Oromia Regional State, Oromia Agricultural Bureau

Agricultural Value Chain System Development Proposal for Coffee and Tea Farms

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Executive Summary

This proposal outlines the development of an Agricultural Value Chain System for coffee and tea farming in Oromia, designed to improve the sector's productivity, quality, and global competitiveness. The system is organized into four interconnected modules: research and development, nursery monitoring, farm management, and industry. The first module focuses on registering research institutions, recording research findings, and introducing new crop varieties, ensuring that farmers benefit from the latest advancements in agricultural science. The second module is dedicated to nursery management, including the multiplication of seedlings, disease surveillance, and the optimal use of fertilizers to guarantee healthy crops.

The third module provides comprehensive farm-level support, such as registering farm owners, preparing seedlings from the nursery, land preparation, disease monitoring, and ensuring effective production practices. The final module addresses the coffee and tea processing industry, focusing on the production of raw (red) coffe

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1 Introduction

The agricultural sector in Oromia plays a critical role in the region's economy, particularly in the production of coffee and tea, which are two of the most important cash crops. However, to remain competitive in both local and international markets, it is essential to develop a comprehensive and sustainable agricultural value chain that addresses each stage of production, from research and cultivation to processing and market readiness. This proposal aims to establish an Agricultural Value Chain System that will enhance the productivity, quality, and market access of coffee and tea farms in Oromia. The system will incorporate four key modules: research and development, nursery monitoring, farm management, and industry. Each module is designed to address the specific needs of the agricultural value chain, providing a holistic approach to improving the efficiency and sustainability of coffee and tea production.

The proposed system will begin with the registration of research institutions, documentation of research findings, and the introduction of new crop varieties, ensuring that the latest innovations are incorporated into farming practices. In the second module, the focus will be on nursery monitoring, which includes the multiplication of seedlings, disease management, and proper use of fertilizers to ensure high-quality crops. The third module will support farm-level activities such as registering farm owners, land preparation, and disease monitoring. Finally, the industry module will focus on processing raw coffee and tea, including the production of red or raw coffee and washing processes, ensuring that the final products meet market standards. By integrating these activities, the proposal seeks to establish a robust, sustainable value chain that benefits farmers, processors, and the broader agricultural economy of Oromia.

2 Background of Coffee and Tea Farming in Oromia

Oromia is home to some of the most fertile and productive coffee and tea farming regions in Ethiopia, with coffee being one of the primary cash crops that contribute significantly to both the local and national economy. The region is known for producing some of the finest Arabica coffee beans, which are not only consumed locally but also exported to international markets, making it a critical sector for economic development. Tea farming, while less established compared to coffee, has also been gaining prominence in Oromia, particularly in areas with favorable climatic conditions. Despite the potential for growth, both coffee and tea farming in Oromia face numerous challenges, including outdated farming practices, limited access to modern technologies, and a lack of a comprehensive value chain system that integrates research, production, and processing activities. These issues hinder the full exploitation of the sector's potential, limiting productivity and competitiveness in global markets.

In recent years, efforts have been made to improve the agricultural practices in Oromia through research and development initiatives. However, there is still a gap in the integration of research findings into practical farming activities, which leads to inefficient production methods. Additionally, the nursery sector remains underdeveloped, with insufficient monitoring of seedling production, disease management, and fertilizer use. This results in weak plant health and low yields for both coffee and tea farmers. Farm-level practices such as land preparation, seedling management, and disease monitoring are often inadequately supported, resulting in

poor-quality crops. Furthermore, the lack of a well-organized industry system for processing coffee and tea, including proper handling of raw and washed coffee, limits the value-added potential of these products. As a result, Oromia's coffee and tea farmers struggle to meet the increasing demand for high-quality products in both local and international markets. Developing a robust agricultural value chain system that addresses these gaps is critical for unlocking the full potential of coffee and tea farming in the region.

3 Problem Statements

The coffee and tea farming sector in Oromia faces numerous challenges that hinder its potential for growth and competitiveness. One of the key issues is the lack of integrated research and development, which limits the adoption of new, improved crop varieties and innovative farming techniques. Research institutions are not adequately registered or their findings properly documented and shared with farmers, resulting in missed opportunities for enhancing productivity and sustainability. Moreover, the absence of a structured mechanism for introducing new crop varieties under research guidance prevents farmers from benefiting from the latest agricultural advancements, leading to stagnation in production. This gap in research and development integration ultimately affects the overall performance of the coffee and tea value chain.

