

**PROJECT TITLE :**

*LEVERAGING THE YIELDS AND INCOME OF FARMERS IN PLNTATION  
AGRICULTURE THROUGH AUTOMATED TECHNOLOGY.*

**PROJECT TEAM NAME :**

*BEING LEGENDS.*

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## Executive Summary

In this report, I will be explaining a depth analysis of how farmer can increase his yield of plantation agriculture and earn profit. I will elaborating the deep analysis of how technology can be fruitful to the northeastern states of India. Later, I will give recommendations based on the opportunities and strategies using advancement in automated technologies.

Last but the not least, I will talk about their positioning in the market and to meet up to market needs. Overall, this report will give ideas that can help farmers to yield more in any parts of India and also one farmer can drastically increase his profit. The analysis will definitely help in to study one can dare to perform specific type of farming in certain area.

The deep analysis can be weapon in farming technology in north eastern parts of india. This weapon can bring the revolution in agriculture technology and will be new way for future of agriculture.



## Introduction:

The agriculture in north east India is mainly comprised of farms of tea and coffee as it can be cultivated on hilly terrain as it is most prominent available in that geographical locations.

### **Traditional Techniques of Agriculture in North East Regions for Tea:**

Tea cultivation in the North East often involves a practice known as agroforestry, where tea plants are grown under shade trees. This method provides shade to the tea bushes, helps maintain soil moisture, and creates a favorable microclimate for tea cultivation.

Due to the hilly terrain in the North East, tea cultivation is often done on terraced slopes. Terraces help prevent soil erosion, control water runoff, and provide a suitable platform for planting and harvesting tea.

Traditional tea cultivation in the North East often follows organic farming practices. Farmers rely on natural fertilizers, compost, and organic pest control methods to ensure the sustainability and quality of their tea crops.

Tea leaves in the North East are primarily harvested by hand. This labor-intensive method ensures that only the youngest and most tender leaves are plucked, resulting in high-quality tea.

### **Traditional Techniques of Agriculture in North East Regions for Coffee:**

Coffee cultivation in the North East also utilizes the practice of shade-grown coffee, where coffee plants are grown under the canopy of larger shade trees. This method provides protection from excessive sunlight, maintains soil moisture, and promotes biodiversity.

Farmers in the North East often practice intercropping by growing coffee alongside other crops such as spices, fruits, or vegetables. This diversification helps optimize land use, provides additional income sources, and enhances the overall agroecosystem.

Traditional coffee farming in the North East relies on natural methods of pest control, including companion planting, trap crops, and biological control agents, to manage pests and diseases without the excessive use of chemical pesticides.

After coffee cherries are harvested, they are typically processed manually using traditional methods such as wet or dry processing. These methods involve fermentation, washing, and drying of the coffee beans to achieve the desired flavor profile.

While these traditional techniques have been practiced for generations, it is important to note that modern agricultural technologies and practices can also be integrated to enhance productivity, sustainability, and income for farmers in the North East regions of tea and coffee cultivation.

## Seizing Opportunities



### **Social Business Canvas Model:-**

The plantation agriculture will get benefit from this model as it shows what are the main factors they need to focus on.

### **Key Partners:-**

The agricultural farmers can create a relationship with industries as they can provide fund against saved carbon credits. The farmers can save the carbon emissions and in turn they can get earnings from big giant industries which in turn can be invested for advance automated technologies.

### **Key Activities:-.**

The farmers need the perfect awareness programs as they may not be familiar with automated technologies. There is need to be familiar with carbon credits which is going to be next secondary income to people.

### **Social Value Proposition:-**

Problem: unfamiliarity about Carbon Credits and poor knowledge of advance automated technologies restricted the development of farming in north-east India.

Solution- Bring awareness about new technologies and role of carbon credits in global market.



