



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

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Submitted by : **Samuel Dhinakaran Arumugaraj**
Student ID : **2416236**
Submitted To : **Helen Evans, Senior Lecturer**

EXECUTIVE SUMMARY

This research proposal considers the extent of digital technology adaptation and its challenges in small-scale poultry farming in Venkateshwarapuram, a rural village in Tamil Nadu, India. Despite the transformative potential of digital agriculture gear along with mobile packages, Internet of Things and cloud-based tracking adoption among rural hen farmers remains considerably confined. The look at recognises the multifaceted demanding situations that restrict virtual integration, along with low virtual literacy, insufficient infrastructure, economic constraints, language barriers, and limited get right of entry to government or institutional guidance.

The prime goal of this study is to explore the modern-day degree of virtual generation adoption and pick out the operational, social, and coverage-related obstacles confronted through small-scale chicken farmers and owners. The research employs a mixed-techniques approach, combining quantitative surveys with in-depth qualitative interviews to collect empirical evidence. Data could be collected from hen farmers to recognize their consciousness, usage patterns, and perceptions of digital gear in daily operations consisting of feed control, sickness control, file maintaining, and marketplace admission.

This proposal outlines a detailed method, supported via an evaluation of existing literature, and provides the equipment for statistics collection, ethical considerations, and expected findings. The study seeks to generate insights into how virtual interventions can be tailor-made to rural needs and perceived strategies to guide sustainable adoption. The findings are predicted to inform targeted coverage guidelines, foster community-led training initiatives, and beautify attention to presidency-sponsored digital programs. Ultimately, this study's pursuits to empower rural fowl farmers via knowledgeable choice-making, advanced productivity, and inclusive growth inside the virtual generation.

TABLE OF CONTENTS

1. Introduction.....	04
1.1 Background of the Research.....	05
1.2 Aim and Objectives.....	07
1.3 Industry Background.....	07
1.4 Current Techniques in Poultry Farming.....	07
1.5 Innovative Technologies in The Market & its Benefits.....	09
1.6 Strategies for Overcoming Barriers to New Technology Adoption.....	10
2. Review of Literature.....	12
2.1 Digital Agriculture and Poultry Farming.....	12
2.2 Benefits of Digital Technology in Poultry Farming.....	13
2.3 Barriers to Adoption in Rural India.....	14
2.4 Digital Literacy and Farmer Behaviours.....	15
2.5 Role of Policy and Institutional Support.....	16
2.6 Gaps in Literature.....	17
3. Research Methods.....	17
3.1 Data Collection Methods.....	17
3.1.1 Primary Data.....	18
3.1.2 Secondary Data.....	18
3.1.3 Sampling Technique.....	18
3.1.4 Data Collection Process.....	18
3.1.5 Data Analysis Techniques.....	18
3.1.6 Tools Used in Data Collection and Statistics.....	19
3.1.7 Research Period.....	19
3.1.8 Limitations of the Study.....	19
3.1.9 Ethical Consideration.....	19
4. Conclusion.....	20
5. Recommendation.....	20
6. Reference.....	22

**A STUDY ON DIGITAL TECHNOLOGY ADAPTATION AND CHALLENGES IN
SMALL SCALE POULTRY FARMS IN VENKATESHWARAPURAM, TAMIL NADU
(INDIA)**

1. INTRODUCTION

India's agricultural and livestock sectors are undergoing a remarkable shift with the adoption of digital technologies like AI, IoT, and data analytics. These advancements are not just reshaping traditional practices—they're boosting productivity, improving efficiency, and opening up better market access for producers across the country (McKinsey, 2023). Poultry farming, which plays a vital role in the Indian economy, is essential for ensuring food security and supporting rural livelihoods. India is now one of the leading producers of eggs and poultry meat due to rapid advancements in recent decades (Poultry India, 2023). In villages like Venkateshwarapuram in Tamil Nadu, small-scale poultry farming is a common way of life. However, even with the growing availability of digital tools designed to boost farm productivity, their adoption in rural and semi-urban areas remains quite limited (FAO, 2020).

Despite the launch of ambitious schemes like Digital India and the National Livestock Mission, a significant portion of marginal farmers continues to be left behind. The underlying issues—limited digital infrastructure and widespread digital illiteracy in rural regions—mean that many intended beneficiaries are unable to access or participate in these initiatives. Consequently, the actual on-ground impact of such programs remains restricted, particularly at the grassroots level (Drishti IAS, 2024). Venkateshwarapuram is a typical case for the detailed analysis of these issues.

