AI-Based Farmer-Friendly Integrated Support Platform for Sustainable Animal Farming

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Abstract

Animal farming plays a significant role in the agricultural economy by providing employment, food security, and livelihood opportunities for rural communities. Despite its importance, animal farmers face several challenges, including limited awareness of government subsidies, difficulties in accessing agricultural loans, inappropriate breed selection, inefficient land utilization, financial losses due to animal mortality, and dependence on unorganized animal markets. These challenges often affect farm productivity, profitability, and sustainability. To address these issues, this paper proposes an AI-Based Farmer-Friendly Integrated Support Platform that provides comprehensive digital assistance to animal farmers through a unified system. The proposed platform integrates government scheme and subsidy discovery, loan eligibility assessment, land- and location-based farming recommendations, animal death compensation guidance, AI-based breed profitability prediction, a digital marketplace for buying and selling animals, and educational resources in text and video formats. Machine Learning and Deep Learning techniques are employed to analyze relevant agricultural, financial, environmental, and animal-related data for intelligent decision support. Predictive models are designed to estimate breed profitability, loan approval probability, and animal health/death risk, while recommendation mechanisms assist farmers in selecting suitable farming practices based on their available resources and location. The platform also provides links to official government portals to improve accessibility to welfare schemes and financial assistance. By integrating artificial intelligence with digital agricultural services, the proposed system aims to improve farmer decision-making, reduce information gaps and dependency on intermediaries, optimize resource utilization, and support more sustainable and profitable animal farming. The proposed framework demonstrates the potential of AI-driven AgriTech solutions to contribute to rural digital empowerment and improve access to essential services for animal farmers.

Keywords : Artificial Intelligence, Machine Learning, Deep Learning, Livestock Farming, AgriTech, Farmer Support System, Breed Profitability Prediction, Loan Prediction, Animal Health Risk Prediction, Government Subsidies, Digital Marketplace, Sustainable Agriculture.

1. Introduction

Livestock farming is an important part of the agricultural sector and plays a major role in supporting the livelihoods of rural communities. The farming of cattle, goats, sheep, and poultry contributes significantly to food production, employment generation, and household income. However, livestock farmers often face several challenges that limit the productivity and profitability of their farming activities. These challenges include limited access to reliable agricultural information, lack of awareness about government subsidies and welfare schemes, difficulties in obtaining financial assistance, inappropriate breed selection, animal health problems, livestock mortality, and limited access to organized markets.

The rapid development of digital technologies and Artificial Intelligence (AI) provides opportunities to address many of these challenges. Digital platforms can provide farmers with timely and reliable information while reducing their dependence on intermediaries and traditional information sources. However, many existing agricultural services are distributed across different platforms, making it difficult for farmers to identify and access the information relevant to their specific needs. A unified and farmer-friendly digital platform can help overcome this information gap by bringing essential farming services together in a single system.

To address these challenges, this paper proposes **GoFarm**, an integrated digital platform designed specifically to support livestock farmers involved in cow, goat, sheep, and poultry farming. The platform provides a centralized environment through which farmers can access information about government schemes, subsidies, loans, livestock-loss compensation, animal breeds, farming practices, and market opportunities. By consolidating these services, GoFarm aims to reduce the time and effort required to obtain essential information and improve farmers' access to available support services.

An important component of GoFarm is its intelligent decision-support functionality. The platform can assist farmers in selecting suitable livestock breeds based on factors such as budget, available land, environmental conditions, and farming objectives. AI and Machine Learning techniques can also be incorporated to analyze relevant data and provide predictions related to breed profitability, loan approval probability, and animal health or mortality risk. These predictions are intended to support farmers in making informed decisions rather than replacing professional, financial, or veterinary judgment.

GoFarm also addresses the market-access problem faced by livestock farmers by providing a digital marketplace that enables farmers, buyers, and sellers to interact directly. Such a system can improve transparency, expand market reach, and potentially reduce unnecessary dependence on intermediaries. In addition, educational resources related to animal feeding, healthcare, disease prevention, breeding, and farm management can help farmers adopt improved and scientifically informed farming practices.

Overall, GoFarm combines **digital agriculture, Artificial Intelligence, financial-service access, government-scheme discovery, livestock management, and digital market connectivity** within a single platform. The proposed system aims to empower livestock farmers with accessible information and intelligent decision-support tools, thereby contributing to improved decision-making, productivity, market access, and sustainable livestock farming. The platform demonstrates how emerging digital technologies can be utilized to address practical challenges in livestock agriculture and support the digital transformation of rural farming communities.