Furthermore, there is a lack of effective support for nursery management, farm-level activities, and post-harvest processing, which are essential for improving the quality and quantity of coffee and tea. Seedling multiplication, disease monitoring, and fertilizer usage are often neglected, leading to weak crop yields and high susceptibility to pests and diseases. Farm-level follow-up activities such as land preparation, seedling management, and production monitoring are inadequately addressed, resulting in inefficiencies and poor crop management. Additionally, the absence of an organized industry-level system for processing raw coffee and tea, including washed coffee production, limits the value-added potential of these crops. Without a cohesive agricultural value chain system that integrates these critical modules, Oromia's coffee and tea sectors remain underdeveloped, impeding their capacity to compete in both local and global markets.

4 Objectives of the Proposal

The Objectives of Agricultural Value Chain System Development Proposal are as stated below:

1. **Enhance Research and Development Integration and Capability**: To establish a robust system for registering research institutions, documenting and sharing research findings, and introducing new crop varieties based on research instructions. This will enable farmers to adopt the latest agricultural innovations, improve crop resilience, and increase overall productivity in coffee and tea farming.
2. **Strengthen Nursery Management and Seedling Production**: To develop and implement a comprehensive nursery monitoring and follow-up system that includes the multiplication of high-quality seedlings, disease monitoring, and optimal use of fertilizers. This will ensure the availability of healthy and high-yielding plants for farmers, boosting the success rates of coffee and tea crops. This helps:

- To improve the quality of seedlings available to farmers by ensuring effective nursery monitoring and follow-ups.
- To improve farm-level practices by providing essential resources and technical support for land preparation, seedling planting, pest management, and sustainable production.
- To establish a robust industry infrastructure that ensures the effective processing of raw coffee and tea, including washed coffee, which will improve the overall quality and marketability of the products.
- To create a sustainable and scalable agricultural value chain that increases productivity, income, and job opportunities for smallholder farmers in Oromia.

3. **Support Farm-Level Activities and Monitoring:** To provide continuous support and follow-up for coffee and tea farmers through the registration of farm owners, preparation of seedlings, land preparation, disease monitoring, and effective production practices. This will empower farmers with the necessary tools and knowledge to optimize crop production and improve overall farm management.
4. **Develop a Sustainable Processing Industry**: To establish a comprehensive industry module focused on the production of red (raw) coffee and the washing process of coffee. This will improve the value-added potential of Oromia's coffee and tea sector, ensuring that the final products meet international market standards and enhancing the region's competitive edge in the global market.
5. **Promote Sustainable Agricultural Practices**: To integrate environmentally sustainable agricultural practices throughout the value chain, from research to processing, ensuring that coffee and tea farming in Oromia remains resilient to climate change and other environmental challenges.
6. **Increase Market Access and Competitiveness**: To improve the market access of Oromia's coffee and tea through higher quality production and processing standards, thereby increasing the region's competitiveness in both local and international markets, while contributing to the economic growth of the agricultural sector.

5 Scope of the Project

he scope of the project is divided into four key modules that address the critical components of the value chain, from research and development to industry-level processing. These modules aim to improve productivity, quality, and market access for coffee and tea farmers in Oromia, ensuring that the sector remains competitive and sustainable.

1. **Research and Development Module**

   This module focuses on strengthening the research and development capacity within Oromia's coffee and tea farming sector. The activities under this module will include:

   - Registration of Research Institutions: Establishing a formal registry of research institutions that focus on coffee and tea farming in Oromia. This will ensure that all research efforts are organized, tracked, and aligned with regional agricultural priorities.

- Registering Findings of Research: Systematically documenting research findings from both local and international studies, and ensuring that they are accessible to farmers, agricultural experts, and policymakers. The findings will include advancements in pest control, soil fertility, climate adaptation strategies, and improved farming practices for both coffee and tea.
- Introducing New Crop Varieties: Facilitating the introduction and adoption of new coffee and tea varieties that have been developed through research. This includes providing guidance and training for farmers on how to cultivate these new varieties effectively, thereby enhancing crop resilience, quality, and yield.
- This module will support the transfer of knowledge from research institutions to farmers, ensuring that cutting-edge agricultural innovations are incorporated into daily farming practices.

2. **Nursery Monitoring and Follow-ups Module**

   The nursery monitoring and follow-up module focuses on improving the quality of seedlings and early-stage crop development. Key activities under this module include:

   - Multiplying High-Quality Seedlings: Establishing and supporting nurseries that produce high-quality coffee and tea seedlings. This will involve training nursery operators on best practices for seedling multiplication, ensuring that farmers have access to healthy, disease-free plants.
   - Disease Monitoring: Implementing a system for early detection and management of plant diseases in nurseries. This includes training nursery staff and farmers in disease identification and control measures to reduce crop loss.
   - Fertilizer Use and Soil Management: Providing guidelines and training on the optimal use of fertilizers and soil management practices for coffee and tea seedlings. This will ensure that the seedlings are properly nourished for healthy growth, contributing to higher yields and better-quality crops.
   - Regular Follow-ups and Monitoring: Establishing a system of periodic monitoring for nurseries and farms to ensure ongoing adherence to best practices in seedling production, disease management, and fertilizer application.

