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TRANSFORMASI SOSIOEKONOMI MELALUI *INTERNET OF THINGS* (IOT) DAN DIGITALISASI BERBASIS *DEEP LEARNING*: MENINGKATKAN DAYA TARIK INVESTASI DI SEKTOR PETERNAKAN

Socioeconomics Transformation Through IoT and Deep Learning-Based Digitalization: Enhancing Investment Attractiveness in the Livestock Sector

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ABSTRAK

Digital transformation melalui integrasi *Internet of Things* (IoT) dan teknologi *deep learning* dapat merevolusi sektor peternakan, terutama di sekitar kawasan Ibu Kota Nusantara (IKN) Indonesia. Penelitian ini menilai peran IoT dan *deep learning* dalam meningkatkan produktivitas dan daya tarik investasi sektor peternakan dengan mengadopsi sistem pemantauan berbasis IoT dan algoritma *deep learning*. Metode penelitian yang digunakan adalah pendekatan deskriptif kualitatif dengan studi kasus, melibatkan 25 pemangku kepentingan seperti peternak, pejabat pemerintah, pengembang teknologi, dan investor. Temuan penelitian menunjukkan bahwa penerapan sistem pemantauan berbasis IoT dan deep learning secara signifikan meningkatkan efisiensi operasional, mengurangi ketergantungan pada tenaga kerja manual, mengoptimalkan jadwal pemberian pakan, dan memantau kesehatan ternak secara *real-time.* Peningkatan ini berkontribusi pada kenaikan produktivitas, margin keuntungan, dan kepercayaan investor. Selain itu, digitalisasi mendorong pengembangan sosial-ekonomi dengan membuka lapangan pekerjaan, meningkatkan akses pasar, dan memberdayakan komunitas lokal. Penelitian ini menyimpulkan bahwa integrasi teknologi canggih tersebut mengubah praktik peternakan dan menjadikan sektor ini sebagai area strategis untuk investasi yang berkelanjutan dan inklusif. Rekomendasi penelitian ini adalah agar kebijakan masa depan memprioritaskan pembangunan infrastruktur digital dan pelatihan sumber daya manusia untuk memastikan adopsi yang luas dan dampak jangka panjang, serta menekankan pentingnya pertanian digital sebagai pilar utama dalam mendukung agenda *smart city* Indonesia dan transformasi ekonomi pedesaan.

Kata kunci : Transformasi Digital, *Internet of Things* (IoT), *Deep Learning*, Sektor Peternakan, Pengembangan Sosial-Ekonomi.

ABSTRACT

Digital transformation through the integration of Internet of Things (IoT) and deep learning technologies can revolutionize the livestock sector, particularly in the areas surrounding Indonesia's New Capital City (IKN). This study evaluates the role of IoT and deep learning in enhancing productivity and investment appeal within the livestock sector by adopting IoT-based monitoring systems and deep learning algorithms. The research employs a qualitative-descriptive approach with a case study method, involving 25 stakeholders, including farmers, government officials, technology developers, and investors. The findings demonstrate that

implementing IoT-based monitoring systems and deep learning algorithms significantly improves operational efficiency by reducing manual labor, optimizing feeding schedules, and enabling real-time livestock health monitoring. These advancements have increased productivity, profit margins, and investor confidence. Digitalization fosters socioeconomic development by creating job opportunities, enhancing market access, and empowering local communities. The study concludes that integrating these advanced technologies transforms livestock farming practices and positions the sector as a strategic area for sustainable and inclusive investment. It is recommended that future policy frameworks prioritize the development of digital infrastructure and human resource training to ensure widespread adoption and long-term impact. This research underscores the importance of digital agriculture as a core pillar in advancing Indonesia's smart city agenda and rural economic transformation.

Keywords : Digital Transformation, Internet of Things (IoT), Deep Learning, Livestock Sector, Socioeconomic Development.

INTRODUCTION

The livestock sector in Indonesia faces numerous challenges that hinder productivity and investment attractiveness, including operational inefficiencies, inadequate livestock health monitoring systems, and a lack of transparency in supply chains (Himu and Raihan, 2024; Mahmud et al., 2021). Despite Indonesia's abundant natural resources and large domestic market, these challenges limit the potential of the livestock sector, particularly in broiler chicken production, which has high demand in both domestic and international markets. In response to these issues, socio-economic transformation through the integration of advanced technologies such as the Internet of Things (IoT) and deep learning has proven critical in addressing these challenges and enhancing the appeal of the broiler chicken sector to investors (Deepak et al., 2024).