## Seizing Opportunities

### **Key Resources:-**

- The platform connecting industries to farmers.
- The platform connecting farmers with carbon credit evaluators .
- The district headquarters to check maturity and health of soil.
- The awareness campaign at different geographical locations.

### **Impact Measuring:-**

- The advance farming using drone can help us to keep track on health of farms.
- The individual can have the perfect report of farms can predict which regions of farm needs to be focused more for yield
- This can also helps to keep the track on different types of diseases

### **Customer Segments:-**

- Marketing experts
- Industrial experts
- Carbon Credit Evaluators
- Regional farmer officers
- Farmers
- Land Workers

### **Macro-economic environment:-**

- The economy may be barrier at beginning to accept new technologies
- The population of north-east India is away from good education and it can increase difficulties to prove them the importance of automated technologies and carbon credits.

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### **Channels:-**

- Digital Platforms will really help to spread the word of modern technologies in plantation agriculture
- Influencers & Blogs can be very reliable and trustworthy for farmers who are educated and advertisements can also help to reach the illiterate people too.

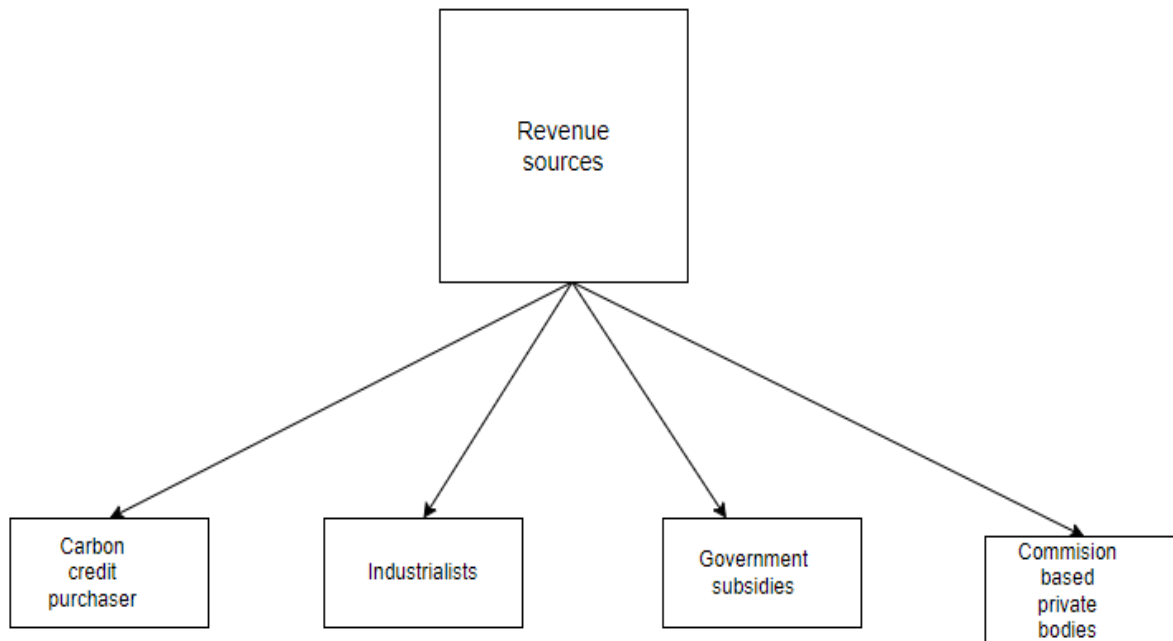
### **Cost Structure:-**

- The farmers have to invest their own money in order to obtain those modern technologies
- If the yields of farmers are successful to reduce the carbon emissions , they can get fund through industrialists and other big giants.
- This money can again used as investment to increase this network and ultimately the productions and profit is going to increase as technologies used are also advanced.

## Seizing Opportunities

### **Revenue Streams:-**

- The main Revenue can be through industrialists, the profit of farms or government subsidies for farmers. Event private fund providers can invest and can take share in profit of carbon credits to ultimately developing the massive network in agricultural sector.





