long periods of time also result in successive policy decisions that are non-congruent (Hacker, J. 2004).

Over periods of time, multiple layering processes working within sub-optimal design spaces tend to gradually transform into sub-optimal mix of measures. Optimising the choice of instruments when pre-existing mixes exist would thus require an additional level of knowledge of instrument-goal interactions and considerations for both long and short-term processes of policy change (Howlett, M. and Rayner, J. 2013).

Lack of awareness of such complexities and precautionary measures to cope with such complexities, result in situations where policies that seem most sensible at first sight – become clouded by ambiguity on closer inspection (Greenberg et al, 1977).A systematic comparative analysis of a public policy is more complex than phenomena such as electoral votes, incidents of political violence, and elitist ideologies. Greenberg et al (1977) posit that the complexity can be noticed on at least four counts:

1. Temporality: i) Multiple Outputs and ii) Postdictive Theory
2. Multiplicity of Policy Aspects
3. Multiple participants: Objective and Subjective
4. Interactions

They argued that systematic study of public policy, through its inherent nature, is seriously complicated, but such complexity need not necessarily prohibit systematic empirical research. The lessons learned would contribute greatly to the formulation of hypotheses and elaboration of theory.

1. i). Temporality: Multiple outputs

Their research experience exposed that the systematic study of public policy is seriously complicated by the nature of the beast. Complexity arose due to the above-mentioned factors, but the complexity in itself did not prohibit systematic empirical research. As long as complexity is well accounted for and confronted directly, and hypotheses remain precise – theoretical models may adequately represent reality. Observation was that most of the lessons to be learned had more to do with the formulation of hypotheses and elaboration of theory, than with the conduct of data analyses.

The authors have found it both practical and productive to identify a "point of last significant controversy" and, somewhat less importantly, a "point of first significant controversy". They have urged others for consideration and also advocated the formulation and trial of alternatives as well. Emphasis has also been made on the issue that objective comparisons cannot be made unless 'a point in time' as a criterion is consistently applied to enable determination which of its many decision points helps establish 'policy'.

1. ii). Temporality: Postdictive theory

To avoid creation of the hypotheses that are capable of falling into the postdictive trap, Greenberg et al, (1977) have advised to simply be aware and not attempt to predict the policy process characteristics using the following two types of variables:

- Quantity of requisite actions or resources to be utilised, whose value for given case is unknown until too late in the process itself .
- Types of policy, which are offered predictively by theorists as inputs but actually are characteristics of output.

Causal variables to be correctly utilised for a policy hypothesis to be predictive, must be visible and quantifiable at a point of time before the effect, and not subject to significant change beyond that point of evaluation.

2. Multiplicity of Policy Aspects

In formulating hypotheses, it may be worth considering whether variables that are subject to differential rating depending upon whether benefits or costs form the basis of evaluation. The general route to avoid the multiplicity problem can be advocated as avoidance of variables that significantly differ in value when applied to different aspects of a said policy.

3. Multiple participants

At times it is questionable whether adequate attention is given to the perception of the policy process by the participants. Different participants might perceive state of affairs differently thus it is imperative to give due importance to perceptions of the participants that are to govern the scoring process of the policy aspects. This outlines the subjective aspect of the policy process.

On the other hand, lies the objective aspect of the multiple participant issue of the policy process. The objective aspect is potentially a problematic issue since the characteristics and behaviours of the participants are just as important variables in policy theory. A theoretical testing of hypotheses comparatively – assigning value to each aspect of the policy representing some objective characteristic of the participants – can help to arrive at a decision as to how such characteristics can be operationalised. This universal method, though working better for some variables than for others, sometimes may not work at all. Other types of schemes may be devised but the posit remains: “In predicting the severity

of conflict by how much is at stake, the true predictor is the average of the perceived stakes across all major participants" (Greenberg et al., 1977).

4. Interactions:

Froman (1967) has hypothesised that 'areal' vs 'segmental' policies are adopted by communities depending on whether such communities are homogeneous or heterogeneous in nature.

Areal policies are defined as those affecting the total population of a city simultaneously through a single move. In contrast, segmental policies are outlined as continuing policies that affect different people at different times in different sections of the city. He thus states that over time the same policy can have different impacts in different places.

As an object of study, researchers have found public policy quite complex, and thus hard knowledge of the policy process may never come to be of the type available for advanced physical sciences. However, understanding of policy phenomena can be augmented through conceptual wrangling with the intricacy of theory along with concurrent conduction of empirical research.

2.3 Latest Trends in Policies

The scope and scale of government action have had elemental change regarding the instruments or means utilised to address public issues. Earlier, governments were mainly focused on the direct delivery of goods or services through bureaucrats, whereas today, a large portfolio of tools is utilised. These tools range from soft loans, guarantees on loans, ease of access to loans, subsidies and grants, insurance, tax benefits, social and economic regulation and many more (Salamon, L.M., 2002).

The public sector is yet to be known as a great contributor to society when it comes to innovation. However, the developments in collaborative efforts of government functions at different levels, in conjunction with public and private entities, can be considered a significant social innovation. This progress helps frame combined and coordinated actions that can be directed towards responding to a wide array of human requirements, effectively

tapping into the private sector's capabilities (Dahl, R.A. and Lindblom, C.E. 1953). They have observed and stated that across the globe, a significant revolution has occurred in the realm of public action.

A number of these 'newer' tools, such as loan guarantees, possess a notable common characteristic: they exhibit a high level of indirectness. Relying highly on a diverse range of 'third parties' including commercial banks, social service agencies, industrial corporations, universities, other government entities, financiers and construction firms to administer publicly funded services and pursue authorised objectives.

Resultant, intricate frameworks of third-party governance emerge, wherein essential aspects of public authority are shared with a multitude of non-governmental or alternative governmental actors. These collaborations often manifest in complex systems that are sometimes challenging to comprehend and occasionally perplexing to manage and control effectively (Dahl, R.A. and Lindblom, C.E. 1953).

In the United States, the contracting arrangements initially devised for the Revolutionary War and later adapted to handle the more intricate demands of World War II, quickly found broader application in various sectors such as agriculture, health, space exploration, and social services after the war. Similarly, insurance, grants-in-aid, loan guarantees, social regulations and other indirect mechanisms have experienced significant expansion.

Given rise of the 'third-party governance', they have suggested a new and different approach to public problem solving – calling it the 'new governance' and emphasise that the new approach has two defining features (Dahl, R.A. and Lindblom, C.E. 1953).

The first of these, evident in the use of 'governance' instead of 'government', emphasises a fundamental aspect of contemporary public problem-solving - its collaborative nature. It recognises that addressing public issues and pursuing public objectives relies on a diverse range of third parties, not only on government. The second feature, denoted by the term 'new', acknowledges that these collaborative approaches, although not entirely new, require a fresh and more cohesive approach. This approach explicitly recognises the

significant challenges they present while also embracing the important opportunities they offer (Salamon, 2002).

The CAP (Common Agricultural Policy) implemented by the European Union (EU) in 2011 aims to address food security, sustainable use resource and rural development in Europe. It supports European farmers and agricultural workers, ensures a stable food supply and aligns with EU priorities such as job creation, economic growth, climate change mitigation and sustainable development.

The CAP consists of three interconnected routes:

- a. Income support for farmers – vide direct payments
- b. Rural development
- c. Market measures – to deal with issues like a sudden dip in prices

Targeted at promoting competitiveness, sustainability and environment-friendly farming practices, the focus of the policy remains on direct payments - which constitute a significantly large portion of the EU farm budget at 72%. While EU-level rules govern direct payments, their implementation is managed by individual member states, allowing flexibility to consider national farming conditions. Direct payments benefit around 7 million farms in the EU, often comprising a substantial portion of their agricultural income - approximately half in the last decade (Department of Agriculture, Food and the Marine, 2020).

In the United Kingdom, since 2021, there has been a transition away from EU based rules in agriculture towards a new system in which farmers are paid to promote environmental sustainability, upgrade animal health and reduce carbon emissions (DEFRA, 2021).

The new approach involves three new schemes that incentivise farmers and land managers to produce public goods. Additionally, grants and assistance are to be provided to enhance farm productivity and prosperity.

2022 onwards, capital grants and financial support for veterinary visits were to be offered for health and welfare management planning and diagnostic testing. Additional support for

endemic disease control and piloting payments-by-results is planned for 2023, pending the outcomes of ongoing research (DEFRA, 2021).

Thornton (2010) has stated that the global livestock sector has experienced dynamic changes. Developing countries are witnessing increased demand for livestock products, while developed countries are seeing stagnating demand, despite improvements in efficiency and environmental sustainability of production systems. The demand for livestock products has historically been driven by population growth, income levels, urbanisation and advancements in science and technology. However, future production will be influenced by factors such as competition for natural resources (e.g., land and water), competition between food and feed, and the need to operate in a carbon-constrained economy.

Advancements in breeding, nutrition and animal health will contribute to increased production potential and efficiency gains. On the other hand, livestock production will face challenges related to carbon constraints and regulations concerning the environment and animal welfare (Thornton, 2010; Omollo et al., 2020).

Socioeconomic factors regarding human health concerns and changes in socio-cultural values can have significant impact on future demand for livestock products. Thornton (2010) posited that the outcomes of these factors would remain uncertain and could vary across regions worldwide in the coming decades.

In India, The National Livestock Mission (NLM) was launched in 2014-15 to promote sustainable development in the livestock sector and replicate the success achieved in the dairy and poultry sectors. Its objectives include improvements in the availability of quality feed and fodder, provision of risk coverage, facilitation of effective extension services and ensuring better access to credit (DAHD, GoI, 2023).

Of late, the NLM has been revised and realigned with an allocation of 23 billion rupees for a five-year period starting from 2021-22. (State-wise allocations for Centrally Sponsored Schemes of NLM for the year 2022-23, 2022) The revised scheme, approved by the

Cabinet of the Government of India, focuses on generating employment, fostering entrepreneurship, increasing per-animal productivity, and boosting the production of meat, goat milk, eggs and wool.

The projected surplus in production is aimed at helping to meet domestic demands and contribute to export earnings. The NLM also aims to develop entrepreneurs and establish linkages between the unorganised and organised sectors. It is implemented through three sub-missions:

- a. Breed Development of Livestock and Poultry
- b. Feed and Fodder Development
- c. Extension and Innovation

Change in the structure of policy in India is evident from the realignment in structure of the NLM 2014-15 (DAHD, GoI. 2023) and also the National Action Plan for egg and poultry 2022 (DAHD, GoI. 2017).

Public action is mobilised via use of tools. These tools are identifiable methods used to structure collective action in addressing public problems. These tools have features that make them distinguishable, although their design features may vary. Tools serve as institutionalised patterns of interaction, defining roles, relationships and considerations within public programs. They shape the implementation phase of policies and involve collective action - not limited to government involvement (Dahl, R.A. and Lindblom, C.E. 1953).

There are internal tools, which administrate government operations and external tools, that impact society as a whole. These tools differ from programs and policies in their level of generality. Programs employ specific tools, whereas policies encompass collections of programs with similar objectives (Dahl, R.A. and Lindblom, C.E. 1953).

Over the timeline of evolution, among all industrial sectors, agriculture and its allied sectors and subsectors have been endowed the world over - with subsidies on capital investment, stock procurement, animal feed purchase as also insurance. Little evidence is

found that, in the short run, these subsidies have not served their primary purpose. However, stretched over a longer horizon, contrarian effects like over-exploitation have been noticed on stock, lands and soil, groundwater and also the climate. Subsidies can be very costly if poorly designed and inefficiently administered (Srivastava, D.K. and Rao, C.B. 2002).

Agricultural growth varies from state to state, and subsidy distribution is inequitable. However, agricultural subsidies help farmers access costly inputs inexpensively. Lal et al, (2021) argue, though, that subsidies hurt the development of a country in the long run. The goal should be appropriate targeting of subsidies with gradual removal over a period of time and government should focus on agricultural investment for prosperity.

2.4 Evaluation and outcome of policies

It is observed that there are some studies available in the public domain regarding the structure, design, motivation and outcome of public action policies regarding intervention by policymakers in the scope of agriculture, which is the backbone of food supply.

Given the importance of food, every country around the world will be researching how to boost food security - amongst the other follow-on benefits that agriculture drives. These studies though, are not always published and thus visibility of how countries assess their policies is difficult to gauge. Only when one scrutinises whether a country has changed its intervention policies, will there be any indicator that such country has assessed its existing policy and sensed the need to reform. The availability of studies on assessment and evaluation of public policy is stretched quite thin.

The fundamentals of evaluation, though, remain elemental and can be delineated with some clarity. As posited by Salamon (2011), the three main criteria for evaluation of tools are:

1. Effectiveness
2. Efficiency
3. Equity

The measure of success in public action primarily lies in its effectiveness, which assesses the degree to which an activity accomplishes its desired goals, regardless of costs involved. In evaluating effectiveness, the focus is on identifying the most reliable and efficient tool that enables addressing public issues and achieving intended outcomes.

Efficiency is the criterion complementary to effectiveness, balancing results and costs. It seeks the optimal balance between benefits and expenses, ensuring the best use of resources.

Equity, again, is a fundamental criterion for evaluating the outcomes of tools - saddling two distinct meanings. The first outcome pertains to fairness, ensuring an equitable distribution of benefits and costs among all eligible individuals. A tool that would facilitate even distribution of program benefits across the country should be considered equitable in this sense of fairness. However, equity also should involve redistribution - directing benefits proportionately to those in need. Redistribution is a key objective of public action, aiming to address disparities and provide support to those lacking resources. In addition to the well-known economic criteria of effectiveness, efficiency and equity, Salamon (2002) also highlights the significance of manageability or implementability as an additional criterion for evaluating tools. Complex tools involving multiple actors tend to be more challenging to manage. Theoretically, tools may appear efficient and effective; however, their practical implementation is often hindered by managerial complexities. Manageability, in this context, refers to the ease or difficulty of implementing programs. Therefore, the selection of simpler, more direct tools is considered a fundamental principle in program design (World Bank, 2009).

Salamon's (2002) and Howlett's (2009; 2011) thoughts converge on the emergence of governance, as different from Government, and draw attention to the diverse range of tools and institutions involved in addressing public issues. The shift from traditional hierarchical structures to complex networks of organisations emphasises the need for skills that enable collaboration and navigate interdependencies.

OECD (2021) and World Bank (2008) articles also noted that the choice of tools can impact the political feasibility and perceived legitimacy of public action. This is primarily determined by which actors and interests are involved in shaping program implementation, and thus, which of them are more likely to support or oppose its passage. Regardless of its potential effectiveness, a program that lacks political support will struggle to make progress. Therefore, considering the political feasibility and garnering support are factors crucial in ensuring the success of a program. Some studies have been documented and are available for us to review. Srivastava and Rao (2002) attempted to assess the issues regarding budget subsidies in India and for the purposes of clarity, grouped the issues into four sections:

1. Rationale
2. Measurement Issues
3. Volume and extent
4. Qualities

A broader discussion of the aforementioned sections by Srivastava and Bhujanga (2002) is outlined hereunder.

1. Rationale:

Investigation into the rationale of subsidies should question the reasons behind their implementation. It is important to evaluate whether subsidies are provided for the right reasons - aligning with economic, social, and environmental goals. Another aspect to consider is whether the right goods or services are being subsidised, ensuring that the subsidies contribute to desired outcomes and address priority areas. Additionally, the potential harm caused by subsidies should be examined, as they can distort markets, create inefficiencies and lead to unintended consequences.

2. Measurement issues:

Issues are weighed down by the fact that explicit subsidies and national account estimates are often inadequate in measuring the total volume of budget subsidies. While explicit subsidies are easily identifiable and recorded in the budget, they represent only a portion of the overall subsidy landscape. There are various forms of support provided by governments that may not be explicitly labelled as subsidies - such as tax breaks, regulatory preferences or implicit guarantees. These hidden subsidies are not captured in explicit subsidy figures or national accounts - leading to an incomplete assessment of the total subsidy volume.

3. Volume and Extent:

Volume and extent of subsidies need to be examined to maintain a balance between expenses and available resources. Such examination should help structure subsidy allocation efficiently and effectively. Also, it is important to consider the possibility of other aspects of subsidies that may become necessary beyond what has been included in the budget-based estimates.

4. Quality:

Assessment of the quality of subsidies takes into account whether they are only input-based - meaning they are provided based on specific inputs used in production or consumption. However, the effectiveness of input-based subsidies can vary depending on their targeting and design. Some subsidies may be poorly targeted - meaning they do not reach the intended beneficiaries or fail to address the desired outcomes effectively. This may result in inefficient resource allocation and consequently, subsidies could fail in achievement of intended goals.

Studies by Roningen and Dixit (1991) demonstrated that agricultural support policies in Japan reduced national income through inefficient usage of resources. The policies also transferred resources from consumers and taxpayers to agricultural producers and from the non-farm to the farm sector. Their study brought to light that less than 70% of the costs to

consumers and taxpayers in Japan are transferred to producers. The rest represented deadweight (income losses) to society arising from misallocated resources.

In other words, Japan's policy of providing support to agricultural producers is inefficient because the costs to consumers and taxpayers of disproportionate policies are considerably more than the benefits to producers. Analyses indicated that consumer expenditures on food items would be 53% lower if domestic food were available at international prices. A study by the Japanese Economic Planning Agency (Roningen and Dixit, 1991).

Livestock policy discussion papers by FAO (2011) and Thornton (2010) examined the development of China's livestock sector - the largest in Asia at that time - and outlined its future trajectory. The study analysed production trends, demand dynamics in urban and rural areas, marketing and trade of livestock products, as well as environmental and health aspects of livestock production.

One key observation was that alongside production policy reforms, there were significant changes in marketing and price policies for livestock products since the 1980s. Market liberalisation for livestock products began earlier compared to grain, with the elimination of the obligatory delivery scheme and the introduction of freedom in marketing decision-making for livestock keepers. Private intermediate traders had also been allowed to participate in the livestock market, leading to the emergence of a competitive market after the abolishment of the state marketing monopoly.

In mapping the future course for the next three decades, FAO (2011) and Thornton (2010) delineated and emphasised certain directions for China's policies. These included reduction in support for urban industrialisation, shifting focus away from the agricultural sector for foreign exchange earnings, prioritising farm income growth, ensuring market stability and long-term food security - emphasising environmental protection and food quality and safety and placing a stronger focus on the state budget and state-owned enterprises. These recommendations aimed to address evolving challenges and align policy objectives with changing socioeconomic and environmental contexts.

There are two competing policy-relevant arguments regarding the impact of agricultural subsidies on productivity. On one hand, contextual to the World Trade Organisation (WTO) trade liberalisation agenda, the discussion centers on the distortionary impact of subsidies on agricultural markets (including on productivity) and how the effects differ across different types of subsidies. Following the WTO agreements, many countries decoupled their agricultural subsidies, aiming to reduce distortionary agricultural support (FAO et al., 2011; Ciaian et al., 2013).

The European Commission explicitly identified food security as one of the major challenges for the post-2013 CAP. In its 2010 communication, the Commission stated that the future CAP should preserve the EU's food production potential in order to guarantee long-term food security for European citizens and contribute to growing world food demand. The 2011 legislative proposal continued this orientation by linking direct payments and market measures to income support, viable food production and the broader objectives of the reformed CAP (European Commission, 2010, 2011).

The impact of subsidies on agricultural production, input allocation and income distribution is documented in literature but significantly less attention has been devoted to impact of subsidies on the productivity and efficacy of farms. Theoretical studies suggest that subsidies can have a positive impact on farm production and at the same time have a negative impact on farm productivity. However, these theories are not conclusive in prediction of the exact relationship between agricultural subsidies and productivity while the empirical studies find mixed effects (Banga, 2014; Latruffe et al., 2017; Rizov et al., 2013). Theoretically, the link between subsidies and productivity is determined by the net effect of allocative and technical efficiency losses and the investment-induced productivity gains caused by the interaction of market imperfections with subsidies. Caveat that need be acknowledged is that the results are based on the EU-15 samples, which consist of the more developed economies in Europe, wherein market failures are less pronounced. The results might very well be different for the samples of less developed countries where, *ceteris paribus*, the credit alleviation effect of subsidies might be stronger (Rizov et al,

2013). Chandel et al, (2019) postulated subsidies may either increase or decrease productivity and thus the net effect may be either positive or negative. The negative impact of subsidies on productivity may result from allocative and technical efficiency losses due to distortions in production structure and factor use, as also the shift of subsidies to less productive enterprises. The positive impact of subsidies may be due to investment-induced productivity gains caused by interactions of credit and risk attitudes with subsidies - for instance, subsidy-induced credit access, lower cost of borrowing, reduction in risk aversion and increase in productive investment (Rizov et al., 2013). Estimation of the net effect of subsidy, though, is an uphill task - seemingly undertaken rarely (Ciaian et al., 2013)

Market price support and deficiency payments are indeed significant instruments in agricultural policy, but they have been observed to operate under distinct support regimes.

Market price support involves interventions by the government to stabilise and maintain prices of agricultural products at a certain level, often through measures such as tariffs, import/export controls and government purchases. This support regime is aimed at protection of farmers' incomes and ensuring price stability in the market.

On the other hand, deficiency payments are those payments made to farmers when market price of a specific agricultural product falls below a predetermined target price or a reference level. This support regime compensates farmers for the gap between target and market prices, thereby providing income support and minimising the risks associated with price fluctuations.

Following on, support mechanisms in agriculture operate within two distinct systems: the high-price system and the low-price system. In the high-price system, market price support is funded by consumers and primarily implemented through import regulations, which helps to keep domestic prices relatively high. Conversely, the low-price system relies on deficiency payments financed by taxpayers, with direct support being the primary method. In this system, market prices are not artificially manipulated and tend to align with global levels (OECD, 2016; Ramaswami, 2019).

These two systems have varied implications for agricultural production, financing and markets. Nonetheless, both systems involve an income transfer to the agricultural sector. Notably, there has been a significant shift in the composition of agricultural support in recent decades - with a decrease in market price support and an increase in direct support.

Implications of subsidy are both short and long term. In short term, studies have revealed immediate effects on increase in size of holding, use of inputs and production. Conversely, the removal of subsidy has resulted into decrease in meat production and selling of flock. Chandel et al, (2019) postulated that the kinds of effect on agricultural production, financing, markets and other aspects differs in the way subsidy is extended (price support or direct payments). There is no doubt that subsidies have well served their short-term objectives. Nevertheless, they have had adverse effects on the environment and economic efficiency in the long term, prime examples being overexploitation of fish stocks, grazing lands, and soil degradation (Chandel et al., 2019; FAO et al., 2021; World Bank, 2017)

An imprecise estimate of subsidies which have environmentally harmful effects (FAO et al., 2021; OECD, 2005; World Bank, 2023) has been valued at hundreds of billions or even trillions of dollars annually. With the passage of time, awareness of governments regarding adverse effects has increased and attempts are being made to eliminate such subsidies as international commitments to reduce subsidies that harm the environment grow. At the same time, it need be kept in mind that subsidies once implemented are usually extremely hard to eliminate because of various economic and political reasons. Information on studies regarding subsidies targeted directly at livestock is limited and similarly, the studies reviewing implications of the same are similarly constrained.

The objectives of the Paris Agreement and the Convention on Biological Diversity emphasise the need for a worldwide shift towards sustainability. To accomplish these objectives, subsidies can be employed, and they are particularly prevalent in the agricultural sector - though limited to it. The OECD found that countries around the globe subsidised the agricultural sector with \$720 billion annually (2018 – 2020), which

corresponded to approximately half of the EU budget for seven years (Heyl et al., 2022; OECD, 2021)

In general, these subsidies have often been criticised for failing to ensure food security, farm livelihoods and sustainable practices. Agricultural subsidies, though, substantially affected environmental outcomes by changing which products, where, how much and how they are produced (FAO, 2022; Lankoski et al., 2025). The purpose of policy instruments is societal change, i.e., technological and behavioural, to achieve policy objectives. Article 2 (1) of the Paris Agreement requires limiting global warming to well below 2 °C and pursuing efforts to constrain the increase in temperature at 1.5 °C above pre-industrial levels (United Nations Framework Convention on Climate Change [UNFCCC], 2015). It has been seen that such instruments - especially cap-and-trade schemes - seem to have the largest potential to achieve environmental goals while avoiding typical governance problems such as rebound and shifting effects or enforcement deficits (Braathen, 2019; World Bank & ICAP, 2021).

Subsidies can be adopted for different reasons. Heyl et al, (2022) utilise subsidies in general as well as for the provision of public goods, or positive externalities such as research and development and these studies are particularly relevant for agriculture. Heyl et al (2022) posit that subsidies can be a tool to achieve universal or equal access to consumption or income. While theory suggests that targeted transfers are the more effective redistributive tool, assessment of who qualifies for the transfers and the actual transfer of funds has been frequently associated with large transaction costs. This makes non-discriminating consumption subsidies the easier alternative. Furthermore, to achieve global environmental goals, it is more effective to combine direct social transfers with ambitious environmental policy instruments rather than aiming at social goals by less ambitious - and therefore, at first glance less costly - environmental instruments (IMF, 2013; OECD, 2021).

Agricultural subsidy is only one puzzle piece that can help the agricultural sector synchronise with global environmental goals. Governance analysis shows that, compared with other policy instruments, subsidies are less effective at achievement of these goals. Therefore, subsidies should be implemented only as a complementary instrument to

provide public goods and augment research and development (Heyl et al., 2022; FAO et al., 2021). Likewise, environmental agreements required removal of environmentally harmful subsidies and instead, implementation of subsidies targeted towards achievement of global environmental goals. This implied that agricultural subsidies may require substantial scaling back. Their study also advocated that environmental objectives be streamlined through EU law to ensure that agricultural subsidies align with global environmental goals. The fundamentals of EU agricultural policy seemed to require reform and enhancement of data and transparency. Methods of evaluation of public policy play a vital role in actual assessment of the effectivity, efficiency, and impact of governmental initiatives. The methods provide a systematic framework for scenario planning the outcomes and consequences of policies - assisting policymakers in making informed decisions and improvements in policy design. Quantitative analysis, a commonly used evaluation method that involves conduct of surveys and analysis of statistical data, is used to measure policy outcomes such as the cost-effectiveness of interventions. Qualitative methods such as case studies and interviews, though, provide insights into the experiences and perspectives of individuals affected by policy (OECD, 2022; Bamberger, 2010).

Policy evaluations often employ mixed-method approaches, combining quantitative and qualitative techniques to gain comprehensive understanding of a policy's effects. Economic analysis is another vital evaluation method that examines the financial implications - both costs and benefits of public policies. Through utilisation of these evaluation methods policymakers can enhance accountability, identify areas for improvement and make evidence-based decisions to achieve desired policy objectives (Bamberger et al., 2010).

2.5 Critique of literature

Food is an essential human need primarily sourced from farming, which is inherently a risky and costly business. Unpredictable conditions can devastate crops - impacting farmers' output, income, and food supply chains. Unlike many other products, demand for food is relatively inelastic, meaning that farmers may find it difficult to compensate for lower prices simply by selling larger quantities. This feature of agricultural markets

contributes to producer vulnerability and weak bargaining power within commodity value chains (FAO, 2006). Also, agricultural production processes are time-consuming, further limiting farmers' control over their incomes. Subsidies have the capacity to play an important role in the food sector by supporting agricultural production and augmenting food security. This can help farmers manage inherent risks and uncertainties of farming, including price volatility, production shocks and income instability (OECD, 2025; World Bank, 2015). Subsidies are mostly intended as temporary measures and should not replace long-term measures in social and physical infrastructure. Though subsidies can provide immediate support, excessive reliance on subsidies can hinder the allocation of resources for productive investments - hindering the achievement of long-term goals such as balanced regional development and inclusive growth. When properly targeted and efficiently administered, subsidies can support productive investment, reduce vulnerability among farmers and help maintain supply in sectors important for nutrition. In this sense, food-sector subsidies can contribute to the welfare of both producers and consumers - provided they are designed to avoid dependency, inefficiency and distortion (FAO, 2008; FAO et al., 2021; World Bank, 2023).

Well-designed food-sector subsidies can strengthen food availability, access and affordability - contributing strongly to broader food security. The value lies not merely in increase of production, but in creation of a more stable food system where producers are better able to manage risk and consumers are better able to access essential food items (FAO, 2008; FAO et al., 2021; World Bank, 2023). Essentially, subsidies are transfers of resources funded by taxes, and their social justification lies in promotion of more equitable distribution of income. It is expected that subsidies contribute to reduction of income disparities over time. Therefore, the effectiveness and social impact of subsidies should be evaluated in terms of their ability to facilitate long-term improvements and promotion of a fairer distribution of resources and opportunities (IMF, 2014; Srivastava & Rao, 2002)

If, and when, the budgetary burden of public subsidy increases, it becomes necessary to examine whether such support actually ensures fairness in the distribution of benefits in

the process of promoting agricultural growth (World Bank, 2022). Equity evaluation not only considers whether subsidies reduce income disparities, it also assesses access to resources and opportunities within a sector (FAO et al., 2021).

The question of who should bear costs of inefficiencies addressed by subsidies, often arises. In the case of public goods (like national defence and air quality) or merit goods (like education and cultural heritage) taxpayers may be asked to contribute towards their provision. However, inefficiency costs cannot be passed on to taxpayers since they are neither a public good nor a merit good. In most cases, the provision of goods and services involves inherent inefficiency costs, which are subsidised by taxpayers when users do not pay enough to cover legitimate costs or inefficiencies. This subsidy component, when it reaches the intended beneficiaries, effectively financially supports the intermediate agents involved in the production process. It is important to carefully consider the allocation of these costs and subsidies to ensure their effectiveness and fairness - wherein lies the inherent complexity (IMF, 2000; Srivastava & Rao, 2002). Bamberger et al. (2010) and Gertler et al. (2016) posit that stronger understanding of subsidy effects on production and productivity requires meaningful interaction between theory and empirical evidence. Although linking theoretical assumptions with field data can be methodologically challenging, it improves the quality of analysis by testing whether policy expectations are supported, qualified or contradicted by observed outcomes.

A critical reading of the available literature reveals that although there is a substantial body of work on public policy design, agricultural subsidies, livestock development and evaluation criteria, there remain important gaps when these discussions are brought into the specific context of incentive-linked egg production in West Bengal. The existing literature provides strong theoretical foundations for understanding how policies are designed, how tools are selected, and how subsidies may affect productivity, efficiency and equity. However, the movement from general policy theory to sector-specific and region-specific empirical understanding remains incomplete. This gap is particularly important for a study that seeks to evaluate the potential and impact of economic incentives linked to egg production, since the effectiveness of such incentives depends heavily on local market

conditions, administrative processes, farmer awareness, cost structures and the experiences of commercial layer farm owners. One major gap lies in the dominance of generalised policy design literature over sector-specific evidence. The literature on policy design, layering, non-design and tool selection provides an important analytical framework. It does not, however, adequately explain how such theoretical issues play out in the practical functioning of livestock or poultry incentive schemes at the state level. In particular, there is limited discussion on how a commercial layer farmer interprets a subsidy scheme, whether the process of accessing such support is considered feasible and whether the incentive is strong enough to alter investment behaviour. The gap is therefore not in the existence of policy theory, but in its translation into the operational realities of commercial poultry enterprises. A second gap relates to the limited empirical evaluation of livestock-focused subsidies in India. Much of the available literature on agricultural subsidies deals with crop agriculture, input subsidies, market price support, fertiliser, irrigation, electricity, or broader farm income support. Studies on livestock policy do exist, but they are fewer in number and often address livestock as a broad category - not focusing specifically on poultry or egg production. Even within poultry, there is comparatively less evidence on commercial layer farms as a distinct unit of analysis. This is a critical limitation because the economics of layer farming differ substantially from other forms of agriculture and even from other livestock enterprises. Layer farms are capital-intensive, feed-dependent and highly sensitive to fluctuations in maize, soybean meal, chick prices, medicine costs, electricity, labour, mortality and egg market rates. Therefore, a subsidy that appears meaningful in a general agricultural framework may not necessarily be adequate in the financial structure of a commercial layer farm. A third gap concerns the limited attention given to state-level incentive schemes and their actual field-level outcomes. National schemes such as the National Livestock Mission and broader policy documents relating to poultry development provide useful direction, but they do not fully capture the design, administration and effect of state-specific industrial or livestock incentives. In the case of West Bengal - incentive frameworks such as WBIS 2017 require closer examination not only as policy documents but also as instruments that interact with banking processes, land

availability, project approval, capital investment, subsidy release mechanisms and entrepreneurial confidence. The available literature tends to discuss subsidies as an economic category, but it studies the complete pathway from scheme announcement to beneficiary utilisation less frequently. This creates a gap between policy availability and policy effectiveness. A fourth gap arises in relation to measurement and evaluation. The literature identifies effectiveness, efficiency, equity and manageability as important criteria for evaluating public policy tools. These criteria are valuable, but their operationalisation in the context of poultry incentives remains underdeveloped. The literature identifies the evaluative principles but does not sufficiently provide ready-made indicators for assessing a state-level incentive scheme in a commercial layer farming context.

