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# AI-Powered Agricultural Land Verification and Loan Provision System

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**ABSTRACT:**

Agriculture is a cornerstone of the economy, especially in developing regions. Despite its importance, challenges such as fraudulent land claims and limited access to financial aid hinder the sector's growth. This project proposes an AI-driven system aimed at automating land verification and facilitating loan approvals. By utilizing AI, machine learning, and geospatial technologies, the system can authenticate land ownership and analyze productivity, offering a reliable solution for both farmers and financial institutions.

## Introduction

The digital transformation in banking has made online loan applications increasingly popular. Artificial Intelligence (AI) has become instrumental in managing vast amounts of financial data. However, loan approvals remain complex, especially for banks that deal with numerous applicants daily. Errors in assessing credibility can lead to financial losses. This project addresses these issues using AI models that can predict eligibility more effectively while also ensuring proper land ownership validation for agricultural applicants.

### *1.1 Challenges in Existing Systems*

Manual land verification is time-consuming and often inaccurate, particularly in rural areas where documentation may be outdated. Financial institutions also struggle with legacy systems that lack the capacity to analyze socio-economic factors, resulting in poor credit assessments.

## Literature Review

A study titled "Prediction for Loan Approval using Machine Learning Algorithm" explored predictive analytics for identifying potential defaulters. It used techniques like data collection, cleaning, and model evaluation, concluding that the Naive Bayes algorithm delivered better performance in predicting loan defaults than other methods.

## System Modules

- User Authentication
- Data Collection and Preparation
- Model Selection and Training
- Accuracy Evaluation
- Model Deployment

A dataset with 511 entries was used, covering fields like gender, marital status, income, credit history, and loan status. This helped build a model capable of predicting loan approval outcomes.

## Implementation

The system integrates satellite data, GIS mapping, and drone imaging to verify land details and assess its productivity. AI models analyze credit history and agricultural data to estimate financial risk and loan eligibility. Blockchain ensures data integrity, while smart contracts automate the approval process. Moreover, AI tools monitor soil quality and crop health, supporting sustainable agriculture.

## Key Features

***1. Land Verification***

- Uses satellite imagery and GIS data for accurate mapping.
- Confirms boundaries, coordinates, and crop types.

***2. Loan Assessment***

- Evaluates creditworthiness and risk based on past performance and environmental conditions.

***3. Soil & Crop Monitoring***

- Assesses crop health using image data.
- Predicts soil quality and suggests best practices.

***4. Loan Automation***

- Reduces manual processing by automating decisions based on real-time inputs.

***5. User-Friendly Interface***

- Farmers can easily input land information and upload documents.
- Banks access real-time data for faster decision-making.

## Future Scope

Further research could explore other machine learning models to enhance prediction accuracy and optimize loan eligibility assessments.

## Testing Methods

- Unit Testing: Validates internal logic and expected outputs.
- Integration Testing: Checks combined modules for proper communication.
- System Testing: Ensures the full application performs as intended.
- White Box Testing: Inspects the internal structure and logic of the code.

## Conclusion

This project successfully demonstrates the use of AI in streamlining agricultural loan approvals. Using Support Vector Machine (SVM), the model achieved a training accuracy of 80% and testing accuracy of 82%. While effective, further enhancements using alternative machine learning algorithms may offer even better results in diverse scenarios.