## **Methodology using Carbon credits:**

Develop a reliable methodology for carbon credit management and tree cover recording.

Deploy automation and navigation technology, such as drones and GPS, to collect

data on tree cover and carbon emissions.

Use machine learning algorithms to analyze the data and make informed decisions.

Work with carbon credit markets to sell carbon credits.

Continuously monitor and evaluate the system to identify

### **Methods for measuring:**

**1. Directly measuring the carbon using samples...**

**2. Using the latest navigation or automation...**

Carbon sequestration measuring methods:

**1. Drone Lidar method:**

Drones can use LiDAR technology, which involves emitting laser or radio waves towards trees and measuring the time it takes for the pulses to bounce back to the drone, to calculate the height of trees.

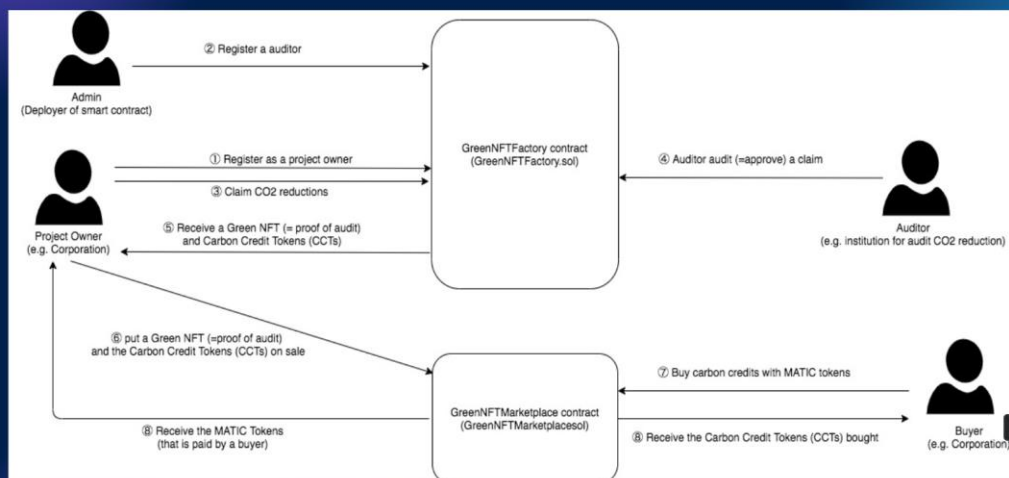
LiDAR is particularly useful in areas with dense vegetation, such as forests, where laser signals may be disrupted.

Radio waves can penetrate through the vegetation and reflect off the ground, providing an accurate measurement of tree height.

# Drone with LiDAR



## Blockchain flow



Tokenized-Carbon Credit Marketplace is a dApp and smart contract that allows users to claim, audit, buy, and sell carbon credits on a single platform, with the goal of incentivizing and accelerating CO2 emission reduction.

The process is transparent and traceable, with Carbon Credit Tokens (CCTs) used to represent the amount of carbon credits.

The CCTs are ERC20 tokens, and a Green NFT is used as proof of audit for CO2 reductions in a project.

The smart contract is deployed on

## **2. Dry wood method:**

Measure height and trunk width of tree and calculate storage in dry wood as we have some experimental calculations.

This measures helps to find in turn carbon credits.

Height will be calculated using drone LiDAR.

Trunk width will be calculated using manual.