A fifth gap lies in the relatively weak treatment of beneficiary perception. Public policy theory acknowledges that participants may perceive policy processes differently, and that subjective understanding can influence policy outcomes. However, much of the subsidy literature remains focused on economic modelling, fiscal burden, productivity effects or macro-policy evaluation. In the case of commercial layer farms, perceptions are extremely important. A farmer may be formally eligible for an incentive but may still not apply because of uncertainty, lack of awareness, documentation burden, previous delays, distrust of administrative processes, or the belief that the incentive amount does not justify the effort involved. A subsidy may influence one farmer's decision to expand, while having no effect on another farmer who may primarily be concerned with feed-price volatility or market uncertainty. The literature therefore falls short of capturing how policy may be experienced by intended beneficiaries. A sixth gap surfaces regarding interaction between subsidies and market volatility. Poultry farming is largely affected by input-output price imbalance. Prices of eggs are influenced by seasonal demand, regional supply availability, prevalent transport-related issues, disease scares and market intermediaries. Feed prices, particularly for maize and soybean meal, can move sharply, directly impacting profitability. Existing subsidy literature often discusses production, income transfer and productivity, but there is limited analysis regarding capability of capital incentives to meaningfully offset recurrent operational hazards.

This is especially important because commercial layer farming requires sustained working capital. Literature does not fully resolve the question of whether investment-linked incentives are sufficient in a sector where operational volatility is a central determinant of viability. Also, regarding regional specificity - West Bengal has its own poultry market dynamics, including district-wise variation in production, dependence on feed ingredients sourced from different regions, market linkages with neighbouring states, infrastructure differences, and variations in access to institutional finance. Neither national nor international literature can automatically explain these conditions. The institutional environment, farmer profile, market maturity, subsidy delivery mechanism and scale of operations differ significantly. There is therefore a need for localised inquiry that captures the specific experience of commercial layer farmers operating within West Bengal's policy and market environment. A further gap is identified in the limited linkage of policy design analysis with farm-level financial decision-making. The literature examines subsidies as instruments of public action but rarely connects them to the investment logic of entrepreneurs. For an entrepreneur to start commercial layer farming or an existing farmer - the decision to establish or expand a farm would depend on project cost, expected egg prices, feed conversion, mortality, loan terms, interest burden, payback period, working capital availability, regulatory approvals and risk tolerance. An incentive scheme would be meaningful if it improves the financial attractiveness of the project or reduces perceived risk. Existing literature does not sufficiently link policy design to such enterprise-level decision making - creating a gap that is central to the present study. Finally, there is a methodological gap. Many studies rely on secondary data, macroeconomic models or policy document analysis. While these are useful, they may not capture the ground-level functioning of incentive schemes. In the context of commercial layer farms, primary data from farm owners becomes essential because it can reveal awareness levels, access barriers, actual utilisation, perceived adequacy and the extent to which incentives influence investment behaviour. The literature therefore supports the need for a study that combines policy analysis with primary stakeholder evidence development.

CHAPTER III: METHODOLOGY

3.1 Overview of the Research Problem

The present study is concerned with evaluation of the potential and effectiveness of economic incentives linked to egg production in West Bengal, with specific reference to the West Bengal Incentive Scheme 2017. The Scheme was introduced by the Government of West Bengal to augment commercial egg production in the State by encouraging establishment and expansion of commercial layer poultry farms and poultry breeding farms. Although the Scheme is wider in its formal coverage, the present research focuses specifically on commercial layer poultry farms because these are directly connected with the production of table eggs, farm-level investment, indigenous supply, farmer income and consumer access to fresh eggs. The research problem arises from the interaction between policy intention and field reality. The Scheme was introduced in response to a recognised demand-supply imbalance in West Bengal's egg economy. Indigenous egg production in the State was insufficient to meet total consumption demand, and the deficit was met by import of eggs from other Indian States. This situation created a logical case for government intervention. If local production could be increased, West Bengal could reduce its dependence on imported eggs, consumers could gain access to fresher produce and commercial layer farmers could benefit from an expanding market supported by fiscal incentives. At the level of policy design, the Scheme therefore appeared to rest on a clear developmental logic. Eggs are an affordable source of high-quality protein and have considerable nutritional importance. A State-level production deficit meant that both food security and consumer welfare could be strengthened through local production. From the farmers' perspective, a market where demand exceeded local supply should, in theory, have offered attractive commercial opportunity. Government support in the form of a fiscal incentive was expected to reduce the financial burden of investment and encourage new entrepreneurs and existing farmers to create additional production capacity.

However, the period following the introduction of the Scheme witnessed a more complex sequence of events. The commercial layer farming sector became exposed to sharp increases in input costs, particularly feed costs. In layer farming, feed is the most significant recurring expense, and price volatility in maize, soya de-oiled cake, vitamins, minerals and other feed inputs directly affects the cost of producing eggs. From around 2021 onwards, feed prices rose substantially. This change altered the economic environment within which farms established or expanded under the incentive structure had to operate. At the same time, egg prices did not rise in proportion to the increase in production costs. The price of eggs moved according to market demand, seasonal patterns, trader behaviour, interstate supply and other factors. Continued inflow of eggs from other States further limited the ability of West Bengal farmers to recover higher costs through higher farm-gate prices. Thus, while production capacity may have been encouraged by policy intervention, the profitability of that capacity came under pressure from market forces. This gives rise to the central methodological challenge of the study. The Scheme cannot be evaluated merely by asking whether production increased after 2017. Increase in production is important but is not sufficient by itself to establish policy success. A policy may increase production but still fail to improve farmer income. It may increase the number of farms but create excessive competition. It may encourage debt-funded investment but leave farmers exposed to working-capital pressure. It may improve availability of local eggs but may not necessarily improve price efficiency or nutritional outcomes for consumers. Therefore, the evaluation must be multi-dimensional. The research problems need also be viewed through the lens of policy design. Subsidies and fiscal incentives are not neutral transfers, rather altering behaviour via changes in the economic calculations of participants. Capital subsidy has the propensity to encourage an entrepreneur to start a layer farm or an existing farmer to expand capacity. However, if the incentive addresses only the initial capital cost, without accounting for recurring operational volatility - long-term sustainability of the enterprise can remain uncertain. This is especially relevant in layer farming - where operational costs are continuous, margins thin and market prices not fully controlled by producers (Bellmann, 2019; FAO, 2010; Singh et al., 2024).

The problem is further complicated by the presence of multiple stakeholders. Farmers may evaluate the Scheme in terms of financial viability, ease of access and adequacy of support. Policymakers may evaluate it in terms of production increase, number of units supported, employment generation and movement towards self-sufficiency. Traders may experience increased local production as a change in supply dynamics. Consumers may benefit if local eggs are fresher and more available but may not be aware of the difference between indigenous and imported eggs. These different perspectives make it necessary to adopt a research design that does not privilege only one stakeholder view. The present study therefore evaluates the Scheme as a live policy intervention operating within a changing economic environment. It examines policy intent, implementation experience, beneficiary perception, market conditions and measurable sectoral trends. It is not limited to a narrow administrative review of the Scheme. Rather, it seeks to understand whether the Scheme has contributed to meaningful and sustainable development of the commercial layer sector in West Bengal. Accordingly, the research problem can be stated as follows: while WBIS 2017 was designed to augment egg production and encourage commercial layer farming in West Bengal, it is necessary to evaluate whether the Scheme has achieved its intended outcomes in terms of production, farmer welfare, market stability, employment generation, consumer benefit and long-term sectoral sustainability, especially in light of changing feed costs, egg price behaviour and continued dependence on interstate egg supply. This methodological chapter sets out how the study investigates this problem. It explains how theoretical constructs are converted into researchable variables, how research questions are framed, how respondents are selected, how data is collected and analysed and how validity, reliability, ethical concerns and limitations are addressed.

3.2 Operationalisation of Theoretical Constructs

The literature review establishes that policy evaluation requires movement from abstract theoretical ideas to measurable or observable indicators. Concepts such as effectiveness, efficiency, equity, manageability, market distortion, farmer welfare and sustainability cannot be used in empirical research unless they are operationalised. Operationalisation refers to the process through which broad concepts are translated into variables, indicators,

questions and analytical categories (Bhattacharjee, 2012). The first major operationalisation construct in this study is policy effectiveness. In general terms, effectiveness refers to the degree to which a policy achieves its stated objectives. In the present study, effectiveness is operationalised through several indicators. These include increase in indigenous egg production, increase in commercial layer capacity, establishment of new farms, expansion of existing farms, reduction in dependence on imported eggs, generation of employment and improvement in availability of fresh eggs within West Bengal. In the primary survey, effectiveness is assessed through respondents' views on whether WBIS 2017 influenced their investment decisions, whether it helped create or expand capacity, and whether it improved business confidence. In secondary data, effectiveness is assessed through available trends in production, farm numbers, capacity and market supply (OECD, 2021; World Bank, 2009). The second construct is efficiency. In public policy literature, efficiency generally refers to the relationship between resources used and outcomes achieved. A full technical cost-benefit analysis of WBIS 2017 may not be possible within this study because complete official data on total subsidy outgo, administrative cost, farm-level productivity and long-term returns may not be available. Efficiency is thus operationalised in a practical manner. The study examines how meaningful the incentive amount was, relative to total project cost, whether the support was timely, whether the subsidy improved financial viability and whether it reduced the investment burden for farmers. An indirect examination of efficiency is also done by scrutinising whether the Scheme created sustainable productive capacity or whether it encouraged investment that later became financially stressed (OECD, 2021; World Bank, 2009). The third construct is equity. Equity concerns the fairness of distribution and access. In this study, equity is operationalised through questions relating to awareness, eligibility, accessibility and perceived fairness. The research examines the following: availability of similar awareness of the Scheme to smaller, medium and larger farms, accessibility of new entrepreneurs to the Scheme as easily as established operators, if procedural requirements favoured better-resourced applicants and also whether benefits appeared concentrated among particular categories of farms (OECD, 2021; FAO et al., 2021).

Regional distribution can also be linked to equity. Policy implications can differ between scenarios aimed at encouraging wider geographical spread and those aimed at encouraging of concentration in certain areas or districts (Ebadi et al., 2023; OECD, 2023). The fourth construct is manageability or implementability. A policy may be sound in design those in but difficult to implement. Manageability is operationalised through indicators such as clarity of scheme guidelines, ease of application, documentation requirements, speed of approval, timeliness of subsidy release, administrative responsiveness and coordination between departments, banks and beneficiaries. These indicators are important because many subsidy schemes fail not because the policy objective is wrong, but because the process of accessing the benefit is too complex, slow or uncertain (OECD, 2022, 2025; World Bank, 2009). The fifth construct is policy awareness. Awareness is a necessary precondition for participation. A farmer cannot apply for or be influenced by a scheme if he is unaware of its provisions. For purposes of this study, awareness is operationalised through the following: knowledge of respondents about WBIS 2017, how they came to know about it, whether they understood the requisite eligibility conditions, whether they were made aware of the process of application and also awareness of extensions or modifications. Policy awareness also helps distinguish between formal availability of a scheme and practical reach among intended beneficiaries (CAG, 2024; Mehto et al., 2022).

The sixth construct is incentive adequacy. A subsidy may exist but still be inadequate to affect investment behaviour. Incentive adequacy is operationalised through respondents' evaluation of whether the amount of support was sufficient relative to project cost, bank loan burden, capital expenditure, interest cost and recurring operating risk. This is especially important in layer farming because initial capital investment is only one part of the business model. Farmers must also sustain feed purchases, labour payments, electricity expenses, veterinary care, medicine, vaccination, mortality risk and market fluctuations (Bellmann, 2019; Singh et al., 2024). The seventh construct is farmer welfare. Farmer welfare should not be treated merely as farm ownership or production volume. Operationalisation through income, profitability, cash flow, debt pressure, financial sustainability, ability to absorb cost increases, capacity utilisation and business confidence

are key areas that need be addressed. The research examines whether farmers felt better off after the Scheme, whether expansion led to improved returns, if feed-cost escalation eroded benefits and also whether new entrants faced higher vulnerability due to debt-funded investment (OECD, 2003; Singh et al., 2024). The eighth construct being market competition. An intended effect of encouraging more farms is increased supply and healthier competition. Increased competition, though, can result in reduced margins if output prices do not support cost structure. Market competition is operationalised through respondents' views on whether the Scheme brought new entrants into the sector, whether production expansion improved market conditions, whether it created oversupply in certain regions and also whether trader behaviour affected farmers' ability to obtain remunerative prices (FAO, 2006; Singh et al., 2024). The ninth construct is market distortion. Subsidies can have the regressive effect of creating distortions if they encourage production decisions that would not be viable without support, or if they favour some participants over others. In this study, market distortion is operationalised by examining whether the Scheme encouraged excessive or poorly timed expansion, whether it altered the competitive position of existing farms, whether it affected market prices, and whether subsidy-led investment created vulnerability when input costs rose (Bellmann, 2019; FAO, 2021).

The tenth construct is consumer welfare. Consumer welfare is operationalised indirectly because the study does not conduct consumer surveys or laboratory testing of eggs. Instead, consumer welfare is examined through freshness, availability, supply-chain time, reduction in dependence on imported eggs and potential improvements in access to locally produced eggs. The assumption is that shorter farm-to-table times may be beneficial for purposes of freshness and quality. However, the study remains careful not to overstate nutritional claims beyond the available evidence (FAO, 2008; OECD, 2021). The eleventh construct is employment generation. The Scheme includes employment generation as one of its intended outcomes. Employment is operationalised through reported number of workers engaged, whether employment increased after establishment or expansion, and whether such employment was additional or merely shifted from other agricultural or rural activities. This distinction is important because the developmental value of employment is

stronger when it creates new livelihood opportunities rather than simply relocating labour from one activity to another (World Bank, 2012; OECD, 2021). The twelfth construct is sustainability. Sustainability in this study refers to the long-term viability of outcomes created by the Scheme. It is operationalised through continued operation of farms, ability to manage feed-cost volatility, profitability over time, debt servicing capacity, resilience to market fluctuations and respondents' views on whether the Scheme should continue, be modified or be phased out. Sustainability is also examined through policy design: whether a one-time capital incentive is sufficient for a sector exposed to recurring operational risk (OECD, 2021; Bellmann, 2019). By operationalising these constructs, the study attempts to create a bridge between theory and empirical inquiry. The methodology, therefore, ensures that the research does not remain at the level of general opinion. Each major concept is linked to indicators that can be investigated through survey responses, interviews, secondary data and analytical interpretation.

3.3 Research Purpose and Questions

The purpose of this research is to assess and evaluate the efficacy of the West Bengal Incentive Scheme 2017 in relation to commercial layer poultry farms in West Bengal. The study examines whether the Scheme has managed to achieve its intended role in augmentation of indigenous egg production, encouragement of investment, improvement of farmer income, generation of employment, reduction in dependence on imported eggs and facilitating consumer access to fresher produce. The study is not merely descriptive. It does not only document the existence of the Scheme or describe its provisions. It seeks to evaluate whether the Scheme has produced meaningful outcomes in the field. This requires investigation of both policy design and policy experience. The study therefore examines the Scheme from the perspective of farmers, policymakers, policy influencers and available secondary evidence. The purpose of the study also includes examination of unintended consequences. A policy may achieve one objective while producing stress elsewhere. For example, an incentive may encourage new investment but also create greater competition among farmers. It may increase production but not profitability. It may reduce dependence on imported eggs but fail to protect farmers from input-cost volatility. It may benefit larger

farms more than smaller ones. The study therefore evaluates not only whether the Scheme worked, but also how it worked, for whom it worked and under what conditions its impact became limited. The research further aims to contribute to policy learning. Government incentive schemes often operate in complex environments where market forces, administrative capacity, beneficiary behaviour and external shocks interact. A study of WBIS 2017 can provide insight not only for the future of this particular Scheme but also for the design of similar incentive schemes in agriculture, livestock and allied sectors. It may help policymakers consider whether capital incentives should be accompanied by market support, working-capital measures, price-risk mechanisms, feed-cost monitoring or better implementation structures.

The study is guided by the following research questions:

1. To what extent has the West Bengal Incentive Scheme 2017 contributed to the augmentation of indigenous commercial egg production in West Bengal?
2. Has the Scheme helped West Bengal move closer to self-sufficiency in egg production and reduced dependence on eggs imported from other States?
3. What has been the impact of the Scheme on income, profitability and financial sustainability of commercial layer farmers?
4. Has the entry of new entrepreneurs and expansion of existing farms created healthy competition, or has it intensified market pressure among farmers?
5. To what extent has the Scheme contributed to employment generation in rural West Bengal, and is such employment additional or merely shifted from other agricultural activities?
6. Have consumers benefited through better access to fresher eggs, improved supply conditions and more efficient pricing?
7. What design changes, if any, are required to improve the effectiveness, targeting, accessibility and long-term sustainability of the Scheme?

These research questions have been designed to be deliberately broad, but are interlinked. The first two questions focus on production and self-sufficiency. The third focuses on farm economics. The fourth examines market structure and competition. The fifth deals with employment. The sixth considers consumer welfare. The seventh links findings to policy recommendation. Together, they create a comprehensive basis for evaluation of WBIS 2017 as an economic incentive scheme.

3.4 Research Design

The study adopts a mixed methods research design. This approach combined literature review, secondary data analysis, quantitative primary survey and qualitative interviews. A mixed methods design has been adopted as it is appropriate due to fact that the research problem involves both measurable outcomes and interpretive experiences. The impact of a policy incentive cannot be understood only through numerical data, nor can it be understood only through opinion. Both are required to arrive at a holistic conclusion (Bamberger et al., 2010; Patton, 1999). This study adopts a research-question-driven evaluative framework rather than a hypothesis-testing experimental framework. The approach was considered more appropriate between the two, as the research attempts to evaluate a contemporary public policy intervention through triangulated mixed-method evidence across multiple operational constructs instead of trying to establish strict causal relationships under controlled conditions.

The study combines secondary data analysis, quantitative farmer survey findings and qualitative stakeholder interviews to assess policy effectiveness, implementation experience, market implications and sustainability outcomes associated with WBIS 2017. Given the applied and evaluative orientation of the research, the study was guided primarily by research questions and operational constructs instead of formal null and alternative hypotheses. This approach is considered methodologically consistent with mixed-method policy evaluation research and applied management research, especially where contextual interpretation, triangulation and multidimensional assessment are often more suitable than purely experimental hypothesis-testing models (Bamberger, 2012; OECD, 2021)

The research design follows a sequential and complementary structure. The first stage is the literature review. This stage examines public policy, subsidy design, agricultural incentives, livestock policy, policy evaluation and the potential advantages and drawbacks of subsidies. The literature review provides a theoretical framework and helps identify the constructs that need be utilised for evaluation (Bhattacharjee, 2012; Bolderston, 2008). It also helps position the present study within the larger academic discussion on policy design and subsidy-linked development. The second stage is secondary data collection and analysis. Secondary data is used to understand the economic and sectoral context in which WBIS 2017 operated. This includes egg production trends, egg price data, feed input price trends, available government data, departmental information and sectoral records. Secondary data helps establish whether broad changes occurred in production, pricing or farm distribution. It also assists in defining the population and designing the sampling strategy. The third stage is primary quantitative data collection through a structured survey of commercial layer farm owners. This survey is designed to obtain comparable responses regarding farm characteristics, awareness of the Scheme, experience of application or benefit, market conditions, feed-cost pressure, profitability, employment and perceived effectiveness of the Scheme. Close-ended questions are used because they allow coding and statistical analysis (Bhattacharjee, 2012; World Bank, n.d.). The initial research design had considered the inclusion of both farm owners and employees (with respect to farm-level data collection). However, the final primary data collection is restricted to commercial layer farm owners only. This decision was taken due to the nature of research objectives - which focus on economic performance, investment decisions, and policy participation under the West Bengal Incentive Scheme 2017. Farm workers, although integral to operations, are not directly involved in financial decision-making, policy access, or strategic planning. Additionally, operational constraints such as dispersed farm locations, limited availability of workers for structured surveys and the informal nature of labour engagement posed practical challenges in obtaining reliable and relevant responses. Therefore, limitation of the sample to farm owners only ensured collection of more accurate, decision-relevant data aligned with the study objectives.

The fourth stage is primary qualitative data collection through interviews and discussions with policymakers, policy influencers and selected sector participants. This component adds explanatory depth. It helps understand policy intent, administrative experience, implementation bottlenecks, market response and possible design improvements. Qualitative evidence is especially important because many aspects of policy functioning cannot be captured through fixed-response survey categories (Bamberger et al., 2010; Patton, 1999). The fifth stage is an integration of findings of the study. Secondary data, survey results and qualitative evidence are to be read together. If all three sources point in the same direction, the finding becomes stronger. If they diverge, the divergence is examined as a meaningful result. For example, government data may indicate production growth, while farmers may report declining profitability. Such divergence would not invalidate the study; rather, it would reveal that production growth and farmer welfare are not necessarily the same outcome (Bamberger et al., 2010; Patton, 1999). The researcher's position also helps shape the research design. Sectoral familiarity is useful because layer farming involves practical realities that are not always visible in academic or official documents. Knowledge of feed cost, farm operations, bird capacity, trader influence, egg price movement and rural business conditions can improve the relevance of the research instrument. Familiarity, though, also carries the risk of assumption and bias. Therefore, the study balances internal understanding with external academic discipline. Evidence is collected systematically, responses are coded consistently and conclusions are drawn only from justifiable data (Holmes, 2020; Patton, 1999). The research design is not experimental and does not attempt to isolate the Scheme's effect through a control group and treatment group in the strict scientific sense. Such a design would be difficult because the Scheme operated in the real world and was accompanied by many concurrent changes in market conditions. Instead, the study adopts an evaluative mixed methods design. Rather than claim perfect causal isolation, it seeks to understand contribution, association, perception and practical impact (Bamberger, 2010; Gertler et al., 2016). It links academic theory with managerial and policy relevance. Instead of mere examination of an abstract concept, it

attempts to investigate a live business and policy problem affecting farmers, consumers and government decision-making.

3.5 Population and Sample

Core population of this study is constituted of commercial layer poultry farms in West Bengal. These farms are directly involved in egg production and are the primary units through which the effects of WBIS 2017 can be assessed. Focus on commercial layer farms becomes necessary due to the Scheme's broader objectives of augmenting egg production, encouraging entrepreneurship and improving fresh egg availability are most directly reflected in this population. The wider poultry sector includes several other actors: broiler farms, hatcheries, feed manufacturers, medicine suppliers, traders, transporters, retailers, backyard poultry units and consumers. These actors are important to the poultry ecosystem, but they do not all form part of the main survey population. Including them indiscriminately would dilute the focus of the study. The present research therefore defines its main survey population as commercial layer farm owners or authorised representatives of such farms operating in West Bengal. The population is likely to be heterogeneous. Farms may differ by district, capacity, age, ownership structure, financial model, scheme participation, market linkage and scale of operation. A small or medium farm may experience the Scheme differently from a large farm. A new entrant funded largely through bank loan may experience greater debt pressure than an established farmer expanding from internal resources. A farm located in a district with strong poultry clustering may have better access to inputs, labour, veterinary services and market networks than one located in a less developed poultry area. Therefore, the population must not be treated as uniform. The sample is the subset of said population selected for primary survey. As it may not be feasible to survey every commercial layer farm in West Bengal, sampling becomes necessary. The objective of sampling is to obtain a sufficiently representative picture of the population such that meaningful analysis can be conducted. The sample should capture variation across relevant categories and should not be limited only to farms that are easily accessible or already known to the researcher (Bhattacharjee, 2012; Lundberg, 2010).

The selection of the sample is informed by secondary data. Available lists from government departments, poultry federations, industry bodies and other sources help identify the possible universe of commercial layer farms. Where a complete official list is not available, multiple sources may be combined to construct a working sampling frame. This is important because an incomplete frame can create bias if certain categories of farms are systematically excluded. Two sampling options were considered: stratified random sampling and multi-stage sampling. Since the population can be divided into meaningful strata, stratified random sampling is suitable and adopted. Strata may include district, farm size, scheme beneficiary status or farm age. For example, if farms are unevenly distributed across districts, stratification can ensure that major producing districts and smaller producing districts are both represented. If farm size varies significantly, stratification can prevent large farms from dominating the sample (Bhattacharjee, 2012; Lundberg, 2010). If the population is geographically spread out and direct sampling of all farms was impractical, multi-stage sampling would have been suitable. In such a design, the first stage would involve selection of districts or clusters. The second stage may involve selection of farms within those districts. This approach can be useful in West Bengal because commercial layer farming may be concentrated in certain districts but still dispersed enough to create logistical challenges (Bhattacharjee, 2012; Lundberg, 2010). The final choice between stratified random sampling and multi-stage sampling depended on the completeness/ level of detail and structure of the data available. Since the data is sufficiently detailed and allows categorisation by relevant variables, stratified random sampling was adopted. If the list was incomplete or if field access was geographically constrained, a multi-stage approach would have been more realistic. In any case, the study aims to preserve representativeness to the extent practicable (Bhattacharjee, 2012; Lundberg, 2010). For the qualitative component, the population and sample are different. Here, the objective is not statistical representation but informed insight. The relevant participants include policymakers, administrators, sector institutions, poultry industry representatives and large farmers. These participants have been selected through judgement sampling because they possess knowledge, authority or influence relevant to the research

questions. Drawing a distinction between the judgement and survey samples is important. The farm-owner survey sought structured evidence from a broader respondent base. The qualitative interviews sought depth from strategically relevant participants. Both remain necessary albeit serving different methodological purposes (Patton, 1999; Hurst, 2023).

3.6 Participant Selection

Participant selection is guided by the nature of each component of the study.

For the quantitative survey, participants are commercial layer farm owners or authorised representatives of commercial layer farms in West Bengal. Farm owners are appropriate respondents because they are directly involved in investment decisions, production management, financial planning, labour engagement, feed procurement and sale of eggs. They are also the persons most likely to know whether WBIS 2017 influenced their decision to establish or expand farm capacity. Where the farm owner is unavailable, an authorised representative may participate if he or she has adequate knowledge of the farm's operations, investment background and market experience. However, care must be taken to ensure that such respondents are not merely operational staff without knowledge of financial or policy-related matters. The credibility of responses depends on the respondent's ability to answer the questions accurately. Participants are selected to reflect variation across the commercial layer sector. Relevant characteristics include farm size, district location, age of farm, whether the farm was established before or after the Scheme, whether it expanded after the Scheme, and whether it applied for or received incentive support. This variation is necessary because the impact of the Scheme may differ across groups. District-level selection is particularly important because commercial layer farming in West Bengal is not evenly distributed. Some districts have stronger poultry presence, which could be attributable to land availability, proximity to feed inputs, transport routes, market access, institutional networks or historical development of the sector. The study therefore seeks to include respondents from important poultry districts while also avoiding excessive concentration in specific locations.

For qualitative interviews, participants are selected through judgement sampling. This includes policymakers and policy influencers. Policymaker was a person representing the Animal Resources Development Department, Government of West Bengal - involved in Scheme design, implementation and monitoring. Policy influencers included representatives of NECC, West Bengal Poultry Federation, a renowned veterinarian and large layer farms. The rationale for including policymakers is that they can explain the Scheme's intent, administrative structure, eligibility, implementation process and perceived achievements. They also provided insight into why the Scheme was extended, how its success is measured and what challenges were encountered. The rationale for including policy influencers is that they operate between government, farmers and markets. They understand practical difficulties in accessing the Scheme, market response to increased production, changes in farm economics and the role of traders, feed companies or institutional bodies. Their insight helped bridge the gap between official policy and field experience. Large farm owners are included as qualitative participants because they have a broader market view. Large farms often have greater exposure to input markets, labour systems, bank finance and price fluctuations. They also have a broader view and deeper understanding of supply flows, price behaviour, interstate movement of eggs and demand patterns helping to interpret whether increased indigenous production influenced market dynamics. Mixed-methods research participant selection, therefore, follows a layered logic - with different respondent groups selected to serve distinct evidentiary and analytical functions. Farm owners provide primary evidence of Scheme experience and economic impact. Policymakers provide policy intent and administrative understanding. Policy influencers and market actors provide contextual interpretation (Creswell & Plano Clark, 2018; Teddlie & Yu, 2007). Together, these participant groups allow a more complete evaluation of WBIS 2017.

3.7 Instrumentation

The study uses separate but related instruments for assessment of the quantitative and qualitative components.

a. Quantitative

The primary instrument for the quantitative component is a structured survey questionnaire for commercial layer farm owners. The questionnaire is designed to collect objective and comparable information. It predominantly uses close-ended questions, such that they can be coded and statistically analysed and the structured format improves consistency across respondents (Bhattacharjee, 2012; World Bank, 2025). The survey questionnaire is organised using the funnel technique. It begins with general and less sensitive questions before moving towards more specific, potentially sensitive, issues. The initial section collects basic farm profile information such as district, approximate bird capacity, ownership pattern and whether the farm started and/or expanded after 2017. This helps classify respondents without immediately asking about financial stress or policy benefit (World Bank, 2025; International Labour Organisation, 2020). It also asks why, if not, the Scheme was not availed of. The next part of the survey aims to address market and economic conditions. It includes questions on changes in feed-cost, movements in egg prices, imbalances between input-output, working-capital pressures, debt burdens and profitability. These questions are required as the Scheme's effect cannot be understood without considering the economic environment in which farms currently operate (Singh et al., 2024; FAO, 2011). The following section is regarding awareness and experiences of WBIS 2017. Questions examine whether respondents were aware of the Scheme, how they had become aware and whether they applied, received a benefit as also whether the process was easy or difficult, whether the documentation requirements were manageable and whether the incentive influenced investment or expansion decisions (CAG, 2024; Mehto et al., 2022). The next sections address perceived impact of the Scheme. Respondents are asked if the Scheme helped increase production, improve income, reduce risk, support employment or improve financial sustainability. Questions use Likert-type scales categories to systematically compare perceptions (Joshi et al., 2015; Sullivan & Artino, 2013). Policy evaluation and future design are assessed in the final section. Respondents are asked whether the Scheme should remain discontinued, be extended and if extended - also be modified, whether incentive amounts should be revised; whether support should

include working capital or feed-cost mechanisms and whether market support is required alongside capital subsidy (OECD, 2021, 2022). Close-ended questions are useful as they allow statistical treatment - however, they also restrict responses. Therefore, limited “other” options are provided where necessary. However, the survey remains structured because its primary purpose is comparability (Bhattacharjee, 2012; World Bank, 2025). The quantitative survey instrument was developed by the researcher in a structured format containing predefined response categories, scaled responses and operationally aligned questions linked to the study’s evaluative constructs. Because portions of the field survey were administered through a trained field investigator, the questionnaire was intentionally designed to minimise interviewer-level variation and improve consistency in administration and response recording. Standardised wording, coding structures and response options were used to support comparability across respondents and districts. The enumerator was also provided with guidance on explaining questions, interacting with respondents and accurate recording procedures during field administration.

b. Qualitative

The qualitative instrument consists of semi-structured interview schedules. Separate schedules are used for policymakers, policy influencers and farm leaders. The interviews contain core themes but allow probing. This design ensures that major topics are covered consistently while still allowing respondents to explain issues in depth. For policymakers, the interview schedule covers policy rationale, Scheme design, eligibility, intended outcomes, administrative process, extension of the Scheme, monitoring mechanisms and perceived success. It also asks whether the Scheme’s design considered input-cost volatility, market prices and out-of-State egg supply. For policy influencers and sector representatives, the schedule covers various issues like awareness among farmers, accessibility, adequacy of support, implementation bottlenecks, market response, farm viability, trader behaviour and suggested modifications. For large farmers the schedule focuses more on market realities, price behaviour, supply dynamics, cost pressures and whether increased production has improved or worsened sectoral stability.

The qualitative component was researcher-conducted to facilitate interpretive depth, contextual probing and thematic consistency, which are important in evaluative mixed-method policy research involving complex stakeholder perceptions and implementation experiences. Before full administration, the instruments - especially the quantitative ones - are reviewed and piloted. Piloting helped identify unclear wording, excessive length, unsuitable categories and possible misinterpretation. This is particularly important because respondents may differ in educational background, familiarity with policy terminology and willingness to disclose financial information. After piloting, wording and sequencing were refined - keeping alignment with the research questions. To preserve objectivity, the instruments are designed to avoid leading questions. They do not assume that the Scheme was successful or unsuccessful - allowing respondents to indicate positive, negative or mixed experience.

3.8 Data Collection Procedures

Data collection proceeds through three major stages: literature review, secondary data collection and primary data collection. The literature review is conducted first. It draws on academic writing, policy studies, government documents and research relating to subsidies, public policy, agricultural incentives, livestock development, policy evaluation and mixed methods. The purpose is to establish the conceptual base of the study and identify the constructs that need empirical examination.

The second stage is secondary data collection. Secondary data is gathered from relevant sources such as government reports, West Bengal poultry federation records, Animal Resources Development Department records, NECC price information, commodity price data and other credible sources of information. The purpose is to understand egg production trends, price movement, feed-cost changes, farm distribution, scheme coverage and sectoral context.