3. **Farm Follow-ups Module**

   The farm follow-up module focuses on supporting farmers through regular engagement and technical assistance at the farm level. This module includes the following activities:

   - Registering Farm Owners: Developing a comprehensive registry of coffee and tea farm owners in Oromia. This will allow for better communication, monitoring, and tailored support for individual farmers.
   - Seedling Preparation and Land Preparation: Assisting farmers in preparing land for planting, including providing training on proper soil preparation, spacing, and land management techniques. This will ensure that farms are properly prepared for optimal seedling growth.
   - Ongoing Disease Monitoring: Implementing a system for continuous disease surveillance and monitoring on coffee and tea farms. This includes the training of farmers on pest and disease management

techniques, helping them identify and control issues before they become significant threats to crops.

- Production Monitoring and Support: Providing ongoing guidance and support to farmers throughout the growing season, from planting to harvest. This includes assistance with irrigation practices, pest management, and harvest techniques to maximize yield and quality.

4. **Industry Module**

   The industry module focuses on processing and adding value to coffee and tea crops at the post-harvest stage. This module will include:

   - Raw Coffee Production (Red Coffee): Supporting the production of red or raw coffee, including the proper harvesting, drying, and storage of coffee beans. This will ensure that the harvested coffee meets the required quality standards for further processing and export.
   - Processing Washed Coffee: Developing systems for processing washed coffee, which involves removing the outer layers of the coffee cherries and ensuring that the beans are properly fermented, washed, and dried. This process improves the quality of coffee and allows Oromia's coffee to compete more effectively in international markets.
   - Training on Industry Standards: Providing training to farmers and industry workers on industry best practices for coffee and tea processing. This includes establishing quality control measures, hygiene practices, and proper handling techniques to ensure that the final product is of the highest quality.
   - Strengthening the Coffee and Tea Industry Infrastructure: Supporting the development of coffee and tea processing facilities in Oromia, including equipment procurement, training on equipment use, and creating networks for collaboration between farmers, processors, and exporters.

6 Implementation Strategies

The development of an Agricultural Value Chain Application (AVCA) software for coffee and tea farming in Oromia aims to provide a digital platform that integrates various agricultural activities, optimizes productivity, and enhances market access. The software will enable seamless interaction between farmers, researchers, nursery operators, extension agents, processors, and other stakeholders, ensuring that critical data is captured, monitored, and analyzed to make informed decisions. The application will be developed in phases, with clear objectives for each module, ensuring that the software addresses key activities within the coffee and tea farming value chain: research registration, nursery management, farm follow-ups, and industry processing.

1. **Research and Development Module**

   The Research and Development (R&D) module will digitize and streamline the registration of research institutions, findings, and new crop introductions, creating an efficient system for the dissemination of agricultural innovations. The implementation strategies for this module are as follows:

   - Registration of Research Institutions: The application will include a module for registering all active research institutions involved in coffee and tea farming. This will allow for the creation of a comprehensive database that includes institutional details, ongoing projects, and key researchers.

This registration process will be interactive, allowing institutions to update their information and collaborate through the platform.

- Research Findings Database: The application will feature a dynamic database to upload and register research findings, agricultural reports, and research papers. Farmers and stakeholders will have easy access to this information, allowing them to integrate the latest research into their farming practices. This will ensure that innovation, best practices, and the latest scientific advancements are quickly disseminated across the farming community.
- Introducing New Crop Varieties: The software will include a dedicated space to track the introduction of new coffee and tea crop varieties. Research institutions will input detailed data on the types of new varieties, their resilience to pests and diseases, and the benefits of adopting these varieties. Extension workers will use the platform to communicate to farmers about new varieties and provide guidance on their cultivation.
- **Timeline**: The development of the R&D module will begin with the registration of research institutions and the creation of the findings database, expected to be completed in the first year of the project. The introduction of new crop varieties will be integrated in the second phase after research and field trials.