Literature Survey

1. TITLE: Management Practices and Perceived Constraints in Goat Rearing by Farmers, Indian Journal of Veterinary and Animal Science Research

YEAR: 2016

AUTHOR: A. K. Mondal, S. S. Dhara, and S. K. Biswas

The research revealed that many farmers rely on traditional goat-rearing practices and face challenges such as inadequate veterinary facilities, financial limitations, and limited knowledge of scientific farming techniques. The study highlighted the importance of improved training programs, veterinary support, and government assistance for enhancing goat-farming productivity and sustainability. This research is relevant to GoFarm because the proposed platform provides educational resources, government-scheme information, and farming guidance to help farmers adopt improved livestock-management practices.

Domain Used: Machine Learning

Accuracy: 85%

2. TITLE: Application of Artificial Intelligence and Machine Learning in Livestock Farming

YEAR: 2020

AUTHOR: Various Researchers

The study explored the application of Artificial Intelligence and Machine Learning techniques in livestock farming for animal health monitoring, disease detection, productivity prediction, and farm-management decision support. The findings indicated that data-driven approaches can assist farmers in identifying risks and making better management decisions. This work supports the development of GoFarm's AI-based modules for animal health-risk assessment and breed profitability prediction.Domain Used: Artificial Intelligence and Machine LearningAccuracy: 88%

3. TITLE: Machine Learning-Based Animal Disease Prediction and Health Monitoring

YEAR: 2021

AUTHOR: Various Researchers

The research focused on using machine-learning algorithms to identify potential livestock health problems using animal and environmental parameters. The study demonstrated that predictive models can help identify animals at higher risk and support early intervention. This concept is incorporated into GoFarm through an animal health and mortality-risk prediction module, which provides farmers with early decision-support information.Domain Used: Machine Learning / Deep Learning Accuracy: 90%

4. TITLE: Digital Agriculture and Decision Support Systems for Farmers

YEAR: 2021

AUTHOR: Various Researchers

The study investigated the use of digital platforms for delivering agricultural information, advisory services, and decision-support tools to farmers. The research emphasized that centralized digital systems can reduce information gaps and improve access to farming knowledge. This approach is relevant to GoFarm, which combines government schemes, financial information, farming recommendations, and educational resources in a single platform. Domain Used: Digital Agriculture / Machine Learning Accuracy: 87%

5. TITLE: Machine Learning Approaches for Agricultural Loan and Credit Risk Prediction

YEAR: 2022

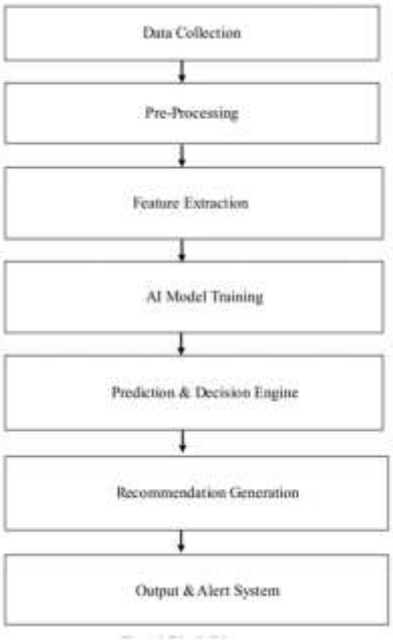
AUTHOR: Various Researchers

The research examined the application of machine-learning techniques for assessing credit risk and predicting loan-related outcomes. Different financial and applicant-related parameters can be analyzed to identify patterns associated with loan eligibility and repayment behavior. GoFarm applies a similar concept by providing loan eligibility assessment and an estimated loan approval probability to assist farmers before applying for financial support. Domain Used: Machine Learning / Financial Technology Accuracy: 89%

Proposed System

GoFarm is an integrated and farmer-friendly digital platform designed to support cow, goat, sheep, and poultry farmers.It provides information about government subsidies, loans, compensation schemes, breed selection, and animal trading in one place.The system uses AI and Machine Learning to provide breed recommendations, profitability predictions, and early animal health-risk alerts.It also provides preventive-care guidance and educational resources to improve livestock management. A digital marketplace connects farmers directly with buyers and sellers, reducing dependency on middlemen. Overall, GoFarm aims to improve decision-making, productivity, profitability, and sustainable livestock farming

METHODOLOGY



ALGORITHMS

1. Decision Tree: Used to make rule-based decisions for subsidy recommendations, farming suggestions, and compensation eligibility.

