Advancing Sustainable And Inclusive Cashew Agroforestry Value Chains In Sierra Leone- A Midterm Evaluation Of The DISCA-VC Project

Adam Sheka Kanu, Raymond Massaquoi, Bai-Bureh O'Bai Kamara, Hindolo Andrew Babeley

Sierra Leone Agricultural Research Institute (SLARI)-Rokupr Agricultural Research Centre (RARC), PMB 1313, Freetown Sierra Leone
Sierra Leone Agricultural Research Institute (SLARI)-Magbosi Land Water And Environment Research Centre (MLW&ERC), PMB 1313, Freetown Sierra Leone

Abstract
The Developing an Inclusive and Sustainable Cashew Agroforestry Value Chain (DISCA-VC) Project, supported by an EU grant and implemented by Solidaridad in Sierra Leone, aims to promote a sustainable and inclusive cashew value chain that enhances decent work, income, and food security for rural communities, especially women and youth, while reducing natural resource and biodiversity degradation. This midterm evaluation employed a mixed methods approach, including surveys, interviews, focus groups, and a two-group pretest–posttest design, to assess the project's impacts in Kambia, Tonkolili, Bombali, and Port Loko districts. Findings indicate significant improvements in key indicators such as average farm size, intercropping practices, and adoption of improved cashew seedlings among project participants. A reduction in bush fire occurrences and mitigated impacts on yield were observed, alongside enhanced natural resource management through community platforms and byelaws. Project communities reported higher cashew production, increased income from cashew farming, greater food security, and increased participation in Village Savings and Loans Associations (VSLAs). Aggregators benefited from entrepreneurship training and showed potential for improved financial inclusion, although value addition and regulatory awareness remain limited. Overall, the DISCA-VC Project demonstrates substantial positive impacts on the cashew sector's sustainability and inclusiveness, with strong potential to achieve its objectives by project completion in 2026.
Keywords; *Cashew agroforestry, Sustainable value chains, Rural livelihoods, Natural resource management, Food security, Smallholder farming*

I.   Introduction

Cashew (Anacardium occidentale) is a vital tree crop that supports the livelihoods of millions of smallholder farmers across West Africa, including Sierra Leone. The cashew value chain has significant potential to enhance rural income, food security, and employment opportunities, particularly for women and youth, while contributing to environmental sustainability through agroforestry practices (Pantera et al., 2021; Sobola et al., 2015). However, challenges such as inadequate access to improved planting materials, limited financial services, weak value addition, and environmental degradation hinder the sector's growth and inclusiveness (Adenle et al., 2018; Kanu et al., 2014; Fay, 2012). In response, the European Union, through a grant agreement, has initiated the Agro-Tech Development Support Project, implementing the 'Developing an Inclusive and Sustainable Cashew Agroforestry Value Chain (DISCA-VC) Project' in Sierra Leone. The project aims to promote a sustainable cashew value chain that provides decent work, increases income, and improves food security in rural communities, with a particular focus on women and youth empowerment (Peprah et al., 2025; Chandran et al., 2024; Baodi et al., 2025). By integrating cashew agroforestry practices, the project addresses the dual objectives of economic development and natural resource conservation, contributing to biodiversity preservation and landscape restoration (Gangle et al., 2023; Lei et al., 2016). The DISCA-VC Project seeks to achieve four interlinked results: (1) enhanced natural resource protection and landscape restoration through cashew agroforestry; (2) improved access to sustainable services and finance for cashew producers; (3) increased food safety, employment, and income via value addition in the cashew value chain; and (4) an improved business environment for the cashew sector in Sierra Leone (Turay et al.,, 2020; Costa & Bocchi, 2017; Sierra-Baquero, 2024). By integrating cashew agroforestry practices, the project addresses the dual objectives of economic