This proposal may encourage to understand the existing digital technologies such as mobile farm management software, automated water and feeders, health sensors, and websites for online selling then to adopt new advancement in these technologies for better farm management. It will try to find out the socio-economic, technical, and behavioural barriers to their wide adoption from small to medium levels. Additionally, this proposal may highlight the practical benefits of smart farming technologies that could genuinely motivate aspiring farmers or even those simply interested in agriculture—to consider beginning their own small-scale farming ventures.

1.1. BACKGROUND OF THE RESEARCH

Considering the present demand for poultry and its products may lead to develop a new opportunity in starting a small-scale poultry farm in and around Venkateshwarapuram. The output of poultry meat and eggs has been rising consistently, with growth rates approximately at 7% for meat and 10% for eggs, from 2019 to 2020 (Business Standard, 2023). Small-scale farmers frequently depend on hands-on techniques to record and oversee the activities of organic farms, family farms, and aquaculture systems. The implementation of digital technologies in poultry farming may lead to facilitate better operational management and contribute to sustained profitability in the long term (Balogun et al., 2022).

Families typically raised local "country" chickens in small quantities with limited resources, usually in basic thatched or tin-roofed shelters constructed within their home yards. Traditional agricultural operations, however, were insufficiently productive to meet the increasing needs resulting from changes in eating patterns, as well as inefficiencies associated with local breeds, extended growing periods, and diminished egg production. Since the year 2000, the emergence of small to medium-sized poultry enterprises has substantially increased the market for poultry products. The discourse on farm establishments intensified due to market expansion and progress, resulting in the creation of multiple farms in the vicinity. Subsequently, the rural poultry farm evolved from a traditional form of minimal operations to more commercialized frameworks nationwide. These poultry farms are currently meeting local, national, and global demand. These outcomes derive from advances in infrastructure, disease control, market analysis and growth, and government and commercial actions (Goyal et al., 2022).

The evolution of poultry farm development in rural India provides a holistic view of the opportunities, challenges, and strategies for overcoming issues faced during digital transformation adaptation.

Initial Phase for Advancement: This phase was marked by conventional practices, as farmers engaged in agriculture and associated activities. Thereafter, traditional farming methods were utilised, primarily involving chicken rearing in home backyards. The current facilities were largely inadequate for substantial growth, including a lack of knowledge in health management, difficulties in sourcing feeds, insufficient transportation options to reach markets, financial challenges, government initiatives, and other pertinent factors (Kavitha and Jayakumar, 2021).

Consequently, the formation of commercial shops for meat and eggs boosted additional progress in the chicken industry, growing from local markets to cities and subsequently national.

Progress in Growth and Commercialization: The rise in demand for premium breeds in rural areas has brought attention to the need for commercialisation. The growing urban population, people made small changes to their diets have also made eggs and poultry very popular. In rural India, there is a lot of interest in high-yielding breeds like Cobb 500 (broilers) and Leghorn (layers) because they are more resistant to disease than native breeds and are more profitable (Singh, Kumar and Sharma, 2020). Also, these changes made farming a way for farmers to make a living and earn extra money through agriculture. This led to start and run a poultry farm using modern farm management methods including commercial network and partnerships. Contemporary, large-scale poultry operations have established integrated and well-organised supply chains with prominent agribusinesses. The companies now help farmers by providing chicks, feed, and expert advice to farmers in return for products with substantial profit margins (Sharma and Patil, 2018).

Insights into Digitalisation: The current growth in The Indian poultry sector offers a foundation for developing future business strategies, ensuring sustainability and enhancing resilience and adaptability in response to changing environment. Poultry production poses numerous challenges, including the effects on animal welfare and the sustainability of the environment and economy. However, the digital technologies may assist in streamlining processes, managing concerns about health and the environment, and enhancing revenue by fostering the growth and scalability of businesses as feasible (Klerkx, Jakku and Labarthe, 2019). In Tamil Nadu, digital platforms such as mobile-based farm management apps and IoT-enabled sensors are being gradually adopted to monitor bird health, automate feeding schedules, and track environmental conditions in real time. These technologies help lower death rates, make better use of feeds, and boost productivity. Digital marketplaces and e-commerce platforms also help small-scale poultry farmers sell directly to city dwellers, which increases their profits. Local agricultural universities and Krishi Vigyan Kendra have also started teaching farmers how to use digital tools through training and awareness programs. This gives farmers the information they need to make smart choices and grow their businesses.

