AGROTRACK, One App for All Your Farming Needs

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ABSTRACT:

Technology has transformed farming, and new online platforms have played a key role in connecting farmers directly to mid-level consumers. The platform allows farmers to sell their fresh products, such as fruits and vegetables and other agricultural goods to customers and other stakeholders through personalized information, such as product details, price, and description. In addition to direct sales, the platform provides useful tools such as crop planting recommendations and weather forecasts during the decision-making period to help farmers improve their crops. Farmers can obtain small loans to support their growth and development. The platform's agrotrack service ensures the safety and efficiency of products, thereby creating a better experience for farmers and consumers. The platform promotes a more transparent, efficient, and environmentally friendly agricultural ecosystem by shortening the food chain, promoting sustainability**,** and providing farmers with assistance.

Keywords: Agricultural Technology, Sustainability, Farmer-Consumer Connectivity, Direct Sales, Digital Platforms, Supply Chain Efficiency.

INTRODUCTION:

Agriculture is very important in India, which is one of the largest producers of wheat, rice, fruits, vegetables, milk, and pulses [1]. Despite growth in agriculture, many farmers are still disadvantaged and struggling with poverty, often facing difficulties in accessing fair trade, quality products, and proper support. Agricultural products sold in local markets are often of poor quality because of improper storage and transportation, which affects both farmers and consumers. To solve these problems, AgroTrack could be established to change the face of agriculture. These platforms connect farmers directly to consumers, providing a simple, transparent, and efficient business environment in which farmers can sell fresh and quality products without middlemen. AgroTrack provides smart farming tools specifically for e-commerce, crop recommendations, weather forecasting, pest management, business insights, and more to help farmers make decisions and increase their profits [2]. These platforms support agri-environmental and sustainable ecosystems by shortening the food chain and facilitating direct trade between farmers and consumers.

LITERATURE REVIEW:

With the application of technology, farming has shifted from many processes, and online websites have a significant role in modernizing and exporting agricultural products. AgroTrack connects farmers directly to consumers, eliminates middlemen, and ensures fair trade, increasing the financial stability of agriculture [3]. It offers farmers access to wider markets and builds the latter's trust by providing detailed information on the offered products, transparent pricing, and personal profiles. AgroTrack further helps farmers make crucial decisions in their farming seasons by offering updates on technology, weather, and crop advisories [4]. it also guides farmers in effective ways of managing pest management. Financial services, including finance assistance, that help farmers meet and conquer the many challenges they face in pursuit of sustainable growth. Platforms such as AgroTrack have played an important role in shaping a transparent, efficient, and responsible digital economy that benefits farming communities and the environment, with support for farmers, quality of produce, and nutritious food demands.

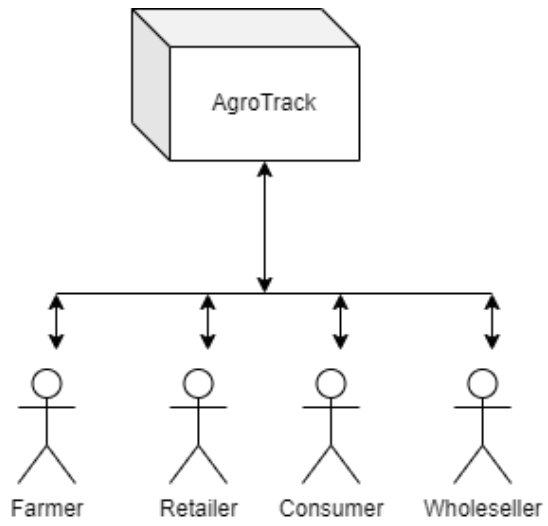

Fig 1 : Main Users of Agrotrack

PROBLEM STATEMENT:

Despite advancements in technology and husbandry, numerous being platforms primarily concentrate on consumers, frequently neglecting the specific requirements of growers. Current operations constantly suffer from usability issues, similar as a lack of stoner-friendly interfaces, patient bugs, and limited functionality acclimatized to growers. likewise, utmost platforms fail to give sufficient information on request trends, crop recommendations, or effective grievance redressal mechanisms, leaving growers without the necessary tools to make informed opinions. growers frequently fall victim to illegal practices due to the involvement of interposers, which reduce their share of gains and produce inefficiencies in the force chain. There's a pressing need for a platform that prioritizes growers by icing access to real-time data, similar as crop prices, rainfall updates, and pest operation results [5], while also easing direct relations with consumers and suppliers. AgroTrack aims to address these gaps by offering an innovative, digital-first approach to agrarian marketing. The platform emphasizes translucency, effectiveness, and ease of use, helping growers increase their profitability and access coffers more effectively. A comprehensive result like AgroTrack is essential to empower growers and contemporize agrarian practices, fostering a more indifferent and sustainable husbandry ecosystem.

METHODOLOGY:

AgroTrack addresses this challenge through making sure the platform is user friendly, and this takes into consideration the business models in place for farmers and other users of the system. This allows for

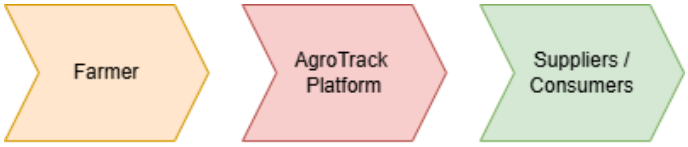

Fig 3 : Supply Chain of AgroTrack

proper usability and ensures that end-users from all walks of life can access essential information. Additionally, AgroTrack also makes tractor rental and provision of agricultural tools to farmers which helps the farmers make the most out of their input.

It comprises the following:

It is intended to be more interactive for navigation across different kinds of products, crop data, and weather conditions. It also has integrations to APIs for external services suppliers and delivery providers that enables complex relationships with farmers and customers. Strategies employed to identify and join multiple users make communication efficient and timely. [6] Also, with AgroTrack, crop recommendation which is environmentally sound, and also weather analysis that aids the farmers in their decisions are present.

Crop Recommendations: Crop yield, along with the random forest machine learning model, helps the app track information, such as rainfall, temperature measurement, and other key pieces of information and trends. They consider optimizing the decisions.

Optimization: Perishable products must be appropriately distributed. In this respect, farm commodities are taken directly to the customer by finding algorithms in commodity transportation, such as the Dijkstra algorithm, which reduces delays and improves quality [7]. Consequently, it is just and sustainable to use agricultural commodities and historical data to estimate payback when using financial services. Protects the personal business information of users.

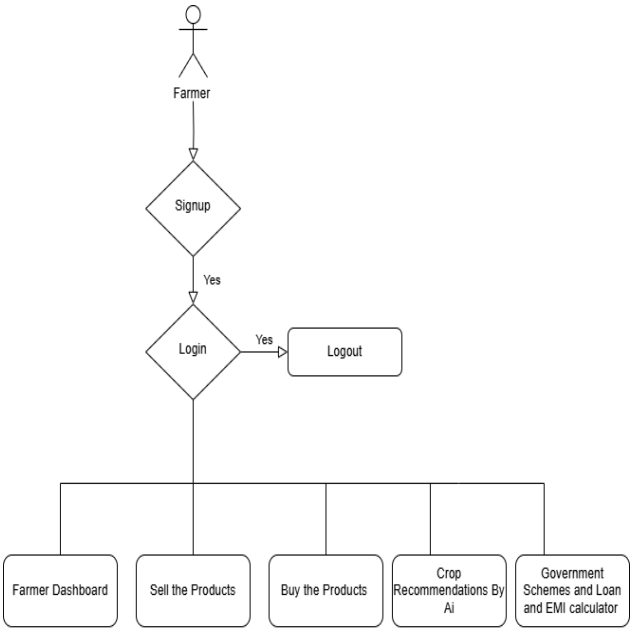

Fig 2 : Flowchart of how the Farmer uses the AgroTrack

RELATED WORK:

Several mobile and web applications have been developed to support farmers by providing access to agricultural information and market connections. However, most of these platforms still rely on intermediaries, limiting their potential to facilitate direct interactions between farmers and consumers. Below is a summary of the most relevant platforms in this domain:

Iffco Kisan App (2015): Developed by Star Global Resources and Bharti Airtel, the Iffco Kisan App serves as a comprehensive platform offering farmers a wide range of information, including crop advice, weather updates, and market prices. Despite its goal of helping farmers make informed decisions, the app has faced performance challenges, such as slow loading times, errors, and reliance on intermediaries for certain market interactions [8].