# Environmental Scan & SWOT:

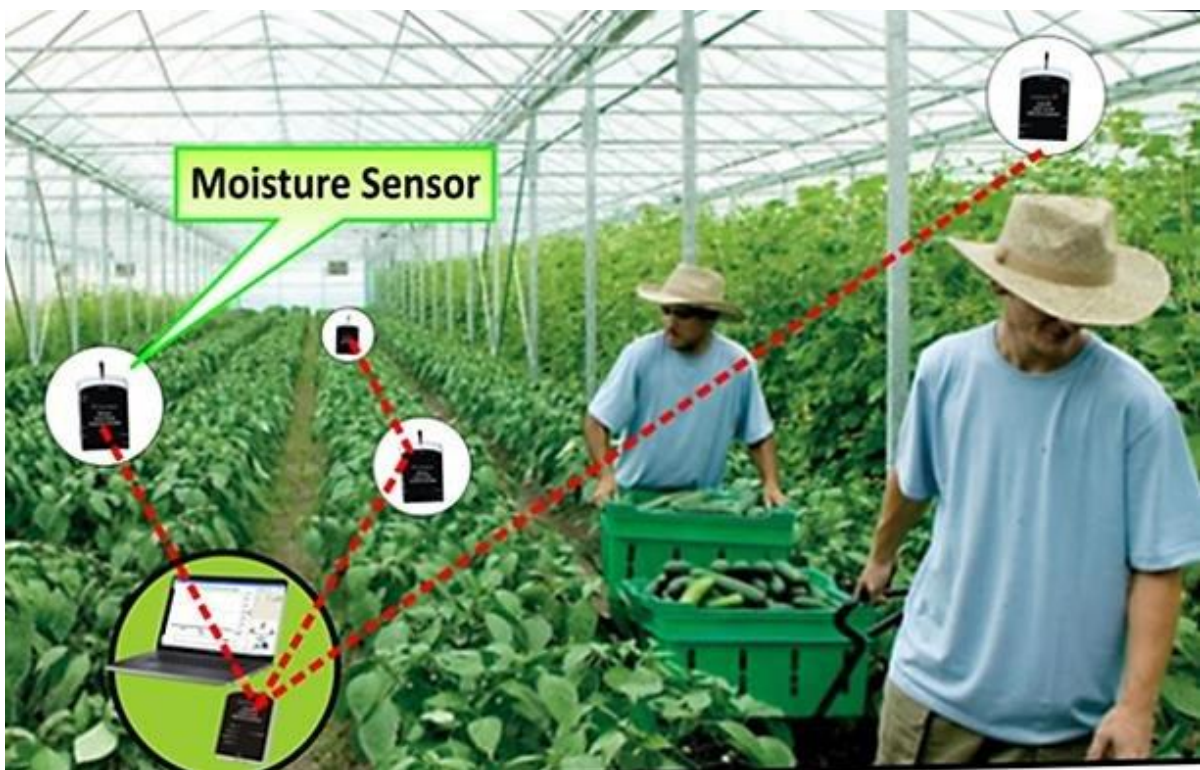
## **Environmental Scan for Plantation Agriculture (Tea and Coffee) using Modern Technologies:**

Technological Advancements: Modern technologies, such as advanced software and drones, offer opportunities to improve various aspects of plantation agriculture. These technologies enable better data collection, analysis, and decision-making, leading to increased efficiency, productivity, and sustainability.

Advanced software and data analytics can assist in precision agriculture practices, including precise irrigation, fertilizer application, pest management, and disease detection. This can optimize resource utilization, reduce costs, and minimize environmental impacts.

Drones equipped with sensors and cameras enable remote sensing and monitoring of plant health, crop growth, soil moisture, and other environmental factors. This real-time data can aid in making informed decisions, identifying potential issues early, and implementing timely interventions.

Advanced software and data analysis tools provide farmers with insights and predictive models based on historical and real-time data. This helps optimize planting schedules, manage crop rotation, improve harvest planning, and optimize resource allocation.



### **SWOT Analysis for Plantation Agriculture (Tea and Coffee) using Modern Technologies:**

Modern technologies enhance efficiency through precision agriculture practices, reducing wastage of resources such as water, fertilizers, and pesticides.

Data-driven decision making, remote sensing, and monitoring enable better crop management, leading to increased yields and improved quality.