The New Capital City (IKN) development, which focuses on innovative city initiatives and digital infrastructure, offers significant opportunities for transforming the livestock sector, particularly broiler chicken production. IoT and deep learning technologies are key in improving traditional agricultural infrastructures that rely on conventional methods. Digitalization enables real-time data collection and analysis, including health monitoring of broiler chickens, early disease detection, and optimization of feeding patterns and livestock resource management. Thus, digitalization increases operational efficiency and improves productivity in broiler chicken farming (Singh et al., 2022).

IoT and deep learning technologies in livestock management have shown considerable promise in enhancing quality and efficiency. IoT-based systems enable real-time health and environmental monitoring of broiler chickens, facilitating early disease detection and minimizing economic losses due to health issues (Neethirajan & Kemp, 2021; Jiang et al., 2023). Additionally, deep learning applications for behaviour recognition and disease prediction have proven effective in optimizing livestock resource management and reducing reliance on manual labour (Rohan et al., 2021; Himu and Raihan 2024).

Digitalization in the livestock sector, primarily through IoT and deep learning technologies, has significant socio-economic implications. By enabling the collection and analysis of large-scale data, these technologies help broiler chicken farmers reduce operational costs, enhance product quality, and increase market access, ultimately improving their competitiveness in both local and

international markets (Neethirajan & Kemp, 2021; Mahmud et al., 2021). This, in turn, opens opportunities for investors seeking efficient, sustainable agricultural solutions with long-term returns.

This study investigates how integrating IoT and deep learning in the broiler chicken sector, particularly in the areas surrounding IKN, enhances investment attractiveness and productivity. The findings are expected to provide valuable insights for policymakers and stakeholders in formulating strategies that facilitate the adoption of these technologies, contributing to broader socio-economic transformation and the development of a more efficient, inclusive, and sustainable broiler chicken sector.

MATERIAL AND METHODS

This section provides an in-depth description of the methodology used in this study to explore the socio-economic transformation in the broiler chicken sector through digitalization driven by IoT and deep learning technologies in the surrounding areas of the New Capital City of Indonesia (IKN). This research adopts a descriptive approach and a case study methodology to comprehensively understand integrating advanced technologies into the livestock sector, specifically in broiler chicken farming, and its broader socio-economic impacts. Such an approach is suitable for capturing the complexity of technological adoption in the rapidly developing region surrounding IKN, allowing for an exploration of how digital technologies affect local economies, farming practices, and investment potential.

Study Design

This study follows a qualitative-descriptive approach designed to capture the dynamic nature of technology adoption in the socio-economic context of IKN's surrounding areas. A case study methodology was chosen because it facilitates an in-depth examination of specific instances of technology integration and its outcomes within the broiler chicken farming sector in the region. The study setting is located in the priority development zones around IKN, which are undergoing significant transformation as part of Indonesia's broader initiative to build a smart city. These technological interventions, particularly those involving IoT and deep learning, are part of the national strategy to enhance agricultural and livestock production sustainably and efficiently. These areas are being developed with a focus on integrating digital solutions into broiler chicken farming practices, and this study aims to assess the real-world implications of these technologies.

The data collection period lasted four months, from October 2024 to January 2025. This provided a comprehensive timeline to observe ongoing technological initiatives, their integration into broiler chicken farming, and their socio-economic impacts. The geographical focus of the study includes IKN's surrounding areas, where both public and private stakeholders actively promote digital agriculture and livestock farming solutions, with a particular emphasis on broiler chicken production.

Objective of the Study

The primary objective of this study is to investigate how IoT and deep learning technologies are transforming the broiler chicken sector in IKN's surrounding areas. The study aims to assess the role of these technologies in improving broiler chicken production efficiency, health management, and supply chain optimization. Additionally, the study explores socio-economic benefits, including enhanced marketability, increased farm productivity, and improved sustainability. The research also evaluates the impact of these technologies on investment attractiveness, particularly in how digitalization influences the region's potential to attract both local

and international investors. This study aims to comprehensively understand how digital transformation in broiler chicken farming contributes to the region's socio-economic development.