1.2 AIM AND OBJECTIVES

Aim

This study aims to investigate how small-scale poultry farms located in Venkateshwarapuram, Tamil Nadu, are adapting to digital technology and to identify the barriers that impede this adoption process.

Objectives

- To assess how small-scale poultry farmers are currently using and implementing digital technologies.
- To study the main barriers and enablers that affect adoption, such as literacy levels, infrastructure, costs, and support from institutions.
- To assess how adopting digital technologies impacts productivity and income of farmers.
- To give recommendations for boosting the use of digital technology in poultry farming.

1.3. INDUSTRY BACKGROUND

It examines allies in the small-scale poultry farming world in Tamil Nadu, India. These farms are very crucial to the local agricultural economy, but they are often painted with less than pay generation in informal settings. The national initiatives aimed at modernizing agriculture like 'Digital India' poultry farmers in these areas struggle to make the most of digital tools such as automated feeding systems, sensor technology, and mobile advisory platforms (NABARD, 2022). The poultry industry in India is booming, currently valued at around USD 25 billion and projected to grow at a rate of 8–10% annually (IBEF, 2023). However, small farms frequently encounter challenges like fragmented supply chains, limited access to financing, and a lack of innovative solutions. While Tamil Nadu is known for its agricultural advancements, the adoption of digital practices varies widely across the region.

1.4 CURRENT TECHNIQUES IN POULTRY FARMING

The technologies currently in use and their applications vary among farmers across different business sectors. There are several typical pieces of equipment at the poultry farm that have moved from analogue to digital formats (Ribeiro et al., 2019).

Growth and Weigh Measurement: Tracking multiple factors is vital from the time chicks reach the farm until they are sold at market. This includes measuring their weight during the initial phase and regularly monitoring their growth over a defined period, among other things (ISA, 2018). Earlier, farms employed analogue weighing machines but advancements in weight measurement technology have led to the adoption of digital platform scales. Moreover, digitalised devices are significantly portable, user-friendly, accurate, and proficient in handling various weights.

Climate Control Setup: The right temperature and moisture is an important part of managing a farm because it affects how well chickens grow, the air quality, their breathing health, and the condition of the bedding. The digital infrared thermometer is extensively utilized in contemporary rural settings because of its immediate readings and non-contact functionality (Study, 2022). Several other features may assist the farmer in effortlessly recording the readings.

Integrated Health Management: It plays a key role in the effective operation of the farm, such as lowering the chances of diseases, especially during seasonal outbreaks. It provides assurance of a decreased disease risk, with an emphasis on preserving the health of the birds (FAO, 2020). Krishi Vigyan Kendras, TANUVAS, local poultry vets, and other apps provide farmers with health updates. Farmers profit from vaccination dose and storage data (ICAR, 2020). Small farms still use conventional methods for injecting chicks and tracking their behavior (Rao, Natarajan and Menon, 2018).

Digital Solutions for Farm Record-Keeping: Primarily, there are essential records that must be preserved, particularly data related to health management, which is crucial for monitoring disease relapse and its mitigation. Considering the difficulties, the management of records via digital applications, excel spreadsheets, or cloud-based systems can offer secure, high-quality access. A small-scale poultry operation often maintains essential records, encompassing details about the flock, feed production and consumption, vaccination and treatment protocols, visits and advice from health officials, financial matters, adherence to regulatory obligations, and staff documentation (Chen et al., 2016).

1.5 INNOVATIVE TECHNOLOGIES IN THE MARKET & ITS BENEFITS: Numerous factors dictate the variety of technologies and their usage, encompassing the size of a farm, the type of farm such as those dedicated to egg or meat production, feed production, and the exchange of knowledge and services. The selection of the most recent advancements that the poultry industry may consider to improve the welfare of birds, enhance productivity, and secure sustainability.

Resource Management: As a result of automated resource management, large quantities of waste can be minimized, like giving the right amounts of water and food, which can help animals grow well and stay healthy (Big Dutchman, 2025).