Table. 3.1:

Secondary data Summary table

Secondary Data				
Source	Variables use	Method of Availability	Period covered	Purpose in study
Department of animal resources and animal health GoWB (DARAH)	WBIS 2017 Scheme notification and provision	Media notification	2017 - 2025	policy analysis
Animal Resource Development Department, GoWB (ARD)	Farm numbers, sanctioned bird capacities	Personal communication	2017 - 2025	Farm and bird capacity analysis
National Egg co-ordination committee NECC	Egg prices	Media notification	2009 onwards	Egg price trend and market analysis
West Bengal poultry federation WBPF	District wise farmer data	Personal communication	Till 2015	District wise farmer distribution and market analysis
Indusmitra	Raw material prices (soybean meal and maize)	Media notification	2016 - 2026	Raw material price trend and market analysis
Internal farm records	Feed formulation and costs, Raw material costs	Personal communication	2025 - 2026	Illustrative farm economics

Source: Prepared by author, (2026)

Secondary data is not accepted without critique. Each source is assessed with reference to terms of purpose, method of collection, coverage, date, unit of measurement and relevance. For example, data collected for administrative purposes may not perfectly match research needs. Price data may be available at different frequencies or locations. Farm lists may not be exhaustive. Government statistics may be published with time lags. These limitations are documented for definition of scope and purpose. Unpublished secondary data obtained through personal communication with government, sectoral officials and individual farms was used selectively in this study where the relevant information was not available in the public domain or where published data were incomplete, outdated or insufficiently disaggregated for the research objectives. Such data were considered useful because the study evaluates a contemporary policy intervention and required operational-level information on scheme implementation, beneficiary coverage, production capacity and district-level developments. The use of such unpublished data was subject to sufficient academic caution. The data was not treated as independently verified official statistics. They were used as supplementary and contextual evidence, not as the sole basis for drawing major conclusions. To maintain ethical and methodological transparency, the source, date and nature of personal communication were recorded, while confidentiality was preserved where required. Limitations arising from restricted access, non-availability to public or lack of independent auditability are acknowledged as limitations in the methodology.

Many commodity databases require subscriptions, restrict downloads, historical depth and are difficult to reproduce by external reviewers. IndexMundi, on the other hand offers publicly accessible historical datasets, transparent downloadable trend data and easy replication by examiners/readers. Historical commodity and agricultural market data were obtained from publicly accessible aggregation platforms like IndexMundi, which compiles data from multiple recognised institutional and statistical sources and disseminates the same through downloadable charts and historical datasets. The secondary data accessed from the platform was used primarily for indicative trend analysis. These commodity-price trends obtained from IndexMundi were not relied upon in isolation though. They were rather triangulated with farmer-reported feed-cost pressures, interview findings and sectoral observations. Where necessary, secondary data is standardised and sanitised. Units are checked and obvious inconsistencies reviewed. Where data is incomplete, the study is cautious in use and does not overstate conclusions. The reasoning behind the same is that the purpose of secondary data is provision of context and trend evidence, not to create artificial certainty (OECD, 2012; UK Statistics Authority, 2021). The third stage is primary quantitative data collection through a structured survey. Mostly farm owners and in some cases authorised representatives are contacted in person or by telephone - depending on accessibility. A structured format paper questionnaire is used. Responses are later entered into Microsoft Excel for collation, sanitization and analysis. The quantitative primary data for the farmer survey was collected through field-based administration of structured survey among commercial layer farm operators across selected districts of West Bengal. Given the geographical spread of respondents, operational requirements of field access and the restricted timeframe of the survey exercise, portions of the survey administration process were assisted by a trained third-party field investigator operating under the supervision and direction of the researcher. The researcher designed the survey questionnaire personally. Post-determination of the sampling framework, the data collection process was finalised. Instructions were then provided regarding survey administration and the consistency of response recording was monitored. The enumerator was briefed on the objectives of the study, respondent categories, ethical considerations, neutrality in questioning and the

explicit need to accurately record responses without influencing respondents. During survey administration, the purpose of the study was explained to respondents. Participation remaining voluntary, respondents are informed that the research is academic and that the information will be used for analysis of the Scheme and sectoral conditions. Sufficient care is taken to ensure that the respondent understands the questions. Where necessary, terms are explained without influencing the answer. Though third-party assistance was used for portions of field data collection - the overall research design, instrument development, respondent selection framework, analytical interpretation and final responsibility for the data remain with the researcher. To improve data reliability and consistency, completed schedules were reviewed and cross-checked by the researcher for completeness, logical consistency and coding accuracy before data preparation and analysis. Any ambiguous or incomplete responses were clarified wherever feasible through follow-up verification. Maintenance of consistency being of high importance for data collection procedures the same core survey instrument is used across farm respondents and coding categories are kept uniform. Interview themes are maintained across stakeholder groups, noting any differences in mode of collection (Bhattacharjee, 2012; OECD, 2025). The fourth stage is qualitative data collection through interviews. Interviews are conducted in person and over the telephone. Notes are taken during interviews. Where possible, responses are written down soon after the discussion to preserve accuracy. The qualitative material is later organised by theme. The qualitative component was researcher-conducted to facilitate interpretive depth, contextual probing and thematic consistency, which are important in evaluative mixed-method policy research involving complex stakeholder perceptions and implementation experiences. The sequence of data collection is also provided due importance in overall structure of the data collection procedure. Secondary data informs the survey design and sample structure. Survey results provide measurable evidence. Interviews then help explain and interpret those results. This sequencing allows the research to move from broad context to focused field inquiry (Bamberger et al., 2010; Hurst, 2023).

3.9 Data Analysis Methods

The study uses both quantitative and qualitative analysis methods.

The first level of analysis concerns secondary data. Secondary data is analysed to identify broad trends in egg prices, feed input prices, production indicators, farm numbers and scheme-related information. The purpose is to understand the economic environment within which commercial layer farms operate. Trend analysis may show whether egg prices rose in line with feed costs, whether production increased over time, whether farm numbers expanded after the Scheme and whether market stress coincided with post-2021 input-cost escalation. The second level of analysis concerns primary survey data. Responses are first populated into Microsoft Excel for sanitisation and standardisation. Data cleaning includes checking for missing values, inconsistent entries, duplicate responses and coding errors. Each variable is assigned a clear code. For example, responses to awareness are coded as aware, partially aware or unaware. Farm sizes are grouped into categories and Likert-scale responses are then coded numerically for analysis (OECD, 2025; Sullivan & Artino, 2013).

Microsoft Excel is used as the main software for structured data organisation and quantitative analysis. Excel is appropriate for this study because the dataset is modest in size, the survey responses are coded, and the required analysis is primarily descriptive and comparative. It allows systematic data entry, cleaning, coding, filtering, frequency counts, percentage calculations, cross-tabulations and chart preparation (Microsoft Support, n.d.). These functions are sufficient for presenting different aspects being surveyed as well as construct-wise comparisons. Excel also supports transparent checking of data and visual presentation of findings, making it suitable for an applied policy evaluation where the emphasis is on clear interpretation rather than advanced statistical modelling. The first stage of primary quantitative analysis is descriptive. Frequencies and percentages are used to summarise respondent profile, awareness of the Scheme, application status, perceived feed-cost increase, profitability pressure and views on policy impact. Descriptive analysis is essential because it gives a clear picture of the dataset before more complex analysis is attempted.

The second stage involves cross-tabulation. Cross-tabulation allows for comparison between groups. For example, scheme awareness is compared across farm size categories. Perceived benefit is compared between farms established before and after 2017. Financial stress is compared between farms that expanded after the Scheme and those that did not. Such comparisons helped identify whether experiences differ across respondent categories. The third level of analysis is qualitative thematic analysis. Interview notes and open-ended responses are reviewed to identify recurring themes. These include administrative delays, lack of awareness, adequacy of subsidy, feed-cost pressures, trader influence, difficulty in obtaining bank finance, perceived market saturation, need for redesign and views on the continuation of the Scheme. Themes are compared across stakeholder groups. Policymaker views are then compared with farmer views and industry views with farm-level experience. Integration is the final stage. Quantitative and qualitative findings are interpreted together, not as separate chapters of evidence. This approach is more required to ensure that the overview is holistic rather than merely juxtaposing quantitative, qualitative and secondary evidence in a mixed-methods research design (Bamberger et al., 2010; Feters et al., 2013). The study avoids overclaiming causality. It attempts to distinguish between the observed trend, respondent perceptions and the attributable policy effect. This is important because many variables simultaneously affect the sector. Conclusions are therefore drawn through reasoned interpretation of converging evidence (Bamberger et al., 2010; Gertler et al., 2016).

3.10 Data Structuring, Coding and Preparation for analyses

Data collected for this study have been structured and prepared systematically before analysis, so that both secondary and primary evidence can be interpreted consistently. Secondary data is first organised by source, period, variable type and unit of measurement. Data on egg production, layer farm capacity, the number of farms, egg prices, feed ingredient prices, and scheme-related information are segregated into clearly identifiable categories. Where data are obtained from different sources, the units and time frames are standardised before comparison.

Variables not directly connected to the research questions are excluded from analysis and this exclusion is noted as part of the data preparation process. Commodity price datasets obtained from IndexMundi.com and other farm-level sources were organised chronologically and used for trend-based interpretation. Since these were secondary aggregation datasets, they were treated as indicative market-context evidence and triangulated with primary survey and interview findings. Primary survey data is structured separately before integration with the secondary evidence. Responses from commercial layer farm owners are first entered into Microsoft Excel and checked for completeness, duplication, inconsistent entries and obvious data-entry errors. Each survey question is converted into a defined variable and closed-ended responses are coded numerically for analyses in Excel. Likert-scale responses are coded in a consistent direction - such as from low agreement to high agreement or from low impact to high impact. Categorical variables, such as district, farm size, scheme awareness, beneficiary status, year of establishment and expansion status, are coded without treating them as scale variables. They are used for frequency analysis, grouping and cross-tabulation rather than inappropriate averaging. Composite indexes are created only where grouped variables are conceptually related and suitable

3.11 Research Design Limitations

The research design has several limitations.

The primary limitation is the lack of experimental control. It cannot, in all practicality, create a controlled comparison between identical farms that did and did not avail of the Scheme while keeping all other factors constant. The Scheme was deployed by the GoWB in real-time and a real market environment affected by a variety of factors such as feed prices, egg prices, disease risk, finance, interstate supply, and, moreover, pandemic disruption. As such, the study evaluates contribution and perceived effect rather than claiming precise causal isolation. The second limitation concerns secondary data availability. Complete and consistent data on farm numbers, subsidy disbursement, production capacity, employment generation and interstate egg movement are not

available. Different sources have different reasonings and outlooks for the collection of data, modes of collection and reporting periods. These limit the precision of trend analysis. Also, since part of the secondary dataset was obtained through personal communication and was not publicly accessible, full external verification was limited. This is recognised as a limitation, and the study mitigated this by triangulating the data with published records, primary survey findings and stakeholder interviews. The third limitation is regarding publicly available raw material price trends. Historical raw material price trends for maize and soybean meal were compiled from a publicly accessible market-data aggregation platform, IndexMundi.com. Since these are secondary aggregation datasets, they are treated as indicative market-context evidence, supplemented by illustrative farm-level data and sectoral references and also triangulated with primary survey and interview findings. The fourth limitation is with regard to the sampling frame. There is no complete official list of all commercial layer farms in West Bengal thus the sample is drawn from available records and field knowledge. This introduces coverage limitations. Some farms may have been excluded because they are not part of formal lists or institutional networks, but there is no corroborating evidence to support the same. Another limitation concerns response bias. Farm owners may answer based on their personal financial situation. Various affecting factors may not be the same for all respondents. A farmer under stress may evaluate the Scheme negatively even if it has actually helped create capacity. A beneficiary may evaluate it positively even if the wider sector remains stressed. Policymakers may emphasise achievements, while farmers may emphasise difficulties. The study addresses this through triangulation but cannot eliminate bias entirely (Bhattacharjee, 2012; Patton, 1999). A further limitation concerns mode of data collection. Some responses were collected in person and others by telephone. Differences in mode may affect depth of response or respondent comfort and their responses thereon (De Leeuw, 2005; World Bank, 2025). The study, though, attempts to maintain consistency through usage of the same structured instrument within categories of respondents.

Last but not the least, another limitation is regarding qualitative judgement sampling. Policymakers and policy influencers are selected for relevance, not statistical

representativeness. Although their responses provide insight, they cannot be generalised numerically onto all possible stakeholders (Hurst, 2023; Patton, 1999). Acknowledgement of these limitations is of prime importance for ability to demonstrate methodological transparency. Objective of the study is not to claim perfect computation, rather production of a disciplined and evidence-based evaluation, where such assessment is essentially conducted within reasonable and practical field constraints (Bamberger et al., 2010; Patton, 1999).

3.12 Validity and Reliability

Multiple safeguards are utilised to address validity and reliability. Content validity is maintained by aligning the instruments with the research questions. The survey and interview schedules cover production, self-sufficiency, farmer income, profitability, market competition, employment, consumer benefit as well as policy redesign (Bhattacharjee, 2012; Taherdoost, 2016). These correspond directly to the study's purpose.

Construct validity is strengthened by operationalising theoretical constructs clearly. Effectiveness, equity, efficiency, manageability, awareness, adequacy and sustainability are translated into specific questions and indicators. This reduces the risk of inconsistent interpretation of abstract concepts. Internal validity is supported through triangulation. The study utilises literature, secondary data, survey responses and interviews. A conclusion is considered stronger when multiple sources support it. When sources disagree, the disagreement is analysed rather than ignored. Standardisation is utilised to achieve reliability. This is done via use of consistent wording and response categories, application of uniform coding rules and rechecking of data entry (Bhattacharjee, 2012; Taherdoost, 2016). Use of close-ended questions improves comparability across respondents and where scale items are used, reliability is rechecked for appropriateness. Several procedural measures were adopted to improve reliability and consistency within the quantitative survey process. Since portions of the questionnaire administration involved a trained field investigator, the study used a structured questionnaire format with predefined response categories, standardised wording and operationally aligned coding systems to minimise

interviewer-level variation. Enumerator briefing and researcher supervision were provided due importance to promote uniformity in administration procedures across districts and respondent categories. In addition, completed schedules were reviewed by the researcher for logical consistency, completeness and coding accuracy prior to analysis. These measures were intended to strengthen reliability, reduce recording inconsistencies and improve comparability of responses across the survey sample. Qualitative credibility is supported through careful selection of informed participants, thematic organisation of responses and comparison across stakeholder groups. (Hurst, 2023; Patton, 1999) The study does not rely on a single interview or isolated opinion. Rather, it looks for recurrent patterns, explanations and meaningful divergence. External validity is approached cautiously. Findings are specific to West Bengal and commercial layer farms. They may offer lessons for other subsidy schemes, but direct transfer to other sectors or States may or may not be directly beneficial.

3.13 Ethical Considerations

The study follows ethical principles appropriate to academic research. Participation remaining voluntary, respondents are informed about the purpose of the study before participation. All respondents participating in the quantitative survey were informed regarding the academic purpose of the study prior to participation. Informed consent is obtained in a practical manner. For surveys and interviews, the purpose of the research and use of responses are explained - respondents' willingness to participate being taken as consent. Participation was voluntary and respondents retained the right to decline participation or refuse to answer specific questions. The field investigator assisting in questionnaire administration was instructed to maintain respondent confidentiality, avoid coercive or leading questioning practices and record responses faithfully without interpretation or manipulation. The identities of respondents were not disclosed within the thesis and collected information was used solely for academic research purposes. Confidentiality has been strictly maintained. Farm-level financial information, business difficulties, criticism of policy and individual opinions are treated carefully. Respondents are not unnecessarily identified in the thesis.

The study avoids harm. Questions are framed paying due respect to respondents - especially as some farmers are subject to financial stress. The research is not intended to expose individual weaknesses but to understand the effect of policy with relevance to sectoral conditions. The researcher also has an ethical duty to interpret data fairly. Evidence is not selectively used to support a predetermined conclusion. Positive, negative and mixed findings are all considered. This is especially important in policy evaluation, where different stakeholders may have different interests. Researcher positionality is also acknowledged. Though sectoral familiarity can improve access and interpretation, it also has the propensity and capability of creating bias. The study therefore, utilises structured instruments, triangulation and transparent reasoning to preserve objectivity (Holmes, 2020; Patton, 1999). Artificial Intelligence (AI) and digital tools are used only for grammar and language refinement to help structure and formatting - not to generate data or fabricate analysis. All interpretations and conclusions are entirely researcher-driven.

3.14 Limitations of the Approach

The overall approach has certain limitations beyond the design limitations already identified. First, the study relies partly on perception. Perception is valuable because policy effectiveness depends on beneficiary experience. However, perception cannot be equated to objective measurement. The study therefore, combines perception with secondary data and interview evidence (Bamberger et al., 2010; Patton, 1999). Second, conclusions regarding farm economics are evaluative rather than forensic. The study examines profitability and financial stress utilising survey responses and available indicators, rather than audited farm accounts. Third, laboratory testing for egg freshness or nutritional quality is not conducted. Consumer welfare is assessed not vide biochemical analysis - rather through supply-chain and freshness logic. Fourth, the study is time-bound. Market conditions are constantly changing. Feed prices may fall or rise, egg prices may change and policy may be modified. Findings must therefore be understood within the period studied. Fifth, the study focuses on commercial layer farms only and does not evaluate the entire poultry value chain. Broiler farming, hatcheries, feed manufacturing and backyard poultry are discussed only where relevant to context. Sixth, the study cannot fully capture

informal market behaviour. Trader influence, delayed payments, informal price arrangements and local business practices are many factors that are difficult to measure precisely. Finally, it needs to be noted that although structured questionnaires, enumerator briefing and researcher supervision were used to improve consistency in field administration, the involvement of a third-party field investigator in the deployment of the quantitative survey process may have introduced limited interviewer-level variation in explanation, interpretation or response recording. Additionally, field-based surveys within geographically dispersed agricultural settings may be subject to occasional inconsistencies arising from operational field conditions. However, review procedures, cross-checking and dataset validation measures were adopted to minimise such risks and improve overall data reliability. These limitations define the scope of the study. They do not make the research invalid. Rather, they help clarify the boundaries within which conclusions should be drawn.

3.15 Conclusion

This methodology provides a structured framework for evaluation of WBIS 2017 as a policy intervention by the Government of West Bengal in the State's commercial layer poultry sector. The research problem is complex because the Scheme operated in a constantly evolving market environment shaped by feed-cost escalation, egg price behaviour, debt-funded investment, interstate supply and farmer-level financial pressure.

The complex backdrop calls for prudence in approach, and the study to adopt a mixed methods design. Literature review provides theoretical grounding. Secondary data establishes context and trends. Farm-owner surveys provide structured primary evidence. Interviews with policymakers and policy influencers provide interpretive depth. Together, they enable a holistic evaluation that would not have been possible with any single method (Bamberger et al., 2010; Patton, 1999).

By operationalising theoretical constructs, selecting appropriate participants, using structured and semi-structured instruments, applying quantitative and qualitative analysis and acknowledging limitations, the study seeks to produce findings that lend credence to academia and are practically useful.

CHAPTER IV: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the findings of the study on the impact and evaluation of the West Bengal Incentive Scheme 2017 for Commercial Layer Poultry Farms and Poultry Breeding Farms. The chapter is organised around the operational constructs developed for the purposes of this study targeted at Commercial Layer Poultry Farms, as outlined below:

- Policy effectiveness of the WBIS 2017 Scheme
- Self-sufficiency of the State with respect to egg production
- Incentive adequacy
- Farmer welfare
- Market competition
- Market distortion
- Employment generation
- Consumer welfare
- Policy awareness
- Equity
- Manageability and
- Sustainability

The findings are structured into two main parts. The first presents secondary data findings, drawing on the Scheme notification, available Government of West Bengal records (WBIS 2017), West Bengal Poultry Federation (WBPF) records, National Egg Coordination Committee (NECC) price records, individual farm records, feed ingredient price trends and

actual farmer-level feed formulation data. The second presents primary data findings, consisting of stratified random sampling survey data from commercial layer farmers and judgment-sample interviews with policymakers, policy influencers, and selected large farmers. The data findings are organised by operational construct rather than by individual question because the study seeks to evaluate WBIS 2017 analytically - not merely report survey and interview responses sequentially. Each construct draws on evidence from multiple survey questions and interview responses. A question-by-question format would fragment related evidence and lead to repetition. A construct-based structure, in contrast, allows the findings to be triangulated, compared, and interpreted against the research questions. This is expected to improve coherence and present the results in a policy-evaluation approach rather than a mere questionnaire summary. The findings evaluate not only whether the capital subsidy encouraged farm investment, but also whether the overall incentive package was sufficient to improve production, reduce import dependence, support farmer welfare, improve consumer access to fresher eggs and strengthen the long-term sustainability of commercial layer farming in West Bengal. The findings do not attempt to establish strict experimental causality. Rather, the study uses a mixed-methods evaluative approach to assess contribution, association and stakeholder perception. This is important because WBIS 2017 operated in a real market environment affected by multiple external variables - including feed price escalation, interstate egg inflows, district-wise clustering, trader influence, bank finance, and changing farm-gate price conditions.

4.2 Overview of Secondary Data Findings

This section introduces the secondary data used for the study. The main secondary sources are:

1. WBIS 2017 Scheme notification and operational procedure
2. WBIS farm, farmer and bird capacity data collated by the ARD, Government of West Bengal

3. WBPF farm district data
4. NECC egg price data
5. Maize and soybean meal price trend data
6. Actual farmer-level price data and feed formulation data

The purpose of the secondary data is not merely descriptive. It provides the background against which the primary findings are to be interpreted. For example, farmer survey responses on feed-cost stress may become more meaningful when read alongside price escalations in maize and soybean meal. Similarly, interview findings on production growth and district clustering can become more meaningful when read alongside WBIS and WBPF farm distribution data. The Scheme was introduced to encourage entrepreneurs to establish new commercial layer poultry farms and poultry breeding farms, expand commercial egg production and generate employment opportunities in rural areas. This study focuses on the impact on commercial layer poultry farms.

4.2a Scheme Design and Incentive Structure

The operational constructs used to approach the study's findings in this section are policy design, incentive adequacy, equity, and manageability. The structure of the WBIS 2017 is discussed before moving into empirical findings. This is important because the Scheme must not be described as merely a capital subsidy programme. It was a broader incentive package intended to reduce entry and expansion barriers in commercial layer farming.

The chart below WBIS 2017 included the following support components:

Table 4.1:

West Bengal Incentive Scheme 2017: subsidy components

WBIS 2017 Special Incentive Scheme		
Component	Disbursal policy	Impact
Capital grant/subsidy	One time grant - Receivable in two tranches	Reduces initial project cost and improves investment feasibility
Subsidy on stamp duty and registration fees	One time grant	Reduces cost of land related formalisation
Interest subsidy on term loan	Receivable for 5 years	Reduces debt servicing burden during initial years
Waiver of electricity duty		Reduces statutory electricity-related cost
Power subsidy		Reduces recurring power burden

Source: Compiled and prepared by author using secondary sectoral data, (2026)

The chart above explains that the Scheme was therefore designed as a mix of capital support, credit-linked support, power-cost support and transaction-cost support. However, it did not directly provide recurring feed-cost support, price stabilisation, working-capital protection or market-risk coverage. This becomes one of the study's central findings, as the later economics of layer farming are heavily influenced by feed price escalation. Note need be made that there is an important distinction between investment encouragement and long-term operating viability. WBIS 2017 appears to have been designed primarily to promote capacity creation, rather than to protect farms from recurring cost volatility after establishment. It can be stated that the secondary data and interviews together show that WBIS 2017 was a production-oriented and enterprise-promoting scheme, but not a comprehensive risk-management framework for commercial layer farming.

4.2b Evidence on production growth and farm expansion

The operational constructs used to describe the study's findings in this section are policy effectiveness, production augmentation, and the State's self-sufficiency regarding egg production.

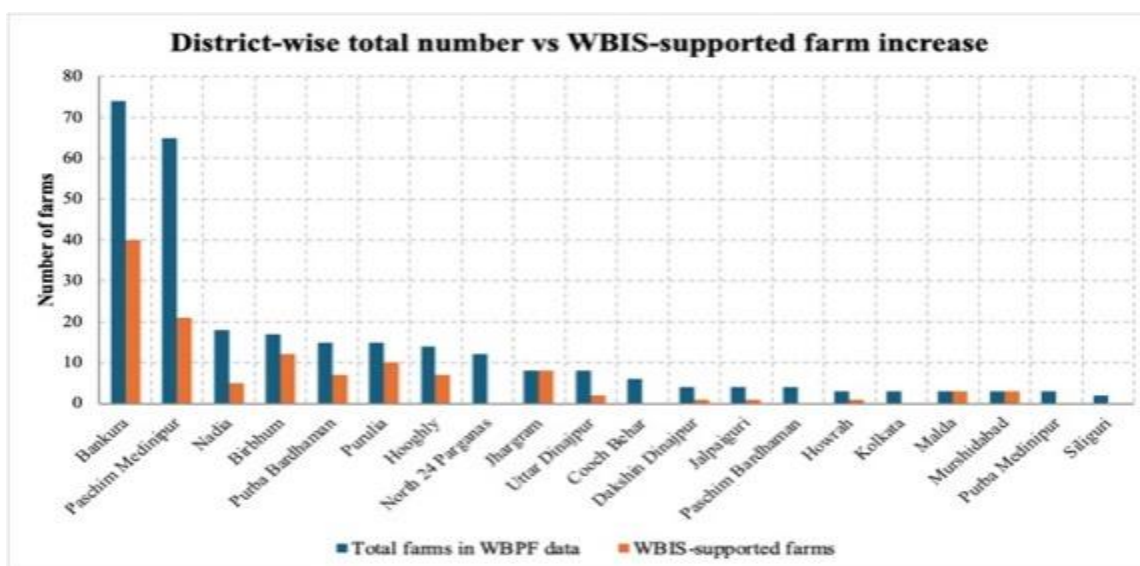
Secondary data obtained from the Animal Resources Development Department (ARD), Government of West Bengal, indicates that WBIS-supported commercial layer projects

contributed to, or supported, an increase of approximately 65 lakh birds in sanctioned commercial layer bird capacity after introduction of the Scheme. This is one of the strongest indicators of production augmentation associated with WBIS 2017 and supports the finding that the Scheme materially contributed to expansion of West Bengal's indigenous commercial egg-production base. The discussion, however, does not merely count farms; it interprets whether the Scheme contributed towards the following:

1. establishment of new farms;
2. expansion of existing farms;
3. district-wise clustering;
4. stronger local production base.

Figure 4.1:

District-wise total vs WBIS-supported farm increase



Source: Compiled and prepared by author using secondary sectoral data, (2026)

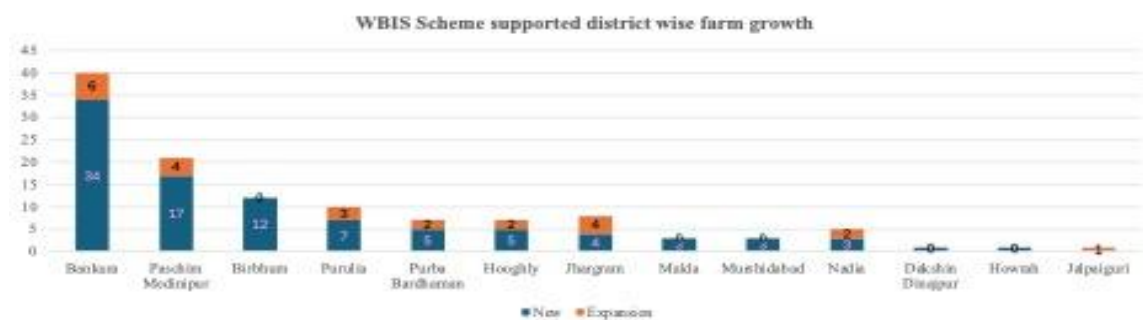
The chart shows the number of WBIS-supported farm cases vs the total number of farms by district. It supports the finding that WBIS 2017 contributed to the creation of production capacity, but that expansion was spatially concentrated, especially in Bankura and Paschim

Medinipur, rather than evenly distributed across West Bengal. This secondary finding needs to be framed cautiously. A rise in farms or bird capacity after 2017 does not automatically prove that WBIS alone caused the increase. However, if farm establishment/expansion coincides with Scheme availability and is supported by primary responses, it can be concluded that WBIS contributed to investment and production growth.

ARD WBIS data indicates that it is effective in encouraging commercial layer farm investment and capacity creation. However, the expansion was unevenly distributed across districts and cannot be interpreted as uniform sectoral development across West Bengal, as can be seen from the chart attached below.

Figure 4.2:

WBIS Scheme supported district wise farm growth

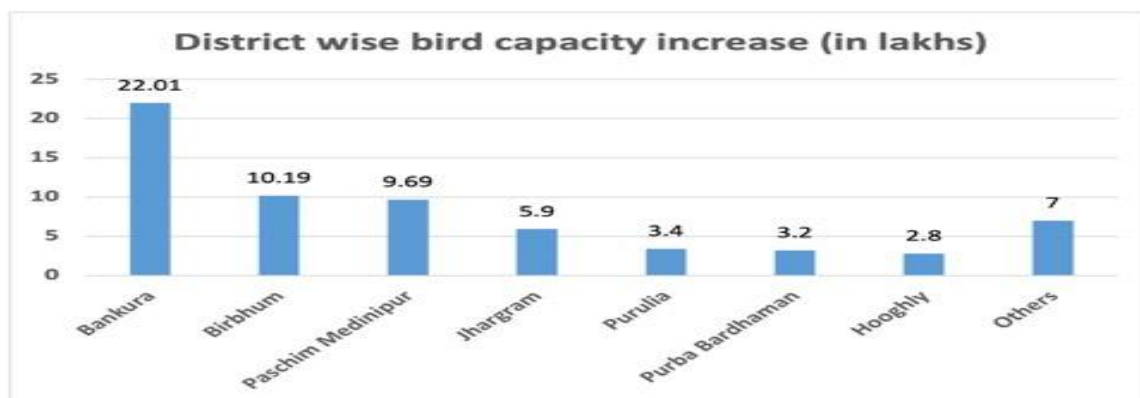


Source: Compiled and prepared by author using secondary sectoral data, (2026)

Note need be made of the distinction between production capacity and production sustainability. A farm may add birds and contribute to State production, but if feed costs rise sharply and egg prices remain under pressure - production increase may not translate into stable farmer income.

Figure 4.3:

WBIS-sanctioned bird capacity increase in West Bengal



Source: Compiled and prepared by author using secondary sectoral data, (2026)

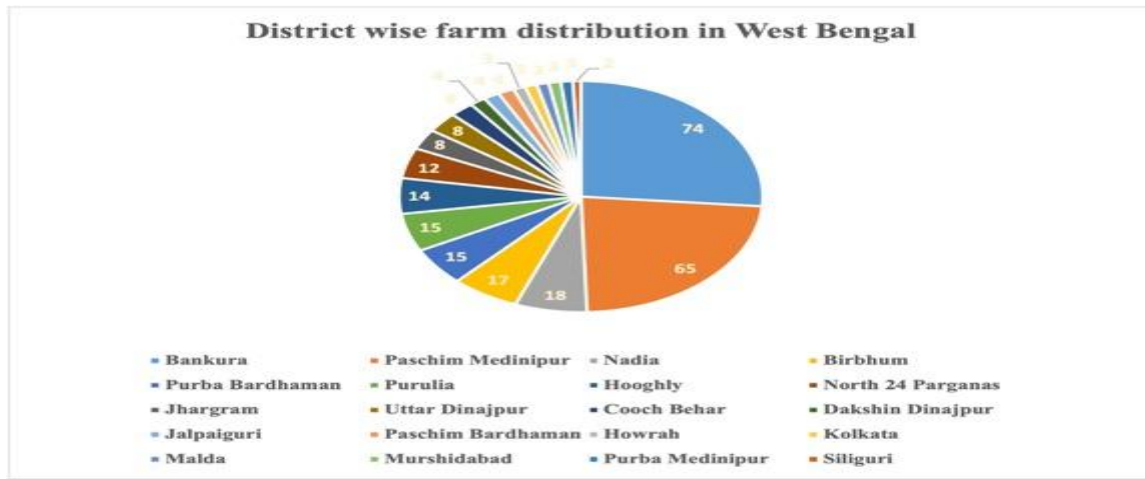
The increase of approximately 65 lakh birds is significant not merely as a numerical expansion of capacity, but because it represents the creation and expansion of productive commercial layer infrastructure across multiple districts. However, this expansion was spatially uneven and concentrated primarily in districts such as Bankura and Paschim Medinipur - suggesting that production augmentation under WBIS 2017 occurred through clustered regional growth rather than uniformly distributed expansion across the State.

4.2c District concentration and market structure

The operational constructs used to describe the study's findings in this section are market competition, market distortion, equity and policy effectiveness.

Figure 4.4:

District wise farm distribution in West Bengal



Source: Compiled and prepared by author using secondary sectoral data, (2026)

The data from WBIS and WBPF demonstrate that commercial layer farms are concentrated in certain districts. District concentration is important because it affects:

1. input procurement networks
2. veterinary and technical service availability
3. egg aggregation and trader bargaining
4. local oversupply
5. farm-gate price pressure and
6. unequal access to sectoral information and support

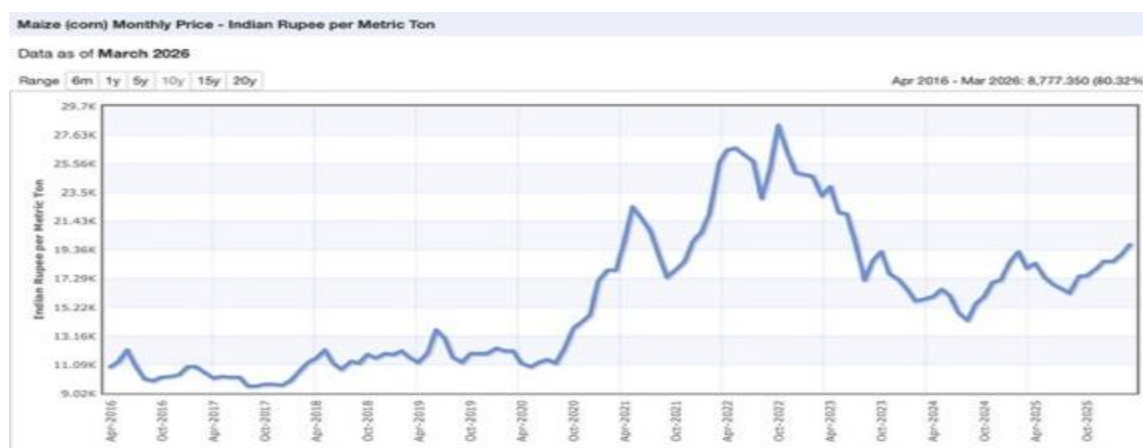
Secondary data identifies the major producing districts and attempts to compare them with less represented districts. Bankura, Paschim Medinipur, and Purba Bardhaman districts show higher farm presence - this is linked to the primary findings on district-wise pressure and clustering. The district concentration appears to have helped create poultry clusters and production capacity, but it may also have intensified localised competition, trader dependence and farm-gate price pressure in certain districts.

