

## **PROJECT PROPOSAL**

### **Project Title:**

Smart Extension System Sierra Leone (SES-SL)  
“Promoting Food Security and Modern Agriculture”

### **Implementing Partner:**

Department of Agricultural Extension and Rural Sociology  
School of Agriculture and Food Sciences  
Njala University

### **Funding Agency:**

National Science Technology and Innovation Council (NSTIC) through the Ministry of  
Technical and Higher Education (MTHE), Government of Sierra Leone

## Project Team

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## Project Summary

1.	Project title	Smart Extension System (SES) Mobile Application “FarmConnect”.
2.	Project goal	Build a SES mobile advisory app. that will enhance knowledge sharing and promote Household Food Security and Modern Agriculture among Rural Farmers Sierra Leone.
3.	Project targets	500 direct end-users
4.	Project theme	Innovative and smart technologies.
5.	Project duration	21 months
6.	Implementing partner	Department of Agricultural Extension and Rural Sociology, School of Agriculture and Food Sciences, Njala University
7.	Funding agency	National Science Technology and Innovation Council (NSTIC) through the Ministry of Technical and Higher Education (MTHE), Government of Sierra Leone
8.	Proposed budgets	45,000 USD

## **Executive Summary**

Sierra Leone's smallholder farmers are craving for real-time information on climate-smart practices, market prices, and best agricultural practices. This existing gap in information accessibility, coupled with the need for modern, data-driven agricultural practices, presents the need for a Smart Extension System (SES) project that will develop an innovative agricultural technology-driven extension mobile application called "FarmConnect. The aim of this project is to build an SES mobile advisory application that will enhance knowledge sharing and promote Household Food Security and Modern Agriculture among Rural Farmers Sierra Leone. This project will develop, implement and intensify the use of the SES mobile app among end-users (smallholder farmers) in the project's pilot study area. The project will target 500 direct and 2,000 indirect end-users in the agricultural communities including farmers and extension workers. As part of the implementation strategy, the project team will conduct a survey through questionnaire administration, in-depth interviews and focus group discussions on the use of the SES mobile app by end-users. The qualitative data will be analyzed using content and thematic analysis, while the questionnaire will be analyzed using IBM SPSS version 26 statistical package. The results will provide an insight for adjusting, updating and scaling up the use of the SES mobile application among the agricultural community. The project will be governed by the Project Steering Committee, the Project Management Team, and Community Stakeholders. The anticipated outputs and outcomes of this project is to host and manage a cost-effective SES mobile application server/hub, build an SES mobile advisory application, enhancing agricultural productivity, improving livelihoods, and promoting sustainable farming practices in Sierra Leone. At the end of the project life cycle, the university will continue to maintain the server and promote the extension outreach. In addition, the department will generate funds through collaboration and partnerships with other organizations to support the scaling up of the SES mobile advisory services.

## **Background and Rationale**

Sierra Leone, characterized by its predominantly agrarian economy, faces challenges in its agricultural sector that hinder sustainable development ((FAO, 2022). Despite the importance of agriculture to the livelihoods of a significant portion of the population, rural farmers often grapple with limited access to timely information, inadequate extension services, and traditional farming practices that may not be optimized for productivity and resource efficiency (Rubio et al., 2018).

The existing gap in information accessibility, coupled with the need for modern, data-driven agricultural practices, presents an opportunity for innovative solutions to uplift the farming community. Recognizing this, the Smart Extension System project aims to leverage technology to bridge these gaps, empower farmers, and contribute to the overall advancement of Sierra Leone's agriculture. Smallholder farmers lack access to real-time information on climate-smart practices, market prices, and best agricultural practices (Rhodes, 2018). The traditional extension services struggle to reach all farmers, limiting the dissemination of knowledge and personalized support (GoSL, 2017). The team is well-grounded with empirical data on these existing challenges within Sierra Leone's agriculture. The rationale lies in utilizing technology to address these challenges, empowering farmers, fostering community collaboration, and contributing to sustainable agricultural development in Sierra Leone. The project will develop an innovative agricultural technology-driven extension mobile application called “FarmConnect”. This mobile app will help to improve smallholder farmers' access to information and help them to improve their productivity and profitability in Sierra Leone.