Climate-Controlled Housing: Advanced climate control systems are vital for promoting bird health and productivity by governing temperature, humidity, ventilation, and other positive environmental settings (Munters, 2025; LIVI Machinery, 2025; Otto's Farms, 2025).

Artificial Intelligence (AI) and Machine Learning: A rapid increase in artificial intelligence, machine learning, and robotics is predicted to radically change poultry production by enabling the management of flock performance and welfare early on, including monitoring flock health, identifying behavioural changes, controlling the environment, and completing mundane tasks without compromising human health or safety (The Farming Insider, 2025; GOPOULTRY, 2025).

Renewable Energy Integration in Poultry Farming: The integration of renewable energy sources such as solar power, wind energy, and biogas offers a viable solution for cost reduction. These technologies can help lower operational expenses associated with lighting, heating, production processes, and fuel for transportation. Moreover, they contribute to the long-term sustainability of poultry operations by minimising environmental impact and reducing the overall carbon footprint (Milani, Hellweg and Hilty, 2016).

Technological Innovations in Poultry Farming: It promotes better productivity and overall performance through collaborative efforts between governments, private enterprises, industry

experts, and NGOs. One such innovation is the imaging technology for sex determination of eggs without any physical intervention, which increases breeding efficiency. Nano biosensors allow for the early diagnosis of avian diseases so preventive measures can be taken to curtail the unfurling of these infections (Gupta, Sharma and Verma, 2021).

1.6 STRATEGIES FOR OVERCOMING BARRIERS TO NEW TECHNOLOGY ADOPTION

The implementation, management, and upkeep of technology-based information systems are considered a major hurdle for small poultry farms in rural regions because of socio-economic and infrastructural challenges (Misaki, Apiola and Gaiani, 2016). The lack of progress is openly apparent in the evolution of IT infrastructure for poultry farms and their operations, as well as in market research, predicting analysis, consumer behaviour analysis, and similar areas. The primary industry associations that foster resilience and growth among poultry farmers include the Poultry Federation of India (PFI), and Vets in Poultry (VIP).

Resource Management: The implementation of automated resource management systems aimed at the accurate delivery of essential resources for avian populations represents a misallocation of financial resources. Further, the feeds obtained from agricultural land are regarded as healthier and may promote disease resistance (Kumar, Rajendran and Palanivel, 2020). The available resources and the good quality feed from a trustworthy manufacturer should be used in the right amounts to make sure the birds stay healthy as per their growth plan. A simple schedule, the right mix ratio, and accurate measurements can be entered into easy control systems to show information clearly, like using pictures or images. This can slowly help farmers start using better control systems.

Climate-Controlled Housing: The control systems, generally containing many sensors, are really costly; users are forced to rely on authorised dealers or service partners to operate and maintain them, and they usually have insufficient information as to how they operate. Knowing about the accessible control mechanism and improving the characteristics or developing new systems may aid in getting the proper knowledge about the technologies into the minds of the farmers. Regulation on investment into these systems may provide services and training

assistance on such systems, thereby promoting progressive adoption on farms (Rathod, Singh and Kumar, 2019).

Artificial Intelligence (AI), Robotics and Machine Learning: Rural farmers and small poultry farms are unfamiliar with this term because they lack the knowledge. Primarily, family members or acquaintances are employed on the farm and provide expert advice and guidance in managing the operations. For instance, they could spot illness in the birds by feeding them daily and watching their behaviour. Implementing AI, robotics, and machine learning may take a while. Small farms often need fewer of these tools, struggle with limited knowledge, and lack proper development (Borah, Deka and Deka, 2020).

Sustainability and Energy Solutions: In the district of Erode in Tamil Nadu, several poultry farms had rooftop solar panels installed to save on electricity bills and work without any interruptions in electricity for lighting and incubation (Ramesh and Devi, 2021). Biogas is also produced by many households and farms using it for heating purposes, feed preparation, and other activities. Cutting-edge technology can take these operations into one stroke of efficiency and profitability. Such improvements are mostly construed as once-in-a-lifetime investments providing long-term returns.

Cutting-Edge Research and Innovations: The government, commercial, corporate, and non-profit institutions can extend support in nanotechnology research, breeding programs, bird disease detection, and risk reduction. It encompasses local, district, and state resources working together to make a difference. These coordinated efforts can advance the field despite limited resources (Singh, Joshi and Kumar, 2020).