4.2d Evidence on feed-cost escalation and operating viability

The operational constructs used to describe the study's findings in this section are farmer welfare, incentive adequacy, efficiency and sustainability.

Figure 4.5:

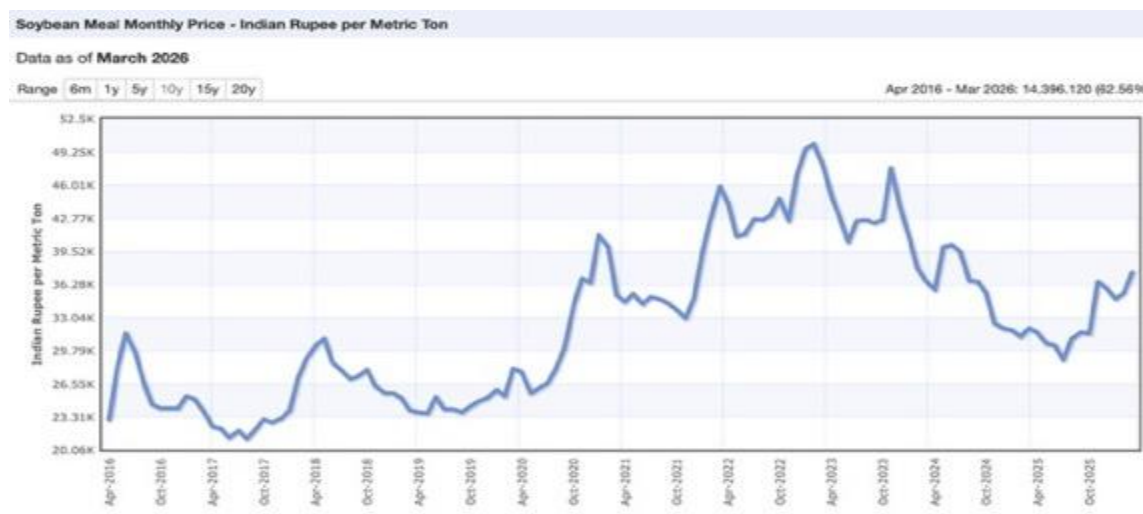
Maize price monthly price – India rupees per metric ton, 2016 – 2025



Source: IndexMundi. (2026). *Commodity prices*.

Figure 4.6:

Soybean meal price monthly price – India rupees per metric ton, 2016 – 2025



Source: IndexMundi.com (2026). *Commodity prices*.

The uploaded price charts for maize and soybean meal show that two critical feed ingredients increased substantially over the 10-year period from April 2016 to March 2026. Maize prices increased from about Rs. 11,000 to around Rs. 19,000 per metric ton from 2016 to 2026, with a peak of around Rs. 27,000 in 2023.

Soybean meal prices too, increased from about Rs. 23,000 to around Rs. 37,000 per metric ton from 2016 to 2026, with a peak of around Rs. 50,000 in 2023. Prices for both ingredients have remained consistently on the higher side since 2020. COVID-19 has had its impact and the same can be seen on these prices, but even after the impact of Covid has subsided - prices have not gone back to 2019 levels.

These prices are only indicative and the actual prices of materials when they arrive at different farms may differ due to various factors such as transportation costs, bargaining power, seasonal buying power and the like. These increases are highly relevant, though, because maize and soybean meal together form the major cost base of commercial layer feed.

Attached below is a typical layer bird feed formula that outlines the quantities of raw material used to make one ton of layer bird feed. Corresponding costs of materials bought by the farm at the time (April 2025) can also be seen to arrive at the final feed product cost per ton.

Table 4.2:

Typical layer bird feed formula: components and costs

MATERIALS NAME	QUANTITY 1 TON	RATE	AMOUNT
MAIZE	520.000	21.5	₹ 11,180.00
SOYA	163.000	48.3	₹ 7,872.90
M DOC	50.000	26.75	₹ 1,337.50
DORB	136.000	15.2	₹ 2,067.20
MCP	4.000	119	₹ 476.00
LSP	25.000	5	₹ 125.00
LSG	91.000	5	₹ 455.00
DOVOPHOS	0.100	237.6	₹ 23.76
SALT	2.700	6	₹ 16.20
TURMERIC POWDER	0.500	195	₹ 97.50
SODA	1.700	38	₹ 64.60
PROAMINO M	1.300	235	₹ 305.50
LYSINE	0.200	230	₹ 46.00
LAYVIT CLASSIC	0.500	303	₹ 151.50
KEMTRACE	1.000	140	₹ 140.00
ROSSZYME PLUS	0.150	210	₹ 31.50
CHOLINE CHLORIDE	0.600	85	₹ 51.00
TOXSTOP	1.000	74.92	₹ 74.92
IMMUNO WALL	0.250	480	₹ 120.00
LACTOMAX	0.100	1175	₹ 117.50
HEPATOCARE	0.500	66	₹ 33.00
SUPRACID	1.000	110	₹ 110.00
HIM C	0.200	185	₹ 37.00
HIMLAY	0.500	920	₹ 460.00
REPLINA	1.000	160	₹ 160.00
L THREONINE	0.250	210	₹ 52.50
ALPHA D3	0.250	900	₹ 225.00
ZMOS	0.300	170	₹ 51.00
EGGS UP	0.300	340	₹ 102.00
ORCAL P	1.000	132	₹ 132.00
LABOUR COSTING FEED MILL			₹ 200.00
ELECTRIC COSTING			₹ 150.00
COST(TOTAL AMOUNT /1 TON)			₹ 26,466.08
PER KG			₹ 26.47

Source: Author's calculation based on internal feed formulation and procurement cost records of a commercial layer farm in West Bengal, 2025–2026 (Bhattacharyya, 2026)

The actual feed formulation data shows a total feed cost of approximately ₹26,466.08 per metric ton, or ₹26.47 per kg. In that formulation, maize accounted for ₹11,180 per ton and soya for ₹7,872.90 per ton. Together, maize and soya alone accounted for approximately ₹19,052.90 per ton, or around 72% of the total feed cost.

This finding is significant because the Scheme's major support components were linked to capital cost, interest burden, electricity duty, power subsidy and registration-related costs.

These are important supports, but they do not directly absorb the recurring volatility of maize and soybean meal prices. Therefore, a farm may have benefited from WBIS at the time of establishment or expansion but still face substantial viability pressure later due to operating cost escalation.

The core finding in this section is that the Scheme was relevant to reducing entry costs and encouraging investment, but its original structure was less suited to protecting farmers from recurring feed-cost escalation. This creates a gap between the success of production-oriented policies and farmer-level financial sustainability.

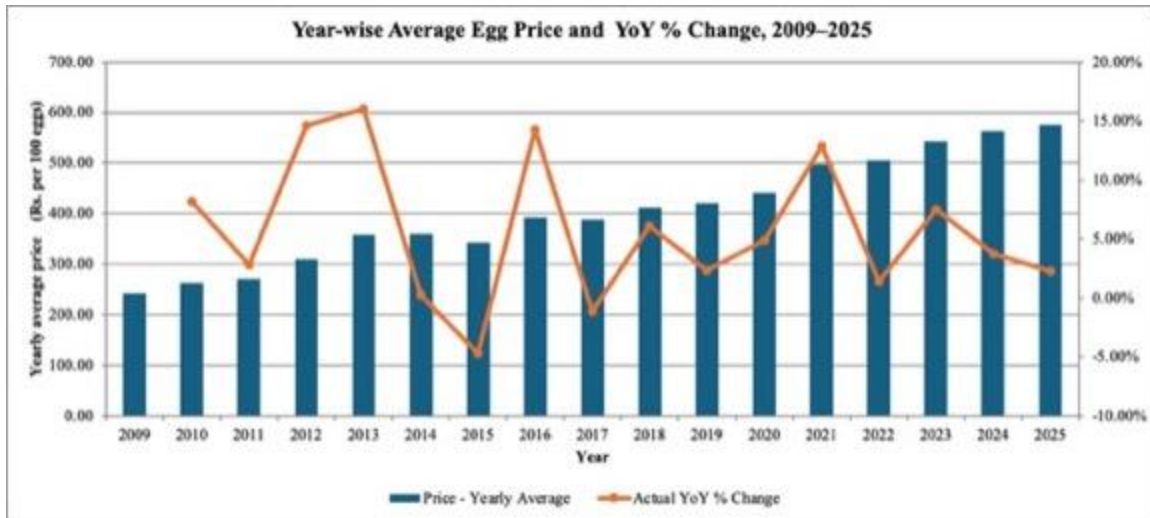
4.2e Consumer welfare, local availability and egg price movement

The operational constructs used to present the findings in this section are consumer welfare, self-sufficiency, policy effectiveness and farmer welfare. The secondary data in this section is used to identify what can be reasonably inferred from egg price movement and local production expansion after the introduction of WBIS 2017.

From the construct of consumer welfare, the relevant question is whether increased local commercial layer production after WBIS 2017 improved consumer access to eggs, particularly in terms of freshness, availability and affordability. The secondary data does not directly measure freshness at the consumer level. Freshness is therefore not treated as a directly observed variable in this study. It is inferred cautiously from the expansion of local production capacity and the possibility of shorter farm-to-market movement. The more directly observable secondary indicator is the movement of egg prices over the study period, as demonstrated by the chart attached below:

Figure 4.7:

Year wise average egg price and YoY% change, 2009-2025



Source: Compiled and prepared by author using secondary sectoral data, (2026)

The NECC yearly average egg price data for 2009 to 2025, presented in the above chart, shows a clear upward movement in egg prices over time. The yearly average price increased by about 137.3% from 2009 to 2025. During the WBIS and post-WBIS period, the yearly average increased by about 48.7% from 2017 to 2025. This shows that the period after the introduction of WBIS 2017 operated in a substantially higher egg-price environment than the pre-WBIS period.

The year-wise pattern further shows that egg prices has not declined after introduction of the Scheme. The largest visible post-WBIS annual increase occurred in 2021, possibly due to impact of COVID-19 - when the yearly average rose by approximately 12.9% over the previous year. Thereafter, prices maintained an upward trend, although the pace of annual increase has moderated in some later years.

From the construct of consumer welfare, this finding indicates that the available evidence does not support a strong claim that WBIS 2017 lowered consumer egg prices. If the Scheme had generated a direct price-reduction effect for consumers, the price series would be expected to show either a decline or a clear moderation in the post-WBIS period. The

observed data do not show such pattern. However, consumer welfare cannot be assessed only through price. In the case of eggs, consumer benefit may also arise from better local availability, shorter supply chains, reduced dependence on long-distance interstate movement and access to fresher eggs in producing districts. The secondary production data discussed earlier indicates that WBIS-supported farms added substantial local commercial layer capacity in West Bengal. Therefore, while the price data does not demonstrate a consumer price benefit, the production expansion data supports a more cautious finding that consumer welfare may have improved through local availability and freshness in some districts. From the construct of self-sufficiency, the egg price trend suggests a similarly cautious finding. The increase in local layer capacity indicates movement towards a stronger indigenous production base. However, the continued rise in egg prices after 2017 suggests that local production expansion did not fully insulate the State's egg market from wider demand-supply pressures, feed costs, transport costs, trader margins or interstate supply conditions. The secondary evidence therefore supports a finding of partial movement towards self-sufficiency, rather than complete market independence. From the construct of policy effectiveness, the data suggests that WBIS 2017 was more visibly effective as a production-capacity and investment-support intervention than as a consumer price-stabilisation intervention. This is important because WBIS 2017 was not designed as a direct consumer price-control scheme. Its more relevant policy objective was to encourage investment in commercial layer poultry farms and strengthen local production. The price data, therefore, does not negate the production-related effectiveness of the Scheme, rather limits the extent to which consumer welfare can be claimed in price terms.

Higher egg prices may increase gross revenue, but they do not automatically imply higher farmer profitability. From the construct of farmer welfare, the rising egg price trend must also be treated cautiously. Farmer welfare depends on the relationship between egg prices and production costs - especially feed cost, working capital, debt servicing and market bargaining power. Since the secondary feed-cost data show substantial increases in maize and soybean meal prices during the broader study period, the increase in egg prices cannot, by itself, be interpreted as evidence of improved farmer welfare. This finding is important

because a higher selling price may coexist with margin pressure if input costs rise faster or remain volatile.

4.3: Overview of primary quantitative data findings: Sampling method and respondent Profile

Quantitative and qualitative approaches have both been utilised in this study. The use of quantitative survey analysis, together with qualitative interview analysis, is an advantage because it allows the findings to combine breadth and depth. The structured farmer survey provides measurable evidence from a larger respondent base - enabling identification of patterns in awareness, Scheme access, incentive adequacy, profitability, feed-cost pressure, market competition, employment, and sustainability. However, numerical responses alone may not fully explain why such patterns occurred. The qualitative interviews with policymakers, policy influencers and selected large farmers help interpret the survey findings by providing institutional, administrative, market and operational explanations. This combination strengthens the study because the survey findings can be validated, qualified or questioned through stakeholder perspectives. It also supports triangulation, reducing dependence on a single source of evidence. For an evaluative study of WBIS 2017, this mixed approach is particularly useful because the Scheme's effects are not limited to measurable farm-level outcomes. They also involve policy design, implementation experience, market behaviour, district-wise variation, farmer confidence and long-term sustainability. Therefore, the combined use of quantitative and qualitative analysis is expected to improve the credibility, balance and explanatory value of the findings. The quantitative component was based on a structured survey of commercial layer farm owners or authorised representatives. The survey population consisted of commercial layer farms in West Bengal that were relevant to the evaluation of WBIS 2017. The sampling approach was stratified random sampling, selected because the population was heterogeneous and unevenly distributed across district, farm size, and Scheme-participation categories. The universal set of layer farms in West Bengal, as seen from the WBPF data, sets $N = 278$ farms. At a 95% confidence level and 5% margin of error, the calculated sample size was 162 farms. Proportionate allocation was then applied across the

three principal beneficiary-status strata in the latest sample frame: The strata were chosen because the study does not merely ask whether farmers knew of WBIS 2017. It seeks to compare how different categories experienced the Scheme. A farmer who existed before the Scheme but did not avail of it may offer insight into barriers, awareness gaps, perceived non-viability or lack of need. A farmer who existed before the Scheme and expanded with support may show how WBIS influenced capacity expansion. A new entrepreneur who entered through the Scheme may show whether WBIS encouraged new investment and first-generation participation.

Table 4.3:

Sample size and stratum for quantitative survey

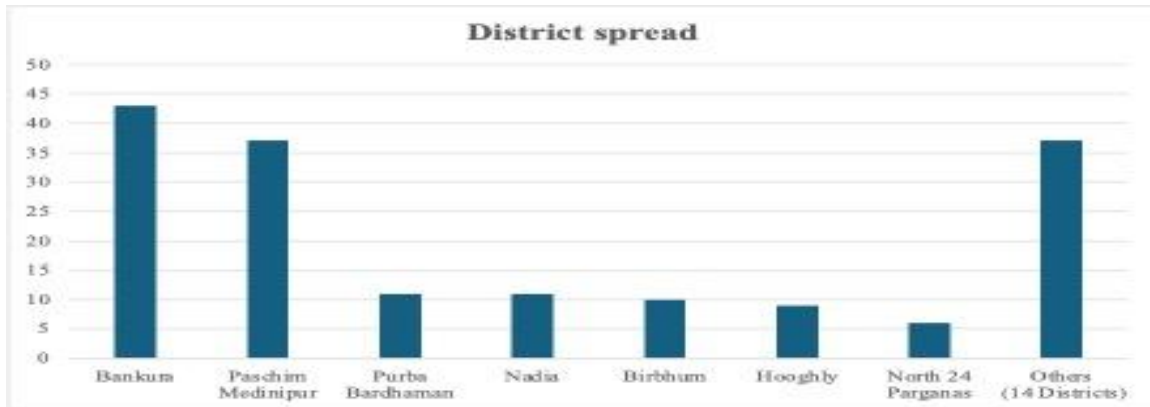
Stratum	Category of farmer	Number of farmers
1	New entrepreneurs who availed of Scheme	56
2	Previous farmers who availed of Scheme for expansion	15
3	Previous farmers who did not avail of Scheme	91
Total		162

Source: Compiled and prepared by author using secondary sectoral data, (2026)

The survey has received responses from 164 respondents, slightly above the calculated sample size of 162. The exercise has achieved a sample exceeding the minimum calculated requirement, although the sampling logic remains based on the 162 target. The respondent profile is presented before the construct-wise findings as it helps to provide context to the interpretation. The achieved survey base is heavily weighted towards farms established before 2017, with a smaller but relevant group of post-2017 farms and expanding farms. This supports comparison between older farms, new entrants, and Scheme-linked expansion cases. The achieved respondent distribution in the uploaded farmer survey data is demonstrated vide the following few charts.

Figure 4.8:

District wise spread of farms

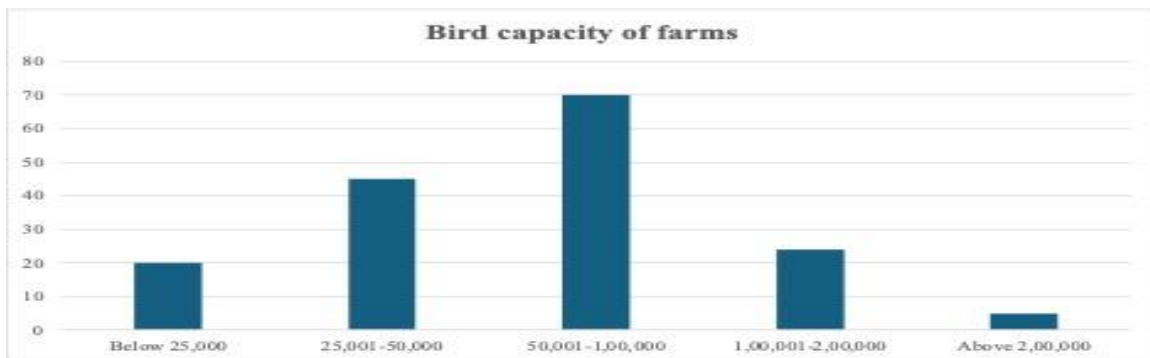


Source: Compiled and prepared by author using secondary sectoral data, (2026)

This data quite starkly shows that the respondents are highest from Bankura and Paschim Medinipur. There is a much lower representation from 5 other districts, almost equal in size. The representation from the ‘Others’ set districts seems quite large, but is actually constituted of respondents from 14 districts. The spread of respondents is expected to be representative of the whole set of farmers in West Bengal.

Figure 4.9:

Capacity-wise number of farms



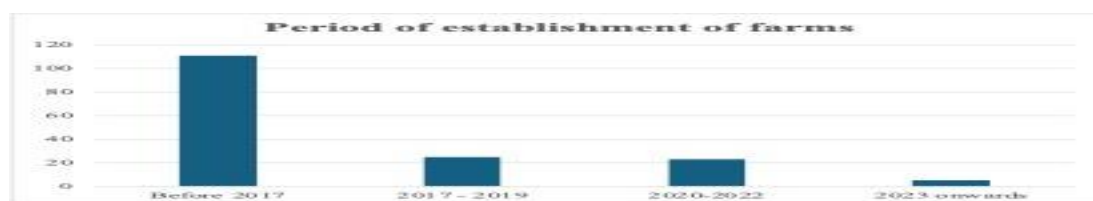
Source: Compiled and prepared by author using secondary sectoral data, (2026)

The respondent’s profile shows that the primary survey captured farms across different bird-capacity categories, although the sample strata were not constructed by bird capacity.

This distribution indicates that the survey reflects the operational structure of commercial layer farming in West Bengal, where medium-scale farms form the main respondent base, while very large farms are fewer in number.

Figure 4.10:

Establishment period of farms, pre and post 2017



Source: Prepared by author based on primary survey data, (2026)

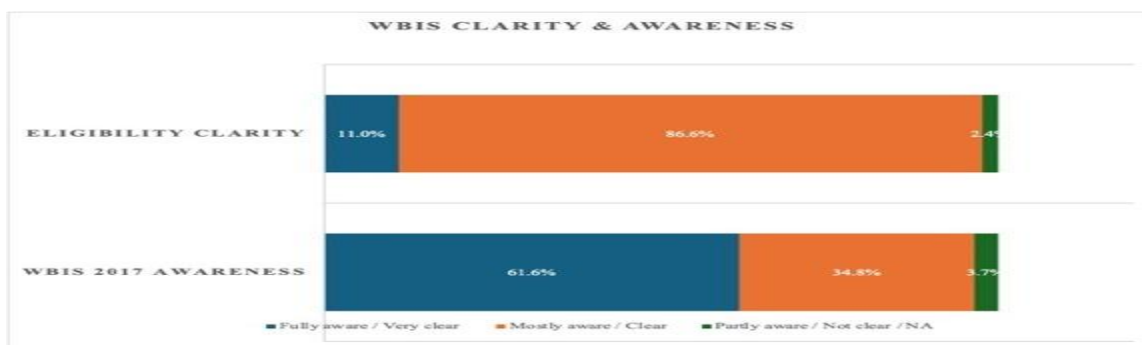
This is important because it provides a strong base for understanding the pre-WBIS commercial layer farming context and for comparing later expansion or non-participation decisions.

4.3a Policy awareness and information reach

The operational constructs used to present the findings in this section are policy awareness and information reach and the chart attached below demonstrates the findings:

Figure 4.11:

WBIS clarity & awareness



Source: Prepared by author based on primary survey data, (2026)

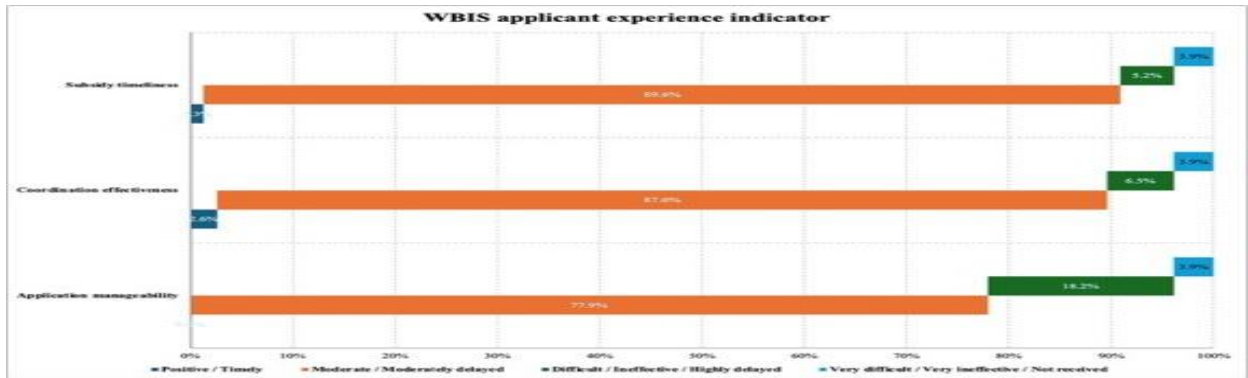
The survey findings show high awareness of WBIS 2017 among respondents. Out of 164 respondents, more than 96% were mostly aware of the Scheme, irrespective of whether they availed of the same. Only a very small number were partly aware or not aware at all. This indicates that among the surveyed commercial layer farm population, Scheme visibility was not a major weakness. However, the finding should not stop at awareness. Awareness need be distinguished from practical comprehension and access. Most respondents reported that eligibility clarity was either clear or very clear - specifically, more than 97%. Thus, WBIS 2017 appears to have achieved substantial awareness among commercial layer farmers, especially through sectoral associations, government channels and district-level networks. However, awareness alone did not ensure uniform uptake, because practical access could have been affected by documentation, land, bank finance, processing delays and other variables.

4.3b. Scheme Uptake, Access and Manageability

The operational constructs used to present the findings in this section are scheme uptake, access and manageability. These constructs are important because the effectiveness of WBIS 2017 cannot be assessed only by examining whether the Scheme existed or whether farmers were aware of it. A policy incentive becomes meaningful only when eligible farmers can apply for it, complete the required procedures, coordinate with the relevant authorities, and receive the sanctioned support within a reasonable period. Therefore, this section examines the survey findings relating to application status, application manageability, coordination effectiveness and subsidy timeliness. The farmer survey shows that 77 respondents applied for WBIS, while 87 respondents did not apply. This helps in understanding the practical experience of accessing the Scheme, while the non-applicant group can provide context on the limits of uptake. For the purposes of approaching this construct from an ‘experience’ angle, only the responses of respondents who have applied for the Scheme were taken into consideration. Therefore, the chart presented below excludes “not applicable” responses and focuses only on applicant experience.

Figure 4.12:

WBIS application experience indicator



Source: Prepared by author based on primary survey data, (2026)

The chart above shows that the application process was not generally experienced as easy. In the case of application manageability, most applicants described the process as moderate, while a smaller but important group described it as difficult or very difficult. This indicates that the process was not impossible for applicants to navigate, but it required administrative preparedness, documentation capacity and sustained follow-up.

A similar pattern is visible in relation to coordination effectiveness. Most applicants again placed their experience in the moderate category, while only a very small number found coordination effective. Some applicants reported ineffective or very ineffective coordination. This suggests that the Scheme was operationally accessible, but the interface between farmers, departments, banks and other agencies was not uniformly smooth.

A major implementation concern for any subsidy or Scheme is timeliness. Most applicants reported that subsidy release was moderately delayed, while a smaller number reported severe delays or non-receipt - with only one respondent reporting timely receipt.

The overall finding is that WBIS 2017, though formally accessible, was not administratively effortless. The survey does not suggest that applicants found the Scheme impossible to access. Rather, it shows a moderate but uneven implementation experience, with subsidy timeliness emerging as the most visible concern. Practical access depended on the farmer's ability to manage documentation, land-related compliance, bank finance

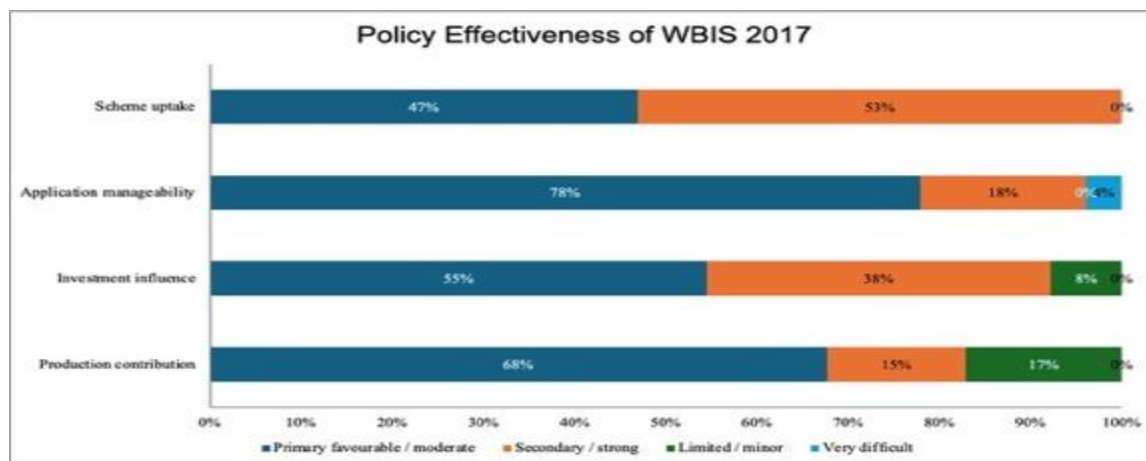
and repeated follow-up with departments. Thus, the Scheme was manageable for some farms, especially those with better administrative capacity. However, it seems to be more cumbersome for newer, smaller or less prepared applicants. This distinction between formal access and practical manageability is important for evaluating the Scheme's effectiveness and for designing future poultry-sector incentives.

4.3c Policy Effectiveness in Encouraging Investment and Production

The operational construct used to present the findings in this section is policy effectiveness, specifically whether WBIS 2017 encouraged Scheme uptake to increase layer farming, facilitated investment decisions, supported expansion and contributed to indigenous commercial egg production in West Bengal. The survey evidence allows policy effectiveness to be assessed not only through final production outcomes, but also through the pathway by which the Scheme moved from awareness to application, from application to investment influence and from investment influence to perceived production contribution. The chart below demonstrates the findings.

Figure 4.13:

Policy effectiveness index of WBIS



Source: Prepared by author based on primary survey data, (2026)

The first indicator of effectiveness is Scheme uptake. The response indicates that the Scheme achieved substantial relevance among the surveyed commercial layer farmers, but

not universal uptake. The near-even division is important because it shows that WBIS was visible and meaningful to a significant part of the sector, while also indicating that a large group either did not require, did not qualify for, or did not proceed with the Scheme. The second indicator relates to the practical manageability of the Scheme. Among applicants, more than 75 % of respondents described the application process as moderate, while the remaining found it either difficult or very difficult. This suggests that WBIS 2017 was not perceived as impossible to access, but it was also not experienced as administratively easy. From the standpoint of policy effectiveness, this matters because an incentive scheme can influence investment only when farmers are able to navigate documentation, land-related compliance, bank finance, departmental coordination and follow-up procedures.

The third indicator directly concerns investment influence. Among respondents for whom this was applicable, about 25 % stated that WBIS influenced investment to some extent, while nearly 18% stated that it influenced investment to a large extent. A smaller number reported only limited influence. This suggests that the Scheme functioned as an investment trigger for a meaningful group of farmers. The fourth indicator relates to perceived contribution to indigenous egg production. Here, the survey finding is stronger. 67% of the respondents identified a moderate contribution, while 15% identified a large contribution - with only a small number reporting minor contribution. This suggests that farmers recognised WBIS 2017 as contributing to the expansion of West Bengal's local commercial egg production base, even where the Scheme did not personally influence every respondent's own investment decision. Taken together, the survey findings show that WBIS 2017 operated through a sequence of uptake, access, investment influence and production contribution. The Scheme had meaningful uptake, was generally manageable though not simple, influenced investment or expansion decisions for many farmers, and was widely perceived as contributing to indigenous production increase. The finding from this section is therefore that WBIS 2017 was effective as an investment-support and production-capacity creation instrument. However, its effectiveness was not uniform. Practical access and administrative manageability affected how smoothly farmers could use the Scheme. Production effectiveness, though, does not automatically imply

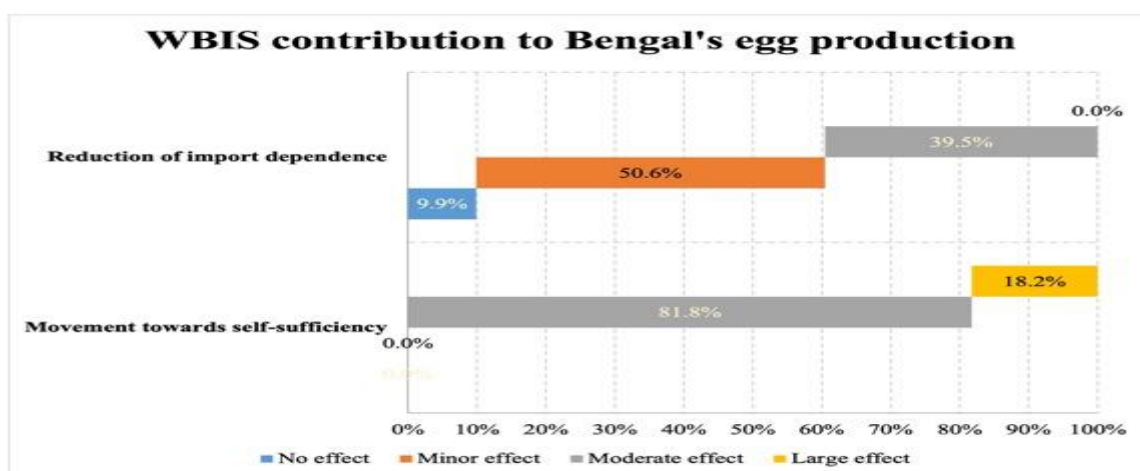
proportional gains in farmer profitability or long-term sustainability, which are assessed separately under the constructs of farmer welfare, feed-cost pressure and market viability.

4.3d Self-Sufficiency and Reduction of Import Dependence

The operational constructs used to present the findings in this section are self-sufficiency, policy effectiveness and reduction of import dependence. These constructs are closely related because one of the important expectations from WBIS 2017 was that increased commercial layer farming within West Bengal would strengthen the State's indigenous egg production base and reduce dependence on eggs brought from other States. The survey findings suggest that farmers recognised movement in this direction, but the evidence also indicates that the change was partial rather than complete.