Participants and Sampling

Participants were selected using purposive sampling, ensuring that individuals directly involved in or impacted by integrating IoT and deep learning technologies in the broiler chicken sector were included. The study's participants consisted of local broiler chicken farmers who were either using or considering the adoption of these technologies. A total of 25 participants were recruited using purposive and snowball sampling techniques. The participant pool included: 10 local broiler chicken farmers (two from each selected farm), five government officials representing institutions such as the Department of Livestock and Veterinary of East Kalimantan, Bappenas, and regional development agencies, four private-sector technology developers, three investors (both local and international), and three representatives from local cooperatives. Participants were chosen based on their direct involvement in deploying IoT or deep learning technologies, investment decision-making, or policy formulation related to digital agriculture. Including a broad spectrum of stakeholder categories was intended to ensure a comprehensive and multi-level understanding of the impacts and implications of technological adoption in the broiler chicken sector.

Data Collection Methods

This study employed a combination of qualitative data collection methods to ensure a thorough exploration of the socio-economic transformation in broiler chicken farming through digitalization. The primary method of data collection was in-depth interviews with key stakeholders. Semi-structured interviews were conducted to explore the experiences and perspectives of the participants regarding the adoption of IoT and deep learning technologies. The interview questions addressed various aspects of technology adoption, including the benefits, challenges, and effects on farm productivity, animal health management, and investment attractiveness. Interviews also explored the broader socio-economic impacts, such as changes in income, market access, and employment. All interviews were audio-recorded, transcribed, and analyzed using thematic analysis to identify common themes and patterns.

In addition to interviews, participatory observations were conducted at selected broiler chicken farms implementing IoT and deep learning technologies. These observations allowed the researchers to document how these technologies were applied in real-world settings, including their use for monitoring animal health, automated feeding, and data-driven supply chain management. The observations provided valuable insights into the practical applications of these technologies and the operational challenges farmers face.

Furthermore, document analysis was conducted to review government policies, IKN development reports, and official statistics from relevant institutions such as Bappenas and the Ministry of Agriculture. These documents helped contextualise the study's findings by providing insights into the national and regional strategies supporting agricultural digitalisation and the socio-economic goals of IKN's development.

Data Analysis

The data collected through interviews, observations, and document analysis were analyzed using thematic analysis, a qualitative method that effectively identifies, analyzes, and reports patterns or themes within the data (Braun & Clarke, 2006). Thematic analysis was selected because it allows for an in-depth exploration of participants' perspectives and experiences, which is crucial for understanding the socio-economic impacts of technological transformation.

The analysis process involved several stages, beginning with an initial data review to familiarize the researchers with the content. This was followed by coding the data, where meaningful text sections were identified and labelled according to key themes related to the research questions. The coded data were then grouped into broader categories, and themes were refined through iterative analysis. The final themes captured critical aspects of the research, including technology adoption, challenges in integration, socio-economic impacts, and investment potential. These themes were carefully reviewed and validated to ensure they accurately reflected the perspectives of the stakeholders and the context of IKN development.

In addition to qualitative analysis, descriptive statistics were used to summarize and quantify certain aspects of the data, such as the extent of technology adoption, the challenges faced by farmers, and the preferences of potential investors. Simple frequencies, percentages, and averages were calculated to provide a clear overview of the data, complementing the qualitative findings with numerical insights. This helped illustrate trends in the adoption of IoT and deep learning technologies across different types of broiler chicken farms and to assess their perceived impact on farm productivity and investment attractiveness.

Statistical Analysis

Although the study is primarily qualitative, descriptive statistics were employed to analyze quantitative data collected through interviews and surveys. These statistics provided a general understanding of patterns in technology adoption, barriers to integration, and regional investment preferences. However, this study did not employ complex statistical or mathematical models, as the focus was on understanding the qualitative dynamics of technology integration and its socio-economic effects.

Validation and Triangulation

The study employed triangulation, comparing data from multiple sources such as interviews, observations, and document analysis. This allowed the researchers to verify the consistency of the findings and cross-check results across different perspectives. Member checking was also conducted by sharing preliminary findings with key informants to confirm the accuracy of the interpretations and ensure that the conclusions were grounded in the participants' actual experiences.