Advanced software and technologies support sustainable practices, such as reduced chemical use, optimized resource management, and environmental monitoring.

Optimized resource utilization, reduced crop losses, and improved decision-making contribute to cost savings for farmers.

Implementing modern technologies may require significant upfront investment in software, hardware, and training for farmers, which could be a barrier for some small-scale farmers.

Adopting and effectively utilizing advanced software and drones may require technical expertise and training, which could be a challenge for farmers lacking the necessary skills.

#### Opportunities:

Consumers' growing interest in sustainably produced tea and coffee provides an opportunity for farmers to differentiate their products and command premium prices by leveraging modern technologies for sustainability and traceability.

Advanced technologies can facilitate integration within the tea and coffee value chains, enabling better coordination and communication between farmers, processors, and buyers, leading to improved market access and opportunities for value addition.

#### Threats:

While modern technologies offer long-term benefits, the initial costs can be a challenge for farmers with limited financial resources, potentially creating a digital divide between large-scale and small-scale farmers.

The use of advanced software and data collection systems raises concerns about data privacy and security, requiring appropriate measures to protect farmers' data and prevent unauthorized access or misuse.

Overall, the integration of modern technologies like advanced software and drones in plantation agriculture for tea and coffee can provide significant advantages in terms of efficiency, productivity, sustainability, and market opportunities. However, addressing challenges related to costs, technical skills, and data security is crucial for successful adoption and realization of the full potential of these technologies.

and drones, can enhance efficiency, productivity, and sustainability. This section provides scientifically grounded recommendations for tea and coffee farmers to effectively harness these technologies.

## **Recommendations**

The integration of modern advanced technologies holds great potential for improving plantation agriculture practices. In the tea and coffee sectors, these technologies, such as advanced software and drones, can enhance efficiency, productivity, and sustainability. This section provides scientifically grounded recommendations for tea and coffee farmers to effectively harness these technologies.

### **1. Embrace Precision Agriculture:**

Tea and coffee farmers should adopt precision agriculture techniques facilitated by advanced software and data analytics. Precision irrigation systems, combined with targeted fertilizer application and real-time disease detection, optimize resource utilization while reducing costs. Implementing these practices based on accurate data analysis promotes crop health, leading to improved yields and minimized environmental impact.

### **2. Invest in Remote Sensing and Monitoring:**

Farmers should invest in drones equipped with sensors and cameras for remote sensing and monitoring purposes. These technologies enable the collection of valuable data on plant health, crop growth, and soil conditions. Regular monitoring allows for timely interventions, empowering farmers to proactively address potential issues. Investing in remote sensing and monitoring capabilities enhances decision-making, leading to higher yields and efficient farm management.

### **3. Leverage Data-Driven Decision Making:**

Tea and coffee farmers should prioritize the adoption of advanced software and data analysis tools for data-driven decision making. Comprehensive software solutions facilitate robust data management, analysis, and predictive modeling. By leveraging historical and real-time data,

farmers can optimize planting schedules, implement effective crop rotation strategies, and efficiently allocate resources. Data-driven decision making empowers farmers to maximize productivity while minimizing risks.

#### 4. Promote Sustainability:

Modern technologies offer opportunities to promote sustainability in plantation agriculture. Tea and coffee farmers should utilize advanced software to optimize resource utilization, reduce chemical inputs, and monitor environmental factors. Implementing precision irrigation techniques, adopting organic farming practices, and minimizing pesticide use are key sustainability measures. These practices reduce ecological footprints and meet the rising demand for sustainably produced tea and coffee.

#### 5. Foster Collaboration and Knowledge Exchange:

Active participation in knowledge-sharing platforms, collaboration with agricultural experts, research institutions, and technology providers are crucial for tea and coffee farmers. Engaging in workshops, training programs, and conferences focused on modern technologies facilitates ongoing learning and keeps farmers informed about the latest advancements. Collaborative efforts enable farmers to leverage collective wisdom, share best practices, and stay at the forefront of technological innovation.

