Innovative and Transformative Smart Farming using Artificial Intelligence,

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The "Innovative and Transformative Smart Farming using Artificial Intelligence" project, developed by Indira Gandhi Krishi Vishvidhalya, is a ground-breaking initiative that empowers farmers in Chhattisgarh and throughout India. This farmer-centric service leverages cutting-edge technologies, including AI-based pest and disease identification, weather forecasting, farming advisories, and expert guidance. With over 7,58,897 registered farmers benefiting from the app, it has significantly improved agricultural practices and productivity. Notably, the app integrates with the Government of Chhattisgarh's land record database, offering personalized insights and tailored recommendations based on individual farmers' land records. This integration enhances the precision and effectiveness of agricultural support, addressing the specific needs of each farmer. "**Crop Doctor 2.0**" is not only a tool for pest identification and weather forecasting but also offers a comprehensive view of farmers' land holdings and historical data. This holistic approach empowers farmers to make informed decisions, optimize resource allocation, and embrace sustainable agricultural practices.

Research Methodology:

The research methodology for the project began with a comprehensive baseline study from Krishi Vigyan Kendras, which provided insights into existing challenges in the agricultural sector. This study analyzed farming practices, market access, knowledge dissemination, and technology adoption. Stakeholder consultations were actively conducted, involving farmers, experts, policymakers, and industry representatives. These sessions gathered valuable feedback and helped align research objectives with farmers' actual needs. Based on these findings, a problem statement was formulated, defining specific challenges to be addressed. Sampling ensured representative data collection, encompassing various regions, crops, farm sizes, and socio-economic backgrounds. Hypotheses were developed to guide research questions, leading to the development of the "Crop Doctor 2.0" app and other citizen-centric services, deploying research findings to benefit the agricultural community

Salient Features:

- Innovative "Crop Doctor 2.0" App: The project introduces the ground-breaking "Crop Doctor 2.0" app, incorporating Industry 4.0 principles into agriculture. This app utilizes cutting-edge technologies like artificial intelligence, machine learning, and data analytics.
- AI-powered pest and Disease Identification: The app enhances agricultural productivity by employing AI for precise pest and disease identification. This technology equips farmers with a tool to promptly and accurately detect crop issues.
- Empowering Farmers with AI Insights: Leveraging AI algorithms, the app delivers block-level weather forecasts and crop-specific farming advisories. This empowers farmers with data-driven insights to make informed decisions.
- Disrupting Market Access: The project promotes fair trade by establishing a direct marketing platform for small and marginal farmers. AI-driven platforms connect farmers directly with potential buyers, eliminating middlemen and enhancing market access.
- AI-Enabled Farm Mechanization: Simplifying farm machinery rental and lending processes, the project employs AI to support a custom hiring system.

Impact:

Improved Crop Management: Farmers have experienced reduced crop losses and enhanced overall crop management thanks to the AI-based pest and disease identification feature. This timely identification and mitigation of crop issues have been instrumental in improving agricultural outcomes.

Enhanced Decision-making: The provision of block-level weather forecasts and crop-specific advisories has empowered farmers to make informed decisions regarding irrigation, fertilization, and pest management. This has translated into improved yields and efficient resource utilization.

Better Market Access: Farmers have benefited from the e-haat application, which has enabled them to establish direct connections with potential

buyers. This has led to higher prices for their produce, eliminated middlemen, and fostered a more transparent and equitable marketplace.

Cost Savings and Efficiency: The custom hiring system for farm machinery has lightened the financial burden on farmers and granted them access to machinery as needed. This has resulted in cost savings, increased operational efficiency, and improved farm practices.

Expert Guidance: Farmers have found value in the expert guidance provided by the project. This guidance has equipped them with the knowledge and confidence to address farming challenges, adopt best practices, and ultimately enhance their farming endeavours.

Beneficiaries:

Approximately 7,58,897 registered users of Chhattisgarh and other states of India include Farmers, Agriculture Officers, Scientists, Students, Women farmers and entrepreneurs, input dealers and landless labourers. App downloaded in 175 countries and all States of India. Nearly 3.7 million farmers of the state is about to integrate