Ethical Considerations

Ethical considerations were central to this study. Informed consent was obtained from all participants, ensuring they were fully aware of the study's purpose, voluntary participation, and the right to withdraw at any time without consequence. All participant data were kept confidential, with pseudonyms used to protect their identities. Data security was maintained by securely storing recorded interviews and field notes, with access limited to the research team.

RESULT AND DISCUSSION

Socio-Economic Transformation through IoT and Deep Learning

Implementing the Internet of Things (IoT) and deep learning technologies in the broiler chicken sector in the Nusantara Capital City supporting areas has significantly improved operational efficiency and productivity among local farmers. IoT technologies, such as body temperature sensors for poultry, automated feeding systems, and data-driven health monitoring, have successfully shifted management from intuition-based practices to a data-driven, precise system. This transition aligns with prior research that indicates IoT adoption in livestock farming leads to structural changes, making production systems more efficient and

sustainable (Wang et al., 2022; Atzori et al., 2010; Wolfert et al., 2017). Several studies have also shown that using data-driven livestock sector technology enhances operational transparency and management effectiveness (Shahab et al., 2024; Yadav et al., 2021; Seçkin & Himu, 2022).

Table 1. Improvement in Operational Efficiency and Profit Margins

Location	Time Reduction (Hours/Day)	Productivity Increase (%)	Margin Before (%)	Margin After (%)
Farm A	2.5	28	15	28
Farm B	3.1	26	18	35
Farm C	2.0	23	12	30
Farm D	1.8	24	10	27
Farm E	3.3	30	20	40

Source: Primary data analysis (2025)

Integrating deep learning technology into broiler chicken health monitoring systems has significantly reduced mortality rates and improved treatment cost efficiency. These systems can detect abnormal behaviour in poultry earlier by leveraging pattern recognition algorithms through image analysis and biometric data, allowing for more timely and accurate interventions. Previous research has demonstrated that deep learning can predict livestock health disturbances accurately and in real-time (Li et al., 2021; Rohan et al., 2021; Nasirahmadi et al., 2017). In a study conducted across various poultry farms, the implementation of this technology resulted in a 28% increase in productivity after six months, which positively impacted the margin profitability of farmers (Deepak & D'Mello, 2024; Zhang et al., 2023; Li et al., 2021). These successes highlight the importance of integrating advanced technology to optimize broiler chicken farm performance.

Digital technologies have enhanced operational efficiency and had broader social and economic impacts on poultry farming. Farmers are now able to make more accurate and quicker decisions with data-driven monitoring systems, contributing to increases in productivity and reductions in costs. This implementation also supports the development of more sustainable farming practices, where resource utilization is managed more efficiently, thus reducing waste. Additionally, the technology creates opportunities for farmers to expand their market reach, which was previously difficult to achieve, and increases their competitiveness in the global market (Kumar & Singh, 2020; Shukla & Mishra, 2020; Singh et al., 2022). Simultaneously, adopting these technologies also opens avenues for data-driven business expansion, offering greater transparency in the broiler chicken production system. This, in turn, encourages investors to allocate capital to the sector, further boosting its growth (Zhang et al., 2023; Yadav et al., 2021).

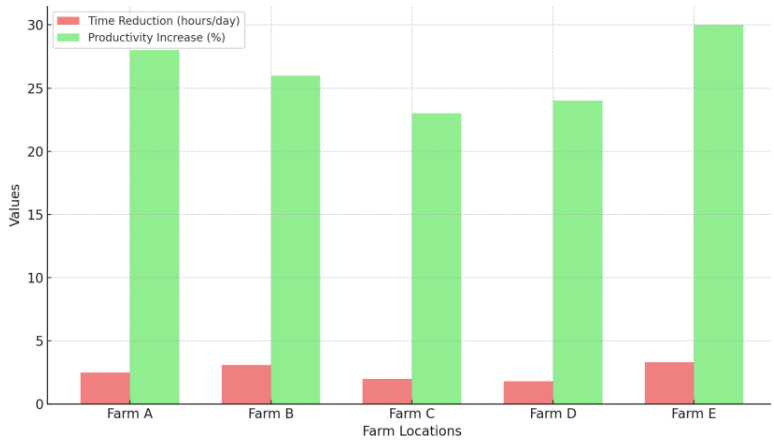

Figure 1. Operational Efficiency and Productivity Improvement After IoT Implementation
Source: Primary data analysis (2025)