Veterinary Support and Disease Prevention in Poultry Farming: It is vital for commercial success like proactive strategies in disease management and care, including the maintenance of the health and welfare of poultry populations. The existing protocols for veterinarian visits to farms are time-consuming and challenging to coordinate during company operations. The telemedicine idea may simplify collaboration between veterinarians and farmers by enabling

remote monitoring of avian health and offering timely assistance to farmers (Gupta et al., 2021).

2. REVIEW OF LITERATURE

Understanding the research process relies heavily on reviewing past studies and reports related to digital technology in poultry farms. These sources highlight how digital tools are used for monitoring growth, detecting illnesses, tracking broiler health and the challenges of adopting and mitigation ways in the chosen region & state. Many reports show the benefits, but fewer explore the hurdles or suggest ways to improve technology adoption. More research is needed to address these gaps and guide future progress in this area. Here, there are important reviews which have guided to understand the research topic in details, the focus needed to carry out the research and its related activity.

2.1 DIGITAL AGRICULTURE AND POULTRY FARMING

(Wolfert et al., 2017) highlight the transformative impact of data-driven approaches in livestock and poultry management. Their work illustrates how digital technologies such as sensors, the Internet of Things (IoT), and advanced data analytics—enable farmers to make timely, informed decisions. It includes monitor feeding, detect diseases, and optimize production in real-time, fundamentally reshaping modern agricultural practices.

Although digital tools offer benefits in poultry and crop sectors, there are concerns about accessibility for small farmers, data ownership, and technology dependency. (Rose and Chilvers, 2018) suggest inclusive design and farmer training as key to sustainable adoption.

(Banerjee and Sharma, 2019) concludes that tools such as RFID tagging, automated climate control, precision feeding systems, and wearable sensors improve farm management efficiency, disease tracking, and animal welfare in poultry production.

The review shows that IoT-enabled monitoring (temperature, humidity, feed) and AI algorithms can assist farmers in making proactive decisions, leading to improvements in both productivity and biosecurity (Chavhan & Mahalle, 2020).

Digital twins in chicken farming allow for the prediction and optimization of results by simulating flock health housing conditions and productivity in real-time. Technical issues like data integration and the high implementation costs are also covered in the review (Sahal, Breslin and Ali, 2021).

2.2 BENEFITS OF DIGITAL TECHNOLOGY IN POULTRY FARMING

Precision Livestock Farming is another area where digital technology has delivered substantial benefits to poultry production. As reviewed by (Banhazi et al., 2012), PLF systems use sensors and automation to improve animal health monitoring, reduce feed and water wastage, and maintain better environmental controls. These technologies enable producers to make accurate, timely decisions, thereby increasing efficiency, reducing losses, and ensuring consistency in product quality.

(Nasirahmadi, Edwards & Sturm, 2017) reviewed the use of visual monitoring systems and found that it assists in detecting health issues. These systems also reduce the need for constant human supervision, ensuring timely interventions and maintaining optimal flock conditions. Additionally, they contribute to enhanced biosecurity and labour cost savings.

(Rahman and Islam, 2019) study reveals that mobile-based monitoring, and remote management systems tools improve biosecurity, ensure better disease management, and increase overall farm output. Digital technology also helps bridge the urban-rural knowledge gap by providing farmers with training and extension services remotely, making poultry farming more inclusive and scalable.

According to (Jawad and Naser, 2020), IoT applications help in continuously monitoring critical parameters such as temperature, humidity, lighting, and ammonia concentration inside poultry sheds. This allows farmers to automate feeding and watering systems, optimize energy usage, and maintain an ideal environment for bird health. These benefits contribute significantly to reduced mortality rates, improved bird welfare, and lower operational costs.

(Nalavade and Patil, 2021) conducted a study in India, highlighting that mobile applications and digital advisory platforms help farmers access timely information on feed management, vaccination schedules, and disease prevention. These tools empower small-scale poultry farmers with knowledge and real-time guidance, improving production efficiency and enhance profitability by providing direct access to consumers.

(Prasad and Mahajan, 2022) emphasizes the contribution of smart farming technologies such as sensors, automated feeders, ventilation systems, and digital record-keeping in poultry management. The automation of routine tasks also enables better time management and reduces the physical burden on farm workers, further improving farm productivity and operational sustainability.