---

development and natural resource conservation, contributing to biodiversity preservation and landscape restoration (Karalliyadda et al., 2025; Chappa,2025; Gupta et al., 2020). Since its inception in September 2022, the project has been implemented across four key districts; Kambia, Tonkolili, Bombali, and Port Loko. To track progress and assess impact, Solidaridad deployed a midterm evaluation focusing on the tangible benefits and personal impacts of the interventions on smallholder farmers participating in the project. This evaluation, which combined both primary and secondary data collection, provides critical insights into the effectiveness of the project interventions and helps identify priority areas for enhanced focus. The findings aim to inform decision-makers and donors regarding the project's contributions to sustainable rural development and guide future policy and programming (Sisto et al., 2018; Díez et al., 2016; De Marinis, 2020).
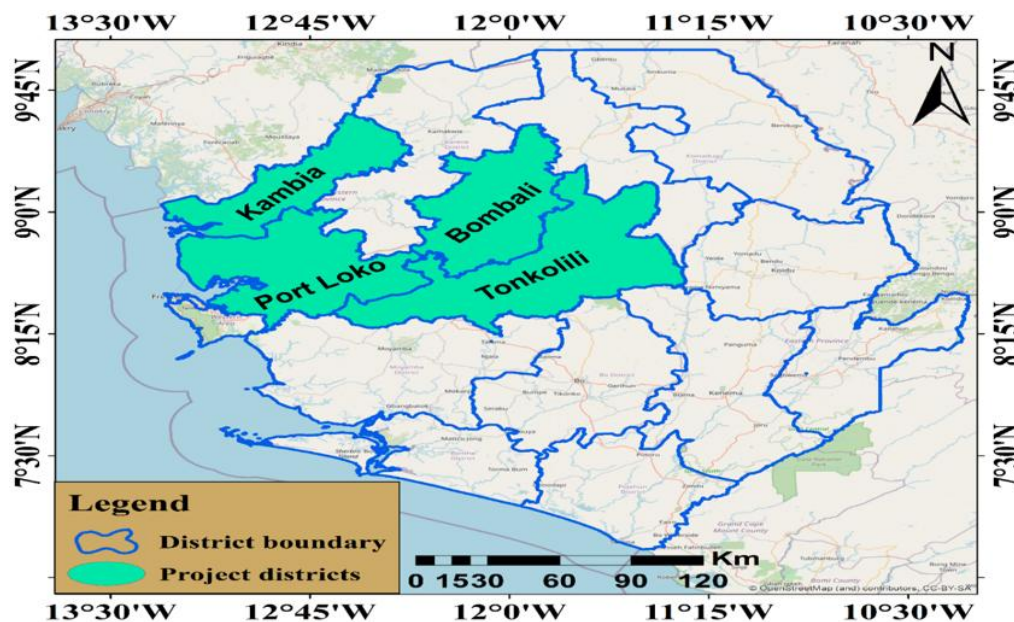

Fig.1: Map of Sierra Leone showing the study areas

Study Design

Given the complexity and diversity of the project participants and stakeholders, a mixed methods research design (MMRD) was adopted for the midterm evaluation to capture comprehensive and robust data. This approach integrated multiple data collection techniques to provide a holistic understanding of the project's impacts. Quantitative data were collected through structured household questionnaires, while qualitative data were obtained using semi-structured interview guides for key informant interviews (KIIs) and focus group discussions (FGDs). Additionally, relevant secondary data were sourced from project reports and pertinent local and international documents to contextualize and triangulate findings. To complement these methods, personal covert observations were conducted by data collectors to gather firsthand contextual information.

A quasi-experimental pseudo two-group pretest–posttest (TGPP) design was applied to assess changes attributable to the project interventions by comparing outcomes among project participants (treatment group) and non-participants (counterfactual group) before and after the intervention. This approach allowed for the estimation of causal effects provided that baseline equivalence between the treatment and control groups was established across key indicators.

Development of Survey Instruments

The primary data collection instruments were developed in alignment with the indicators and outcomes specified in the project's logical framework. The household questionnaire was structured into discrete sections corresponding to each result area, with a series of targeted questions designed to capture the midterm status of relevant indicators. This design enabled a quantitative comparison of responses between baseline and midterm measurements. Similarly, interview and discussion guides for key informant interviews (KIIs) and focus group discussions (FGDs) were developed following the thematic sequence of the project log frame, providing in-depth qualitative data to validate and triangulate quantitative findings.

All survey instruments underwent review by Solidaridad to ensure alignment with the overall evaluation objectives and project goals. Both qualitative and quantitative data collected are disaggregated by location, age, and sex, facilitating subgroup analyses and enhancing the granularity of the evaluation. The household questionnaire was digitized using the KoboToolbox Open Data Kit (ODK) platform to enable electronic data

capture and improve data quality. Skip logic was incorporated to streamline the survey flow by eliminating irrelevant questions for particular respondents. Following comprehensive training of data collectors, all survey tools (household questionnaire, KII and FGD guides) were pretested in the field to assess efficiency, relevance, and coherence with the intended project deliverables. Quality control measures during pretesting ensured that the instruments were fit for purpose. Based on the pretest results, the tools were refined and finalized prior to full-scale field administration.