The project is captured under the themes innovative and smart technologies. Implementing the Smart Extension System (SES) project through the use of the “FarmConnect” mobile app, farmers would gain immediate access to crucial information, enabling them to make informed decisions and adapt to changing farming conditions. The SES will serve as a virtual extension service, delivering tailored guidance, training, and support to farmers, while overcoming geographical limitations. It would facilitate community engagement, creating a platform for knowledge-sharing, collaboration, and mutual support among farmers towards optimized practices, leading to increased yields and sustainable farming (Kumar, 2022).

## **Project Goal and Specific Objectives**

### **Project Goal:**

The overarching goal of this project is to build an SES mobile advisory application that will enhance knowledge sharing and promote Household Food Security and Modern Agriculture among Rural Farmers Sierra Leone through the implementation of an innovative and technology-driven agricultural extension system.

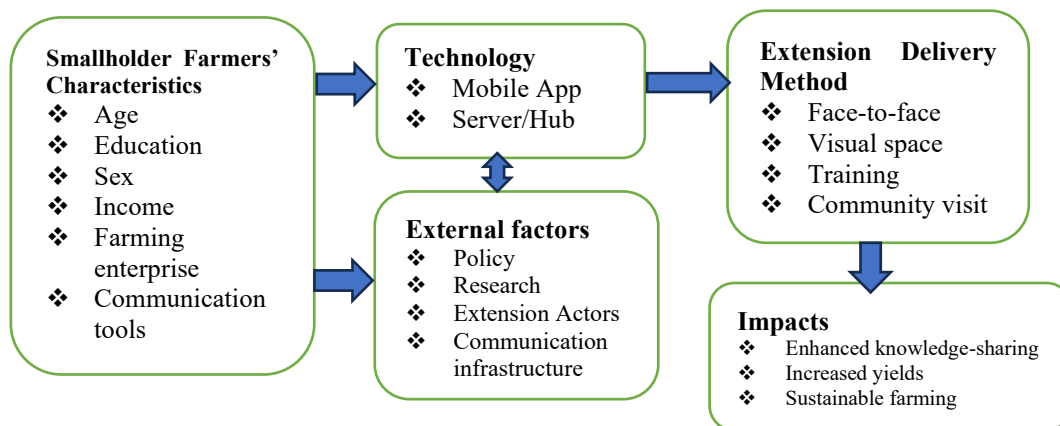
## Specific Objectives

1. To build a gender-friendly SES mobile application (FarmConnect)
2. To host and manage a SES mobile app server/hub at the department
3. To foster community engagement, training and piloting the SES mobile app
4. To promote and intensify the use of the SES mobile app. among rural farmers
5. To support capacity building training programme for M. Sc. student (s)
6. To establish inter-departmental/organizational/institutional collaboration and partnerships within the School of Agriculture and Food Sciences, Njala University, government agencies and NGOs to scale the smart extension system's reach and impact.

## Project Methodology/ Approach

The project team will conduct on-the-ground research and needs assessment and also engage with agricultural experts, local communities, and stakeholders to gather insights and identify priority areas for intervention based on real-world challenges. The project will develop a Smart Extension System (SES) mobile application and also build/host a platform provide a remote advisory service to facilitate knowledge sharing and technical extension advices. The team will engage the farming community in the development process, allowing them to prioritize features that directly address their priority needs and challenges. The team will pilot the SES mobile application a representative agricultural community. A pre, mid and post evaluation study will be carried out to determine the suitability of the SES mobile app. And also develop a detailed plan for scaling up the smart extension system to new farming communities. The project will adopt qualitative interview, observation approach and usability assessment to evaluate farmers' use of the SES mobile app. in the agriculture project's pilot study area. These methods/approaches will give the team an insight into the ease of use and user experience of the SES mobile app (Misaki, 2021).