Krishi Network (2018): The Krishi Network connects farmers to agricultural experts and marketplaces, offering crop advisory services, weather forecasts, and pest management information. While it aims to enhance farming productivity, the app is criticized for its lack of optimization, occasional slow performance, and difficulties in accessing some features, limiting its usability for farmers in rural areas [9].

AgriApp (2014): AgriApp is a mobile application designed to provide farmers with information about crop production, protection, and best practices for smart farming. It also serves as a marketplace for farmers to connect with suppliers. However, the app struggles with login issues, delayed page loading times, and the presence of intrusive ads, which negatively impact the user experience [10].

Farmers Livestock India (2020): This platform focuses on helping farmers make informed decisions by providing tailored agricultural content. It aims to support small-scale farming and reduce reliance on middlemen. However, issues like visibility problems with market rates, bugs, and fake contact information undermine its reliability and effectiveness for farmers seeking real-time data [11].

REACH - India Farmer App (2019): Created by ADAMA, REACH is designed to offer farmers a wide range of information related to crop production, protection, and the latest agricultural practices. It also functions as a marketplace for agricultural products. Despite its diverse features, the app faces challenges such as bugs and an overload of advertisements, which hinder its overall usability [12].

RESULTS:

The AgroTrack platform shows great pledge in transubstantiating husbandry by easing direct connections between growers and consumers, perfecting the effectiveness of transportation, and offering real- time data to guide better decision- timber. The platform farther aids growers by furnishing accurate rainfall vaticinations, helping them to plan conditioning similar as planting and harvesting more effectively [13]. This enables growers to secure necessary capital in a way that's both sustainable and fair. By removing interposers, AgroTrack helps insure that growers admit a fairer price for their products, which in turn supports profitable stability and promotes translucency. The platform also contributes to sustainability by reducing food waste and loss while encouraging environmentally responsible farming practices. However, challenges remain, such as occasional delays in areas with poor internet access. To address this, AgroTrack plans to incorporate offline capabilities to ensure broader accessibility. In summary, AgroTrack not only empowers farmers but also promotes sustainable agriculture, enhancing the overall confidence and productivity of its users.

DISCUSSION:

The results of this research demonstrate the development of AgroTrack in modern agriculture and solve long-standing problems facing in agricultural fields. Connections between farmers and consumers through AgroTrack reduce dependency on middlemen, reduce costs, and establish trust through transparent businesses [14]. Earlier research has proven the benefits of eliminating middlemen to increase farmers' profit and consumers' access to new products. In general, there

has been an improvement in communication between farmers and buyers, and changes are now faster and more efficient. Technological integration is consistent with the research importance of innovation in promoting direct and efficient agribusiness. The platform boosts productivity by giving farmers the best crops to plants under specific conditions and enhances the decision-making abilities of farmers, thus supporting knowledge on the role of technology in today's agriculture. It is essential to guide farmers on how to plan their critical activities, such as planting and harvesting, appropriately. As these tools reduce uncertainty, they provide a basis for effective farming and help increase yields. Together, these resources make AgroTrack an effective solution that provides insight to farmers regarding practical improvements [15]. AgroTrack's financial services through predictive analytics improve access to credit and support sustainable lending for agricultural growth. These findings are in line with previous studies that identified digital platforms as having an interest in accounting and agriculture. In general, an upgrade of AgroTrack's offline abilities will enhance its performance in places far from towns. In addition, the platform can enhance both transparency and sustainability in its operations, but the processing is entirely reliant on digital processes, and hence cannot be expanded to other areas with limited technology. AgroTrack can be used in sustainable and profitable agriculture. Future research avenues include solutions that work in collaboration with one another offline, improving methods for short-term forecasting models, including weather and crop analysis, and offering to expand the platform with more farming. Further, studying AgroTrack's long-term economic impact on agricultural communities would provide a better understanding of how it developed into a fully transparent foodecosystem. The results indicated that this platform represents a model for future agricultural initiatives worldwide.