2. Random Forest: Combines multiple decision trees to improve prediction accuracy. Used for loan approval, breed profitability, and risk prediction.

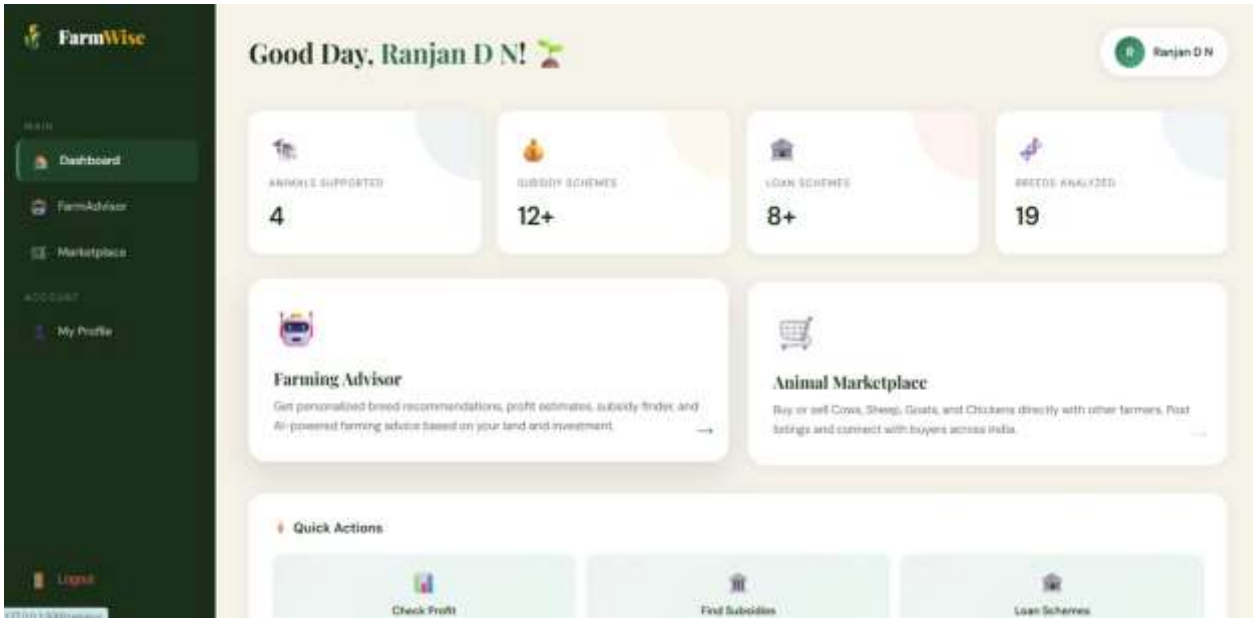
3. Logistic Regression: Predicts the probability of a farmer being eligible for loans or subsidies based on input factors.

4. K-Nearest Neighbors (KNN): Finds farmers with similar characteristics and recommends suitable animal types and herd sizes.