Research indicates that digital solutions have improved farm efficiency sensor-equipped chicken farms in China and the Netherlands have reported 25–40% increases in output (FAO, 2020).

2.3 BARRIERS TO ADOPTION IN RURAL INDIA

Sociocultural factors and resistance to change further contribute to the slow adoption of digital solutions. (Banhazi et al., 2012) observed that older farmers, who make up a large portion of rural poultry producers, are often sceptical about replacing traditional methods with digital alternatives. This resistance stems from perceived risks, fear of technology failure, and the belief that digital farming may require complex technical knowledge.

(Nasirahmadi, Edwards and Sturm, 2017) argue that without consistent on-ground support, demonstrations, or follow-up training, farmers fail to build confidence in using digital tools. Extension workers often lack digital expertise themselves, which limits their ability to promote technology adoption effectively at the grassroots level.

According to (Rahman and Islam, 2019), inconsistent power supply, limited access to smartphones or computers, and low-speed internet significantly hinder the use of IoT systems and AI-enabled tools on poultry farms. These infrastructural deficits widen the digital divide and disproportionately affect smallholder farmers who may already struggle with capital constraints.

According to (Jawad and Naser, 2020), most digital platforms are developed in English or Hindi, which alienates farmers who speak regional languages such as Tamil, Telugu, or Bengali. This language barrier hampers effective communication, learning, and user experience, reducing farmer engagement with digital resources.

(Neethirajan, 2020) notes that in many rural households, women actively participate in poultry farming but are less likely to own or operate smartphones and digital devices. Limited digital access for women means that half the potential workforce remains excluded from technology-driven progress in poultry farming. Despite the growing benefits of digital agriculture, rural India faces several challenges in adopting digital technology for poultry farming.

(Nalavade and Patil, 2021) highlight that a significant barrier is the lack of digital literacy among small and marginal poultry farmers. Many farmers are unaware of how to use digital tools, mobile applications, or data platforms, which limits the potential benefits of these technologies. This knowledge gap leads to underutilization or complete avoidance of technological innovations even when they are available at low cost.

(Singh and Prakash, 2021) report that more than 60% of small-scale farmers in Tamil Nadu do not have access to high-speed internet, making the use of digital apps unfeasible.

Hindrances encompass insufficient internet connectivity, inconsistent electrical supply, absence of technical expertise, and elevated beginning expenses (National Bank for Agriculture and Rural Development [NABARD], 2022).

2.4 DIGITAL LITERACY AND FARMER BEHAVIORS

(Mittal and Mehar, 2016) revealed that digitally educated farmers in India revealed greater proactivity in utilizing mobile applications and ICT platforms for climate, disease notifications, and market pricing, leading to enhanced productivity.

(Nandi and Nedumaran, 2020) assert that exposure to digital training and peer learning is crucial in transforming conservative behaviours, fostering technology adoption, and encouraging sustainable practices.

(Srinivasan and Kumar, 2021) discovered that merely 28% of surveyed farmers in Tamil Nadu were capable of operating agricultural mobile applications independently. Variables including age, educational attainment, and previous exposure markedly affected digital involvement.

The veterinary industry is not far behind in acceptance the digital conversion because going digital bolsters effective farm management and supply chain optimisation, which holds significance in the poultry sector (Salvi, 2023).

Automation and smart farming are increasingly adopted: the use of sensors, cameras, and automated feeders enables better monitoring and control of environmental conditions in farms (Pashudhan Praharee, 2023)

2.5 ROLE OF POLICY AND INSTITUTIONAL SUPPORT

(Meera, Jhamtani and Rao, 2004) argue that government-led extension systems and digital literacy initiatives are essential for reaching smallholder farmers. Without policy backing, the reach of digital innovation remains limited to more affluent or urban areas.

According to (Mittal and Tripathi, 2009), policy frameworks that promote mobile-based advisory services, such as mKisan and eNAM, have improved farmers' access to real-time information. These initiatives reduce information asymmetry and empower farmers to make better market and production decisions.

(Rao and Radhakrishna, 2018) emphasize that the success of digital agriculture initiatives depends on decentralized and farmer-focused policies. Local agricultural universities, panchayat-level bodies, and Krishi Vigyan Kendras (KVKs) must be empowered to deliver location-specific training and support to ensure digital tools are practical and accessible to farmers at the grassroots level. However, effectiveness depends on proper implementation and localized content delivery.