Figure 4.14:

WBIS contribution to Bengal's egg production



Source: Prepared by author based on primary survey data, (2026)

The survey responses show a moderately positive perception regarding West Bengal's movement towards egg self-sufficiency. A large majority of respondents reported that WBIS 2017 had a moderate effect on self-sufficiency, while a smaller but important group reported a large effect. Specifically, nearly 80% of respondents identified a moderate effect, while about 18% identified a large effect. This indicates that farmers generally perceived the Scheme as contributing to the strengthening of local commercial egg

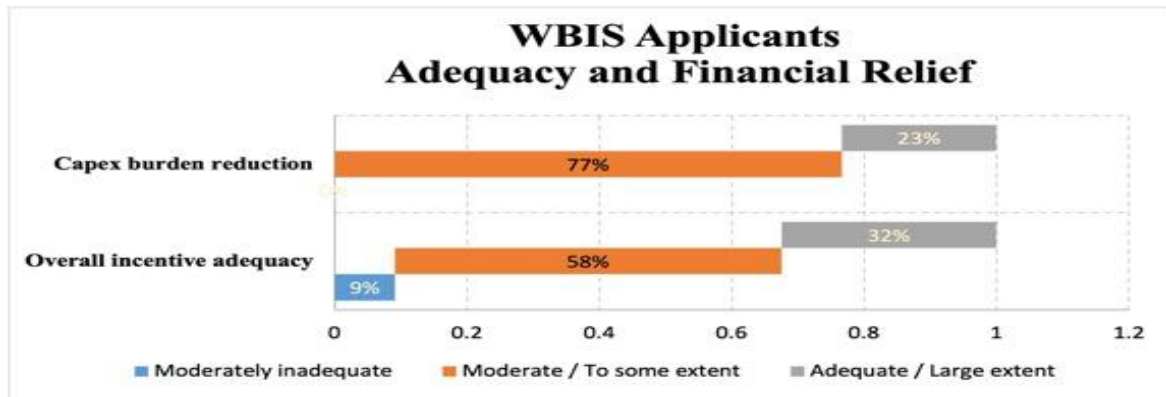
production. The finding is consistent with the broader evidence of new farm establishment, expansion of commercial layer capacity and district-level growth after the introduction of WBIS 2017. However, the responses on reduction of import dependence were more cautious. While local production may have increased, farmers did not generally indicate that interstate egg inflows had been eliminated or substantially neutralised. On this indicator, 50% respondents reported only a minor effect, about 40% reported a moderate effect, and the remaining reported no effect. This suggests that although WBIS 2017 may have helped West Bengal move towards a stronger indigenous supply position, the State's egg market continued to remain connected to interstate supply flows. Imported or out-of-State eggs therefore appear to continue to influence availability, pricing and market behaviour, particularly in larger consumption centres and price-sensitive channels. The contrast between the two indicators is important. Farmers were more positive when asked about movement towards self-sufficiency, but more guarded when assessing actual reduction in import dependence. This indicates that increased local production capacity should not be treated as equivalent to full self-sufficiency. A State may increase its own production base while still relying on eggs from other States to meet demand, stabilise supply, serve urban markets or influence farm-gate pricing - especially in urban and price-sensitive channels. The Scheme was therefore effective in strengthening the local production base, but was not, by itself, sufficient to fully insulate West Bengal from external egg supply.

4.3e Incentive Adequacy and Financial Relief

The operational constructs used to present the findings in this section are incentive adequacy and financial relief. The findings must be interpreted with reference to the full structure of WBIS 2017, because the Scheme was not limited to capital subsidy alone. It included multiple support components such as capital subsidy, interest subsidy on term loan, waiver of electricity duty, power subsidy, and subsidy on stamp duty and registration fees. Therefore, the adequacy of the Scheme should be assessed as a combined incentive package rather than as a single capital grant.

Figure 4.15:

WBIS applicants- adequacy and financial relief index



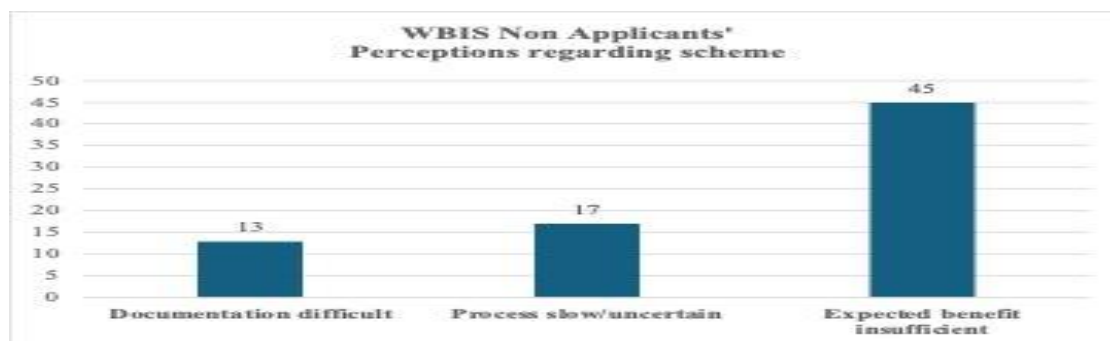
Source: Prepared by author based on primary survey data, (2026)

The survey findings show a mixed but broadly positive assessment by respondents of project-level financial relief. Among applicable respondents, approximately 58.4% considered the incentive package moderately adequate, while about 32.5% considered it adequate. A smaller proportion, around 9.1%, considered it moderately inadequate. This indicates that the Scheme was generally viewed as useful for reducing the initial investment and debt burden, although the majority did not consider it fully adequate. Regarding capital expenditure and the debt burden, the finding is somewhat clearer. Among applicable respondents, approximately 76.6% stated that WBIS reduced the investment burden to some extent, while about 23.4% stated that it reduced the burden to a large extent. This is suggestive that the Scheme provided meaningful project-level relief, particularly during establishment or expansion. However, the response pattern also shows that the Scheme's relief is perceived as mostly partial, rather than complete. This distinction is important. WBIS 2017 appears to have been useful as an investment-enabling scheme, but its adequacy cannot be judged only at the point of project establishment. A commercial layer farm faces ongoing exposure to feed prices, working capital needs, disease and mortality risk, power costs, market price fluctuations and debt service. Therefore, even if the Scheme reduced initial capital burden, it did not necessarily protect farmers from later operational stress. Another important aspect of incentive adequacy and financial relief emerges from

the responses of farmers who did not avail of WBIS 2017. This group is analytically important because non-availment does not necessarily mean lack of awareness or lack of relevance. It may also reflect the perceived difficulty of accessing the Scheme, uncertainty about the process, or a judgement that the likely benefit was not sufficient in relation to the effort, documentation and waiting time involved. Lack of access to land required, inability to invest further, lack of organisational structure to handle expansion and several other similar variables can also lead to non-expansion decisions. Responses of non-availing farmers need be interpreted carefully. Since these respondents did not directly experience the subsidy process, their views may be based on observation, peer experience, sectoral discussions or even perceived complexity rather than on actual receipt of benefits. These perceptions remain quite relevant though, as they influence future uptake. If non-beneficiaries perceive the Scheme as administratively difficult, delayed, insufficient, or poorly addressing operating risks - a Scheme's practical attractiveness may be hampered even though formal eligibility exists.

Figure 4.16:

WBIS non-applicants' perception index



Source: Prepared by author based on primary survey data, (2026)

The chart attached above shows that the most common perception among non-applicants was that the expected benefit was insufficient. This is a significant finding because it suggests that for many non-applicants, nearly 60%, the Scheme's incentive package may not have appeared attractive enough to justify participation. Although WBIS 2017 included several components — capital subsidy, interest subsidy, electricity duty waiver, power

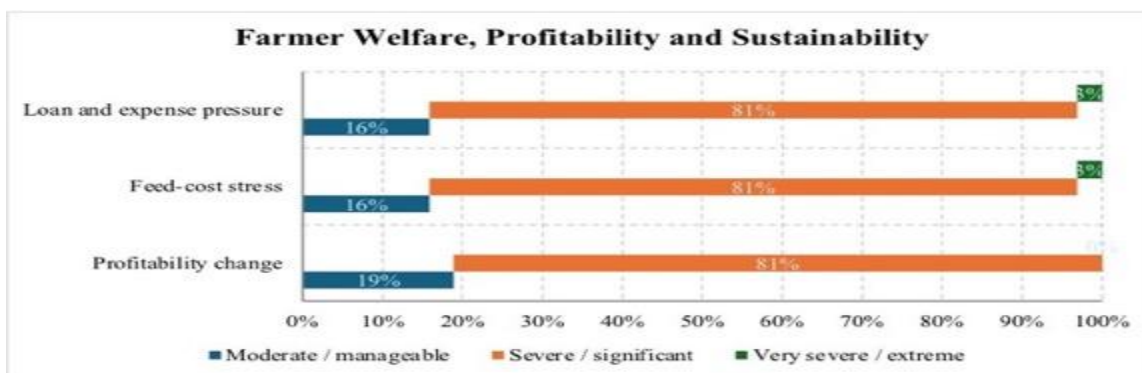
subsidy, and stamp duty/registration support — the perceived value of these benefits may have been lower for farmers who did not have immediate expansion plans, who were already established, or who expected recurring operating pressures to matter more than project-level support. The remaining respondents' perceptions are that the process would be slow or uncertain (about 22%) or that there would be difficulty with documentation (about 18%). This points to an implementation-related concern. Even where the Scheme was formally available, uncertainty regarding approval, processing or disbursement may have reduced its practical attractiveness. It also reinforces the finding that formal eligibility and actual access are not the same. Documentation requirements may be manageable for organised or better-advised farms, but more discouraging for farmers with limited administrative support. The non-applicant data qualifies the findings on incentive adequacy of applicants. It also strengthens the distinction between formal availability and effective accessibility. Survey data demonstrates that WBIS was useful for many applicants, but its perceived relevance and accessibility were not uniform across the wider farmer population. The Scheme provided meaningful project-level relief for many applicants, but among non-applicants, its perceived adequacy was weaker. The dominant concern was not only the administrative burden but also the belief that the expected benefit was insufficient. This suggests that future schemes may need clearer benefit communication, simpler procedures, faster processing and stronger alignment with farmers' actual financial risks.

4.3f Farmer Welfare, Profitability and Sustainability

The operational constructs used to present the findings in this section are farmer welfare, profitability and sustainability. This is one of the central findings of the primary survey because it tries to distinguish between the production-related effectiveness of WBIS 2017 and the financial condition of farmers after establishment or expansion. The Scheme appears to have supported investment and production capacity, but the survey evidence shows continuing pressure on profitability, feed cost and loan or expense servicing.

Figure 4.17:

Farmer welfare, profitability and sustainability index



Source: Prepared by author based on primary survey data, (2026)

The strongest finding relates to profitability. The survey shows that the entire respondent base reported some decline in profitability. Approximately 81.1% of respondents reported that profitability had declined significantly, while about 18.9% reported that profitability had declined moderately. This indicates that reduced profitability was not a marginal or isolated experience among the surveyed farmers. It was a broad sectoral concern across the respondent group. A similar pattern appears in relation to feed-cost stress. Approximately 81.1% of respondents reported a severe effect from feed-cost escalation, while about 15.9% reported a moderate effect and about 3.0% reported a very severe effect. This finding is especially important because feed is the dominant recurring cost in commercial layer farming. The primary finding is also consistent with the secondary feed-cost evidence, which showed sharp increases in maize and soybean meal prices during the broader study period. The actual feed formulation data also showed feed cost at approximately ₹26.47 per kg, with maize and soya forming around 72% of the total feed cost. Therefore, the survey response is not merely a perception of stress; it reflects the underlying cost structure of the industry. Loan and expense servicing capacity also shows substantial pressure. Approximately 81.1% of respondents reported being under serious pressure, about 15.9% reported that servicing was manageable only with difficulty and about 3.0% reported extreme difficulty. This indicates that financial stress was not limited to input cost alone,

but extended to the broader ability of farms to manage operating expenses and financial commitments. The data does not show that WBIS 2017 caused financial distress. Rather, it shows that WBIS encouraged investment and production capacity within a market that later became more difficult due to feed-cost escalation, working-capital pressure and limited pricing power. Subsidy-supported expansion can increase exposure where farms take on debt or increase scale and then encounter adverse cost and market conditions.

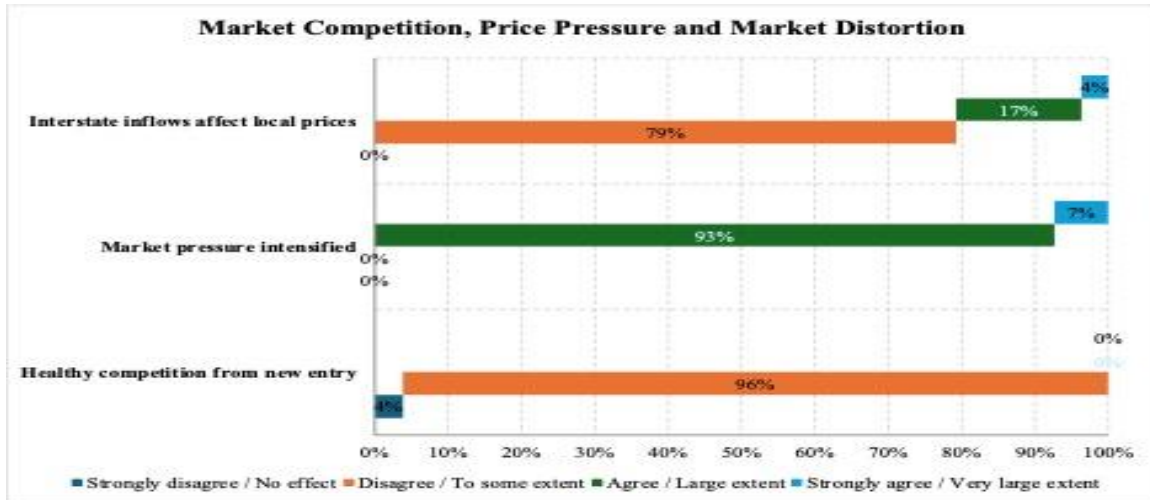
The finding from this section is that the strongest divergence in the study is between production effectiveness and farmer welfare. WBIS 2017 appears to have supported production capacity, but farmers continued to face serious profitability erosion due to feed-cost escalation, working-capital pressure and limited pricing power.

4.3g. Market Competition, Price Pressure and Market Distortion

The operational constructs used to present the findings in this section are market competition, price pressures and market distortion. These constructs are important because WBIS 2017 was designed to increase commercial layer production in West Bengal, but production expansion also has market consequences. A policy that successfully encourages new farms and expansion may strengthen the local production base, but if this growth is concentrated in particular districts or occurs without parallel market planning, it may also create pressure on farm-gate prices, increase dependence on traders and intensify competition among producers.

Figure 4.18:

Market competition, price pressure and market distortion index



Source: Prepared by author based on primary survey data, (2026)

Survey responses indicate that farmers did not generally view the post-WBIS market as healthy competition. About 92% disagreed and 3% strongly disagreed with the proposition that new entry had managed to create healthy competition. By contrast, 152 agreed and 12 strongly agreed that market pressure had intensified. Interstate price influence was quite clearly earmarked. About 80% of respondents stated that interstate egg inflows affected local prices to some extent, while the remaining 20% reported that the effect was large to very large. This is indicative of the fact that local producers remain exposed to outside supply and trader-led price pressure. These findings point to a distinction between production effectiveness and market effectiveness. WBIS 2017 may have been successful in supporting new farm establishment, expansion and bird-capacity creation. However, once additional production entered the market, farmers still had to sell eggs in a price-sensitive environment influenced by traders, interstate supply, district-wise concentration, transport flows and local demand conditions. The survey, therefore, suggests that policy-supported production growth was not matched by an equally strong market-support structure. This section therefore supports a balanced finding. WBIS-supported production

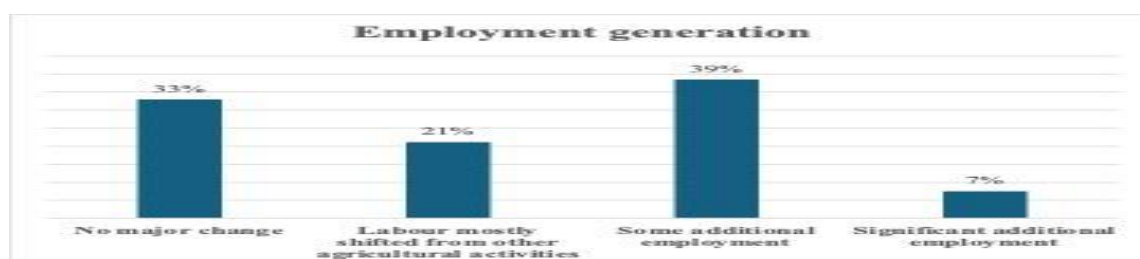
expansion appears to have strengthened West Bengal’s local egg production capacity, but it also contributed to a more competitive and pressured farm-gate environment in certain areas. The evidence does not show that WBIS 2017 created market distortion in a simple or direct manner. Rather, it shows that production incentives, when not accompanied by district-wise planning, market intelligence, aggregation support, producer coordination or price-risk mechanisms, may expose farmers to intensified competition and trader-led price pressure.

4.3h Employment Generation and Rural Development

The operational constructs used to present the findings in this section are employment generation and rural development. These constructs are important because WBIS 2017 was not intended only to increase egg production or farm investment. One of the broader policy expectations was that commercial layer farm expansion would create rural employment, both directly on farms and indirectly through associated activities such as feed transport, egg handling, veterinary services, medicine supply, equipment maintenance, and trading.

Figure 4.19:

Employment generation index



Source: Prepared by author based on primary survey data, (2026)

The primary survey findings show that the employment effect was positive but moderate. Among relevant responses, approximately 38.5% of respondents reported that commercial layer expansion generated some additional employment, while about 7.5% reported significant additional employment. Together, this indicates that around 46% of respondents

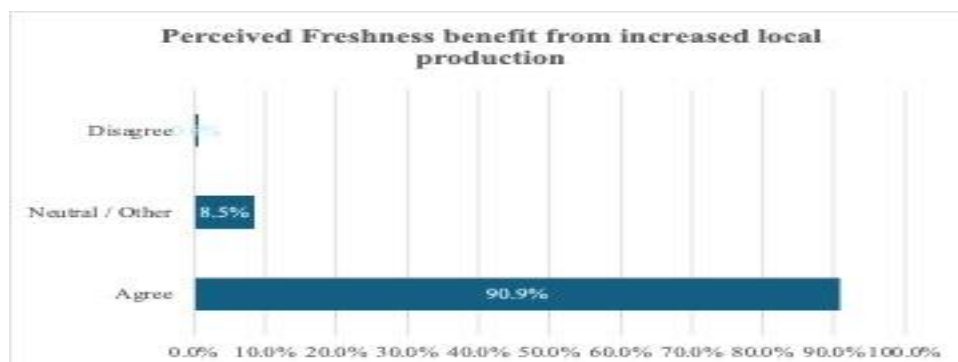
observed some level of additional employment generation. This supports the finding that commercial layer expansion contributed to rural employment opportunities, though the effect was not uniform across all farms. At the same time, the survey also shows that employment additionality requires careful interpretation. Approximately 32.9% of respondents reported no major change in employment, while about 21.1% stated that labour was mostly shifted from other agricultural or rural work. This is important because employment generation should not be assessed solely by counting workers on poultry farms. For a policy evaluation, it is necessary to distinguish between genuinely new employment and reallocation of existing rural labour from one activity to another. The findings, therefore, suggest that WBIS-linked commercial layer expansion did generate employment - but the quality and additionality of this employment were mixed. In some cases, poultry farming may have created new jobs in farm labour, supervision, feed movement, egg handling and veterinary support. In other cases, it may have absorbed workers who were already engaged in agriculture or other rural activities. This distinction matters because rural development is stronger when employment is additional, stable and skill-enhancing, rather than only a transfer of labour from existing local occupations.

4.3i Consumer Welfare, Freshness and Local Availability

The operational constructs used to present the findings in this section are consumer welfare, freshness and local availability. These constructs are relevant because one of the expected benefits of increasing indigenous commercial layer production in West Bengal was that consumers would gain access to a more reliable and fresher supply of eggs. However, the finding need be framed carefully. The survey evidence supports a strong finding on perceived freshness and local availability, but it does not by itself establish nutritional improvement or consumer price reduction.

Figure 4.20:

Freshness index

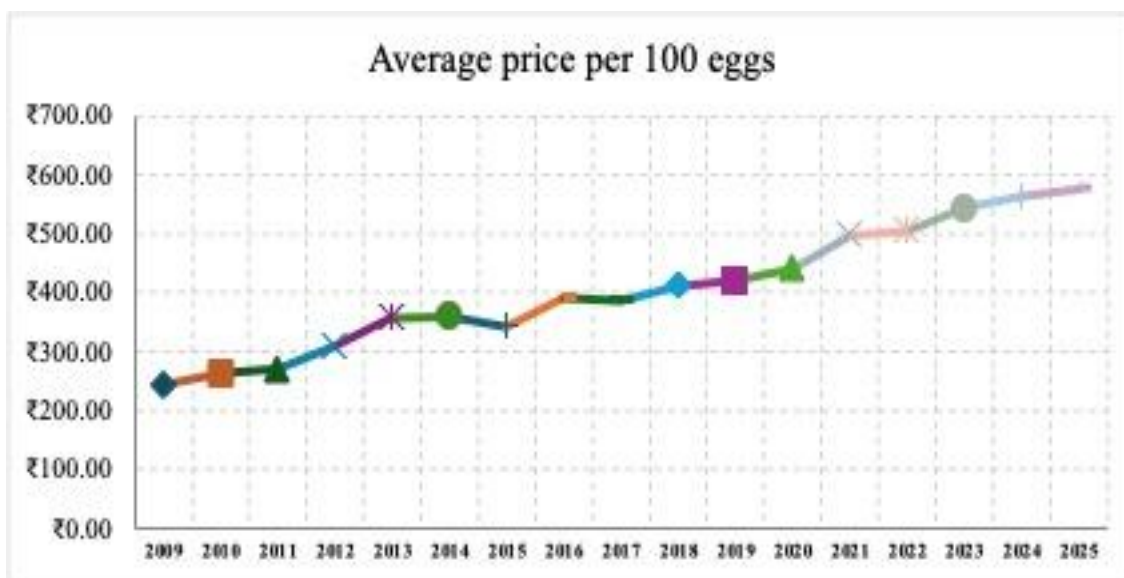


Source: Prepared by author based on primary survey data, (2026)

The primary survey provides one of the clearest positive findings in the study. Approximately 91% of respondents agreed that increased local production improved the freshness benefit available to consumers. A meagre 0.6% disagreed, while the remaining responses were neutral or otherwise not clearly affirmative. This indicates that farmers strongly associated local production expansion with consumer-side freshness advantages. The likely reason is that locally produced eggs can reach nearby markets faster than eggs transported over longer distances from other States. Shorter farm-to-market movement can support better freshness, lower transit delay and more reliable local availability - particularly in districts where layer capacity expanded, as well as their neighbouring districts, after WBIS 2017. At the same time, this finding should not be overstated. The survey does not directly measure egg freshness at the retail level, nor does it test nutritional quality. Therefore, the finding should be limited to perceived freshness, improved local availability, reduced transit time and stronger local supply conditions. It is not presented as suggestive that the Scheme directly improved nutritional outcomes or consumer health.

Figure 4.21:

Bengal egg price index



Source: Compiled and prepared by author using secondary sectoral data, (2026)

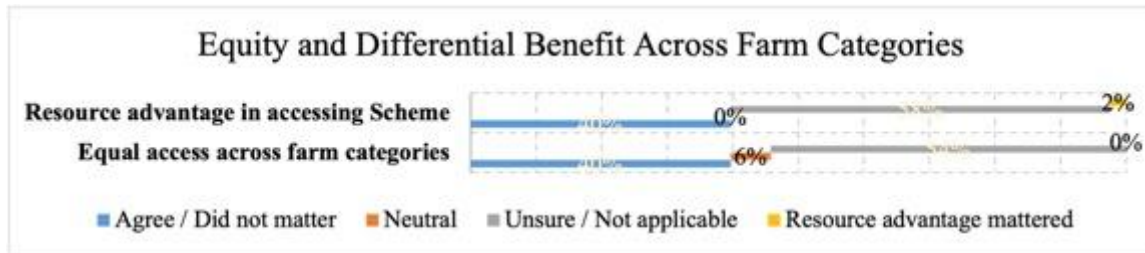
This consumer welfare finding should also be cross-referenced with the evidence on egg prices. The NECC yearly average egg price data shows that egg prices increased over the observed period, including after the introduction of WBIS 2017. Therefore, the consumer welfare gain cannot be strongly claimed in terms of price reduction or direct nutritional improvement. The price data suggest that increased local production did not materially lower average egg prices; rather, they continued to rise during the study period. Consumer benefit is therefore more perceptible in terms of freshness and availability than in affordability.

4.3j: Equity and Differential Benefit Across Farm Categories

The operational constructs used to present the findings in this section are equity and differential benefit across farm categories. This construct is important because WBIS 2017 was intended not only to encourage production expansion but also to make incentive support available to different categories of commercial layer farmers. The findings therefore need to distinguish between formal eligibility and effective accessibility.

Figure 4.22:

Equity and differential benefit index



Source: Prepared by author based on primary survey data, (2026)

The survey responses on equity are mixed. Regarding equal access across farm categories, approximately 40% of respondents agreed that access was equal, while only 6.1% remained neutral. However, approximately 54.3% were either unsure or treated the question as not applicable. This indicates that while some farmers perceived the Scheme as broadly accessible, a large share of respondents lacked sufficient information or experience to assess whether accessibility was equal across the sector.

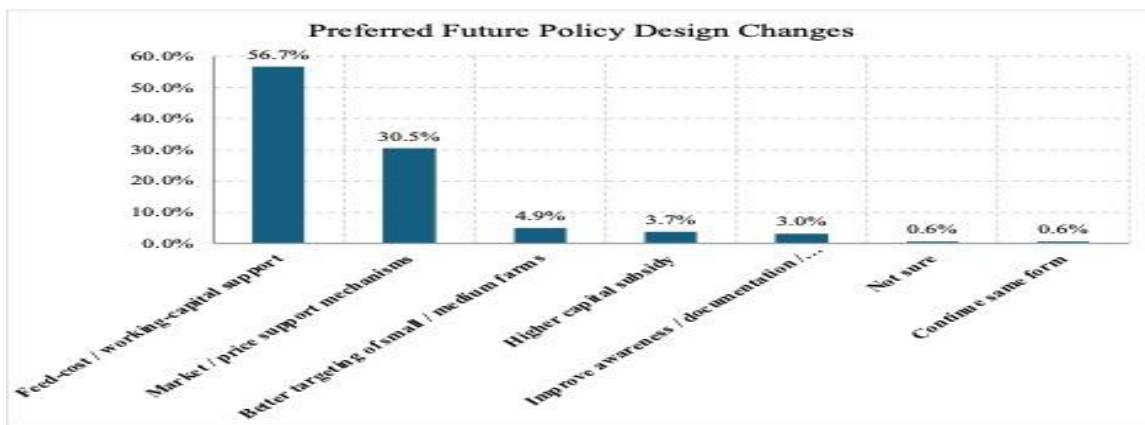
A similar pattern emerges regarding resource advantage. Approximately 39.6% of respondents stated that resource advantage did not matter at all in accessing the Scheme. On the other hand approximately 57.9% were unsure, while a small proportion indicated that resource advantage did matter. This suggests that respondents did not strongly perceive the Scheme as captured by better-resourced applicants, but the high level of uncertainty limits any firm conclusion about the extent of equity in access. The finding, therefore, remains cautious. WBIS 2017 may have been formally open to multiple categories of farms, including small, medium and large farms on one hand and new entrepreneurs and existing operators, on the other. Effective benefit may still have varied depending on documentation capacity, bankability, land readiness, administrative follow-up and the ability to withstand delayed subsidy release. Thus, formal eligibility did not necessarily translate into practical access.

4.3k: Future Policy Design and Sustainability

The operational constructs used to present the findings in this section are future policy design and sustainability. These constructs are important because the earlier primary findings show that WBIS 2017 was effective in encouraging investment and production-capacity creation. However, farmer welfare and long-term viability remained under pressure from feed-cost escalation, working-capital stress, market pressures and delayed financial relief. The future policy question is therefore not whether investment support should be withdrawn, but whether the design of support should be expanded to reflect the actual operating risks of commercial layer farming. The Scheme has now ended. Respondents, when asked if any policy is now implemented - what support structure they would like to see implemented, responded as enumerated in the chart attached below.

Figure 4.23:

Future policy design preferences



Source: Prepared by author based on primary survey data, (2026)

The survey data show a clear preference for redesigning the support structure beyond the original establishment-oriented model. The strongest preference was for feed-cost and working-capital support, selected by approximately 56.7% of respondents. This is the most important finding under this construct because it directly reflects the financial stress

already identified in the farmer welfare and sustainability sections. Commercial layer farming is heavily exposed to recurring feed costs, especially maize and soybean meal. Therefore, farmers appear to view future sustainability as dependent on protection against operating-cost volatility rather than only on initial project subsidy. The second major preference was for market or price-support mechanisms, selected by approximately 30.5% of respondents. This links closely with the findings on market competition, price pressure and interstate egg inflows. Farmers appear to recognise that production expansion alone is insufficient if farm-gate prices remain vulnerable to trader behaviour, external supply flows and weak bargaining power. This indicates that future support should consider the marketing side of the egg economy and not merely the establishment of farms. A much smaller but relevant group, approximately 4.9%, looked for better targeting of small and medium farms. This proportion is lower, but remains analytically important as it connects future policy design with the equity finding. If smaller and medium farms face greater difficulty in documentation, finance, working capital and delayed subsidy absorption, a uniform incentive structure may not produce uniform benefit. Only approximately 3.7% of respondents preferred higher capital subsidy, while approximately 3.0% prioritised improvement in awareness, documentation and implementation. Very few respondents preferred continuation of the Scheme in the same form or were unsure. This suggests that farmers were not simply asking for a larger version of the existing scheme. Instead, the preference pattern indicates demand for a wider and more operationally responsive support framework. The survey also presents a clear negative finding on the sustainability dimension of WBIS 2017. For Scheme alignment with Sustainability Development Goals, 100% of respondents disagreed that the Scheme had meaningful alignment with such SDGs. Similarly, for Scheme support for responsible or sustainable production, 100% of respondents disagreed. This indicates that, from the farmers' perspective, WBIS 2017 was not perceived as a sustainability-oriented scheme. The responses suggest that farmers viewed the Scheme mainly as an investment and production-support intervention, rather than as a framework promoting environmental responsibility, resource efficiency, responsible farm practices, or broader sustainable development outcomes. This is

important because it shows a gap between production augmentation and sustainability integration. While WBIS may have encouraged the creation of commercial layer capacity, the survey does not indicate that farmers associated it with SDG-linked outcomes or responsible production standards.

4.4: Overview of qualitative data findings: Sampling method and respondent profile

The qualitative component of the study used judgement sampling, also known as purposive sampling. This method was appropriate because the purpose of the qualitative inquiry was not to achieve statistical representation, but to obtain informed insight from respondents strategically placed within the policy, institutional, market, and operational ecosystem of commercial layer farming in West Bengal. Since the study evaluates WBIS 2017 as a policy intervention, it was necessary to include respondents who could comment not only on farm-level experience, but also on policy rationale, implementation, market behaviour, sectoral organisation, production expansion, interstate supply, farmer viability and future policy needs. The judgement sample was therefore designed to include different respondent categories with distinct types of knowledge. The first category was a policymaker from the Animal Resources Development Department - included to understand the original rationale for WBIS 2017, the design of the Scheme, the administrative process, the implementation experience and the official assessment of outcomes. This respondent category was important because the Scheme cannot be evaluated solely on the basis of beneficiary experience; it must also be understood from the standpoints of policy intention, administrative design and implementation. The second category consisted of policy influencers and sector institutions, including respondents associated with NECC and WBPF. The NECC respondent was included to provide insight into the egg market, price movement, production trends, interstate egg supply and farmer-level market impact. The WBPF respondent was included because the Federation represents sectoral knowledge relating to farm distribution, farmer access, district clustering, industry-level concerns and the practical relationship between farmers and policy structures. These respondents helped place the farmer survey findings within the wider egg economy of West Bengal. A veterinarian respondent was also included as a policy influencer with technical and

operational knowledge. This respondent category was important because commercial layer farming is not only a financial or policy activity. It is also shaped by flock health, mortality risk, disease management, feed practices, farm operations, skilled labour availability and long-term viability. The veterinarian's perspective, therefore, helped interpret farmer welfare and sustainability findings from an operational standpoint. The final category consisted of policy-influenced farmers, including an existing large farmer who expanded using the Scheme and a new entrant large farmer. These respondents were selected to understand how WBIS 2017 influenced actual investment behaviour, bankability, expansion decisions, new entrepreneurship, access barriers and post-entry viability. Including both an expansion case and a new-entrant case helped capture differences between established operators and farmers whose entry into commercial layer farming was more directly linked to the Scheme environment. Each respondent occupied a different but relevant position within the policy-market ecosystem. The qualitative component was not implemented to replace the stratified farmer survey. It was, rather, juxtaposed to deepen, explain and qualify the quantitative findings. The farmer survey provided structured evidence from a structured sample of the farmer base and the interviews helped interpret why certain patterns appeared in the data. This helped strengthen the study by combining breadth from the survey with depth from strategically selected respondents.