Sampling Approach

A combination of purposive and systematic random sampling techniques was employed to select project participants (treatment group), non-project participants (counterfactual group), and key stakeholders. Purposive sampling was used to target project participants and relevant stakeholders in order to effectively capture data related to the achievement of project outcomes. Non-project participants were also purposively selected to allow for comparative analysis between beneficiary and non-beneficiary groups. To enhance representativeness and reduce selection bias within these groups, systematic random sampling was applied, whereby every fourth household was selected for inclusion in the survey sample.

Sample Frame

The household survey sample frame consisted of the 3,743 smallholder farmers engaged by the project across the four participating districts. For focus group discussions (FGDs), the sample frame comprised members of the 80 Natural Resource Management (NRM) committees as well as farming households within the project areas. Key informant interviews (KIIs) targeted a diverse range of stakeholders at both the community level — including chiefs, councillors, master farmers, as well as women and youth leaders — and institutional level, encompassing representatives from Solidaridad, the Ministry of Agriculture and Food Security (MAFS), District Councils, the Environment Protection Agency (EPA), and the Sierra Leone Agricultural Research Institute (SLARI).

Sample size

The household sample size was calculated using the Yamane formula (1973) as given below:

$$n = \frac{N}{1 + N(e)^2}$$

In this, n is the sample size, N is the total population size of 3,743 smallholders across the four chief regions of the project, and e represents the margin of error, set at 5%, corresponding to a 95% confidence level. Applying this formula yields a calculated sample size of approximately 361 households, which is rounded up to 400 households to enhance representativeness. The sample is evenly distributed among the four target areas, with 100 households allocated to each area. Within each area, the sample is evenly stratified between the treatment group (project participants, n=50) and the control group (non-participants, n=50) for comparative analysis.

Focus group discussions (FGDs) were conducted across 80 project communities and the four districts, with a total of eight FGDs organized—two per district (one for the treatment group and one for the counterfactual). Participants included members of Natural Resource Management (NRM) committees and farming households, encompassing both project beneficiaries and non-beneficiaries. Each FGD consisted of 8 to 12 participants, incorporating representation from women, youth, and marginalized groups. FGDs were conducted within the same communities as the household surveys to enable direct triangulation of qualitative and quantitative data. For key informant interviews (KIIs), a total of 12 respondents were purposively selected to provide institutional and community-level perspectives. The sample included representatives from Solidaridad (n=2), the Ministry of Agriculture and Food Security (MAFS) (n=2), local chiefs (n=2), the Environment Protection Agency (EPA) (n=1), the Sierra Leone Agricultural Research Institute (SLARI) (n=1), youth leaders (n=2), and women leaders (n=2).

Data Collection
Primary Data Collection
Quantitative Data

Quantitative data were collected using a structured household questionnaire administered via Kobo Toolbox and Kobo Collect platforms on Microsoft and Android devices. Fifteen data collectors were recruited and organized into two teams, each consisting of four enumerators led by a team leader. To ensure uninterrupted data collection, enumerators were equipped with power banks for continuous device operation and mobile internet connectivity to enable real-time GPS coordinate capture and daily submission of completed surveys. Motorbikes were hired to facilitate flexible and efficient movement across the diverse and often remote project communities.

Qualitative Data Concurrently, the two team leaders conducted Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). Considering the busy schedules of some key informants, remote interviews

via telephone or email were employed as alternatives when face-to-face meetings were not feasible. A list of relevant KIIs was developed in collaboration with Solidaridad, targeting community leaders, local authorities, and institutional stakeholders. KIIs followed a semi-structured format to allow focused yet flexible inquiry, enabling respondents to elaborate on pertinent issues. FGDs provided a platform for comprehensive community assessments, exploring project participants' needs, livelihood challenges, socio-economic conditions, gender and governance relations, access to and control over natural resources (e.g., land), as well as vulnerabilities impacting livelihood sustainability. The discussion encouraged inclusive participation, ensuring that all voices were heard, including those of women, youth, people with disabilities, and other marginalized groups.

Secondary Data

A detailed literature review supplemented the preliminary data collection, including Solidaridad project documents, strategic plans, implementation manuals, and similar interventions by other development partners. Relevant national policies and government documents affecting agricultural development and food security were also reviewed. The literature review laid the theoretical foundation for the final evaluation and informed the study's objectives and analytical framework. Additionally, covert observation techniques were employed in the field to assess behaviors and situations that might not be effectively captured through direct questioning. The combined methodologies facilitated collection of location-, gender-, and age-disaggregated data, enabling nuanced analysis of program impacts across demographic groups in the targeted districts.