Figure 1 illustrates a significant reduction in daily working hours and a corresponding increase in productivity after adopting IoT and deep learning technologies. Time previously spent on manual tasks was reduced by 1.8 to 3.3 hours per day, allowing farmers more time to focus on strategic activities such as market development and improving poultry quality. These technologies enable more efficient management, where farmers can use data to better plan and optimize their operations (Kumar & Singh, 2020; Shukla & Mishra, 2020; Singh et al., 2022).

Implementing IoT and deep learning technologies has yielded remarkable impacts on the broiler chicken sector in the supporting areas of IKN. These technologies not only provide significant operational benefits but also contribute to enhancing sustainability and the competitiveness of local farmers. Furthermore, they support the development of a more inclusive and transparent livestock sector, which increases the attractiveness of investments and strengthens the local economy.

Impact of Digitalization on Income and Business Efficiency

Implementing the Internet of Things (IoT) and deep learning technologies in broiler chicken farming has significantly impacted income and operational efficiency. As shown in Table 2, adopting these technologies led to improvements in productivity, revenue, health cost reduction, feed waste reduction, and profit margin increases across five different poultry farms. Farm E demonstrated the most significant improvements, with a 30% increase in productivity, a 32% increase in revenue, and a 25% improvement in profit margins. These gains were attributed to better resource management, enhanced monitoring of poultry health, and optimized feeding schedules. Continuous health monitoring through IoT sensors enabled early disease detection, preventing large-scale outbreaks and reducing associated health-related costs. On Farm E, health costs were reduced by 20%, while overall cost reductions across the other farms ranged from 8% to 15%.

One of the significant benefits of IoT adoption was the reduction in feed waste. By utilizing real-time data, farmers could adjust their feeding practices to better match the nutritional needs of the poultry, resulting in a notable reduction in feed waste. Farm E achieved a 25% reduction in feed waste, while other farms reported reductions between 18% and 22%. This reduction in feed waste helped lower operational costs, improving overall efficiency and directly impacting the profitability of the farms.

Table 2. Productivity, Revenue, Health Cost, Feed Waste, and Profit Margin Improvements

Location	Productivity Increase (%)	Revenue Increase (%)	Health Cost Reduction (%)	Feed Waste Reduction (%)	Total Cost Reduction (%)	Profit Margin Increase (%)
Farm A	28	25	15	20	10	15
Farm B	26	30	18	22	12	18
Farm C	23	27	12	18	9	20
Farm D	24	22	10	19	8	17
Farm E	30	32	20	25	15	25

Source: Primary data analysis (2025)

Integrating deep learning technology also played a key role in optimising farm operations by automating health monitoring and environmental control, reducing the need for manual labour, and minimising human error. The overall improvement in business efficiency was reflected in the increased profit margins, which ranged from 15% to 25% across the farms.