4.4a Policy Effectiveness

The qualitative interviews indicate that WBIS 2017 was broadly perceived as effective in encouraging commercial layer investment and increasing production capacity in West Bengal. Across respondent categories, the Scheme was understood primarily as a production-oriented intervention - designed to address the State's dependence on eggs from other States, improve local production, encourage rural investment and generate employment. The policymaker respondent identified production deficit, reduction of import dependence and employment as high-priority concerns behind the Scheme, while also indicating that WBIS 2017 had a strong production-policy orientation rather than being primarily a welfare-linked intervention. The policy influencer interviews also support the finding that the Scheme contributed to investment confidence and production

expansion. The NECC respondent rated new farm entry, investor confidence and project bankability as high, while also identifying bird capacity increase, farm number increase and district clustering as high after WBIS 2017. The veterinarian respondent similarly assessed new farm entry, investor confidence and bankability as high. Also, bird capacity increase, farm numbers and district clusters ratings were rated high. The WBPF respondent also viewed new farm entry, investor confidence and bankability positively, though it rated expansion of existing farms lower and noted very high district concentration. The farmers' interviews further reinforce this pattern. The existing large farmer who expanded with the Scheme rated both new farm entry and expansion of existing farms as high, suggesting that WBIS was perceived as relevant not only for new units but also for capacity expansion among existing operators. The new entrant farmer also rated new farm entry, investor confidence and bankability as high, indicating that the Scheme had investment-signaling value for first-generation or new commercial layer investors. However, the qualitative evidence also shows that policy effectiveness should not be interpreted as uniform or complete. Several respondents recognised production growth but also indicated that reduction of dependence on eggs from other States was only partial. NECC and the veterinarian respondent both described the continued influence of interstate supply as medium, rather than eliminated. WBPF also noted that dependence on interstate supply and the role of interstate traders continued at a medium level. The qualitative finding is therefore that WBIS 2017 was effective as an investment encouragement and production-capacity creation scheme. It contributed to new farm entry, investor confidence, project bankability and expansion of the local production base. However, the interviews also indicate that this effectiveness was stronger in relation to production augmentation than in relation to complete self-sufficiency or insulation from interstate egg supply.

4.4b Incentive Adequacy

The qualitative interviews present mixed findings on incentive adequacy. Respondents generally recognised that WBIS 2017 was meaningful as an investment-support scheme, but they also indicated that the incentive framework was less adequate as a long-term operating-risk support mechanism. This distinction is important because WBIS 2017 was

not only a capital subsidy scheme. It contained different components, including capital support, interest subsidy, electricity-related support and stamp duty or registration-related support. The qualitative findings, therefore, concern the adequacy of the broader incentive package, not merely the capital subsidy component. The policymaker respondent indicated that the incentive amount, eligibility conditions and operational terms took account of different farm sizes and bank finance but not input-cost volatility. This is a significant finding because it suggests that the Scheme design was oriented towards project establishment and investment feasibility, rather than recurring operating-cost protection. The policymaker also indicated that the Scheme was intended to favour first-generation entrepreneurs and to support existing farms expected to expand, suggesting that adequacy was linked to investment mobilisation rather than continued risk absorption.

The NECC response regarding the assessment of incentive adequacy was differentiated. Project cost, debt-equity structure, and capital subsidy relevance were rated as medium, but the small-farm impact was indicated as low, while the large-farm impact was high. This suggests that the same incentive package may have had different practical value depending on farm size and financial capacity. WBPF was more critical, rating project cost, debt-equity structure, capital subsidy relevance and small-versus-large farm impact as low, while still recognising first-generation entrepreneurs as a high-relevance category.

The veterinarian respondent placed greater emphasis on the relevance of capital subsidy and first-generation entrepreneurship, rating both as high. However, later responses from the same interview recommended increasing support for electricity costs, raw material purchases, small farm growth and development of marketing channels and value-added products. Skills training was given special mention - noting that upskilling could improve bird health and overall farm management. This indicates that while the original incentive may have helped investment decisions, future adequacy would require a wider support structure.

The large-farmer interviews also show variation. The existing farmer who expanded using the Scheme rated debt-equity structure and capital subsidy impact as high, suggesting that the Scheme had meaningful investment value from an expansion perspective. By contrast,

the new entrant farmer rated project cost, debt-equity structure and capital subsidy relevance as low, while still identifying first-generation entrepreneur relevance as high.

It can thus be derived that WBIS 2017 was adequate as an investment encouragement mechanism for several respondents, but its adequacy was uneven across farm categories and limited in addressing recurring risks. The interviews suggest that future incentive adequacy should include feed-cost support, working-capital assistance, power-cost relief, market support and timely subsidy release if another Scheme is launched.

4.4c. Equity

The qualitative findings on equity suggest a clear distinction between formal eligibility and effective benefit. Respondents did not uniformly suggest that WBIS 2017 was deliberately exclusionary. Some of the interviews though, indicate that practical benefit varied by farm size, bankability, documentation capacity, land readiness and ability to manage the approval process. This makes equity one of the more nuanced constructs in the qualitative findings. The policymaker respondent indicated that all categories of farmers had practical access to the Scheme, including small, medium, and large farms, new entrepreneurs, existing poultry operators, and farmers from less-developed districts. This reflects the formal policy view that the Scheme was open across categories and was not intentionally designed to benefit only larger or better-connected applicants. However, the policy influencer interviews provide a slightly differentiated picture. NECC assessed small-farm benefit as low, medium-farm benefit as medium and large-farm benefit as high, while also recognising both new entrants and existing players as beneficiaries. WBPF similarly rated benefit to small farms as low, medium farms as medium and large farms as high. These responses suggest that although the Scheme may have been formally available across categories, larger farms may have been better positioned to convert eligibility into actual benefit. The veterinarian respondent provided a somewhat different, but related view. Statement was that small and medium farms benefited equally, but large farms and existing players benefited more - while new entrants benefited less. This suggests that equity was shaped not only by scale but also by prior operational experience. Existing farms may have had stronger knowledge of land, construction, bank processes, documentation, power

connection, feed procurement and regulatory compliance. New entrants may have faced greater learning costs even where they were eligible. The large-farmer interviews further illustrate this difference. The existing farmer who expanded using the Scheme stated that small and medium farms did not benefit equally, while large farms, new entrants and existing players benefited more. The new entrant farmer, however, indicated that small, medium and large farms could all benefit, though new entrants received only medium benefit and existing players received higher benefit. This difference may reflect the positional experience of each respondent. This construct can therefore arrive at a finding that WBIS 2017 had broad formal eligibility, but equity in actual benefit was uneven. Larger farms, existing operators and administratively prepared applicants appear to have been better placed to benefit effectively.

4.4d. Manageability

The qualitative findings on manageability show that WBIS 2017 was generally seen as administratively usable, but not without practical barriers. The main concerns related to documentation, land and regulatory issues, subsidy-release delays, bank coordination and the ability of farmers to follow up with departments. The qualitative evidence therefore supports a distinction between a Scheme being formally accessible and being practically easy to use. The policymaker respondent assessed the application process and departmental coordination as high, documentation requirements and bank coordination as medium, and district-level implementation variation as high - indicating that from an administrative perspective, the Scheme process functioned, but implementation varied by district and required coordination across departments and banks. The policymaker also identified delays in fund release and incomplete documentation as major administrative challenges, while not viewing project verification, approval delay, bank issues or monitoring as major problems. The policy influencer interviews provide a more field-facing perspective. NECC identified documentation burden as medium, bank financing as medium, land and regulatory issues as high, departmental processing as medium and delays as low. The veterinarian respondent similarly rated documentation burden as medium, bank financing as medium, land and regulatory issues as high, departmental processing as medium and

delays as medium. WBPF was more critical, identifying documentation burden, land and regulatory issues, and delays as high, while bank financing and departmental processing were rated medium. The farmer interviews also suggest that manageability differed according to applicant type. The existing farmer who expanded using the Scheme rated documentation burden as medium, land and regulatory issues and delays as high, while treating project approval, bank financing and departmental processing as relatively low barriers. The new entrant farmer identified documentation burden, land and regulatory issues and delays as high, while project approval and bank financing were medium. This suggests that newer entrants may have found the process more burdensome because they had to simultaneously manage land, finance, documentation, construction and regulatory requirements. The qualitative manageability construct finds that the Scheme was manageable for applicants with adequate administrative capacity, but neither simple nor smooth. The Scheme's manageability was thus assessed by the interview respondents as moderate. It was not inaccessible, but did require preparedness, follow-up and institutional familiarity. Land availability and documentation burden emerged as recurring barriers across interviews. Delays - particularly in subsidy release - also affected the practicality of the incentive.

4.4e Market competition and distortion

The qualitative interviews demonstrate that the WBIS-supported production expansion received mixed reviews from the respondents. They generally recognised that the Scheme augmented production capacity, but some also indicated that concentration of production intensified market pressure in certain districts. This finding is better viewed as a distinction between augmented production growth and market stability. The Scheme may have supported production augmentation, but the market system did not necessarily absorb the concentrated supply increase without creating localised pressure. The NECC respondent provided a clear market-level interpretation, stating that the increase in the number of farms led to some farm-gate price pressure and trader bargaining power. Regional oversupply though, was visible mostly in Bankura and also Paschim Medinipur. It was also indicated that interstate egg inflows had high influence on the Kolkata market and high impact on

indigenous producers. This suggests that even after local capacity increased, West Bengal farmers remained exposed to interstate supply and trader-led price behaviour. The veterinarian respondent provided a more district-specific view, stating that farm-gate price pressure depended on district concentration - with medium pressure in Paschim Medinipur and high pressure in Bankura. The respondent also identified increased trader bargaining power, medium price volatility and regional oversupply in some districts. On interstate inflows - the veterinarian assessed Kolkata market influence, timing of interstate supply and price-setting practices as high.

WBPF similarly indicated that market pressure was uneven and district specific. It was noted that farm numbers did not create pressure in all districts, but farm-gate pressure, trader bargaining and regional oversupply appeared in some districts. It also rated the influence of interstate egg inflows and their timing of supply on market behaviour, trader conduct, price-setting practices and indigenous producers as high. The farmer interviews reinforce this. The new entrant farmer assessed farm-gate price pressure and trader bargaining power as medium, and regional oversupply as medium depending on district. It also identified Kolkata market influence, trader behaviour and timing of interstate supply as high. The existing farmer who expanded under the Scheme identified the effects of the Scheme on farm numbers as high, farm-gate price pressure as medium and having led to regional oversupply in some districts.

4.4f Farmer Welfare and Sustainability

The qualitative interviews indicate that farmer welfare and sustainability were the most important limitations of WBIS 2017. Respondents generally recognised that the Scheme supported production capacity and investment, but some also indicated that long-term farmer welfare remained vulnerable due to feed-cost volatility, working-capital pressure, debt-funded investment, market price fluctuation and uneven bargaining power. The policymaker respondent acknowledged that input-cost volatility, working-capital burden and recurring operating-cost risk were not adequately considered, or structured into, the original policy design. The policymaker also identified sustainability cognizance and absence of feed-cost or price-risk support as limitations, while recognising that the Scheme

was sufficient to encourage production increase. This distinction is central to this finding - the Scheme worked as an investment trigger, but it was not designed as a complete sustainability framework.

NECC also indicated that the Scheme was successful in production but only partly successful in farmer welfare. It was also stated that the current subsidy structure did not cover recurring feed-cost exposure, market price fluctuation, mortality and disease risk or working-capital requirement. WBPF similarly highlighted the sustainability gap. It stated that recurring feed-cost exposure, market price fluctuations, mortality risk, and pressure on working capital requirements were not adequately covered. It also recommended intervention in raw material prices, indigenous raw material production, working capital, regulatory structure and lending-institution alignment. The veterinarian respondent linked sustainability to farm scale and operational support. The response indicated that smaller farms were more vulnerable. The farmer interviews also support the finding. The existing farmer who expanded using the Scheme agreed that WBIS was successful in production but weak in welfare, useful but in need of redesign, and no longer suitable in its present form. The new entrant farmer expressed the same broad assessment and called for easier documentation, improved government coordination, reduced red tape and easier monitoring. A substantive qualitative finding can therefore be framed that WBIS 2017 contributed to production growth, but farmer welfare and sustainability remained inadequately protected. The respondents indicate towards relevance of the policy being dependant on design of policy not only from an establishment-focused incentive but also a broader sustainability framework that includes feed-cost support, working-capital assistance, price-risk awareness, district-wise planning, market linkage, training and timely subsidy release.

4.4g. Employment

The qualitative interviews present employment generation as one of the positive outcomes of commercial layer expansion under the WBIS environment. Respondents across categories recognised that commercial layer farms create direct and indirect rural employment through farm labour, supervisory work, feed transport, veterinary services,

medicine supply, egg handling, trading and ancillary activities. However, the interviews also suggest that the quality and additionality of employment should be interpreted carefully. The policymaker respondent identified employment as one of the high-priority concerns behind the Scheme and rated direct farm employment as a high priority. Indirect employment in feed, medicine, transport and trading was assessed as medium, while skilled employment was rated medium and unskilled employment high. The policymaker also indicated that additional employment versus labour shift from other agricultural work was medium. This suggests that the policy expectation of employment generation was recognised, but employment additionality was not treated as absolute. NECC assessed farm labour and supervisory staff as high, medicine and veterinary services as high and ancillary rural employment as medium. It was also identified that skilled employment creation and seasonal-versus-permanent employment were high, while agricultural labour shift was medium. This indicates that layer farming was seen as creating a more organised and semi-skilled rural employment ecosystem - especially in relation to supervision, veterinary support and technical farm operations. WBPF also assessed farm labour and supervisory staff as high, feed transport and ancillary rural employment as medium, medicine and veterinary services as high, and egg grading and handling as low. This pattern suggests that employment gains were more visible in farm operations and support services than in value-added or handling activities. The veterinarian respondent gave one of the strongest positive assessments of employment. The respondent rated farm labour, supervisory staff, feed transport, medicine and veterinary service, and ancillary rural employment as high. It was also stated that skilled employment creation was high in the industry and that permanent employment was higher than seasonal employment. This is important because the veterinarian's operational perspective indicates that commercial layer farming generates demand for regular labour and technical services, not only casual work. The farmer interviews are consistent with this. The existing farmer who expanded using the Scheme rated farm labour, supervisory staff and veterinary services as high, while feed transport and ancillary employment were medium. The new entrant farmer also identified high farm labour and veterinary service contribution, with medium feed transport and

ancillary employment. The findings from an employment construct can therefore be summarised as indicating that the WBIS-linked commercial layer expansion contributed positively to rural employment, particularly through farm labour, supervision, veterinary services, and support activities. However, the interviews also indicate that some labour may have shifted from other rural or agricultural work. Employment gains were therefore real, but not entirely additional in every case.

4.4h. Consumer Welfare

The qualitative findings on consumer welfare are positive but bounded. Respondents generally indicated that increased local production improved availability and freshness in some areas, but there was no evidence of reduced consumer prices. On the contrary, prices kept increasing. Consumer welfare in the qualitative interviews is therefore best understood through freshness, reduced farm-to-market time, better local availability and lower dependence on long-distance supply, rather than through affordability alone. The policymaker respondent identified freshness and supply-chain delay as one of the problems the Scheme was expected to address, although it ranked below dependence on eggs from other States, demand-supply gap and rural investment or employment. The policymaker also assessed reduced farm-to-table time and improved availability in local markets as medium, difference between local and imported eggs as high, and consumer price impact as low. This supports a cautious finding: WBIS may have improved availability and freshness, but not prices.

NECC also provided a moderate consumer welfare assessment. It was stated that increased local production improved availability in local retail markets in some districts, while farm-to-market time, imported egg freshness issues and consumer awareness of local versus imported eggs were assessed at medium levels. This indicates that consumer benefits were visible but uneven, dependent on location and market conditions. WBPF gave a district-specific view. It was stated that farm-to-market time benefits were mostly visible in rural areas, and availability improved in some districts. It also rated consumer awareness of local versus imported eggs as high, while the price difference was treated as not applicable. This suggests that consumer welfare gains were spatially uneven and may have been stronger

near producing districts than in larger urban markets. The veterinarian respondent was more positive about freshness and availability. It rated farm-to-market time and availability in local retail markets as high, while consumer awareness of local versus imported eggs was medium and price difference was low. This supports the argument that increased local production can improve supply-chain freshness even where price effects are limited.

The farmer interviews also support a bounded-consumer-welfare finding. The new entrant farmer rated imported egg freshness issues and consumer awareness as high, but price difference as low. The existing farmer who expanded under the Scheme rated farm-to-market time, local availability and imported egg freshness issues as medium. The qualitative finding is therefore that WBIS-linked local production expansion appears to have supported consumer welfare mainly through improved freshness and availability in selected districts. However, the interviews do not support a claim of consumer price reduction. The consumer welfare effect was therefore real but limited: stronger in terms of supply-chain freshness and local availability, weaker in terms of affordability or price moderation.

4.5 Integrated Findings: Secondary, primary quantitative and primary qualitative data

This section integrates the findings from the three evidence streams used in the study: secondary data, primary quantitative farmer survey data, and primary qualitative interview data. The purpose of this integration is not to repeat the detailed findings already presented in the earlier sections, but to identify whether the evidence from different sources converge, diverge, or qualify regarding interpretations of WBIS 2017. The integration is therefore presented through an evidence matrix organised by operational construct.

Table 4.4:

Integrated evidence matrix by operational construct

INTEGRATED EVIDENCE MATRIX BY OPERATIONAL CONSTRUCT				
Operational construct	Secondary data indication	Primary quantitative survey indication	Primary qualitative interview indication	Integrated finding
Policy effectiveness and production augmentation	Post-2017 farm growth, bird-capacity addition and district clustering indicate production expansion.	Respondents perceived WBIS as influencing investment and contributing to production increase.	Stakeholders recognised new farm entry, investor confidence, bankability and bird-capacity growth.	Strong convergence that WBIS was effective as an investment and production-capacity support scheme.
Self-sufficiency and import dependence	Increased local capacity suggests movement towards stronger indigenous production.	Respondents perceived moderate movement towards self-sufficiency, but weaker reduction in import dependence.	Stakeholders acknowledged improved local supply but continued interstate dependence.	WBIS contributed to partial self-sufficiency, but did not eliminate interstate egg inflows.
Incentive adequacy and financial relief	Scheme included capital subsidy, interest subsidy, power/electricity support and stamp duty/registration support.	Respondents recognised project-level relief but also reported operating stress.	Stakeholders noted that feed-cost, price-risk and working-capital exposure were not adequately covered.	Adequate as investment support; inadequate as long-term operating-risk protection.
Access, manageability and equity	Scheme-linked growth was spatially uneven across districts.	Awareness and eligibility clarity were high, but application experience and timeliness were uneven.	Formal access was broad, but practical benefit varied by scale, bankability and administrative capacity.	Formal eligibility did not always translate into equal effective access.
Farmer welfare, profitability and sustainability	Feed-cost data shows major input-cost escalation and high dependence on maize and soya.	Respondents reported profitability decline, feed-cost stress and expense/loan servicing pressure.	Stakeholders called for feed-cost support, working capital, raw material intervention and lending alignment.	Strong divergence between production success and farmer welfare; sustainability remained weak.
Market competition and distortion	District clustering suggests localised concentration.	Respondents reported intensified market pressure and continued interstate price influence.	Stakeholders identified regional oversupply, trader bargaining and interstate inflow effects.	Production expansion strengthened supply but increased localised price pressure in some districts.
Employment and rural development	Employment was a stated policy objective.	Respondents reported moderate employment generation, with some labour reallocation.	Stakeholders recognised farm labour, supervision, veterinary services and ancillary employment.	Positive but moderate employment effect; partly additional and partly reallocated.
Consumer welfare and local availability	Egg prices increased, so price reduction is not supported, local capacity increased.	Respondents strongly perceived freshness and availability benefits.	Stakeholders supported freshness/local availability benefits but prices increased.	Consumer benefit is strong in freshness and availability, not affordability.
Future policy design and sustainability	Feed and price trends show a volatile operating environment.	Respondents preferred feed-cost/working-capital support and market/price support.	Stakeholders recommended redesign, feed support, working capital, market planning, training and timely release.	Future policy should move beyond establishment support towards sustainability-oriented support.

Source: Compiled and prepared by author using primary and secondary research data, (2026)

This structure is appropriate because the study evaluates WBIS 2017 as a policy intervention rather than as a set of isolated survey or interview responses. Each operational construct draws evidence from more than one source. For example, policy effectiveness is reflected in secondary farm-growth data, farmer perceptions of investment and production contribution, and interview-based assessments of new farm entry and investor confidence. Similarly, farmer welfare is reflected in feed-cost data, survey responses on profitability and loan pressure, and interview comments on feed-cost support and working-capital stress. The integrated matrix shows that the strongest convergence appears in relation to policy effectiveness and production augmentation. Secondary data indicates post-2017 growth in commercial layer farms and bird capacity; the farmer survey shows that respondents perceived WBIS as contributing to investment and production increase. Interview respondents also recognised the Scheme's role in new farm entry, bankability and investor confidence. Therefore, WBIS 2017 can be identified as effective in encouraging the augmentation of production capacity. However, the evidence is more cautious in relation to self-sufficiency and import dependence. Increased local production capacity suggests movement towards a stronger indigenous egg base, but the survey and interview findings indicate that interstate egg inflows continued to influence the market. The integrated finding is therefore one of partial progress, not complete self-sufficiency. The matrix also highlights a major distinction between investment support and long-term sustainability. WBIS 2017 was not only a capital subsidy scheme; it included capital subsidy, interest subsidy, electricity duty waiver, power subsidy and stamp duty/registration support. These components provided project-level relief. However, the survey and interview evidence shows that the Scheme did not sufficiently address recurring risks such as feed-cost escalation, working-capital pressure, market price fluctuation and delayed subsidy release. A further integrated finding concerns equity and manageability. While the Scheme may have been formally open to different categories of farms, effective access varied by documentation capacity, land readiness, bankability and ability to manage administrative follow-up. This supports the distinction between formal eligibility and practical accessibility. The strongest divergence in the study appears between production

effectiveness and farmer welfare. WBIS helped strengthen local production capacity, but farmers continued to experience profitability pressure, feed-cost stress and market vulnerability. This does not suggest that WBIS caused financial stress. Rather, it shows that investment support alone was insufficient in a volatile operating environment.

Overall, the integrated evidence indicates that WBIS 2017 achieved important production and investment outcomes, but future policy relevance depends on redesigning support around sustainability, working capital, market linkage, feed-cost risk, differentiated targeting and time-bound implementation.

CHAPTER V:

DISCUSSION

5.1 Introduction

This chapter discusses the study's findings relative to the literature review, design of the scheme, the secondary data, the primary quantitative survey of commercial layer farmers and the qualitative interviews with the policymaker, policy influencers, and selected large farmers. The purpose of the chapter is not to repeat the findings already presented in the Findings chapter, but rather to interpret what they mean for policy effectiveness, farmer welfare, market functioning, consumer welfare and future incentive design. The central argument emerging from the evidence is that WBIS 2017 was more successful as a production-capacity and investment-encouragement policy than as a full farmer-welfare or long-term sustainability policy. The Scheme contributed to new farm entry, expansion of existing farms and creation of additional layer capacity. However, its design remained primarily establishment oriented. It reduced some entry and project costs through capital grant, interest subsidy, electricity-related relief and stamp duty and registration support but did not directly address recurring feed-cost volatility, working-capital pressure, price risk, market organisation or district-wise production concentration. This distinction is critical because commercial layer farming is different from many forms of agricultural investment. A layer farm is capital-intensive at the establishment stage, but its survival depends on recurring operating costs, especially feed, and on the relationship between feed prices and egg prices. The literature on subsidy design cautions that subsidies may encourage investment and output, yet still produce inefficiency, inequity, or vulnerability if they are not aligned with the sector's inherent behaviour. This study confirms that point in the specific case of West Bengal's commercial egg production sector.

The discussion is structured around the study's operational constructs and research questions. First, this chapter links WBIS 2017 to policy design and the literature on subsidies. It then discusses the findings by operational construct. Finally, it synthesizes these themes into a construct-wise and research-question-wise interpretation.

5.2 Linkage of WBIS 2017 to Literature, Constructs and Research Questions

The literature review established that public policy is not merely a statement of intention. It is a combination of objectives, instruments, implementation systems and stakeholder responses. The discussion of policy design by Howlett and Mukherjee (2014) is relevant here because a scheme may be well intentioned yet incomplete if its instruments do not match the complexity of the problem being addressed. Similarly, the discussion of policy tools by Salamon (2002) is useful because it frames policy evaluation through effectiveness, efficiency, equity and manageability. These four criteria are directly relevant to WBIS 2017.

WBIS 2017 was introduced to address a production deficit in West Bengal's egg economy. The Scheme sought to encourage entrepreneurs to establish commercial layer poultry farms and poultry breeding farms, enhance commercial egg production and generate rural employment. This connects directly to the constructs of policy effectiveness, self-sufficiency, employment generation and consumer welfare. However, the actual design of the Scheme also included capital grant, interest subsidy on term loan, waiver of electricity duty, power subsidy and support for stamp duty and registration fees. This broader structure connects the Scheme to the constructs of incentive adequacy, efficiency, equity and manageability. For reference, the research questions are outlined in the chart below;

Table 5.1:

Research questions

RESEARCH QUESTIONS	
RQ1	To what extent has the West Bengal Special Incentive Scheme 2017 contributed to the augmentation of indigenous commercial egg production in West Bengal ?
RQ2	Has the Scheme helped West Bengal move closer to self-sufficiency in egg production and reduced dependence on eggs imported from other States ?
RQ3	What has been the impact of the Scheme on income, profitability and financial sustainability of commercial layer farmers ?
RQ4	Has the entry of new entrepreneurs and expansion of existing farms created healthy competition, or has it intensified market pressure among farmers ?
RQ5	To what extent has the Scheme contributed to employment generation in rural West Bengal, and is such employment additional or merely shifted from other agricultural activities ?
RQ6	Have consumers benefited through better access to fresher eggs, improved supply condition and more efficient pricing ?
RQ7	What design changes, if any, are required to improve the effectiveness, targeting, accessibility and long term sustainability of the Scheme ?

Source: Prepared by author, (2023)

The study's research questions are therefore not separate from the constructs. RQ1 and RQ2 examine policy effectiveness and self-sufficiency. RQ3 examines incentive adequacy, farmer welfare and financial sustainability. RQ4 examines market competition and market distortion. RQ5 examines employment generation. RQ6 examines consumer welfare through freshness, availability and pricing. RQ7 draws together effectiveness, targeting, accessibility, equity, manageability and sustainability.

The constructs act as the bridge between the Scheme, the findings and the research questions. This linkage is important because a simple answer to whether WBIS 2017 'worked' would be misleading. It worked on some dimensions and remained weak on others.

Table 5.2:

Linkage of Scheme, construct and research questions

LINKAGE OF SCHEME, CONSTRUCT AND RESEARCH QUESTIONS			
Scheme aspect	Operational Construct	RQ #	Research question
Commercial layer farm establishment and expansion	Policy effectiveness; self-sufficiency	RQ1, RQ2	Whether the Scheme increased local capacity and moved West Bengal towards self-sufficiency.
Capital grant, interest subsidy, power-related and registration-related support	Incentive adequacy; efficiency	RQ3, RQ7	Whether project-level incentives were sufficient relative to capital cost, debt and later operating risk.
Eligibility and application process	Equity; manageability; awareness	RQ7	Whether formal access translated into practical access for different farm categories.
Production expansion in selected districts	Market competition; market distortion	RQ4	Whether increased local production created healthy competition or intensified price pressure.
Rural employment objective	Employment generation	RQ5	Whether employment was additional, skilled, permanent or shifted from other rural work.
Fresh local egg supply objective	Consumer welfare	RQ6	Whether consumers benefited through local availability and freshness rather than direct price reduction.
Future policy redesign	Sustainability; targeting; accessibility	RQ7	Whether future schemes require feed-cost, working-capital, market and training support.

Source: Prepared by author, (2026)

5.3 Policy effectiveness and production augmentation

The first and most direct research question asks whether WBIS 2017 contributed to the augmentation of indigenous commercial egg production in West Bengal. The evidence supports a positive but qualified answer. Secondary data indicated an increase in farm presence and bird capacity after the Scheme period, particularly in poultry-concentrated districts such as Bankura and Paschim Medinipur. The approximately 65 lakh increase in sanctioned bird capacity serves as one of the principal quantitative indicators used to assess production augmentation under Research Question 1. This increase provides strong evidence that the Scheme materially contributed to the creation of productive capacity in West Bengal's commercial egg sector. Primary survey responses also indicated that farmers perceived the Scheme as having a moderate to large contribution to local commercial egg production. Qualitative interviews with ARD, NECC, WBPF, the veterinarian and large farmers also recognised new farm entry, increased investor confidence and higher bird capacity as major outcomes. The magnitude of the increase in sanctioned capacity is important because it demonstrates that WBIS 2017 operated not merely as a symbolic subsidy intervention, but also as a policy instrument capable of influencing actual production infrastructure and investor behaviour.

This finding corresponds with the literature on subsidies, which indicates instruments can reduce investment barriers and encourage productive asset creation (Salamon, 2002). WBIS 2017 lowered part of the project burden and signaled government support for the sector. This would have improved the bankability of projects and encouraged both new entrepreneurs and existing farmers to consider entry or expansion. From that perspective - the Scheme was effective in the important, but narrow, sense of stimulating productive capacity. However, effectiveness cannot be treated as a single-dimensional measure. Salamon's (2002) approach to policy evaluation makes it clear that effectiveness must be considered in relation to the policy's stated goals and the broader consequences of instrument choice. WBIS 2017 was effective as a production-oriented tool, but not necessarily as a complete sector-development tool. This distinction is central to the discussion. A Scheme may increase the number of farms and birds, but the sustainability

of that capacity depends on feed cost, working capital, debt servicing and market absorption. The qualitative interview with the policymaker strengthens this interpretation. The policymaker rated production deficit, employment and reduction of import dependence as high-priority concerns, while welfare-linked policy was lower in design priority. This shows that the Scheme's internal logic was primarily production-facing. The evidence, therefore, does not contradict the Scheme design. Rather, it reveals the limits of what that design could achieve. The finding also aligns with the literature on policy layering and instrument selection. WBIS 2017 intervened in a market that already had existing production clusters, trader networks, interstate supply flows and price-setting arrangements. The Scheme added an investment incentive to an existing market structure without creating a parallel mechanism to stabilise market risk. Thus, production augmentation occurred. But the market environment did not automatically become more favourable for farmers.

5.4 Self-Sufficiency and Import Dependence

The second research question asks whether WBIS 2017 managed to help West Bengal move closer to self-sufficiency in egg production and reduce its dependence on eggs imported from other States. The answer is again positive but partial. The study found that local commercial layer capacity improved. Survey respondents largely perceived that WBIS contributed to movement towards self-sufficiency. Qualitative respondents also recognised a stronger local production base. However, the evidence did not support a conclusion that West Bengal became fully self-sufficient or insulated from interstate supply. This distinction between production growth and self-sufficiency is important. A State can increase local production and yet remain dependent on external supply if demand continues to grow, if distribution remains uneven, if urban markets are linked to interstate trade, or if imported eggs influence price expectations. The interviews particularly suggest that Kolkata and surrounding consumption markets remained influenced by interstate supply flows. NECC, WBPF and the new entrant farmer all indicated that interstate egg inflows continued to affect price and market behaviour. Self-sufficiency, therefore, has to be interpreted as a continuum rather than a binary outcome. WBIS appears to have shifted

West Bengal toward a stronger indigenous production base. It did not fully eliminate import dependence. The Scheme should therefore be assessed as having made partial progress towards RQ2. This is not a failure in itself because the scale of the original demand-supply gap was substantial, and a production incentive alone could not realistically be expected to reorganize the entire supply chain. The literature on food security and agricultural support is relevant here. Subsidies can support domestic production and reduce import reliance, but they do not, and cannot, automatically determine final market outcomes (FAO, 2008).

Demand, logistics, trader networks, price signals, and consumer markets are among the many variables that matter to every industry. WBIS 2017 addressed the supply-side investment problem. It did not, however, directly attempt to address market channel design, egg aggregation, cold chain, consumer-level differentiation between local and imported eggs, or price-risk management issues. These omissions limited the Scheme's effect on import dependence. The evidence, primary and secondary, on this research question cautiously converge on a conclusion. WBIS did help West Bengal move towards self-sufficiency. However, while the Scheme strengthened the indigenous production base, the objective of achieving egg self-sufficiency was fulfilled but partially. Local production was augmented, but the dependence on interstate inflows and price influences continued. This has implications for future policy. Production incentives need to be accompanied by market intelligence, district-wise demand mapping and organised farmer-market linkages.

5.5 Incentive Adequacy and Efficiency

The third research question examines the impact of WBIS on income, profitability and financial sustainability. Before discussing farmer welfare, it is necessary to examine incentive adequacy and efficiency, as these constructs clarify what the Scheme was actually designed to support. In the policy-evaluation literature, efficiency concerns the relationship between resources deployed and outcomes achieved, while adequacy concerns whether the instrument is sufficient to influence the intended behaviour. Subsidies and grants are policy tools through which governments seek to reduce investment barriers, alter private decision-making and encourage productive asset creation (Salamon, 2002).