Training and Pretesting

Prior to field deployment, a comprehensive one-day training session was conducted for all data collectors. The training covered ethical research practices, including obtaining informed consent, managing participant refusals, effective probing techniques, and covert observation methods. Each questionnaire item was carefully reviewed to ensure alignment with project objectives, outcomes, and cross-cutting themes, while ensuring cultural and linguistic appropriateness.

A pretest of the data collection instruments was subsequently carried out to familiarize enumerators with the tools and identify any necessary adjustments before full-scale data collection commenced.

Quality Assurance and Control

To uphold data quality and integrity, data collectors received training on ethical standards and respondent privacy. The relevance and consistency of data collection tools were rigorously assessed through pilot testing and internal reviews prior to use.

All survey responses were geo-referenced using Global Positioning System (GPS) coordinates to verify enumerators' presence at designated locations. GPS data were cross-checked by overlaying coordinates on OpenStreetMap platforms as part of spatial quality control.

Furthermore, daily data submissions enabled continuous monitoring and supervision of fieldwork. The project team regularly reviewed incoming data on the central server to identify discrepancies or gaps promptly. Comprehensive data cleaning procedures were conducted prior to analysis to ensure accuracy, completeness, and reliability of the dataset.

Data Analysis

Prior to analysis, data underwent rigorous cleaning to correct errors, address missing values, and standardize formats, ensuring integrity and readiness for both qualitative and quantitative analysis.

Descriptive statistics, including measures of central tendency (mean, mode, frequency), summarized the data and were visually presented using tables, charts, and graphs. Quantitative data distributions were examined with histograms and pie charts, with disaggregation by gender, age, and location to identify trends and group differences.

Qualitative data were analyzed using conceptual content analysis. Data were organized into themes aligned with project indicators, enabling the aggregation of related responses for triangulation with quantitative findings. This concurrent analysis substantiated interpretations and enriched understanding of project impacts. Food and nutrition security were assessed using the Minimum Dietary Diversity for Women (MDD-W) and the Months of Adequate Household Food Provisioning (MAHFP), providing disaggregated insights into dietary quality and food availability.

Results were interpreted and presented through clear narratives supported by tables, charts, and an indicator summary matrix outlining project outputs against measurable targets. Limitations affecting interpretation include potential respondent bias due to cultural factors, challenges arising from high illiteracy rates, subjectivity in qualitative coding, spatial sampling limitations, and temporal variability across data collection points.

Participation was entirely voluntary, with informed consent obtained prior to data collection. Respondents could withdraw or decline to answer at any stage. To protect privacy, no personal identifiers were collected; only community or institutional affiliations were recorded.

Additional protective measures included: interviewing only consenting participants; respecting participant dignity by avoiding intrusive photography; conducting interviews in open, visible spaces; seeking permission from household heads when interviewing women; using local languages to ensure understanding; scheduling interviews to minimize disruption; and enforcing strict conduct codes prohibiting sexual abuse, discrimination, and disrespect for cultural or religious practices. The "Do No Harm" principle was rigorously observed throughout the study.

Findings of the midterm evaluation
Demographic characteristics of household respondents
Category and Location of Respondents

A total of 416 household interviews were conducted, with 76% of respondents identified as cashew farmers and 24% as aggregators. Among these households, 53.9% were located in communities participating in the project, while 46.1% were from non-participating communities. The respondents were evenly distributed across the four participating districts.

Gender, Age, and Religion

The survey sample consisted of 50.2% male and 49.8% female respondents. Among them, 58.3% were older than 35 years (classified as non-youth), while 41.7% were 35 years or younger (classified as youth). Islam was the predominant religion, practiced by 65.5% of respondents, whereas 34.5% identified as Christians.