## Conceptual and Theoretical framework



### **Conceptual Framework of the Project**

The conceptual framework depicts that farmers' socioeconomic characteristics, such as age, income, and education level, can influence their access to and use of technology and extension services. Mobile apps can provide farmers with real-time information and resources that they may not have been able to access otherwise. Extension services can provide farmers with technical advice and training on a range of agricultural topics through a variety of methods, including visual space, such as videos and images, which can be particularly useful for farmers who may have limited literacy skills. External factors, such as government policies and market conditions, can also influence farmers' access to and use of technology and extension services. The use of technology and extension services can have a range of impacts on farming, including increased productivity, improved crop yields, and more sustainable farming practices

### **Theoretical Framework:**

The theoretical framework underpinning the smart extension system draws from several key theories including innovation diffusion theory, social learning theory and network theory. The adoption of technology in agriculture aligns with the Innovation Diffusion Theory, where the system represents an innovation that spreads through social systems, impacting the practices of adopters (farmers). Training programs and community engagement are influenced by the Social Learning Theory, emphasizing the importance of social interactions and shared experiences in the learning process. The creation of a collaborative community within the smart extension system aligns with principles of Network Theory, where connections and interactions contribute to the resilience and effectiveness of the network (Finkbeiner & Braun, 2013). These theories provide a theoretical framework for designing and implementing smart extension systems that can help farmers adopt new technologies and practices, improve their productivity and sustainability, and enhance their livelihoods.

### **User participation**

User participation is a crucial element in the success of the Smart Extension System project. The project will target 500 direct and 2,000 indirect end-users in the agricultural communities including value chain actors (farmers) and extension workers and other stakeholders. A representative of the direct end-users will participate in the development, implementation, and ongoing improvement of the system. User participation is not just a one-time activity but an ongoing and integral aspect of the project, ensuring that the smart extension system remains responsive to the evolving needs and aspirations of the farming community in Sierra Leone.

### **Data collection**

As explained earlier in the methodology, the project will conduct surveys and administer questionnaires to farmers, extension workers, and other stakeholders. The data collection methods will also involve in-depth interviews, focus group discussion and feedback mechanisms on the usability of the mobile app by farmers.

### **Data analysis**

The qualitative data will be analyzed using content and thematic analysis, while the questionnaire will be analyzed using IBM SPSS version 26 statistical package. Data analysis in the Smart Extension System project is not a one-time activity but an ongoing process that informs decision-making, system enhancements, and the overall success of the project.

### **Anticipated Outputs and Outcomes**

The anticipated outputs and outcomes of this project is to host and manage a cost-effective SES mobile application server/hub, build an SES mobile advisory application, enhancing agricultural productivity, improving livelihoods, and promoting sustainable farming practices in Sierra Leone.

#### **Anticipated Outputs:**

1. A fully functional SES mobile application and an innovation hub/platform developed and deployed for agricultural information, personalized insights, and community collaboration.
2. A comprehensive training programs designed and delivered for farmers, extension workers, and local support teams thereby equipping users with the skills and knowledge to effectively use the smart extension system and adopt modern agricultural practices.
3. Features within the platform that facilitate community engagement, knowledge-sharing, and collaboration.
4. Established partnerships with governmental bodies, NGOs, and other stakeholders to enhances scalability, sustainability, and alignment with broader agricultural development initiatives

#### **Anticipated Outcomes:**

The project's anticipated outcome are as follows;

1. Catalyst for technological innovation in Sierra Leone's agriculture
2. Increased crop yields and enhanced farming practices among smallholder farmers.
3. Improved access to market information and increased income.
4. Adoption of sustainable farming practices.
5. Increased income, improved living standards.

### **Knowledge Utilization and Dissemination Plan**

The Knowledge Utilization and Dissemination Plan for the SES project is to establish a centralized innovative platform and deploy SES mobile app to users (farmers). Conduct training sessions to disseminate knowledge on the use of the smart extension system, best practices, and technological updates. Collaborate with media outlets for coverage on the project's impact, success stories, and technological innovations. Utilize online platforms and social media channels for real-time updates, engaging content, and community interactions and ensuring that insights gained contribute to the broader agricultural landscape in Sierra Leone.

### **Project Governance**

The project governance framework will comprise the Project Steering Committee (Project Manager, Representatives from Stakeholder Organizations (NSTIC & MTHE) and Technical Experts from Njala University), Project Management Team (Project Lead, I. T. Specialist, Extension Outreach Specialist, M & E Officer, NGO Representative and Finance Officer), and Community Stakeholders (Selected Community Representatives, Farmers' Association Representatives and Local Leaders). The project governance framework will be designed to ensure effective decision-making, collaboration, and oversight throughout the lifecycle of the Smart Extension System project.