Similarly, subsidy literature emphasises that the quality of a subsidy depends not merely on its existence, but on whether it is properly targeted, sufficient for the intended purpose and capable of producing the desired economic outcome without generating inefficiency or unintended distortions (Srivastava and Rao, 2002). Therefore, WBIS 2017 must first be assessed in terms of whether its incentive package — including capital subsidy, interest subsidy, power-related support and registration-cost relief — was adequate and efficient as an investment-support mechanism. Only thereafter can farmer welfare be discussed meaningfully, because farmer welfare depends not only on whether the Scheme helped farms get established or expanded, but also on whether such support was sufficient to sustain profitability, debt servicing, working-capital management and resilience against feed-cost volatility. This distinction is important because a scheme may be adequate for capacity creation, but inadequate for long-term welfare and sustainability. WBIS 2017 was not only a capital subsidy scheme. It included multiple incentive components: capital support, interest subsidy on term loan, waiver of electricity duty, power subsidy and stamp duty / registration-related support, albeit at different levels of each. Therefore, the Scheme attempted to reduce several categories of project cost and some ongoing power-related burden. The findings show that the incentive package was meaningful at the project level. Applicants generally found the support moderately adequate or adequate. Many respondents recognised that it reduced the investment burden to some extent. The large farmer who expanded under the Scheme rated project cost relief, debt-equity structure relevance and capital subsidy relevance as high. The NECC and veterinarian interviews also suggested that the Scheme had relevance for investor confidence and bankability.

However, adequacy was not uniform. The new entrant farmer and WBPF were more critical of the incentive amount relative to project cost, debt-equity structure and practical farm economics. Investment levels are not the same across every district or entrepreneurs/farmers, for that matter. The cost of procuring land can be a major factor in the investment pattern. Prices of raw materials for construction, machinery and transport costs for the same can also vary depending on location of the farm. The political and social frames can also act as variables depending on location. Thus, the level of incentive provided can have a

different impact on farms with different levels of investment. Non-applicant farmer responses are also very relevant. Many non-availing farmers indicated that the expected benefit was insufficient for proceeding with expansion. Others cited delays, uncertainty, and documentation difficulties as reasons not applying to the Scheme. This demonstrates that adequacy was experienced differently by applicants and non-applicants, by large and small farms, and by existing operators and new entrants. This finding corresponds closely with the literature on subsidy quality. A subsidy may be formally available and still be inadequate if the beneficiary does not perceive it as sufficient relative to risk, effort or investment requirement. Srivastava and Rao (2002) argue that the quality of a subsidy must be assessed not merely by its existence, but by whether it is well targeted, capable of achieving the intended outcome and free from hidden inefficiencies. In commercial layer farming, the project cost is only the entry point. The farm must then survive through repeated fluctuations in feed costs, medicine, labour, electricity, mortality risk, debt servicing and egg prices. This is consistent with poultry-sector literature, which treats poultry farming as an enterprise exposed to continuing input, health, production and market risks. A subsidy that addresses establishment, but not recurring exposure may therefore be adequate at the moment of investment, yet inadequate across the business lifecycle (Srivastava and Rao, 2002; FAO, 2010; Bellmann, 2019). Efficiency also requires careful interpretation. A full cost-benefit analysis of public expenditure could not be conducted because official data on subsidy outgo as well as long-term farm-level returns were not available. The study, therefore, assesses efficiency in a practical policy sense. Did the Scheme produce the intended investment and production outcomes and did the value of support remain meaningful to beneficiaries?

On the first count, the Scheme appears efficient enough to mobilise investment. On the second count, its efficiency weakened because delayed release, documentation burden and failure to address recurring risks reduced the practical value of the support. This produces a nuanced interpretation. Though WBIS 2017 was reasonably adequate as an investment-enabling incentive, it was inadequate as a continuing farm-viability mechanism. Its

efficiency was higher in terms of production augmentation and lower in terms of long-term welfare.

5.6 Equity, Awareness and Manageability

The literature review discussed equity as both fairness of access and distribution of benefits (Salamon, 2002; Srivastava and Rao, 2002). This is important in evaluating WBIS 2017 because a subsidy scheme cannot be judged only by whether it was formally open to all eligible farms. Equity also requires examination of whether different categories of farmers were practically able to access and benefit from the Scheme. In the policy-evaluation literature, equity is treated as a central criterion alongside effectiveness and efficiency, because public support must be assessed in terms of how fairly benefits and costs are distributed among intended beneficiaries. Salamon's (2002) policy-tools framework identifies equity as a key basis for evaluating government instruments, while Srivastava and Rao's (2002) discussion of subsidy quality similarly cautions that subsidies may become weak or inequitable if poorly targeted or disproportionately accessible to better-resourced beneficiaries. Contextual to WBIS 2017, this would mean that formal eligibility for small, medium, large, new and existing farms does not automatically prove equitable benefit. Actual equity depends on practical factors such as awareness, documentation capacity, bankability, administrative follow-up and the ability to withstand delayed subsidy release. Therefore, the study interprets equity not merely as legal availability of the Scheme, but as the extent to which different farm categories could convert eligibility into actual benefit. Relevant to WBIS 2017, the evidence shows high formal awareness but uneven practical access. The farmer survey indicated that awareness of WBIS among commercial layer farmers was high. The qualitative interviews also confirmed that existing farmers and new entrepreneurs were generally aware of the Scheme through government channels, poultry associations, district offices, consultants and sector networks. Awareness, therefore, was not the main weakness of WBIS. However, awareness does not automatically lead to uptake. Uptake depends on documentation capacity, land status, bankability, project approval, ability to invest upfront, ability to follow up with departments and ability to wait for subsidy release. This is where manageability and equity

overlap. The Scheme may have been formally open to small, medium and large farms, but actual benefit was shaped by the ability to navigate the administrative and financial process. The policymaker interview stated that all categories of farmers had access to the Scheme. This reflects the formal policy position. However, NECC and WBPF indicated that large farms benefited more than small farms, and that small farms had lower practical benefit. The veterinarian suggested that existing players and large farms benefited more, while new entrants and smaller farms faced greater vulnerability. The existing large farmer who expanded utilising the Scheme felt that small and medium farms did not benefit as much as large farms, whereas the new entrant farmer stated that though all farm sizes did benefit, existing players appeared to have received more favourable outcomes. This mixed evidence is instructive. It suggests that though the policy was not designed to exclude any segment of participants, practical access and outcome was not equal in real terms.

Manageability, too, was found to be indicated as moderate rather than good. Survey responses indicate that applicants mostly found the application process manageable but not easy. Subsidy timeliness has consistently emerged as a major concern from all angles surveyed. Qualitative interviews repeatedly identified documentation, land and regulatory issues, delays and bank coordination as barriers. WBPF was particularly critical of documentation burden and delays. The policymaker also acknowledged delays in fund release and incomplete documentation as administrative challenges. This finding corresponds with Salamon's (2002) criterion of manageability and the literature on implementation. A policy may be sound in purpose but weakened by implementation burdens. Schemes that rely on multiple actors - district offices, banks, technical inspections, different authorities and departmental committees - make the process more complex. Complexity may not defeat implementation, but it can create unequal access because better-organised applicants are more able to comply. Therefore, the discussion of equity cannot be limited to whether the Scheme was formally open to all. It must ask whether a new, smaller or less administratively prepared farmer could realistically access the benefit with the same ease as an established, bankable and well-advised operator. The evidence suggests that the answer is no. Though formal eligibility existed, effective

accessibility varied. Future schemes need to, therefore, simplify documentation, provide handholding, create time-bound processing and differentiate support according to scale, vulnerability and project type.

5.7 Farmer Welfare, Profitability and Financial Sustainability

Farmer welfare is the construct where the strongest divergence appears. WBIS 2017 appears to have supported production, but the financial welfare of farmers remained under severe pressure. This is one of the most important conclusions of the study because it demonstrates that production growth and farmer welfare are not the same outcome.

The literature on agricultural subsidies helps explain this distinction. Subsidies can encourage production, investment and asset creation, but their net effect on farmer welfare depends on whether the support is aligned with the actual risks faced by producers. Studies on agricultural subsidies by Chandel, Lal and Kumari (2019) indicate that such support may improve production and investment outcomes but may also produce uneven or limited welfare effects where the subsidy does not adequately address continuing production risks, market volatility or cost pressures. In commercial layer farming, the central risk is not only the initial capital cost of establishing or expanding a farm. The enterprise remains repeatedly exposed to feed ingredient prices, egg-price movements, mortality and disease risk, working-capital requirements and debt-servicing obligations. A capital-linked incentive may therefore reduce the cost of entry or expansion, but it does not protect the unit against later escalations in cost components (FAO, 2010; Bellmann, 2019). This can help explain why WBIS 2017 would have been effective as a production-capacity instrument while remaining weaker as a farmer-welfare and sustainability mechanism. Primary survey findings indicate a widespread decline in profitability across all respondents. A very large share reported significant profitability decline, severe feed-cost stress and serious pressure on loan servicing. Secondary data supported this view. Maize and soybean meal prices rose sharply over the 2016-2026 period, with particularly high rise in prices after 2020. The farm-level feed formulation data showed that feed cost was approximately ₹26,466 per metric ton, or ₹26.47 per kg, and that maize and soya alone accounted for about 72 per cent of total feed cost. This confirms that feed-cost stress is not

merely a subjective complaint, it is structurally embedded in layer-farm economics. The qualitative evidence strongly confirms this point. The policymaker acknowledged that input-cost volatility, working-capital burden and recurring operating-cost risk were not built into the original Scheme design. NECC, WBPF and the veterinarian responses also stated that the existing subsidy structure was insufficient to cover recurring feed-cost exposure, market price fluctuation, mortality risk and working-capital requirement. The existing and new entrant large farmers both agreed that WBIS was successful in production but weak in welfare, and that it required redesign.

The discussion must be careful not to claim that WBIS caused farmer distress. The evidence does not support such a direct causal claim. Farmer distress appears to have arisen from feed-cost escalation, price rigidity, debt burden, trader influence and market volatility. What the evidence does support is that WBIS encouraged investment and expansion in a sector that later became financially more difficult. Therefore, farms created or expanded under the Scheme became exposed to operating risks that the Scheme was not designed to manage. A further issue that must be recognised in interpreting the farmer-welfare findings is the timing of feed-cost volatility. The major escalation and instability in maize and soybean meal prices became particularly visible during and after the COVID-19 period. However, the primary survey and interview schedules did not include a separate question asking respondents to isolate COVID-19 as an explanatory factor. Therefore, the present study does not treat COVID-19 as a directly measured variable. It is instead treated as an external contextual shock that altered the operating environment of commercial layer farming after the introduction of WBIS 2017. This distinction is very important. The evidence supports the finding that farmers experienced serious feed-cost pressure and profitability decline, but the study does not claim that respondents directly attributed these outcomes to COVID-19. The secondary price evidence on the timing of cost escalation rather suggests that WBIS-supported capacity enhancement encountered a substantially more volatile post-2020 cost environment than the one prevalent when the Scheme was originally designed. This reinforces the conclusion that production-oriented incentives can generate investment but may not protect farmer welfare and financial sustainability during

external shocks. This is an important policy lesson. Incentive design needs to align with the enterprise's lifecycle. In layer farming, support at establishment may be necessary, but not sufficient. If recurring operating risks are ignored, production-oriented policy may create capacity without creating resilient producers. Therefore, future schemes should not be judged only by number of farms, bird capacity or subsidy released. They should also be judged by survival rate, debt servicing, capacity utilisation, feed-cost resilience, price realisation and farmer welfare.

5.8 Market Competition, Price Pressure and Market Distortion

The fourth research question seeks to identify whether entry of new entrepreneurs and expansion of existing farms created healthy competition or, alternatively, resulted in intensified market pressure. The findings indicate that market pressure intensified, particularly in districts with high farm concentration and in market channels influenced by interstate egg inflows and trader behaviour. The literature review cautions that subsidies may create market distortions when production is encouraged without sufficient attention to demand absorption, regional concentration, price behaviour and the wider market structure (OECD, 2001; Bellmann, 2019). Srivastava and Rao's (2002) discussion of subsidy quality is relevant here, as it warns that subsidies may become inefficient or distortionary where their design does not adequately account for targeting, outcomes and market effects. The WBIS case, however, shows a more nuanced form of distortion. The evidence does not establish that the Scheme created direct or uniform market distortion across West Bengal. Rather, it suggests that WBIS-supported production expansion took place within an egg market already shaped by trader influence, interstate supply flows and uneven district-level farm concentration. Additional production capacity strengthened West Bengal's indigenous egg supply base. However, in districts where farm concentration was high, farmers remained dependent on trader-led markets and it also intensified competition among producers. The finding, therefore, is not that WBIS directly distorted the market. Rather, it suggests that production-oriented support can amplify existing market pressures when it is not accompanied by market planning, district-wise targeting and price-risk mechanisms. The survey responses indicate that farmers did not generally

perceive post-WBIS entry as healthy competition. Instead, they reported that market pressure had intensified. Respondents also felt that interstate egg inflows continued to influence local farm-gate prices. The qualitative interviews support this finding. NECC response pointed to farm-gate price pressure, trader bargaining power and regional oversupply, particularly in Bankura and Paschim Medinipur. The veterinarian's response similarly noted that market pressure varied by district concentration, with Bankura experiencing the highest pressure. The WBPF response also described the pressure as uneven and district-specific and noted that interstate egg inflows continued to influence market behaviour. This suggests that production incentives should be linked with market planning. Farm clustering can create benefits such as stronger input networks, veterinary access and technical support. However, when too many farms are concentrated in a few districts, clustering can also lead to local oversupply, greater trader dependence and weaker bargaining power. Thus, the same concentration that improves production efficiency may reduce farm-gate price realisation if market channels are not sufficiently diversified. The market is further complicated by the influx of interstate eggs. It continues to serve large urban markets, especially Kolkata and nearby areas. The timing and pricing of the interstate egg supply influences local prices, as traders' access to these eggs does translate into weaker bargaining power for local farmers. This weakens the assumption that higher local production automatically improves farmers' incomes. Research question 4 is therefore answered with a qualified finding. WBIS-supported expansion increased production capacity, but farmers did not generally perceive the resulting competition as healthy. Market pressure intensified in some districts, especially where farm concentration increased. On the other hand, interstate supplies continued to influence prices. Future policy needs, therefore, combine production incentives with market intelligence, district-wise planning, alternative sales channels and price-risk awareness, among others.

5.9 Employment generation and rural development

The fifth research question examines whether WBIS-linked expansion generated new employment or mainly shifted labour from other rural activities. The evidence indicates a positive employment effect, but perceptions of the extent of genuine additional

employment were mixed. Commercial layer farms require labour for feeding, egg collection, shed management, cleaning, vaccination support, manure handling, supervision, security, loading and transport. They also generate indirect activity in feed movement, medicine supply, veterinary care, equipment maintenance, trading and logistics. The survey evidence indicated some additional employment generation, though not uniformly across all farms. Qualitative interviews were generally positive. The policymaker response rated direct farm employment as high. NECC, WBPF and the veterinarian responses all indicated high employment effects in farm labour, supervisory staff and veterinary services, while the veterinarian response also highlighted skilled employment creation and permanent employment. However, the finding must be qualified. The survey and interviews indicated that some labour may have shifted from existing rural or agricultural work. Employment generation is therefore real, but not always fully additional. From a policy-evaluation perspective, a worker moving from farm labour to poultry farm labour is not the same as a new employment opportunity created for an otherwise unemployed person. The development value is higher where jobs are stable, better paid, skill-enhancing and additional to existing employment. It is therefore indicative that the Scheme generated more regular rural employment than some crop-based operations. Layer farming is especially relevant because it operates throughout the year, unlike many seasonal crop activities. The employment finding aligns with the Scheme's stated employment objective and with the literature indicating that livestock and allied agricultural enterprises can support rural income diversification and non-crop employment (Thornton, 2010) and supports a moderately positive interpretation. WBIS-linked commercial layer expansion likely created both direct and indirect rural employment, including technical and semi-skilled roles. However, the study cannot claim that all such employment was new or additional. Future policy should improve employment outcomes by adding training, certification, biosecurity education, technical staff development and linkages with veterinary and farm-management services. This would convert employment generation from a simple headcount outcome into a quality-of-employment outcome.

5.10 Consumer Welfare, Freshness and Pricing

The sixth research question asks whether consumers benefited through access to fresher eggs, improved supply conditions and more efficient pricing. The evidence supports a consumer benefit in terms of freshness and availability, but not in terms of price reduction. The study did not conduct laboratory testing of egg freshness or nutritional quality. Therefore, the consumer-welfare finding need be interpreted cautiously. Consumer welfare assessment was indirect - through supply-chain factors such as local availability and farm-to-market time.

Locally produced eggs generally travel shorter distances than those imported from other states. Increased local production can thus reasonably improve access to fresher produce, particularly in production districts and nearby markets. This is very pertinent in the context of eggs, which have a very short shelf life. The survey data showed strong farmer agreement that local production improved freshness benefits for consumers. Qualitative interviews too supported this view. The policymaker response assessed the difference between local and imported eggs as high, with farm-to-table time and local availability as medium. The NECC response indicated improved availability in some districts. The WBPF respondent stated that freshness and availability gains were stronger in rural areas and selected districts. The veterinarian response, though, was more positive -rating farm-to-market time and local retail availability as high. On the other hand, the secondary price data did not support a consumer price-reduction claim. NECC yearly average egg prices increased during the study period, including after the introduction of WBIS 2017. This means that increased local production did not translate into lower average egg prices. This does not necessarily mean that WBIS failed consumers. It means that consumer benefit took the form of availability and freshness rather than affordability. Egg prices are shaped by feed costs, demand, transport, trader margins, interstate supply and national market trends, not merely local farm capacity. The literature on subsidies and food security becomes quite relevant in this context. FAO (2008; 2010) posits that subsidies, under some circumstances, improve availability and domestic supply without reducing final consumer price if cost pressures are high. In fact, if feed costs increase sharply, consumer prices may

rise even as local production increases. The policy issue is therefore not whether WBIS reduced prices; it was not designed as a price-control scheme. The more appropriate question is whether it improved local availability and reduced reliance on long-distance eggs. On that narrow measure, the evidence is positive but uneven. Future policy should make consumer welfare more explicit. If freshness is a policy objective, the State could support local egg branding, traceability, freshness labelling, district-level distribution networks and consumer awareness regarding local versus long-distance eggs. Without such measures, the freshness advantage may remain invisible to consumers and may not translate into better price realisation for local farmers.

5.11 Discussion of Sustainability and Future Policy Design

Sustainability is the construct that integrates with all of the other constructs. A policy is sustainable when its outcomes endure after the initial intervention, when beneficiaries remain viable, when market effects are manageable and when public support does not create dependency or distortion (Srivastava and Rao, 2002; Bellmann, 2019; Heyl et al., 2022). In the case of WBIS 2017, sustainability is the main area requiring redesign. The evidence shows that farmers and stakeholders do not primarily ask for a larger version of the same capital-subsidy scheme. The survey data indicated the strongest preference for feed-cost and working-capital support, followed by market or price-support mechanisms.

Qualitative interview respondents recommended various aspects like feed-cost support, working-capital assistance, district-wise targeting, market intelligence, price stabilisation or market linkage, cold chain and logistics support, farmer training and better monitoring to be integrated into any further Scheme. The NECC respondent specifically recommended restarting the Scheme with redesign focused on feed-cost subsidy and subsidy-release delay resolution. The WBPF response highlighted further government intervention in raw material prices and indigenous raw-material production. The veterinarian recommended support for raw material purchase, support for small farms to grow, marketing support and skills training practices as important for any further Scheme. This convergence is one of the strongest results of the study. It shows that the sector no longer views establishment subsidy as sufficient. Stakeholders now understand that farm viability depends on

operating resilience. Feed cost, working capital, price realisation and skilled management are now central to policy design. This interpretation is also supported by the literature review. Agricultural subsidies can create short-term production gains, but long-term outcomes depend on whether policy instruments can address the actual source of risk. The literature also warns that subsidies can be inefficient or regressive if poorly targeted (Chandel, Lal and Kumari, 2019; Srivastava and Rao, 2002).

Therefore, the appropriate response is not indiscriminate continuation of subsidy, but redesign. Future support must be conditional, targeted, transparent and connected to measurable outcomes. The sustainability dimension also includes environmental and responsible production concerns. Survey responses indicated weak perceived alignment between WBIS and Sustainability Development Goals and responsible production. The policymaker and veterinarian interviews suggested that responsible farming practices, technology inclusion and staff training need to be encouraged. This points to a policy gap: WBIS supported production but did not embed sustainability standards. Future schemes need to link support to biosecurity, waste management, manure utilisation, energy efficiency, staff training, water management and compliance with responsible farming protocols. Thus, the discussion of RQ7 leads to a clear conclusion. WBIS 2017 should not simply be continued in its original form. It should be redesigned into a broader poultry-sector support framework that combines targeted capital support with feed-cost risk mechanisms, working-capital assistance, market development, training, district-wise planning and sustainability-linked compliance.

5.12 Integrated answers to research questions

Research question 1: WBIS 2017 did contribute meaningfully to indigenous commercial egg production in West Bengal. Secondary data, survey findings and interviews converge most strongly on this point. The Scheme supported new farm entry, capacity creation and investor confidence but the geographical impact, though, was not aligned.

Research question 2: The Scheme did help West Bengal move towards self-sufficiency in egg production but did not entirely succeed in eliminating dependence on egg import from

other States. Local production increased, but interstate influx continued to influence Kolkata and other markets. The finding, therefore, is one of partial progress - not entirety.

Research question 3: WBIS provided project-level financial relief and supported investment decisions, but did not ensure farmer income, profitability or long-term financial sustainability. Farmer welfare remained under pressure due to feed-cost escalation, working-capital burden, debt servicing and limited pricing power.

Research question 4: The increase in production, from new and expanded farms put together, did not manage to create uniform, healthy competition. In several districts, especially where farms were concentrated and trader influence remained strong, market pressures intensified. The Scheme was therefore stronger in terms of production expansion than in market stabilisation.

Research question 5: Commercial layer expansion contributed positively to rural employment, particularly in farm labour, supervision, veterinary services, feed transport and ancillary activities. However, the employment effect was qualified because some labour may have shifted from other rural or agricultural work.

Research question 6: Consumers seem to have benefited from improved local availability and fresher supply in selected districts. However, there is no evidence on measured nutritional improvement and prices actually rose. Consumer welfare gains, therefore, are stronger in terms of supply-chain than affordability.

Research question 7: If redeployed, WBIS would require redesign for policy relevance. The studies provide strong evidence that there is a need to move from an establishment-oriented incentive model towards a sustainability-oriented support framework.

5.13 Discussion Synthesis

The overall interpretation of the study is that WBIS 2017 was a rational and relevant policy response to West Bengal's egg production deficit. The Scheme addressed a genuine problem and produced meaningful results in production capacity. It also helped build confidence among investors and entrepreneurs in the commercial layer sector, somewhat changing the perspective of viewing egg production only as that of a farmer to a near industrial level. From this perspective, the Scheme was not misdirected. At the same time,

the Scheme's original policy logic was incomplete when assessed against the full operating realities of commercial layer farming. It focused on encouraging establishment and expansion, while the later crisis arose from a variety of causes. The Scheme did not create these problems, but it did not protect farmers from them either. Therefore, the central finding is not one of success or failure, but of partial success and design insufficiency. This study's contribution lies in identifying this difference. A production-based policy evaluation would conclude that WBIS worked. A farmer-welfare evaluation would consider it inadequate. Market evaluation would show that capacity expansion without market support intensified pressure. Consumer-welfare evaluation only, would find freshness benefits, but an absence of price benefits. A sustainability evaluation would call for redesign. The mixed-methods construct-wise approach allows all these truths to be held together without forcing a simplistic conclusion. Therefore, WBIS 2017 should be understood as a first-generation production augmentation scheme. Any future iterations would require redesign for relevance.

5.14. Limitations of Interpretation

The discussion of findings in this chapter must be understood within certain interpretive limitations. These limitations do not weaken the relevance of the study, but they define the boundaries within which the findings should be read. The study evaluates WBIS 2017 as a live policy intervention operating within a complex and changing market environment. Therefore, the findings cannot be interpreted as if the Scheme operated in isolation from other economic, institutional and sectoral forces. This study does not claim strict experimental causality. WBIS 2017 was introduced in a real-world policy environment, and its implementation coincided with several external developments, including changes in feed ingredient prices, interstate egg inflows, market behaviour, credit exposure, district-wise concentration of farms and broader disruptions during and after the COVID-19 period. The evidence supports the conclusion that WBIS contributed to investment, farm establishment, expansion and local production-capacity creation. However, the study does not claim that all observed changes in West Bengal's egg economy were caused only by the Scheme. Also, since part of the secondary dataset was obtained through personal

communication and was not publicly accessible, full external verification was limited. This is recognised as a limitation, and the study mitigated this by triangulating the data with published records, primary survey findings and stakeholder interviews. Next, COVID-19 has to be treated as an external contextual shock rather than as a directly measured variable. The primary survey and qualitative interviews did not, intentionally, include a separate question asking respondents to isolate the effect of COVID-19 on feed prices, logistics, labour, credit, egg demand or farm profitability. Therefore, the study cannot claim that respondents directly attributed farmer-welfare stress to the pandemic. However, the secondary evidence on maize and soybean meal prices shows that major feed-cost volatility intensified during and after the COVID-19 period. It is therefore reasonable to recognise COVID-19 as part of the wider operating environment in which WBIS-supported and non-WBIS farms functioned. This discussion, accordingly, treats COVID-19 as an intervening market condition that affected the sustainability context of the Scheme, not as an independently tested causal variable. Also, the consumer-welfare findings must be interpreted cautiously. The study does not conduct a consumer survey, retail-market survey or laboratory testing of egg freshness and nutritional value. Consumer benefit is therefore inferred indirectly from shorter farm-to-market movement, improved local availability and reduced dependence on long-distance supply. The evidence supports a cautious finding that local production expansion may have improved freshness and availability in some districts. It does not support a strong claim that WBIS 2017 directly affected consumer prices or measurably improved nutritional outcomes. Next, the farmer-welfare findings are based primarily on survey responses, stakeholder interviews and secondary cost trends rather than audited farm accounts. The study captures farmer perceptions of profitability decline, feed-cost stress, loan-servicing pressure and working-capital difficulty. These findings are important because beneficiary experience is central to policy evaluation. However, they should not be read as a forensic financial audit of every farm. The findings are best understood as evidence of perceived and reported sectoral stress, supported by secondary data on feed-cost escalation. Fifth, the qualitative evidence is based on judgement sampling. The interviews with policymakers, policy influencers, veterinarians, sector

institutions and selected large farmers provide depth and contextual interpretation, but they are not statistically representative. Their purpose is to explain, qualify and triangulate the survey and secondary findings. Therefore, qualitative evidence is used to strengthen interpretation, not to numerically generalise across the entire commercial layer sector. Finally, the study is time bound. WBIS 2017 has operated through a period marked by policy extension, market change, input-cost volatility and shifting sectoral conditions. The conclusions are therefore valid for the period and evidence examined in this study. Future changes in feed prices, egg prices, government policy, disease conditions, interstate supply, consumer demand or credit markets may alter the policy relevance of the findings.

5.15 Conclusion

This chapter has discussed the findings of the study by integrating the literature review, secondary data, farmer survey and qualitative interviews. The discussion shows that WBIS 2017 was most effective as a production-oriented and investment-support intervention. It encouraged new farm entry, supported expansion of existing farms, improved investor confidence and contributed to the strengthening of West Bengal's indigenous commercial egg production base. In this sense, the Scheme was aligned with its core policy objective of augmenting local egg production. However, the discussion also shows that production augmentation did not automatically translate into farmer welfare, profitability or long-term sustainability. A variety of factors like feed-cost escalation, working-capital pressure, delayed subsidy release, market dependence on traders and continued interstate egg inflows limited the Scheme's deeper economic impact. The evidence therefore supports a distinction between capacity creation and sustainable sectoral development. The chapter also indicates that consumer welfare improved more plausibly through freshness and local availability than through price reduction. Employment effects were positive but partly mixed in terms of additionality. Overall, WBIS 2017 may be regarded as a partly successful policy intervention: strong in production and investment outcomes, but weaker in welfare, market resilience and sustainability. These findings provide the basis for the next chapter, which presents conclusions and recommendations for redesigning future incentive support.

CHAPTER VI: SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the study on the potential and evaluation of economic incentives linked to egg production in West Bengal, with specific reference to the West Bengal Incentive Scheme 2017 for Commercial Layer Poultry Farms and Poultry Breeding Farms. The study focuses on Commercial layer poultry farms and was designed to evaluate whether WBIS 2017 achieved its intended objectives of augmenting indigenous egg production, encouraging investment, reducing dependence on eggs imported from other States, improving farmer welfare, supporting employment generation and strengthening consumer access to fresher eggs.

The study adopted a mixed-methods approach. The literature review established the theoretical foundation for evaluating subsidy-linked policy interventions through constructs such as policy effectiveness, efficiency, equity, manageability, incentive adequacy, farmer welfare, market competition, market distortion, consumer welfare, employment generation and sustainability. The methodology translated these constructs into researchable indicators and used secondary data, a structured farmer survey and qualitative interviews to assess the Scheme. The results and discussion chapters then integrated evidence across secondary data, primary quantitative data and qualitative stakeholder responses. The central conclusion of the study is that WBIS 2017 was effective as a production-oriented, investment-support intervention but weaker as a framework for farmer welfare and sustainability. It contributed to capacity creation, new farm entry, the expansion of commercial layer farming, and the strengthening of the indigenous egg production base. However, its effect on farmer profitability, long-term viability, market stability and consumer affordability was more limited. The Scheme supported establishment and expansion but did not adequately address recurring operating risks such as feed-cost escalation, working-capital stress, market-price volatility, trader dependence and district-wise concentration of production.

This conclusion does not imply that the Scheme failed. Rather, it suggests that WBIS 2017 was partly successful - strong in production augmentation, but incomplete in ensuring sustainable sectoral development. This chapter now summarises the findings, explains the study's contribution to knowledge and practice, presents policy recommendations, identifies limitations and suggests future research directions.

6.2 Summary of Findings

The findings of the study are summarised around the seven research questions and the operational constructs developed in the literature review and methodology chapters.

The first research question examined the extent to which WBIS 2017 contributed to the augmentation of indigenous commercial egg production in West Bengal. The strongest convergence of evidence was found here. Secondary data showed approximately 65 lakh sanctioned bird capacity expansion after introduction of the Scheme. The farmer survey indicated that respondents perceived WBIS as contributing to investment and production capacity. The qualitative interviews with ARD, NECC, WBPF, a renowned and well-respected veterinarian, and large farmers also supported the view that the Scheme encouraged new farm entry, investor confidence, project bankability, and the enhancement of farms' bird-capacity. Therefore, WBIS 2017 can be concluded to have contributed meaningfully to indigenous commercial egg production. However, the impact was spatially uneven, with stronger concentration in districts such as Bankura and Paschim Medinipur.

The second research question examined if the Scheme managed to help the state of West Bengal move closer to self-sufficiency and reduce dependence on import from other States. Evidence from data collected suggests partial improvement. Increased indigenous capacity strengthened West Bengal's production base, and respondents broadly recognised a movement towards self-sufficiency. Interstate influx continued and their timing and pricing affected farm-gate negotiations. It can thus be safely concluded that WBIS helped West Bengal move closer to self-sufficiency but not achieve self-sufficiency or market independence.

The third research question examined the impact of the Scheme on income, profitability and financial sustainability of commercial layer farmers. This was the most important area

of divergence. The Scheme provided project-level financial relief and helped investment decisions, but it did not ensure farmer welfare across the business lifecycle. Survey responses showed strong profitability pressure, feed-cost stress, loan-servicing difficulty and working-capital strain. Secondary feed-cost data showed that maize and soybean meal prices rose sharply during and after the COVID-19 period. Quantitative surveys confirmed the effect of the same on farms' economic performance. Qualitative interviews reaffirmed that the Scheme did not adequately address recurring feed-cost exposure, market-price fluctuation, mortality risk, working-capital requirement and various other risks that the industry is exposed to. Thus, a secure conclusion is that WBIS was useful at the point of investment, but insufficient for long-term farmer welfare and financial sustainability.

The fourth research question examined whether new entry and expansion initiated healthy competition or intensified market pressure. The evidence suggests that farmers did not generally experience post-WBIS competition as healthy. Additional production strengthened the indigenous supply base, but also intensified producer-level competition in districts with high farm concentration and strong dependence on traders. Continued interstate egg inflows further weakened the bargaining power of the farmers. Thereon, qualitative interviews also affirmed that market pressure was uneven and district-specific - Bankura and Paschim Medinipur being important examples. Therefore, WBIS-supported expansion increased capacity, but market planning could not keep pace with growth in production.

The fifth research question examined employment generation and whether such employment was additional or shifted from other rural activities. The findings indicate a positive but qualified employment effect. Commercial layer expansion created employment in farm labour, supervision, feed transport, veterinary services, medicine supply and ancillary rural activities. Layer farming is a year-round activity and therefore has greater potential for regular employment than some seasonal crop operations. However, employment additionality was mixed. Some labour may have shifted from other agricultural or rural activities rather than representing wholly new employment. Therefore, the employment effect was real, but not fully additional in every case.