#### Conclusion:

Integrating modern advanced technologies into plantation agriculture presents significant opportunities for tea and coffee farmers. By embracing precision agriculture techniques, investing in remote sensing and monitoring capabilities, leveraging data-driven decision making, promoting sustainability, and fostering collaboration, farmers can unlock numerous benefits. These technologies empower farmers to optimize resource utilization, increase productivity, reduce costs, and contribute to sustainable agricultural practices. By implementing these recommendations, tea and coffee farmers can position themselves for success.

## Strategic Alliances & Influencers

Tea and coffee farmers in plantation agriculture can benefit from forming strategic alliances and collaborating with influencers in the field of advanced technologies and carbon credits. Strategic alliances with technology providers, research institutions, and agricultural associations can provide access to the latest advancements and tailored solutions for precision agriculture. Partnerships with technology providers offer expertise, technical support, and customized solutions. Collaborating with research institutions and universities fosters knowledge exchange and access to cutting-edge innovations. Agricultural associations and cooperatives facilitate networking and collective engagement with stakeholders.

In the realm of carbon credits, tea and coffee farmers can collaborate with carbon credit aggregators, project developers, and environmental NGOs. Carbon credit aggregators and project developers specialize in quantifying emissions reduction and carbon sequestration achieved through sustainable practices. Environmental NGOs provide guidance, technical support, and advocacy for earning carbon credits. Certification bodies and standards ensure adherence to recognized methodologies and offer credibility to carbon credit projects. Government agencies and programs focused on sustainable agriculture provide funding, technical support, and information on carbon credit schemes.

By leveraging these alliances and influencers, tea and coffee farmers can adopt advanced technologies such as precision agriculture, drones, and data-driven decision making, resulting in improved efficiency, productivity, and sustainability. Simultaneously, they can earn carbon credits by implementing sustainable practices verified by certification bodies and supported by carbon credit programs. These collaborations open opportunities for knowledge exchange, technical expertise, and market recognition for sustainable agricultural practices, contributing to the long-term success of tea and coffee farmers in the plantation agriculture industry.

## Positioning & Repositioning:

Positioning and repositioning strategies play a crucial role in plantation agriculture to differentiate products, target specific markets, and respond to changing consumer demands. Here are some considerations for positioning and repositioning in the plantation agriculture industry:

### **Positioning:**

Identify unique selling points and attributes that set your tea or coffee apart from competitors. This could include factors like organic certification, specialty varieties, sustainable farming practices, or distinct flavor profiles. Position your products as premium, high-quality offerings to attract discerning customers.

Understand the preferences and needs of different customer segments. Consider targeting niche markets, such as specialty coffee shops, health-conscious consumers, or eco-conscious buyers. Tailor your marketing messages and product offerings to meet the specific demands of these segments.

Develop a compelling brand story that connects with consumers on an emotional level. Highlight the heritage, sustainability practices, community impact, or unique cultivation techniques behind your tea or coffee. Effective branding can differentiate your products and create a strong connection with customers.

Identify untapped domestic or international markets for your tea or coffee products. Research consumer trends and preferences in these markets and adapt your positioning strategy accordingly. Consider factors like flavor preferences, brewing traditions, and cultural associations to resonate with the target market.

## **Repositioning:**

Continuously monitor consumer preferences, market trends, and competitor activities. Identify emerging opportunities or shifting consumer demands that require a repositioning strategy.

Conduct market research and analysis to gather insights on customer perceptions and preferences.

Evaluate opportunities for product innovation or diversification to meet changing market demands. Consider introducing new varieties, blends, or value-added products. Reposition your brand as innovative and responsive to evolving consumer needs.

If sustainability becomes a significant concern for consumers, reposition your tea or coffee products as environmentally friendly and socially responsible. Highlight sustainable farming practices, certifications, or community initiatives to appeal to conscious consumers.