CONCLUSION:

The AgroTrack platform demonstrates a transformative approach to modernizing agriculture by bridging the gap between farmers and consumers. By leveraging technology, AgroTrack empowers farmers to access real-time information, sell their produce without intermediaries, and make informed decisions based on accurate weather forecasts and market trends [16]. This user-friendly application not only enhances productivity but also contributes to the economic well-being of farmers by reducing inefficiencies in the agricultural supply chain. AgroTrack’s ability to integrate advanced algorithms ensures optimal resource utilization, while its emphasis on sustainability aligns with global goals to minimize food waste and support environmentally friendly practices. The platform serves as a robust foundation for future enhancements, including the integration of AI and machine learning to provide predictive insights and further streamline agricultural operations. As the platform continues to evolve, incorporating offline functionality and advanced data management methods, AgroTrack is more than a tool; it is a step towards a transparent, efficient, and sustainable agricultural ecosystem that empowers farmers and meets the growing demands of the population.

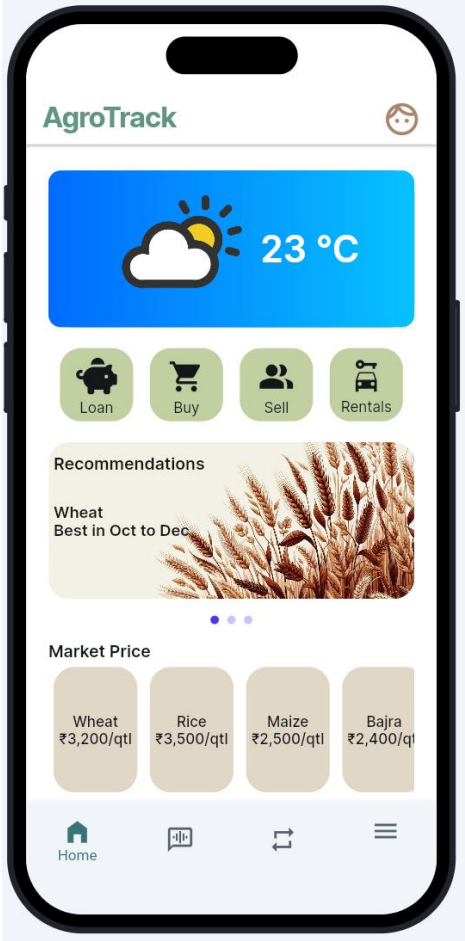

Fig 4: AgroTrack Home

