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Revolutionizing Agriculture with the Smart Farming Mobile App

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Extended Abstract

Introduction: The agricultural sector is critical to Bangladesh's economy, but productivity is still low due to low adoption of technology especially digital technology [1]. To address this, the Smart Farming Mobile App was developed with technical support from Japanese University and industry experts in Bangladesh. With over 130 million mobile users in Bangladesh [2], the app aims to bridge the gap between traditional farming and digital technology, enhancing productivity, profitability, and sustainability while contributing to food security and poverty reduction.

Research Achievements: The app is built upon research into digital agricultural solutions, focusing on practical, user-friendly tools that farmers can easily integrate into their daily practices [3]. These efforts have shaped a platform tailored to the specific challenges of local farmers in Bangladesh and connected them with best practices in Bangladesh and across similar contexts.

Features of the App: The app offers a comprehensive solution for farmers, including:

1. **Expert Consultation & Training:** Farmers can consult agricultural experts through the app to receive real-time advice on crop management, pest control, soil health, seed beading and modern farming techniques. It provides farmers with market price updates and disease outbreak alerts. The app offers online training modules, one-on-one video consultations, and opportunities for peer-to-peer learning through forums and discussion groups, allowing farmers to upgrade their skills. It also supports sharing crop photos to get expert diagnosis.
2. **Marketplace for Products and Equipment:** The app enables farmers to list their agricultural products and machinery for sale or rent. This digital marketplace removes intermediaries, allowing farmers to earn higher profits and have better control over their sales. It provides safe payment options, networking opportunities to connect with

other farmers, buyers, and industry professionals, and scope to expand product categories.

3. **Investment Opportunities & Contract Farming:** The app facilitates connections between farmers seeking funding and investors interested in agricultural projects, including contract farming agreements. This feature enables individuals who are passionate about agriculture but lack the means to participate physically to invest in farming initiatives. This creates a win-win scenario for both parties, as investors can benefit from guaranteed returns, risk mitigation, and the opportunity to support ethically compliant and sustainable farming practices.

Impact on Farmers and Consumers: The Smart Farming Mobile App aims to transform the agricultural value chain by offering significant benefits to both farmers and consumers:

- **Increased Income for Farmers:** By using the app to sell their products directly to consumers, farmers can eliminate middlemen and retain a larger share of the profit. For instance, a product typically sold for BDT 40 by the farmer can reach the market at BDT 200. Using the app, farmers can sell directly to consumers at a price range of BDT 80-100, benefiting both farmers and buyers.
- **Cost Savings for Consumers:** Consumers benefit from lower prices by purchasing products directly from farmers through the app. This direct connection also promotes transparency, fostering trust between buyers and producers.
- **Survey Funding:** After the pilot phase of the app, a survey conducted among the farmers revealed that 99% of them were highly enthusiastic about using the app.

Solutions to Challenges in Bangladesh: The app addresses critical challenges in the Bangladeshi agricultural sector, such as market access, lack of investment opportunities, and limited technical knowledge. By providing a digital marketplace and training modules, the app helps farmers overcome these barriers, enabling them to adopt modern practices and connect with a wider market. The collaboration with Japanese University has further strengthened efforts to introduce innovative farming methods and technology in rural Bangladesh.

Pilot Phase Success: The app has been piloted in three rural sub-districts of Bangladesh, with positive feedback from farmers. The “total solution” nature of the app has made it popular among early adopters, highlighting its potential to drive broader adoption.

Challenges and Opportunities: While the app presents numerous advantages, several challenges remain:

- **Cost of Technology and Smartphone Adoption:** Many farmers lack smartphones, often relying on family members for access. The initial investment required for smartphones, data plans, and other necessary tools may be a barrier for small-scale farmers with limited financial resources.
- **Device Compatibility:** Ensuring the app works seamlessly across different types of smartphones, including older and low-cost models, is crucial to avoid limiting its

accessibility. Expanding smartphone use and collaborating with government initiatives can help overcome these challenges.

- **Connectivity Issues:** In some remote areas, reliable internet access remains a challenge, which can limit the functionality of the app.
- **Digital Literacy:** Efforts are needed to improve familiarity with digital tools.

Future Prospects: The app aims to expand to all regions of Bangladesh by 2025, with plans to adapt it for other developing countries. Future updates will integrate AI and IoT, offering enhanced resource management and predictive analytics, turning the app into an intelligent farming assistant.

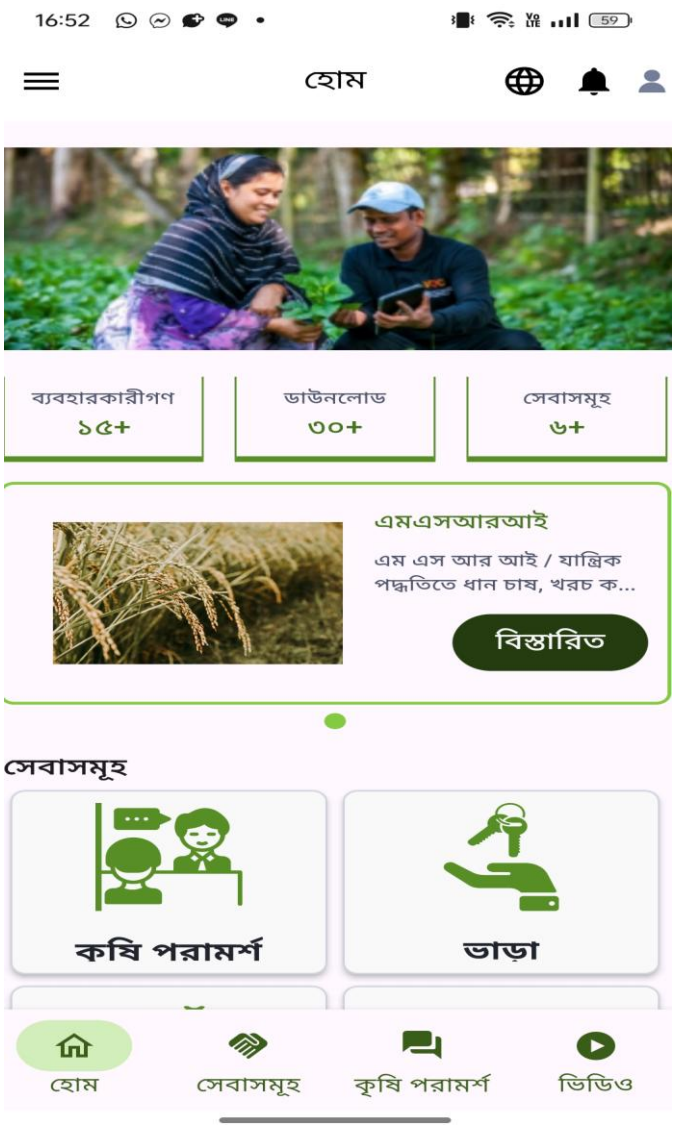

Figure 1: An instance of the smart farming mobile app.
[Available at https://play.google.com/store/apps/details?id=com.nexkraft.oriscape]

Conclusion: The Smart Farming Mobile App is a transformative tool for the agricultural sector in Bangladesh. It empowers farmers with access to expertise, direct sales channels, and investment opportunities, making agriculture more profitable and sustainable. This initiative modernizes farming and lays the foundation for a digitally connected agricultural future.

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