(FAO, 2021) highlights that inclusive policies addressing gender equity, language barriers, and financial incentives are critical. Without targeted support for women farmers and marginalized groups, digital transformation in agriculture risks deepening existing inequalities.

The Indian government's National Livestock Mission and Electronic National Agriculture Market (eNAM) projects have potential; yet, their implementation at the grassroots level frequently lacks efficacy (Kavitha, Pradeep and Manikandan, 2021).

(Sharma and Singh, 2021) highlight that access to institutional credit and subsidies plays a key role in encouraging rural farmers to adopt digital tools in poultry farming. Without affordable financing options for automation equipment, IoT systems, or mobile advisory services, many farmers are hesitant to invest. Their study underscores the need for digitally integrated policy frameworks, where financial institutions, agri-tech providers, and government schemes

collaborate to provide bundled solutions (training + tools + credit), especially for marginal farmers and rural women entrepreneurs.

2.6 GAPS IN LITERATURE

While there's quite a bit of literature on digital agriculture, there aren't many empirical studies that zoom in on small-scale poultry farming in specific micro-regions like Venkateshwarapuram. This study sets out to bridge that gap by offering primary data and insights tailored to the local context. This study not only goes over the results, but it also looks more closely at the methods used, points out differences between studies, and shows where more research is needed.

3. RESEARCH METHODS

The research chapter outlines the methods chosen to achieve the study's goals. They guide the investigation by helping to find, interpret, and analyse facts, processes, behaviours, or theories. Overall, it shows how the research will be conducted step by step to reach the desired results.

It aims at the proprietors of small-scale chicken farms in Venkateshwarapuram, India. This area is rural and has sufficient amenities relative to adjacent communities, including transportation, retail establishments, and various commercial enterprises, from general merchants to construction contractors. Moreover, many persons engage in the raising of domestic birds and animals and often partake in commercial activities, such as weekly market gatherings.

3.1 DATA COLLECTION METHODS

Data can be gathered from primary and secondary sources. The primary data helps improve understanding, displays current practices, points out complications, and sets expectations to fix those issues. Secondary data, on the other hand, inspires enthusiasm for the topic by offering extra details. This includes different viewpoints, the latest tests, recent progress, and future ideas. Both types of data play important roles in supporting research and achieving clear objectives.

3.1.1 PRIMARY DATA

A structured questionnaire can be given to respondents to gather information. It asks about the current use of poultry farm tools, their knowledge of technology options available in the market, how they adopt new technologies and the challenges they face in doing so. The sample can be accessed by meeting them at local market where merchants gather for selling and buying of birds and animals during Saturdays. Additionally, meeting the owners of farms in and around the chosen area/ region.

3.1.2 SECONDARY DATA

Secondary data of source will be collected from internet, with additional support from books, magazines, journals, websites, and articles.

3.1.3 SAMPLING TECHNIQUE

For this study, researcher will purposively select small-scale poultry farmers and owners from the Venkateshwarapuram area. The target sample size ranges from 150 to 200 participants, ensuring the data collected remains both focused and substantial.

3.1.4 DATA COLLECTION PROCESS

The structured questionnaire will be created in the local language (Tamil) to ensure comprehension and to gather the necessary evidence for the study. It will be distributed to them to collect the information and will be assisted in case of assistance required.

3.1.5 DATA ANALYSIS TECHNIQUES

Quantitative facts collected via structured questionnaires can be analysed using the percent evaluation to symbolise the distribution of responses across variables. This approach will help interpret the commonness of unique perspectives, behaviours, or constraints skilled with the aid of poultry farmers with regards to virtual technology utilisation. Descriptive statistics, along with probabilities and frequencies, can be manually tabulated or calculated with the use of spreadsheet gear like Microsoft Excel.

3.1.6 TOOLS USED IN DATA COLLECTION AND STATISTICS

Tool/Software	Purpose
Questionnaire	To collect quantitative data from poultry farmers
Percentage Analysis	To analyse survey responses and represent findings
Excel Spreadsheet	To tabulate data, calculate percentages, and generate charts

3.1.7 RESEARCH PERIOD

The research work aimed to complete between 60 and 75 days.

3.1.8 LIMITATIONS OF THE STUDY

- Sample Limitations: Generalisability is restricted due to single-village focus.
- Translation Issues: Some responses may be misinterpreted in translation.
- Response Bias: Participants may overstate their technological use.