### **Suitability of the Host Institution**

Njala University, as the host institution, has a strong reputation in agricultural research and education. The university has faculties and departments focused on both agriculture and technology-related disciplines. Njala University is a well-established institution with academics that have wealth of experiences in managing research projects and initiatives. The suitability of the host institution for the Smart Extension System project is contingent on a combination of expertise, local presence, project management capabilities, financial stability, and a commitment to sustainability and ethical practices. Njala University is an ideal host institution that has the requisite technical expertise that have a holistic understanding of the project's goals and a capacity to navigate the intersection of agriculture and technology in the Sierra Leonean context.

### **Capacity Building**

The project will provide support grants for M. Sc. student (s). The student (s) can engage in applied research within the project scope and conduct studies on the impact of smart extension systems on farming practices and community dynamics. Incorporating post-graduate student (s) into the Smart Extension System project not only contributes to individual capacity building but also enhances the overall organizational capacity, research output and visibility of Njala University. It creates a symbiotic relationship where students gain practical experience, and the university becomes a hub for innovative research in agricultural technology and extension services.

### **Monitoring and Evaluation Strategy**

The monitoring and evaluation strategy is designed to provide a holistic view of the Smart Extension System project's progress, impact, and areas for improvement. Regular assessments, stakeholder engagement, and a commitment to continuous learning contribute to the project's overall success. The key performance indicators include development of the SES mobile app and the establishment of the innovation platform/hub, deployment and use of the SES mobile App, effectiveness of training programs, level of community engagement, budget utilization and resource allocation, stakeholder perceptions, expectations, and contributions, adherence to ethical guidelines in research and data collection and the overall project objectives, activity plan and timeline.



**Gender, Ethics and Sustainability**

The SES project will ensure equitable participation and benefits for youth including both men and women. It will uphold ethical standards in research, data collection, and community engagement and promote inclusivity and diversity in project activities, considering cultural and social contexts. The project is design to empower local communities, especially women, through knowledge and skills development. It will develop and disseminate project information in a manner that is sensitive to gender norms and cultural contexts. The gender, ethics, and sustainability framework are integral to ensuring that the Smart Extension System project not only achieves its technological goals but also contributes positively to the social fabric of the communities it serves. At the end of the project cycle, the university will continue to maintain the server and promote the extension outreach. In addition, the department will generate funds through collaboration and partnerships with other organizations to support the scaling up of the SES mobile advisory services.

## Proposed Project Activities and Timeline

SES Proposed Workplan																					
Activity	Year 1												Year 2								
	Q1			Q2			Q3			Q4			Q1			Q2			Q3		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Project appraisal and launch																					
Develop SES mobile app prototype																					
Hosting & managing the SES mobile app server/hub																					
Stakeholders' engagement																					
Conduct trainings/workshops on SES mobile app. use																					
Pilot production and trial of SES mobile app prototype																					
Conduct extension outreach on the implementation of SES mobile app use																					
Conduct follow-up visits																					
Facilitate collaboration and networking activities																					
Post-graduate student research support																					
Conduct project monitoring and evaluation																					
Dissemination, publication and project closing																					

### Proposed SES Project Budget

No.	Activity	Amount (\$)
1.	Project appraisal and launch	3,000
2.	Develop SES mobile app prototype	10,000
3.	Hosting & managing the SES mobile app server/hub	5,000
4.	Stakeholders' engagement	2,000
5.	Pilot production and trial of SES mobile app prototype	3,000
6.	Conduct trainings/workshops on SES mobile app. use	3,750
7.	Conduct extension outreach on the implementation of SES mobile app use	5,000
8.	Conduct follow-up visits for the SES mobile application use	2,000
9.	Facilitate collaboration and networking activities	2,000
10.	Post-graduate student research support	3,000
11.	Conduct project monitoring and evaluation	3,000
12.	Dissemination, publication of project impacts and project closing	1,500
13.	Contingency (3.9%)	1,750
	<b>Total</b>	<b>45,000</b>

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