Marital Status, Educational Level, and Household Size

The majority of respondents (73.9%) were married. The surveyed communities exhibited a high rate of illiteracy, with 58.2% of respondents having no formal education. When disaggregated by gender, illiteracy was found to be higher among females (65.6%) compared to males (51%). The average household size was 5.93 persons, approximately six individuals per household. Figure 2 illustrates the percentage distribution of respondents by educational level and marital status.
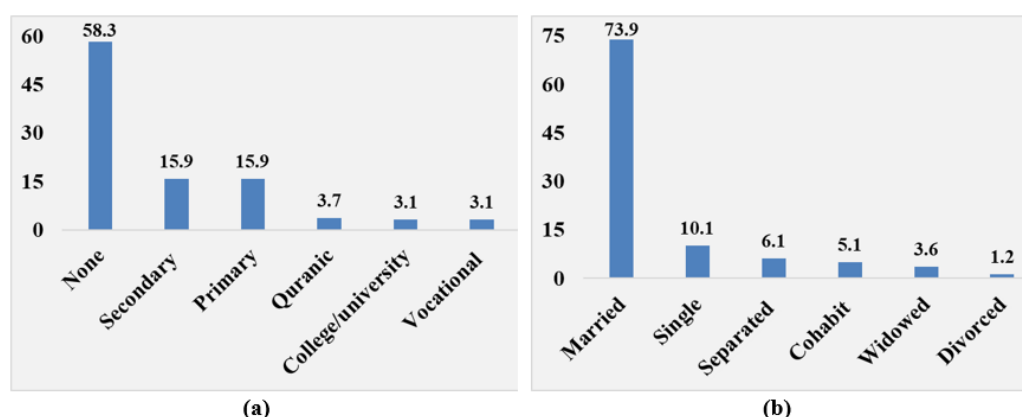

Figure 2: Percentage distribution of household respondents by (a) education, (b) marital status.

Farmer and Plot Information

The average duration of cashew farming was 3.9 years in project communities, compared to 3.3 years in non-project communities. Farmers in project areas owned an average of 1.4 cashew farms, while those in non-project areas averaged 1.1 farms. Additionally, the mean farm size was notably larger in project communities, at 4.4 hectares, compared to 1.7 hectares in non-project communities. These findings indicate a significant positive impact of the DISCA-VC project in expanding the area under cashew cultivation.

Table 1 indicates that most cashew farms (77.6%) in both project and non-project communities are established on family land. The remaining farms are situated on freehold or inherited land (14.1%), rented or leased land (4.3%), and land under sharecropping arrangements (4%). These figures highlight the predominance of the communal land tenure system in rural areas.

Regarding beekeeping, 45.6% of surveyed farmers reported having beehives on their cashew farms. However, cross-tabulation reveals a marked difference between communities: 64.9% of farmers in participating communities maintain beehives compared to only 20.9% of those in non-project communities.

Figure 3 illustrates the percentage distribution of respondents based on their perceptions of land degradation and afforestation within their communities. A high level of perceived land degradation was reported in the project communities, with the majority (74.6%) indicating that less than 25% of degraded land has been afforested. Further analysis revealed that 32.7% of respondents in project communities believed that at least 25% of degraded land had been afforested, compared to only 16.4% of respondents in non-project communities. These findings underscore the significant role of the Natural Resource Management (NRM) committees in the participating communities in promoting sustainable land governance.
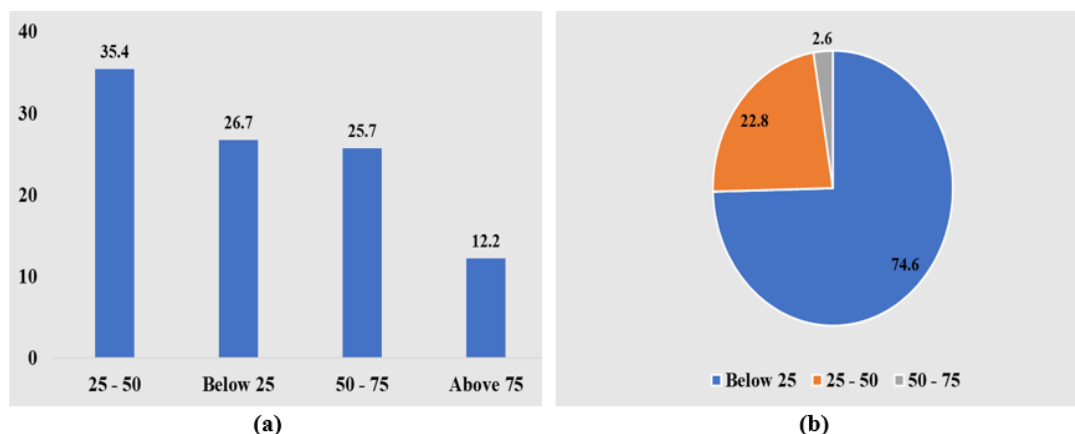

Figure 3: Percentage distribution of household respondents by perceptions of (a) percentage of land degraded, (b) percentage of land afforested.

Table 1: Comparison of baseline and mid-term values for farmer and plot information.