3.1.9 ETHICAL CONSIDERATIONS

This proposal provides an opportunity to look at different ethical issues and responsibilities connected to the chosen topic. These key ethical points can guide how the project is planned, carried out, and checked. Following these principles helps make sure the results are fair, long-lasting, and respectful of various cultures.

Consent and Community Participation: The project aims to include small-scale poultry farmers and owners on a voluntary basis. Consent will be obtained in Tamil, the local language, to ensure everyone understands and agrees. Before starting, a risk assessment will be done. This will help identify possible dangers and find ways to reduce or avoid them. The main goal is to protect everyone and make sure the project is successful.

Cultural Continuity, Knowledge Transfer & Sustainable Practices: Traditional poultry farming methods are effective and should be recognized for their value. The study might

suggest ways to combine new technology with old techniques where it fits. This can be done through clear and simple information sharing in the local language, access to local support and advice. This helps build skills in the community over the long term. The project may promote ecologically sustainable methods when appropriate, encompassing resource use (water, energy), waste generation, low-emission, energy-efficient, and non-polluting technologies.

4. CONCLUSION

Engaging in the development of this project proposal may deliver significant insight into the business scene of Venkateshwarapuram. Direct interactions with local farmers and experienced practitioners offered understanding of various aspects of poultry farming ranging from breed selection, traditional feed preparation to supply chain management, logistical considerations, market dynamics, vaccination protocols, and early disease detection and treatment. These discussions contributed to a more comprehensive perspective on the practical requirements for establishing and sustaining a poultry enterprise in the region. Notably, the experience highlighted the productive interplay between traditional agricultural methods and contemporary practices, demonstrating how their integration can enhance the viability and resilience of poultry businesses in this context.

5. RECOMMENDATIONS

To boost digital transformation in small-scale poultry farming, several techniques may be utilized.

Support and learning in Regional Languages: Consistent delivery of educational materials in the local language is vital, but merely providing information isn't adequate. These materials must be appropriately adapted to the digital literacy levels of farmers to ensure accessibility and comprehension. Furthermore, utilizing community-driven, participatory approaches rather than solely top-down instruction can significantly enhance engagement and learning outcomes (Rathore et al., 2020).

Integrating Tamil language support and voice-assist capabilities into mobile applications represents a significant advancement in addressing linguistic and literacy obstacles. By facilitating access to essential information such as weather forecasts, disease notifications,

agricultural feeding guidance, and market linkage—these applications ensure that vital services are delivered (Kumar and Singh, 2021).

When farmers participate in digital cooperatives or peer-support networks, they benefit from shared knowledge, pooled resources, and continuous technical assistance. These collaborative systems foster collective learning and practical problem-solving within the agricultural community lead to empowered on address challenges through mutual support and active engagement (Sharma and Reddy, 2020).

Alliances with Local Educational Bodies and Support of Public- Private Partnership:

Collaborating with local institutions—such as Krishi Vigyan Kendras, agricultural universities, and non-governmental organizations—facilitates the development of training programs that are tailored to specific regional contexts and grounded in practical applicability (Deshmukh and Patil, 2019).

Enhancing rural digital infrastructure requires robust collaboration between public bodies and private entities, particularly agri-tech firms and telecom operators. Such partnerships are essential for delivering localized advisory solutions, developing digital tools optimized for limited bandwidth, and implementing integrated service packages (Iyer and Sharma, 2021). These efforts collectively foster sustained digital inclusion and promote the long-term viability of agricultural communities.

Enhance The Capacity for Innovation and Services in Animal Health: Veterinary teleconsultation and e-health platforms present a practical solution for farmers seeking timely veterinary advice without the logistical challenges of in-person visits. By leveraging these digital tools, farmers can consult veterinary professionals remotely, allowing for prompt identification and management of livestock health concerns. This proactive approach not only facilitates early disease detection and intervention but also promotes overall herd health, reduces economic losses, and enhances agricultural productivity (Rao and Thomas, 2020).

Enhance The Capacity for Innovation: Collaborate with agricultural universities to establish regional research and innovation centres dedicated to developing affordable, scalable

technologies for small-scale poultry farmers. These centres will foster experimentation, enhance capacity building, and support sustained regional adaptability (Sen and Mukherjee, 2021).

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