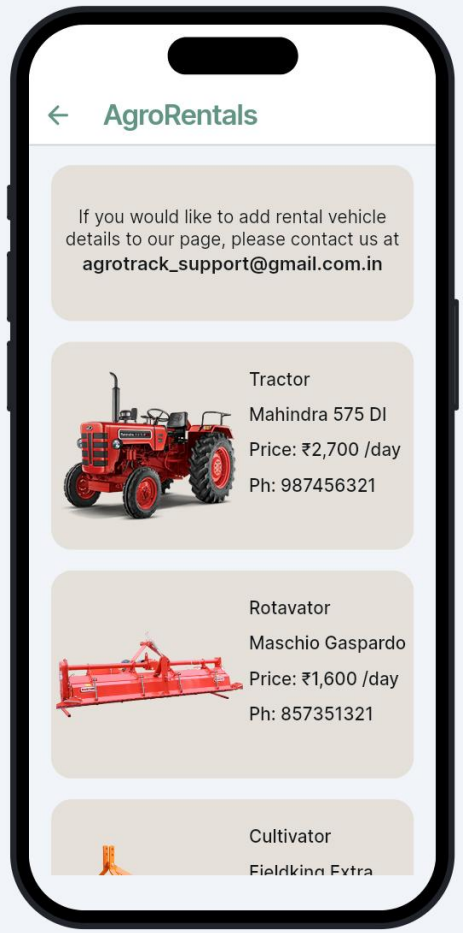

Fig 5: Rentals Page

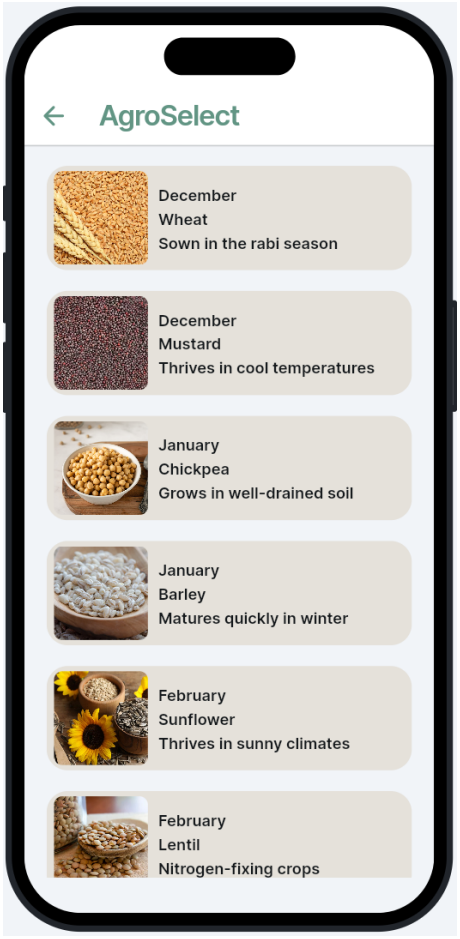

Fig 6: Crop Recommendation Page

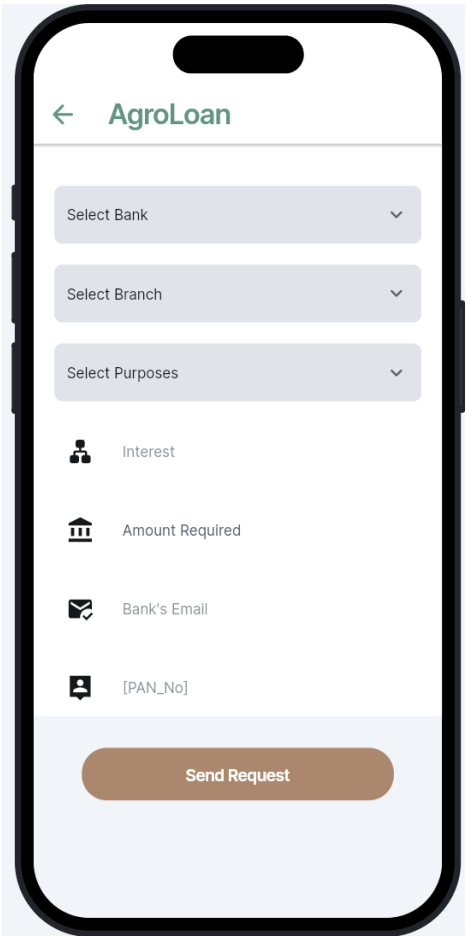

Fig 7: Loan Page

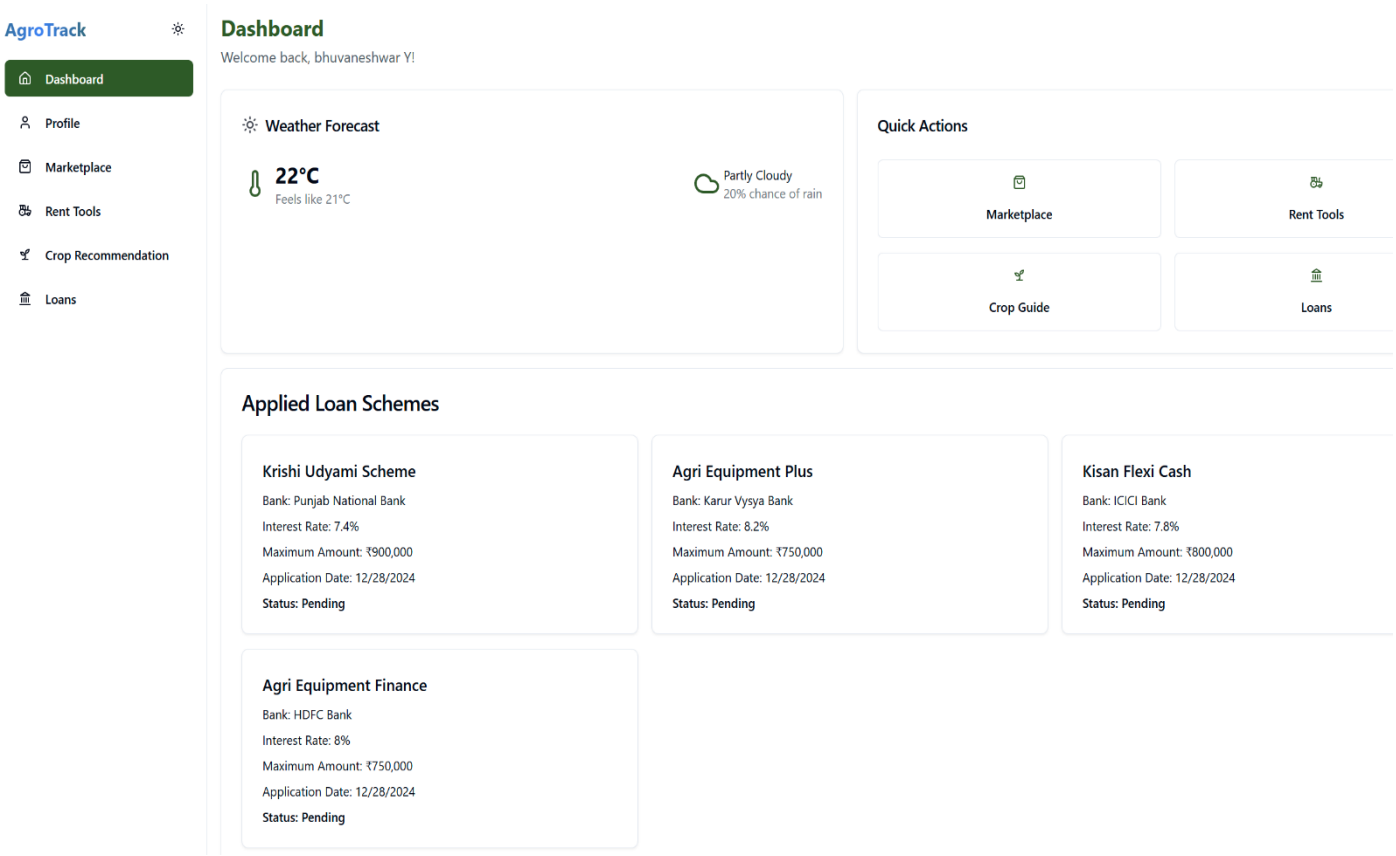

Fig 8: Dashboard of AgroTrack

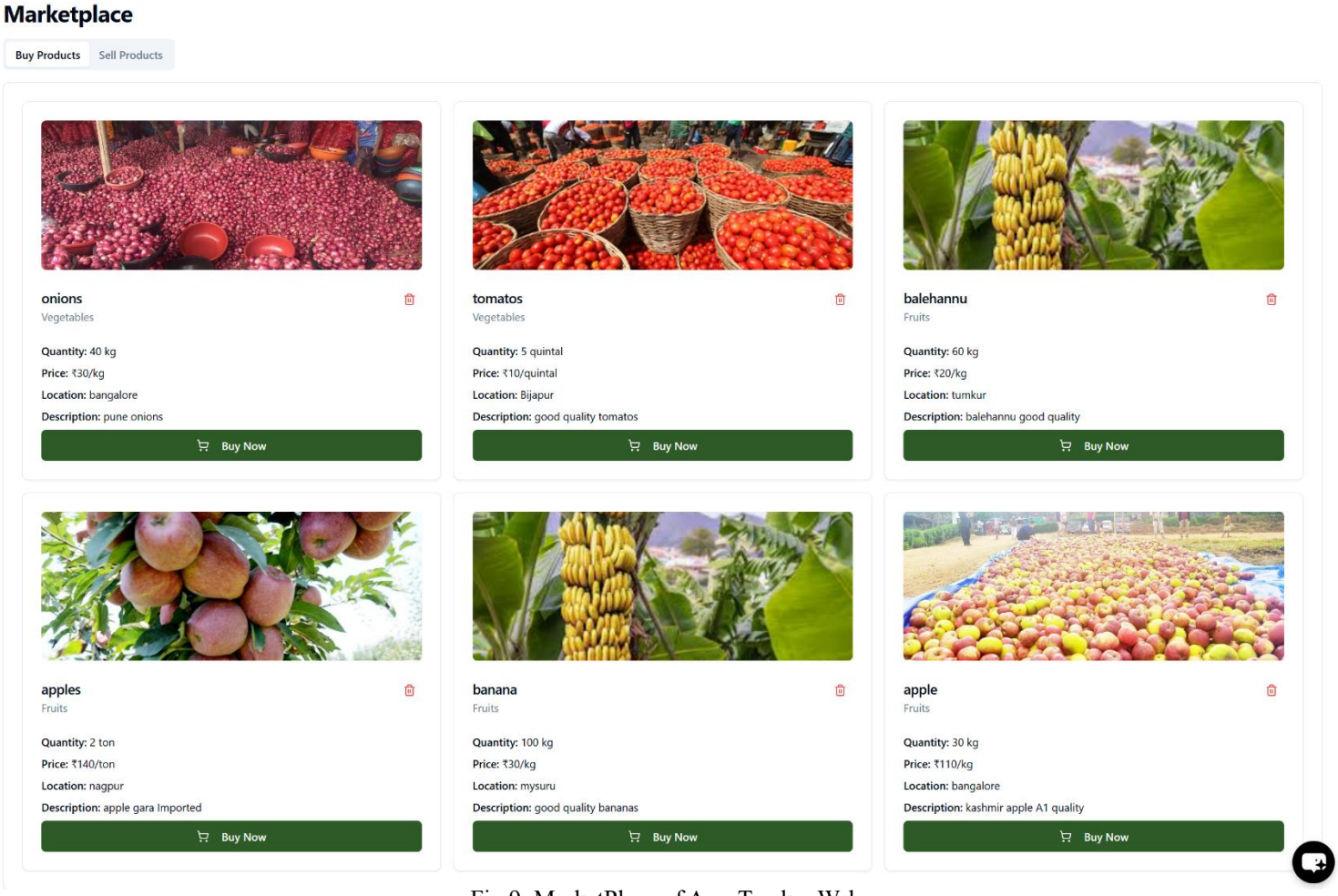

Fig 9: MarketPlace of AgroTrack – Web

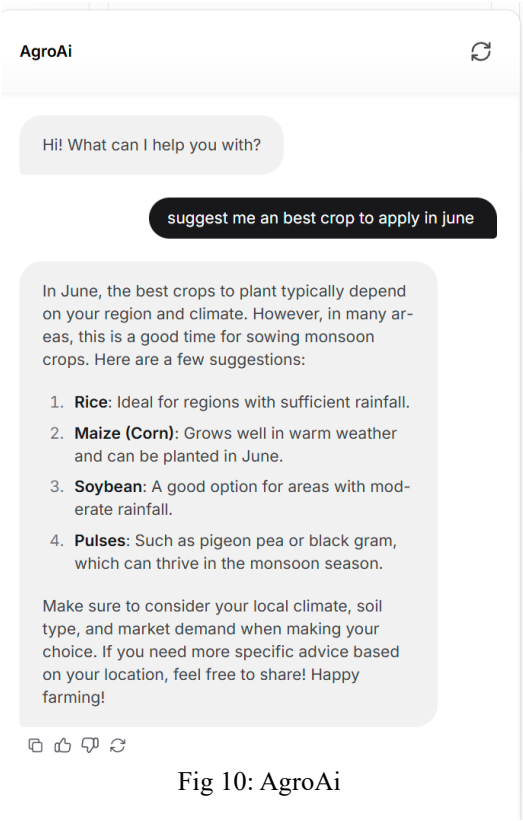

Fig 10: AgroAi

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