2. **Nursery Monitoring and Follow-ups Module**

The nursery module will be essential for managing the propagation of high-quality seedlings, monitoring diseases, and ensuring the use of fertilizers. The implementation strategies for this module are as follows:

- Nursery Registration and Monitoring: The software will allow nurseries to register and track the multiplication of seedlings. Each nursery will create a digital profile with data on the types of seedlings produced, growth progress, and quality assurance metrics. This information will be accessible to extension agents, who will monitor nursery operations and provide technical assistance.
- Disease Monitoring System: A disease tracking and reporting system will be incorporated into the software. Nursery operators and farmers will be able to input data on disease outbreaks and conditions affecting seedlings. The system will use a combination of manual reporting and geospatial mapping to help identify hotspots of disease and monitor trends. A mobile application will allow real-time reporting and instant feedback from experts.
- Fertilizer and Soil Health Management: The software will include tools for tracking fertilizer use and soil health management. By recording data on the types and amounts of fertilizers applied, the application will generate recommendations for optimal nutrient management. Additionally, soil test results will be uploaded, and customized fertilizer recommendations will be made based on soil conditions and seedling needs.
- **Timeline**: Nursery registration and basic monitoring functions will be available in the first quarter, followed by the implementation of the disease monitoring system in the second quarter. The fertilizer management module will be integrated in the third quarter, based on nursery performance data.

3. **Farm Follow-ups Module**

The Farm Follow-ups module is designed to support farmers in land preparation, seedling distribution, disease management, and overall production management. The implementation strategies for this module are as follows:

- **Farmer Registration and Profile Creation**: The software will allow farmers to register their profiles, capturing essential information such as farm location, size, crop types, and production methods. This data will be stored in the system, enabling tailored support for each farmer. Extension workers will have access to this information to provide personalized guidance.
- **Seedling Distribution Tracking**: The software will include a feature to track the distribution of seedlings from nurseries to registered farmers. This will ensure that farmers receive quality seedlings at the right time and monitor the progress of seedling distribution.
- **Land Preparation and Production Planning**: The application will provide step-by-step guidelines for land preparation, including soil testing, fertilizer recommendations, and planting schedules. Farmers will be able to input their activities, track progress, and receive alerts and reminders from extension agents.
- **Disease and Pest Monitoring**: A real-time disease and pest monitoring tool will be included, where farmers can report pest outbreaks and symptoms of diseases. Extension agents will be able to provide immediate support through the software, ensuring quick interventions. Integrated pest management (IPM) guidelines will be made available, along with diagnostic tools.
- **Timeline**: The farmer registration module will be launched in the first quarter, followed by the distribution tracking and land preparation modules in the second quarter. Disease and pest monitoring functionalities will be integrated starting in the third quarter, with continuous updates throughout the project.

4. **Industry Processing Module**

The Industry module will focus on processing raw coffee and tea into market-ready products, with a particular emphasis on quality control and product tracking. The implementation strategies for this module are as follows:

- Processing Facility Registration: The software will enable the registration of coffee and tea processing facilities, including wet mills for coffee and tea processing plants. Each facility will have a digital profile where key data such as production capacity, equipment status, and processing volumes will be recorded.
- Production Tracking and Quality Control: The software will feature a production tracking system that allows processors to log the processing stages, including fermentation, washing, drying, and grading. Quality control checkpoints will be built into the system, allowing for the real-time monitoring of product quality at each stage.
- Certification and Compliance Management: The software will include tools to help processors maintain industry certifications, such as organic, Fair Trade, or Rainforest Alliance. This will include tracking compliance with international standards and providing reminders for audits and certifica-

tion renewals.

- Market Linkages and Export Tracking: A market and export module will allow processors to connect with local and international buyers. The software will track product orders, export volumes, and shipping details, and offer tools for marketing and branding. This will improve the traceability of Oromia's coffee and tea products in the global market.
- Timeline: The processing facility registration and basic production tracking features will be available in the first year. Certification management and market linkages will be integrated in the second year, with the system continuously updated based on feedback from processors and market demands.

5. **Integration and Data Analytics**

   The software will feature an integration platform that allows for seamless data flow between the modules, enabling real-time analysis and decision-making. The integration of data from research institutions, nurseries, farms, and processing facilities will allow stakeholders to monitor the entire value chain, from crop cultivation to finished products.

   - **Data Dashboards and Analytics**: The application will include dashboards for decision-makers, such as farmers, extension agents, and Oromia Agricultural Bureau officials, to track key performance indicators (KPIs) in real-time. This will include data on production, disease outbreaks, seedling performance, processing output, and market trends.
   - **Predictive Analytics**: The software will employ machine learning and predictive analytics to forecast trends, such as pest outbreaks, disease risks, and market demands. This will help stakeholders make proactive decisions, improving overall efficiency and sustainability.

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