Adjust your marketing and communication strategies to reflect the new positioning. Update packaging, branding, and messaging to align with the repositioned brand image. Leverage digital marketing channels, social media, and influencer partnerships to reach and engage with target consumers effectively.

Seek collaborations or partnerships with like-minded organizations, influencers, or sustainability initiatives to enhance your repositioning efforts. Collaborative initiatives can amplify your message, increase brand visibility, and reinforce the desired brand positioning.

Remember, positioning and repositioning strategies should be supported by effective marketing and communication efforts. Consistently monitor market dynamics, consumer preferences, and industry trends to stay ahead and adapt your strategies accordingly.





## **Empathy Map**

Hear:-. Farmers can hear the experiences from other successful farmers.

Say & Do:- This is important because one can completely try to reduce carbon emissions for sake of carbon credits.

Think & Feel:- We can feel the actual use once it is established in our farms.

Pain:- The pain is to investment of farmer at beginning for modern technologies

Gain:- The gain is to earn profit from goods and secondary as being consumer of carbon credit emissions in market thus this type of plantation techniques can help in dual source of income.

## Experience Map

The experience map for plantation agriculture using modern technologies encompasses several stages. In the awareness stage, farmers become familiar with the benefits of advanced technologies like software, drones, and precision agriculture through industry publications, conferences, and word-of-mouth.

In the research stage, farmers delve deeper into available technologies, exploring software solutions, drone technologies, and sustainable farming practices for carbon credits. Moving to the adoption stage, farmers select the most suitable technologies and invest in advanced software for data management and analysis, as well as drones equipped with sensors for remote sensing and monitoring.

The implementation stage involves integrating these technologies into daily operations, using data-driven insights to optimize irrigation, fertilization, and pest control practices. In the monitoring and improvement stage, farmers regularly assess the performance of implemented technologies, making necessary adjustments and seeking collaboration with experts and sustainability initiatives.

The benefits and results include increased crop yields, improved resource efficiency, reduced environmental impact, potential carbon credit earnings, enhanced profitability, and recognition as leaders in the industry. This experience map demonstrates the journey of tea and coffee farmers as they embrace modern technologies, driving efficiency, sustainability, and overall success in plantation agriculture.

## Conclusion:

In conclusion, the application of modern advanced technologies in plantation agriculture, specifically in the tea and coffee sectors, offers promising opportunities for increased efficiency, productivity, and sustainability. The use of advanced software, data analytics, and drones enables precision agriculture practices, allowing farmers to optimize resource utilization and minimize environmental impacts.

By harnessing the power of these technologies, farmers can make data-driven decisions, monitor crop health remotely, and implement timely interventions. This empowers them to optimize irrigation, fertilizer application, pest management, and disease detection, resulting in improved yields and enhanced crop quality.

Moreover, modern technologies provide avenues for sustainable practices in plantation agriculture. The ability to collect and analyze real-time data facilitates reduced chemical usage, optimized resource management, and environmental monitoring. This not only contributes to environmental sustainability but also aligns with the growing market demand for sustainably produced tea and coffee.

Despite the benefits, there are challenges to consider. The initial investment required for adopting these technologies may pose a barrier for small-scale farmers, and technical skills and knowledge may need to be developed or acquired. Additionally, concerns related to data privacy and security must be addressed to ensure the protection of farmers' information and prevent unauthorized access.

Overall, the integration of modern advanced technologies in plantation agriculture represents a promising path for the tea and coffee sectors. It provides opportunities to increase productivity, reduce costs, enhance sustainability, and tap into premium markets. Addressing the challenges and providing support to farmers in adopting and effectively utilizing these technologies will be key to unlocking their full potential and securing a prosperous future for plantation agriculture as leaders in the industry.

This experience map demonstrates the journey of tea and coffee farmers as they embrace modern technologies, driving efficiency, sustainability, and overall success in plantation agriculture.

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