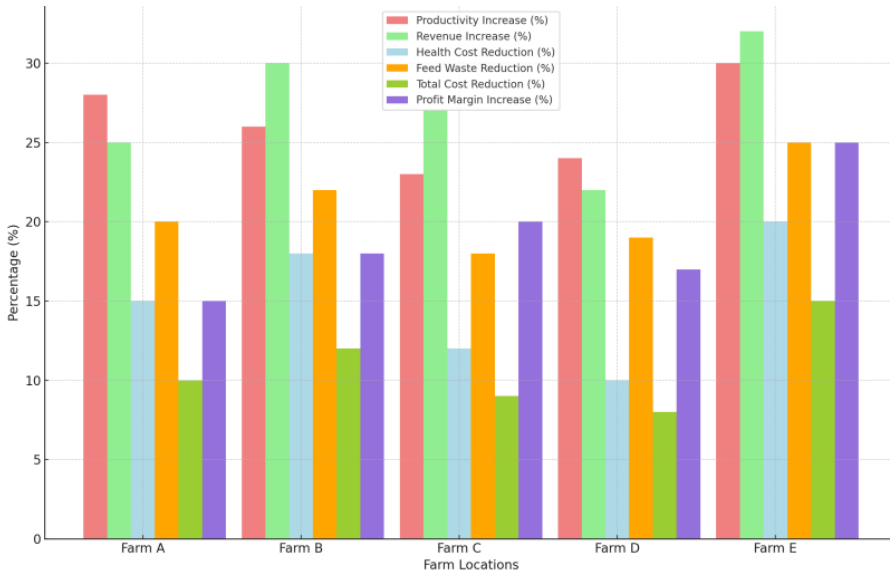

Figure 2. Productivity, Revenue, and Business Efficiency Improvement After IoT Implementation
Source: Primary data analysis (2025)

The results depicted in Figure 2 clearly illustrate the correlation between productivity, revenue, cost reductions, and profit margin improvements. Farm E achieved the highest improvements across all metrics; however, even farms with lower increases in productivity and revenue still saw notable gains in efficiency and profitability. The visual representation of this data reinforces the positive impact of digital technologies on improving operational practices, contributing to enhanced financial sustainability and competitiveness in the broiler chicken sector.

As these technologies continue to evolve, they offer immense potential for further advancements in the broiler chicken industry, allowing farms to produce more efficiently, reduce waste, and improve product quality. Additionally, these technologies help increase investor confidence by providing transparency and real-time insights, making it easier for

farms to secure funding and expand operations. Adopting IoT and deep learning technologies has proven to be a valuable investment for the modern livestock sector, delivering operational and financial benefits that contribute to long-term sustainability and growth.

Implementing IoT and deep learning technologies in broiler chicken farming has had a transformative impact on business operations. These technologies have enabled farmers to reduce costs, improve efficiency, and increase income, contributing to developing a more sustainable and competitive livestock sector. Digitalization has become essential for modernizing the livestock industry, enhancing its economic viability through optimized resource management, improved health monitoring, and the automation of various tasks.

Impact of Digitalization on Investment

A significant productivity improvement, digitalisation has profoundly enhanced the attractiveness of investments in the livestock sector surrounding the Nusantara Capital City (IKN). The adoption of Internet of Things (IoT) and Artificial Intelligence (AI) technologies has transformed the sector by increasing operational transparency and enhancing the predictability of business outcomes. As Zhang et al. (2023) note, the digital transformation of the livestock sector has made it more economically measurable and less risky, thereby boosting investor confidence. By monitoring operations in real-time through IoT systems, investors can track farm performance and make more accurate predictions about returns, which helps reduce uncertainties and facilitates better risk management (Kumar & Singh, 2021; Shukla & Mishra, 2020).

Table 3. Investment Increase and Operational Efficiency After Implementing IoT and AI Technologies

Farm Location	Investment Increase (%)	Productivity Increase (%)	Revenue Increase (%)	Investment Risk Reduction (%)	Type of Investment Partnership
Farm A	18	28	25	20	Joint Venture with Tech Startups
Farm B	25	26	30	22	Collaboration with Local Cooperatives
Farm C	15	23	27	18	Public-Private Partnership
Farm D	20	24	22	17	Direct Investment by Private Investors
Farm E	30	30	32	25	Investment in Technology and Infrastructure

Source: Primary data analysis (2025)

The investments observed in the IKN region highlight this trend, especially in joint ventures between agricultural technology startups and local cooperatives.

These collaborations leverage the technological expertise of startups alongside the distribution networks and local resources of cooperatives, creating a mutually beneficial environment. Such partnerships have facilitated more efficient and sustainable livestock farming systems, crucial drivers for attracting long-term investments (Li et al., 2022; Gupta & Kumar, 2021; Widiarta, 2025). These collaborations demonstrate how digital technologies enhance operational efficiency and act as a catalyst for securing sustainable investment, essential for the sector's long-term growth.

Furthermore, public-private partnerships related to technology investments have become increasingly common. Farms implementing IoT and AI technologies have experienced heightened investor confidence in the sustainability and profitability of their projects. Research by Shukla and Mishra (2020) indicates that digitalization creates favorable conditions for investors by allowing them to more accurately evaluate and monitor enterprise performance. This trust in technology is reflected in the increased investments directed towards livestock farms that adopt digital solutions. Table 3 shows a rise in investment and its direct impact on productivity, revenue, and profit margins.