The sixth research question examined consumer benefit through freshness, supply and pricing. The evidence supports a cautious positive finding on freshness and local availability, but not on price reduction. Increased local production can reasonably shorten farm-to-market time and improve access to fresher eggs, especially in producing districts and nearby markets. However, the study did not conduct consumer surveys, retail-market surveys or laboratory testing of egg freshness and nutritional quality. NECC egg price data also showed that prices continued to rise over the study period. Therefore, consumer welfare gains were stronger in supply-chain terms than in affordability or measured nutritional terms.

The seventh research question examined design changes required to improve effectiveness, targeting, accessibility and sustainability. The evidence clearly supports redesign. Farmers, policy influencers and sectoral respondents did not generally recommend continuation of the Scheme in the same form.

Taken together, the findings show that WBIS 2017 achieved important production and investment outcomes, but did not fully protect farmer welfare, market resilience or long-term sustainability. The Scheme was effective in creating capacity; it was less effective in ensuring that such capacity remained economically secure under volatile market conditions. The strongest demand was for support that addresses recurring operational stress, especially support related to feed-cost volatility and working capital. Future policy should therefore move from a primarily establishment-oriented incentive model to a sustainability-oriented support framework.

6.3 Contribution to Knowledge

This study contributes to knowledge in several ways. First, it provides a focused evaluation of a State-level poultry incentive scheme operating in a live environment - an area where published empirical research is limited. Much of the available literature on subsidies examines agriculture in general, crop-related input subsidies and broader livestock development. Comparatively less attention has been given to commercial layer farming as a distinct policy and enterprise category. This study addresses that gap by evaluating the specific case of WBIS 2017 in West Bengal's commercial egg production sector.

Second, the study contributes by demonstrating the difference between production-capacity creation and sustainable sectoral development. Policy success is often measured by visible outputs, such as the number of farms, investment created, birds added, or production increased. This study shows that such measures, though important, are insufficient. A scheme may succeed in augmenting production and still remain weak in farmer welfare if recurring operating risks are not addressed. The study, therefore, adds to subsidy-evaluation literature by showing that capital-linked incentives need to be assessed not only at the point of establishment, but also across the business lifecycle of the beneficiary enterprise.

Third, the study strengthens the use of operational constructs in applied policy evaluation. Instead of evaluating WBIS through a narrow success/failure framework, the study used multiple constructs: policy effectiveness, efficiency, equity, manageability, awareness, incentive adequacy, farmer welfare, market competition, market distortion, consumer welfare, employment generation and sustainability. This construct-wise approach allowed the study to identify areas of success and weakness more precisely. For example, WBIS performed well under policy effectiveness and production augmentation, moderately under awareness and access, unevenly under equity and manageability, and weakly under farmer welfare and sustainability.

Fourth, the study contributes to knowledge by integration of several sources of data - namely secondary data, quantitative survey evidence and qualitative interviews. Secondary data helped establish production, price and feed-cost context. The farmer survey provided measurable evidence on awareness, application, adequacy, profitability pressure, market competition, employment and redesign preferences. Qualitative interviews, in turn, qualified the secondary and quantitative data from the aspects of policy rationale, implementation experience, market structure and sectoral interpretation. This integration enabled the study to avoid over-reliance on a single source of evidence. It also demonstrated, through utilisation of multiple sources, how apparent success in one evidence stream can be qualified by another. It also demonstrated the need to assess data from different aspects. For instance, production growth in secondary data was supported

by survey and interview evidence but it was insufficient to assess welfare stress, which was explained through both feed-cost data and stakeholder responses.

Fifth, the study adds to the understanding of subsidy adequacy. It shows that formal subsidy availability is not the same as practical adequacy. WBIS included multiple components, including capital subsidy, interest subsidy, electricity-duty waiver, power subsidy and stamp-duty or registration support. Yet many farmers still perceived the Scheme as insufficient relative to project risk, recurring costs and delayed disbursement. This supports the broader proposition that subsidy adequacy must be judged in relation to the real risk structure of the sector, not merely in relation to the notified incentive amount.

Sixth, the study contributes to knowledge on equity in subsidy design. Formal eligibility does not guarantee equal practical access. The findings suggest that larger farms, existing operators and administratively prepared applicants were often better positioned to access benefits. Smaller farms and new entrants could face greater difficulty due to documentation, land readiness, bankability and ability to withstand delays. This distinction between legal eligibility and effective access adds useful insight to the evaluation of agricultural and allied-sector incentives.

Finally, the study contributes to policy-design knowledge by highlighting the effect of external shocks. COVID-19 was not directly measured through the survey or interviews and therefore cannot be treated as a directly tested causal variable. However, feed-cost volatility intensified during and after the COVID-19 period, changing the operating environment in which WBIS-supported farms functioned. This reinforces the conclusion that production-oriented incentives may support investment under normal conditions but may not protect farmer welfare during external shocks. Future policy needs to include shock-responsive mechanisms.

6.4 Contribution to practice and relevance

The study has practical relevance for all stakeholders involved in the poultry value chain, ranging from policymakers, farmers, industry associations, financial institutions and others as well.

For policymakers, the study provides a grounded evaluation of how a State-level incentive scheme operates after implementation. It shows that the Scheme's success should not be assessed only through farm numbers or production capacity. A more complete evaluation must consider whether farmers remain viable, whether markets absorb additional supply, whether employment is genuinely additional, whether consumers benefit and whether the policy remains relevant under changed cost conditions. This is important for any future redesign of WBIS or similar schemes in livestock and allied sectors.

For the Government of West Bengal, the study provides evidence that the original logic of WBIS was not misplaced. West Bengal had a production deficit, dependence on eggs from other States and a need to strengthen local commercial egg production. The Scheme helped address these concerns to some extent. Therefore, the practical lesson is not that production incentives should be abandoned, but that they should be redesigned. The next phase of policy should retain the strengths of WBIS while correcting its limitations.

For farmers, the study highlights that subsidy-led investment must be evaluated against long-term business viability. Establishing or expanding a commercial layer farm involves much more than project cost. Feed, medicine, labour, electricity, mortality, debt servicing, biosecurity and market access determine whether the farm remains viable. Farmers should therefore assess policy incentives not only as upfront relief, but as one element within a larger risk-management and business-planning framework.

The study is particularly relevant for new entrepreneurs. WBIS encouraged new entry and improved confidence, but new entrants were often more exposed to debt-funded investment and operational learning costs. Future entrepreneurs need to be cautious about assuming that subsidy availability alone makes a project viable. They must examine feed procurement, working capital, market channels, repayment cycles and price volatility before entering the sector.

For poultry associations such as WBPF and sector institutions such as NECC, the study demonstrates the importance of collective coordination. Farmers operating individually have limited bargaining power against traders, interstate supply flows and input-cost volatility. Associations can play a stronger role in market intelligence, price information,

aggregation, farmer training, government linkage, documentation support and advocacy for feed-cost or working-capital mechanisms.

For financial institutions, the study shows that poultry finance should not be assessed only on project cost and subsidy eligibility. Banks should consider operational cash-flow cycles, feed-cost volatility, repayment timing, moratorium structures and market-linkage strength. Loan products for commercial layer farms should be better aligned with biological and business cycles of poultry production.

For consumers, the study is relevant because increased local production can improve access to fresher eggs. However, production expansion alone cannot automatically ensure consumer welfare. Retail pricing, awareness of freshness, supply-chain transparency and quality differentiation remain important. Consumer benefit can be strengthened if locally produced eggs are clearly identified, better marketed and supported through shorter, more efficient supply chains.

Overall, the practical relevance of the study lies in its balanced finding. WBIS 2017 was not ineffective; it was incomplete. It worked as an investment-support scheme, but future policy must move towards an integrated production, market and sustainability framework.

6.5 Policy Recommendations

The first recommendation is that future poultry-sector incentives should not be limited to establishment and expansion support. Capital subsidy, interest subsidy and power-related support remain useful, but they should be part of a broader framework that addresses operational viability. Commercial layer farming is exposed to recurring risks, especially feed-cost volatility. A future scheme should therefore include mechanisms that support farms beyond the initial project stage, focusing on high-impact areas of the business components.

The second recommendation is to introduce feed-cost monitoring and conditional feed-cost support. Since maize and soybean meal form a major part of layer feed cost, abnormal increases in these inputs can quickly erode profitability. The Government should consider a feed-cost index for the commercial layer sector. If feed ingredient prices cross a defined

threshold, temporary support may be triggered. Such support may not need to be permanent. It can be designed as a shock-responsive mechanism for abnormal market conditions.

The third recommendation is to include working-capital assistance. Many farms face stress not only because of capital investment, but because of continuous cash outflow for feed, labour, electricity, medicines and debt servicing. Future schemes may include working-capital interest subvention, short-term credit guarantees or emergency liquidity support during periods of input-price escalation or market disruption.

The fourth recommendation is for faster and time-bound subsidy release. Delayed disbursement reduces the practical value of incentives, as support received after the farmer has already experienced financial pressure is less effective. Future schemes need to prescribe clear timelines for application processing, verification, sanction and disbursement. A digital tracking system could also allow applicants to monitor application status and identify pending requirements.

The fifth recommendation is simplification of documentation. Documentation is necessary for accountability, but excessive procedural burden reduces accessibility. The Government should create standardised application templates, district-level help desks and pre-application guidance. Poultry associations may be formally involved in awareness and documentation support, especially for small and medium farms.

The sixth recommendation is differentiated targeting. A uniform incentive may not always produce commensurate benefit. Small farms, medium farms, new entrepreneurs and large established operators all face different risks. Future support should distinguish between first-generation entrepreneurs, expansion by existing farms, small and medium farms, and large-scale integrated projects. Support should be higher where vulnerability is higher.

The seventh recommendation is district-wise planning. WBIS-supported growth appears to have been spatially concentrated. Clustering can create benefits such as input networks, veterinary access and technical knowledge. However, excessive concentration can also cause local oversupply, trader dependence and weaker farm-gate bargaining power. Future schemes should assess district-level carrying capacity, existing farm density, market access

and logistics before encouraging further expansion. The approximately 65 lakh sanctioned bird-capacity expansion under WBIS 2017 demonstrates that large-scale capacity creation is possible through targeted incentives. However, future expansion should be linked to district-wise carrying capacity, market absorption and infrastructure planning to avoid excessive concentration and localised market pressure.

The eighth recommendation is to strengthen market linkage and producer aggregation. Production incentives should be connected to market planning. Farmers need alternatives to trader-dependent selling. Producer groups, farmer producer organisations, cooperatives or district-level aggregation platforms could help improve bargaining power. Institutional sales, direct retailing, school nutrition programmes, hospitals, hostels and e-commerce channels may also be explored as non-conventional sales channels.

The ninth recommendation is improved market intelligence. Farmers require reliable information on egg prices, interstate supply, demand trends, feed prices and seasonal patterns. A State-supported poultry market intelligence system could help farmers make better production and sales decisions. Such a system could be developed with NECC, WBPF and government departments.

The tenth recommendation is to support responsible and sustainable production. Future schemes should include environmental and biosecurity standards, waste management practices, energy efficiency, water management, disease-prevention protocols and training of farm personnel. This would help align poultry-sector incentives with broader sustainability goals.

The eleventh recommendation is farmer training and skill development. Commercial layer farming requires technical knowledge of feed management, flock health, vaccination, biosecurity, mortality control, record keeping, financial planning and market strategy. Government-supported training programmes should be established for farm owners, supervisors and workers. Veterinarians and technical experts can be involved in structured training modules.

The twelfth recommendation is stronger institutional coordination. WBIS operated across farmers, banks, departments, consultants and sector institutions. Future schemes should

create a formal coordination committee including the Animal Resources Development Department, poultry associations, NECC, veterinarians, banks and farmer representatives. This would improve feedback, monitoring and policy responsiveness.

The thirteenth recommendation is to include a shock-responsive policy window. The COVID-19 period demonstrated that poultry farming can be affected by external disruptions in feed supply, logistics, labour, demand and credit servicing. A future scheme should include temporary relief provisions for abnormal shocks, including emergency working-capital support, repayment restructuring, feed-cost support or fast-track assistance.

The final, and probably one of the most important, recommendation is continuous evaluation. Incentive schemes should not be evaluated only after they are completed. Monitoring should be built into the scheme design. Periodic assessment should examine production, farmer profitability, subsidy release, district distribution, employment, market pressure and consumer availability. This would allow mid-course correction rather than delayed redesign.

6.6 Limitations

The study has several limitations.

WBIS 2017 operated in a real market environment affected by multiple variables - ranging from feed prices, egg prices, interstate supply, trader behaviour, bank finance, district concentration to COVID-19-related disruptions, among others. Rather than isolated causal impacts, the study evaluates contributions and associations based on respondents' perceptions, after studying available quantitative secondary data. The study, therefore, does not claim strict experimental causality. Also, since part of the secondary dataset was obtained through personal communication and was not publicly accessible, full external verification was limited. This is recognised as a limitation, and the study mitigated this by triangulating the data with published records, primary survey findings and stakeholder interviews.

Second, COVID-19 was not included as a separate survey or interview variable. This was done deliberately to reduce attribution bias in respondents' answers. The study recognises COVID-19 as an external contextual shock because feed-cost volatility intensified during and after that period. However, it does not claim that respondents directly attributed their financial stress to COVID-19.

Third, secondary data availability was limited. Complete official data on all farms, subsidy disbursement, production volume, employment and interstate egg movement were not uniformly available. The study, therefore, used available data cautiously and triangulated it with survey and interview evidence.

Fourth, farmer welfare was assessed through survey responses, stakeholder interviews and secondary cost trends, rather than audited farm accounts. The findings, therefore, reflect reported and perceived financial stress, not outcomes of forensic financial audit of individual farms.

Fifth, consumer welfare was assessed indirectly. The study did not conduct a consumer survey, retail survey or laboratory testing of egg freshness and nutritional quality. Therefore, consumer benefit is discussed in terms of local availability, supply-chain time and perceived freshness, not measured nutritional improvement.

Sixth, qualitative interviews were based on judgement sampling. The respondents were selected because of their knowledge and relevance, not for statistical representativeness. Their views provide depth and interpretation but cannot be numerically generalised to all stakeholders.

Seventh, the study is specific to commercial layer farming in West Bengal. Its conclusions may be useful for other livestock or poultry schemes, but direct transfer to other States or sectors should be done with caution.

Last, but not the least, the approximately 65 lakh bird-capacity increase refers to sanctioned or supported capacity under WBIS-linked projects and should not be interpreted as audited average operational bird population at all times.

These limitations do not weaken the study's core conclusion; they clarify the boundaries within which the findings are to be interpreted. The evidence collected is sufficiently credible to support the conclusion that the structure of WBIS 2017 materially contributed to West Bengal's capacity, but requires redesign to better support farmer welfare, market, resilience and long-term sustainability.

6.7 Future research directions

Future research can utilise and build on this study from several angles. First, farm-level financial analyses could be conducted using audited accounts and detailed cost records. This would allow more precise measurement of profitability, debt servicing and working-capital cycle pressures, feed-cost volatility impact and return on investment across different farm sizes.

Second, future studies could examine the effect of COVID-19 and other external shocks more directly. A focused study could investigate how the pandemic affected feed supply, logistics, egg demand, labour availability, credit repayment and farmer resilience.

Third, consumer-side research is required. Future studies should survey consumers, retailers and wholesalers to assess awareness of local versus imported eggs, willingness to pay for fresher eggs, retail price behaviour and perceptions of quality. Laboratory testing of freshness and nutritional indicators could also strengthen consumer-welfare analysis.

Fourth, interstate egg movement should be studied in greater detail. The timing, volume, pricing and market channels of eggs entering West Bengal from other States remain important to farm-gate price formation. Better data on interstate supply would improve market-policy design.

Fifth, district-level clustering could be studied. Research can examine whether clustering improved efficiency through input networks and technical services, or whether it created local oversupply and market pressure. Such work would help future district-wise planning for either concentration or dispersion, as may be required.

Sixth, employment generation should be studied in greater depth. Future research can distinguish between direct, indirect, skilled, unskilled, permanent, seasonal, additional and

shifted employment. This would help assess the true rural-development effect of commercial layer expansion.

Seventh, comparative research may be conducted across States. West Bengal's experience can be compared with poultry incentive policies in other Indian States to identify better design features, market structures and support mechanisms.

Eighth, future research can examine alternative policy models such as feed-cost support, price-risk insurance, producer aggregation, working-capital guarantee schemes and market-linkage platforms. Such research would help determine which combination of tools is most suitable for commercial layer farming.

Finally, future research should examine sustainability and responsible production in layer farming. Areas such as waste management, manure utilisation, energy efficiency, water use, biosecurity, disease risk and environmental compliance deserve greater attention if poultry-sector growth is to remain sustainable.

6.8 Final Conclusion

This study concludes that WBIS 2017 was a relevant and meaningful intervention by the Government of West Bengal in its commercial layer poultry sector. It responded to a genuine policy problem - the State's dependence on eggs from other States and the need to strengthen indigenous production. The Scheme helped create production capacity, encouraged new farm entry, supported expansion and improved investor confidence. It also contributed to rural employment and likely improved access to fresher eggs in selected districts.

The Scheme's success, however, was partial. It was stronger as a production and investment-support instrument than as a farmer-welfare, market-resilience or sustainability framework instrument. Feed-cost escalation, working-capital pressure, delayed subsidy release, district-wise concentration, trader dependence and continued interstate egg inflows limited the conversion of production gains into stable farmer welfare.

The central lesson is that production support alone is insufficient. Future policy must combine investment incentives with operating-risk protection, market planning, district-

wise targeting, farmer training, faster implementation, responsible production standards and shock-responsive support. WBIS 2017 should therefore not be viewed either as an entirely successful or as a failed policy, but as a first-generation production-oriented scheme. Any future version must be broader, more adaptive and more firmly aligned with long-term sustainability.

APPENDIX A

RESEARCHER POSITIONALITY AND BIAS-MITIGATION NOTE

This research was conducted by a researcher with both academic and industry exposure to the commercial poultry sector in West Bengal. The researcher is a first-generation commercial layer farmer who established a medium-scale layer poultry enterprise between 2021 and 2022 with an operational bird capacity of 90,000-layer birds. The enterprise was established after availing support under the West Bengal Incentive Scheme 2017 (WBIS 2017), which forms the principal policy context of this study.

The researcher, therefore, occupies a partially embedded position within the sector being studied. Such proximity provided certain practical advantages to the research process, including contextual familiarity with poultry-farming operations, market structures, feed-cost dynamics, subsidy administration procedures, sectoral terminology and stakeholder concerns. The researcher's direct operational exposure also enabled easier interpretation of industry-specific responses and facilitated access to respondents and sectoral insights that may otherwise have been difficult to obtain.

At the same time, the researcher recognises that prior participation in the Scheme and involvement in the sector may create risks of interpretive bias, confirmation bias, selective emphasis or subconscious predisposition toward particular policy outcomes. The possibility that personal business experiences may influence analytical interpretation was therefore acknowledged from the outset of the study. In anticipation of the same, the primary farmer survey was outsourced to an external enumerator. In addition to providing assistance to addressing the issues regarding the geographical dispersion of respondents and the operational scale of the survey exercise, this outsourcing of the quantitative survey also served to mitigate researcher bias.

The qualitative interview component of the study was conducted personally by the researcher rather than being outsourced or administered through a third-party enumerator. This approach was adopted because the qualitative portion of the research involved exploratory, interpretive and policy-sensitive discussions relating to implementation

experience, stakeholder perception, market dynamics, operational challenges and the broader effectiveness of the West Bengal Incentive Scheme 2017 within the commercial layer poultry sector. Unlike the structured quantitative survey, the qualitative interviews required contextual probing, follow-up clarification and flexible exploration of emerging themes during discussion.

Personal conduct of the interviews by the researcher helped ensure thematic consistency, interpretive depth and accurate contextual understanding across different stakeholder categories, including policymakers, policy influencers and commercial farm operators. Direct researcher involvement also assisted in establishing respondent confidence during discussions involving commercially and operationally sensitive issues. The qualitative interviews, therefore, functioned not merely as standardised question-and-answer exercises but as guided interpretive interactions intended to generate nuanced insights for triangulation alongside the quantitative and secondary data findings.

The researcher maintains business interests outside the poultry sector as well, including stockbroking and buy-to-let investments in India. Prior professional experience also includes engagements on global projects with companies such as Honeywell UK and Ford Motor Company, UK. The researcher's academic background includes an M.B.A., M.Sc. Finance and B. Com (Honours). These contributed to familiarity with structured analytical methods, which in turn helped structure and assess multiple aspects of the research design and interpretation.

Given the researcher's positionality, several measures were consciously adopted to mitigate bias and maintain analytical neutrality:

1. Use of Mixed Methods and Triangulation

Findings were not derived from personal experience or perception alone. The study relied upon triangulation across secondary data, quantitative survey findings and qualitative stakeholder interviews. Contradictory and non-supportive findings were also retained and discussed where identified.

2. Inclusion of Diverse Respondent Categories

The primary data included both Scheme beneficiaries and non-beneficiaries, as well as respondents with differing farm sizes, operational experiences and policy perceptions. Qualitative interviews additionally included policymakers, policy influencers and industry stakeholders to reduce single-perspective interpretation.

3. Structured Survey Instrumentation

Quantitative data was collected using a structured questionnaire with predefined coding and standardised administration procedures in order to reduce researcher-led variation during data collection.

4. Third-Party Quantitative Data Collection Support

The quantitative farmer survey was administered through structured field support and enumerator involvement rather than being conducted exclusively through direct researcher-led interviewing. This reduced the likelihood of excessive researcher influence on respondent answers.

5. Retention of Critical and Negative Findings

The study consciously retained findings relating to delayed subsidy disbursement, feed-cost escalation, market pressure, uneven benefit distribution, implementation limitations and sustainability concerns, even where such findings may not align positively with the researcher's own beneficiary status.

6. Evidence-Oriented Interpretation

The conclusions of the study were based on converging or diverging empirical and/or perspective-based evidence rather than anecdotal operational experience.

7. Academic Framing and Reflexivity

Throughout the research process reflexivity was maintained regarding the researcher's embedded role within the sector. The researcher remained conscious of the distinction between practitioner experience and academic evidence and attempted to maintain analytical separation between personal commercial interests and scholarly evaluation.

The researcher does acknowledge a relationship with the commercial layer poultry sector and beneficiary status under the WBIS 2017 Scheme. Deliberate methodological and

analytical safeguards, though, have been adopted to augment credibility and maintain research integrity throughout the study.

APPENDIX B:

NOTE ON PERSONAL COMMUNICATION AND INTERNAL DATA SOURCES

Certain secondary and contextual data used within this study were obtained through personal communication, institutional interaction and internal commercial records rather than through publicly archived datasets. These sources were utilised primarily to supplement, triangulate and contextualise the findings derived from published literature, government notifications, survey responses and interview data.

Information relating to operational aspects of the poultry sector, implementation observations, industry conditions and scheme-related insights was obtained through personal communication with officials and stakeholders associated with the Animal Resources Development Department (ARD), Government of West Bengal, and the West Bengal Poultry Federation (WBPF). Such communications included clarifications regarding sectoral trends, implementation conditions, district-level poultry expansion patterns, operational challenges and industry observations relevant to the evaluation of WBIS 2017. These communications were used as contextual and interpretative inputs rather than as standalone empirical evidence.

In addition, certain operational and cost-related data used for illustrative and analytical purposes were derived from the researcher's own commercial layer farming operations. These include internal feed formulation records, ingredient composition structures, procurement records and periodic cost lists relating to major feed raw materials such as

soybean meal and maize. These internal records were particularly useful in understanding feed-cost escalation, working-capital pressures and production economics within commercial layer farming operations during the study period.

The use of internal farm records was considered appropriate because the study examines practical operational realities within the poultry sector and feed constitutes one of the most significant cost components affecting layer farm sustainability and profitability. However, such internally generated records were not treated as representative industry-wide statistical datasets in isolation. Instead, they were triangulated with farmer survey responses, interview findings, commodity-price trends and sectoral observations from secondary sources in order to improve analytical reliability and contextual validity.

Where figures, charts or analytical discussions relied upon such internal or personal communication-based data, the same has been appropriately identified within figure notes, source notes or references as applicable. Unpublished internal records and personal communications were used strictly for academic and research purposes within the scope of this thesis.

APPENDIX C:

SECONDARY DATA WORKING TABLES

1. WBPF & WBIS district-wise farmer distribution

District	Total farms in WBPF data	WBIS-supported farms	Non-WBIS / existing listed farms
Bankura	74	40	34
Paschim Medinipur	65	21	44
Nadia	18	5	13
Birbhum	17	12	5
Purba Bardhaman	15	7	8
Purulia	15	10	5
Hooghly	14	7	7
North 24 Parganas	12	0	12
Jhargram	8	8	0
Uttar Dinajpur	8	2	6
Cooch Behar	6	0	6
Dakshin Dinajpur	4	1	3
Jalpaiguri	1	1	0
Paschim Bardhaman	4	0	4
Howrah	3	1	2
Kolkata	3	0	3
Malda	3	3	0
Murshidabad	3	3	0
Purba Medinipur	3	0	3
Siliguri	2	0	2
Total	278	121	157

2. NECC Egg rates (Unit; Indian Rupees per 100 eggs)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Average	Yearly Increase	% Increase YoY
2009	220.52	207.82	224.52	208.37	237.58	238.37	255.13	233.94	259.9	238.9	296.93	258.43	242.8		
2010	276.46	257.68	247.29	218.8	253.74	267.53	256.9	236.55	275.2	274.84	296.6	289.52	261.59	18.79	6.88
2011	295.68	239.11	245.63	223.93	225.94	272.23	263.81	255.39	271.27	292.68	316	333.76	289.94	7.35	6.83
2012	296.84	279.97	280.63	243.1	276.39	328.3	297.77	332.39	375.1	332.16	325.53	344.39	309.37	38.43	6.25
2013	370.87	387.29	317.39	293.73	293.65	378.17	354.42	348.1	352.9	371.26	429.43	426.52	398.88	49.51	6.36
2014	416.9	337.32	337.74	292	318.65	338.87	333.42	341.39	367.13	333.48	403.07	406.61	399.87	6.99	6.86
2015	379.65	311.75	297.04	288.93	316.71	385.27	345.56	345	335.73	317.61	387.43	426.97	342.9	-56.97	-6.85
2016	428.06	382.86	331.81	314.67	391.26	412.1	447.74	379.06	389	403.33	482.4	420.87	391.93	49.03	6.34
2017	379.84	356.68	374.63	314.77	358.03	392.73	378.85	378.81	394.83	416.65	500.93	412.83	387.43	-4.58	-6.81
2018	438.87	403.32	339.39	353.87	382.94	412.87	466.65	384.35	483.37	422.13	448.8	464	401.85	23.72	6.86
2019	468.52	461.54	399.23	349.23	365.03	414.03	487.26	373.87	416.33	438.29	459	495.94	428.69	9.54	6.82
2020	486.9	386.41	356.65	351	347.94	422.83	389.97	428.55	534.6	378.74	514.9	525.1	441.3	28.61	6.85
2021	489.61	465.25	436.48	463.23	532.26	568.5	531.52	474.77	489.33	471.71	508.17	547.61	498.2	56.98	6.13
2022	511.65	474.32	439.26	434.03	478.32	549.23	496.81	485.71	504.23	518.03	581.57	598.29	505.82	4.92	6.81
2023	594.84	489.82	490.63	468.47	524.41	565	509	514.84	578	588.48	581	630.1	543.83	38.01	6.88
2024	616.29	576.38	483.36	442.83	538.06	531.23	586.42	538.06	580.5	583	617	686.77	563.41	28.28	6.84
2025	565.16	511.07	484.32	466.83	551.13	588.83	567.32	588.65	682.17	686	678.33	719.68	576.84	12.73	6.82
2026	597.74	544.82	488.71	557.33											6.88

APPENDIX D:

PRIMARY FARMER SURVEY SAMPLING FRAME AND STRATIFIED ALLOCATION

1. Introduction

This appendix presents the sampling frame, sampling logic and stratified allocation procedure adopted for the quantitative farmer survey conducted as part of the study evaluating the West Bengal Incentive Scheme 2017 in the commercial layer poultry sector of West Bengal.

The appendix has been included to enhance methodological transparency, demonstrate representativeness of the quantitative sample and provide a clear audit trail regarding respondent selection.

The sampling design was intended to ensure that the survey adequately represented the principal categories of commercial layer poultry farmers relevant to the Scheme evaluation. Since the study aimed to compare perceptions and outcomes across different types of farms and scheme participation categories, a stratified sampling approach was considered more appropriate than simple random sampling.

2. Population and Sampling Frame

The target population consisted of identifiable commercial layer poultry farms operating within districts of West Bengal. These farms were either associated with, or not, the WBIS 2017 Scheme.

The sampling frame was constructed using compiled lists obtained from:

- WBPF layer farmer records and
- ARD Scheme-related beneficiary information

The final usable sampling frame consisted of **278 commercial layer farming units**.

The frame included three principal strata.

The inclusion of both beneficiary and non-beneficiary farms was necessary because the study evaluated not only direct subsidy outcomes but also wider sectoral and market effects associated with the Scheme.

Stratum	Category of farmer	Number of farmers
1	New entrepreneurs who availed of Scheme	96
2	Previous farmers who availed of Scheme for expansion	26
3	Previous farmers who did not avail of Scheme	156
Total		278

3. Sampling Technique

The study adopted a **stratified sampling technique with proportionate allocation**.

Stratification was considered appropriate because the population was heterogeneous in terms of:

- Scheme participation status
- Farm establishment background
- Expansion characteristics
- Exposure to policy incentives

The use of stratification improved representativeness and reduced the risk of over-representation or under-representation of any major farmer category.

Proportionate allocation was used so that the relative representation of each stratum in the sample reflected its proportion within the total population.

4. Sample Size Determination

The quantitative sample size was determined using a conventional sample size estimation approach for finite populations at:

- **95% confidence level**, and
- **5% margin of error**.

The resulting calculated sample size was:

$$n = 162$$

$$n = 162$$

Where:

- $N = 278$ represented the population size,
- $n = 162$ represented the required sample size.

The sample size was considered adequate for quantitative descriptive and evaluative analysis within the context of the study.

5. Stratified Proportionate Allocation

Post sample size determination, the total sample of 162 respondents was proportionately distributed across the three strata.

The allocation formula used was:

$$n_h = \frac{N_h}{N} \times n$$

$$n_h = \frac{N_h}{N} \times n$$

Where:

- n_h = sample allocated to stratum,

- N_h = population size of stratum,
- N = total population size,
- n = total sample size.

6. Final Stratified Allocation

The final sample allocation was as follows:

Stratum	N	%	n
New entrepreneurs under Scheme	96	34.50%	56
Existing farmers availed of Scheme for expansion	26	9.40%	15
Existing farmers not availed of Scheme	156	56.10%	91
Total	278	100%	162

The allocation ensured that all major stakeholder categories relevant to the policy evaluation were represented proportionately within the survey sample.

7. District-Level Allocation

Following stratum-level allocation, respondents were further distributed across districts using proportionate representation based on the available district-wise frame.

District-level allocation was intended to address the following:

- reduce geographic concentration bias,
- capture regional variation in Scheme penetration and
- reflect differing levels of commercial poultry concentration within the State.

District-level distribution was also useful for identifying variation in:

- farm expansion patterns,
- implementation experiences,
- feed-cost pressures,
- market accessibility,
- operational sustainability.

8. Farm Size Consideration

Within each major stratum, efforts were made to include variation across farm sizes so that the sample reflected the diversity of commercial layer operations within the State.

The sample therefore, included farms across varying bird-capacity categories, including:

- small farms (below 25,000 birds)

- small to medium (25,001 to 50,000 birds)
- medium (50,001 to 1,00,000 birds)
- medium to large (1,00,001 to 2,00,000 birds)
- large (above 2,00,000 birds)

This improved the survey's analytical usefulness because policy outcomes and operational pressures often varied significantly by farm size.

9. Respondent Selection Procedure

Respondents within each stratum were randomly selected and surveyed based on availability.

Where multiple eligible respondents existed within a farming unit, preference was given to:

- owners,
- principal operators and / or
- managing partners.

The survey targeted respondents capable of providing reliable information regarding:

- investment decisions,
- subsidy utilisation,
- operational economics,
- production changes,
- feed-cost pressures,
- market competition,
- employment generation and
- sustainability concerns.

10. Methodological Justification

The use of a stratified proportionate sampling design was considered methodologically appropriate because the study was evaluative in nature and required comparison across multiple farmer categories affected differently by the Scheme.

The approach strengthened:

- representativeness,
- analytical comparability,
- construct-level evaluation,

- triangulation potential and
- policy relevance of findings.

The design also supported the study's mixed-methods structure by allowing quantitative findings to be integrated with secondary data analysis and qualitative stakeholder interviews during the interpretation stage.

11. Limitations of the Sampling Approach

The sampling approach improves representativeness - however, certain limitations remain and are outlined below.

These include:

- dependence on available and verifiable farm records,
- possible exclusion of informal or unregistered units,
- practical accessibility constraints during fieldwork,
- varying willingness of respondents to participate and
- unequal district-wise density of commercial farms.

However, despite these limitations, the sample is considered sufficiently robust for the purposes of evaluative quantitative analysis within the scope of the study.

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