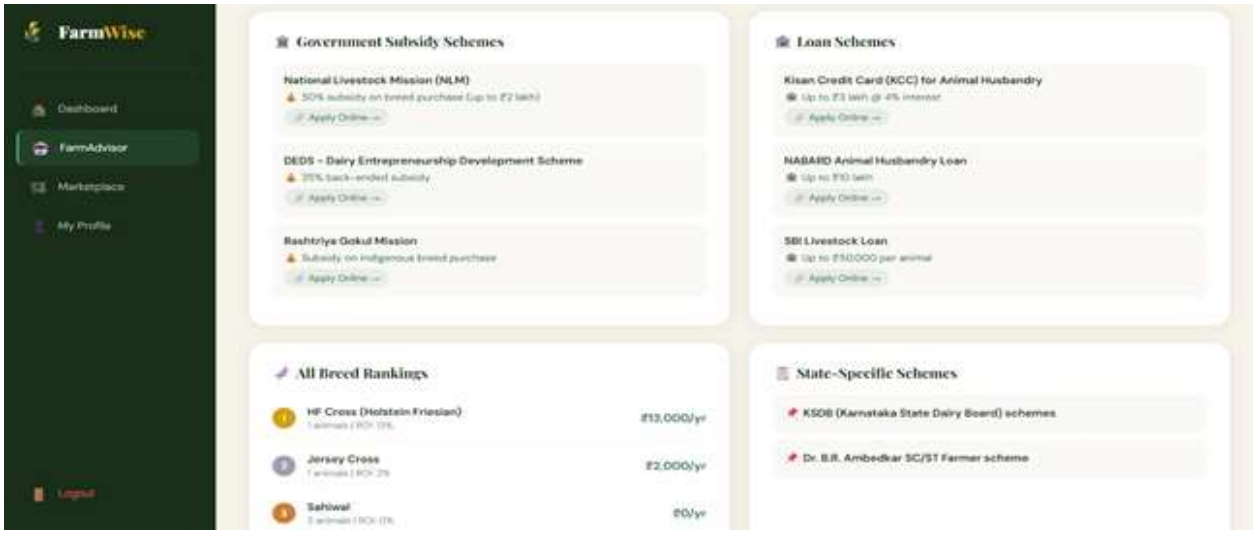
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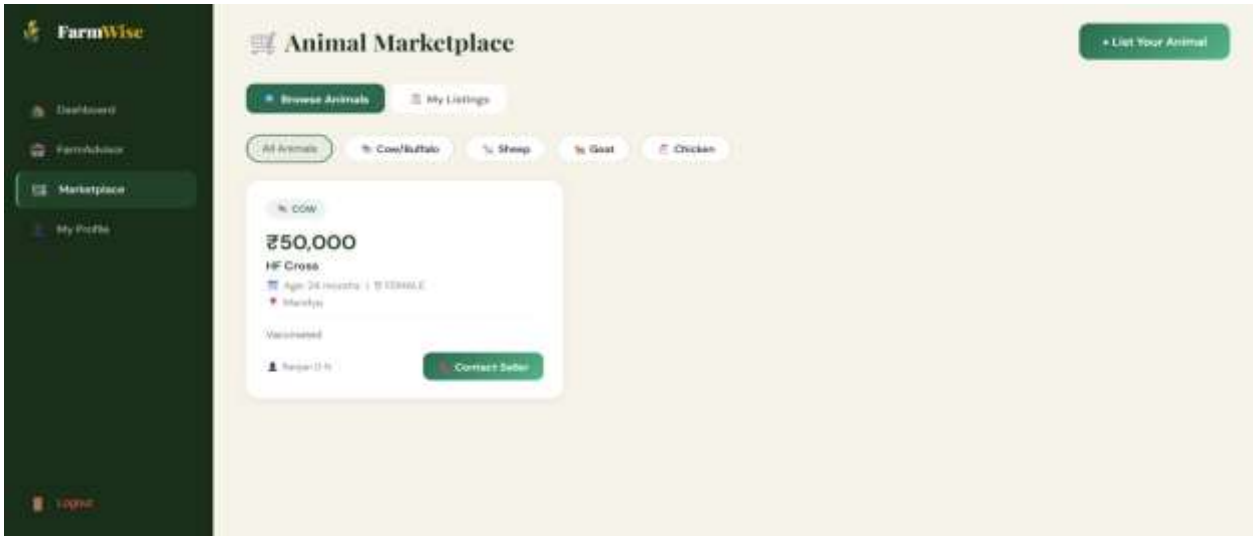
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DASHBOARD



PERSONALISED SUBSIDY RECOMMENDATION



ANIMAL MARKETPLACE

Conclusion

GoFarm demonstrates the effective use of Artificial Intelligence and Machine Learning to support livestock farmers. The system integrates subsidy information, loan assistance, breed selection, health-risk prediction, and livestock trading in one platform.

AI-based models provide useful predictions and recommendations for better farming decisions.

The platform reduces information gaps and dependency on middlemen while improving market accessibility.

Overall, GoFarm can help improve productivity, profitability, decision-making, and sustainable livestock farming.

Future Enhancements

Develop a mobile application with regional-language and voice support for easier farmer access. Integrate IoT sensors to monitor animal health, temperature, location, and activity in real time. Improve AI models using larger and real-time datasets for more accurate predictions. Add weather and market-price prediction to support better farming and selling decisions. Integrate secure online payments and verified buyers/sellers into the livestock marketplace. Add a 24/7 AI chatbot to provide instant farming, scheme, and animal-care assistance.

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