Implementing IoT and AI technologies enhances operational efficiency and opens new avenues for attracting larger, more sustainable investments. Digitalization directly impacts the attractiveness of the livestock sector to investors by reducing risks, providing greater predictability, and enabling transparent monitoring of operations. In addition to improving productivity and reducing waste, these technologies foster innovative investment collaborations between the private sector and local cooperatives. Therefore, digitalization is a key driver in developing a more sustainable and globally competitive livestock sector.

Social and Economic Implications

Direct benefits of efficiency and productivity, the application of digitalization in the broiler chicken sector of Nusantara Capital City (IKN) has significantly fostered inclusive economic development. By leveraging the Internet of Things (IoT) and deep learning technologies, farmers now have better access to critical information, enhancing their market competitiveness. These technologies facilitate real-time monitoring of poultry health, optimize feed distribution, and improve production outcomes, ultimately increasing farmers' income (Pillai et al., 2020; Rahman & Al-Hasan, 2021). The ability to access more accurate data empowers smallholder farmers to expand their market reach, compete more effectively, and enter both domestic and international markets without compromising product quality (Wang et al., 2022).

Table 4. Impact of Digitalization on Employment and Income of Farmers

Location	Job Increase (%)	Income Increase (%)	Market Access (%)	HR Training and Development (%)
Farm A	20	28	25	22
Farm B	25	30	35	30
Farm C	15	20	22	18
Farm D	18	22	20	20
Farm E	30	32	40	35

Source: Primary data analysis (2025)

Digitalization also creates new job opportunities, particularly in the agricultural technology and livestock development sectors. Integrating IoT devices and deep learning algorithms requires skilled labour to design, operate, and maintain these systems. This has stimulated the growth of a skilled workforce in the agricultural technology sector, strengthening the overall broiler chicken farming industry. Zhao et al. (2023) argue that digital transformation in agriculture and livestock farming significantly creates new job opportunities within livestock farming, data processing, and information technology, all of which support smart agriculture.

Strengthening human resource (HR) capacity is critical to successfully implementing digitalization in the livestock sector. Gupta et al. (2021) found that the success of digitalization largely depends on the workforce's preparedness to adapt to new technologies. Many farmers, particularly older generations, face challenges in adopting new technologies. Structured training programs are essential to equip farmers with the necessary skills to utilize these technologies effectively. According to Soni and Kumar (2020), continuous training and mentoring are necessary to help older farmers, who may not be as familiar with new technologies, adapt to digital farming practices.

Equally important is the development of supporting infrastructure. Stable internet access and efficient data management systems are essential for fully realizing the potential of IoT and deep learning technologies. Without adequate infrastructure, the benefits of these technologies cannot be fully realized. Yadav et al. (2021) suggest that developing supporting infrastructure is a crucial first step in ensuring that digitalization in the livestock sector thrives. Policymakers and relevant institutions must prioritize infrastructure development to ensure that the benefits of digitalization reach all levels of farmers, from large-scale operations to smallholder farmers.

The implementation of IoT and deep learning technologies not only leads to operational efficiency but also significantly accelerates inclusive social and economic development. By providing better access to information, expanding market access, and creating new job opportunities, these technologies help small and medium-sized farmers grow and compete in broader markets. To ensure that the benefits of digitalization are equitably distributed, policies supporting HR capacity building and infrastructure development must be a priority for policymakers and relevant institutions.

CONCLUSIONS

This study shows that integrating IoT and deep learning technologies into broiler chicken farming around Indonesia's New Capital City (IKN) has improved operational efficiency, farm productivity, and farmer income. By using real-time monitoring, predictive analytics, and automated feeding, farmers have reduced costs, minimized feed waste, and enhanced livestock health, leading to higher productivity and profitability. The research highlights a digital farming model that combines innovation with socio-economic development, bridging traditional farming practices with modern technology. This has enabled smallholder farmers to expand market access and make data-driven decisions, enhancing their competitiveness in local and global markets. To ensure long-term success, investing in digital infrastructure and providing training programs to enhance farmers' technological skills is essential. These steps will support the sustainable growth of broiler chicken farming, strengthen Indonesia's agricultural economy, and contribute to rural development.

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