Indicators	Baseline values			Mid-term values		
	Treatment	Control	Average	Treatment	Control	Average
Years of farming	3.6	3.2	3.4	3.9	3.3	3.6
Number of cashew farms	1.2	1.1	1.2	1.4	1.1	1.3
Total farm size (ha)	2.3	1.9	2.1	4.4	1.7	3.1
Fruiting farm size (ha)	2.1	1.8	2.0			
% intercropping	74.8	65.2	70.0	91.8	89.6	90.7
% farms mapped	34.1	21.7	27.9			
% farms with beehive	27.6	22.7	25.2	64.9	20.9	42.9
Land holding arrangements						
% freehold/inheritance	56.1	58.3	57.2	15.8	12.4	14.1
% family land	39.7	25.3	32.5	74.9	80.3	77.6
% rented/leased				7.0	1.5	4.3
% share cropping				2.3	5.8	4.0

Table 1 reveals inconsistencies in landholding arrangements between the baseline and mid-term values, which may be attributed to either systematic errors during data collection or changes in land ownership over time. It is important to note that indicators such as fruiting farm size and the percentage of farms mapped were not measured during the mid-term evaluation. Nonetheless, there was a notable increase from baseline to mid-term in total farm size, the prevalence of intercropping, and the percentage of farms with beehives, reflecting the positive impact of the DISCA-VC Project.

Improved Cashew Seedlings

Across the surveyed communities, 83.9% of cashew farmers cultivate improved cashew seedlings. Crosstabulation reveals that 100% of farmers in the project communities grow the improved polyclonal variety, compared to 63.7% of farmers in non-project communities. Table 2 details the sources of the improved polyclonal seedlings by community type, highlighting that 98.8% of project participants obtained their improved cashew seedlings directly from the DISCA-VC Project. This underscores the significant role of the project in enhancing farmers' access to improved cashew varieties.

Table 2: Percentage disaggregation of the source of improved cashew by community type.

Community type	Source of improved polyclonal (%)								
	Agro-dealer	FBO	Relative	MAFS	Open market	Other NGO	Own farm	DISCA-VC	Total
Participant			0.6			0.6		98.8	100
Non-participant	9.3	1.2	43.1	3.5	19.7	20.9	2.3		100

The average number of improved cashew seedlings planted per farmer in project communities was 710, compared to 116 in non-project communities, highlighting the substantial contribution of the DISCA-VC Project to cashew cultivation. In 2024, the average cost of an improved cashew seedling was SLE 11.26, with a median price of SLE 10.00. Most farmers who planted improved varieties rated the seedlings as either very good (53.3%) or good (46.7%). The average total expenditure on cashew seedlings per farmer in 2024 was SLE 597.7 in project communities, compared to SLE 325.2 in non-project communities.

Table 3 shows that while the proportion of cashew farms covered by improved varieties was not assessed, there was a marked increase in both the adoption of improved polyclonal varieties and the number of improved seedlings planted from baseline to mid-term. The significant rise in improved seedling planting in non-project communities suggests a positive spillover, or neighborhood effect, stemming from the impact of the DISCA-VC Project.

Table 3: Comparison of baseline and mid-term values on improved cashew seedlings planted

Indicators	Baseline values			Mid-term values		
	Treatment	Control	Average	Treatment	Control	Average
Type of seedling						
% improved polyclonal	67.4	60.4	63.9	100	63.7	81.9
% unknown varieties	32.6	39.6	36.1	0.00	36.3	18.2
Proportion of farm covered by improved varieties						
% of farm	22.8	16.8	19.8			
Quantity of improved seedlings planted						
Mean number planted	103.2	45.5	74.4	710	116	768

Farm Agro-inputs and Best Practices

Only a small proportion of farmers (1.2%) in project communities applied agro-chemicals (fertilizers only) on their cashew farms, with an average expenditure of SLE 125.00. During the 2024 cropping season, an overwhelming majority of farmers implemented fire belts (98.7%), followed by under-brushing (74.8%), weeding (64.3%), pruning (18.7%), and pest control measures (3.3%).

Bush fires continue to pose a significant threat to cashew plantations, with 73.4% of farmers reporting fire incidents on their farms in 2024. However, the incidence of bush fires was slightly lower in project communities (71.6%) compared to non-project communities (74.9%). The average number of fire occurrences per farm in 2024 was 1.2 in project communities and 1.5 in non-project communities. This marginally reduced fire frequency in project areas is attributed to the efforts of Natural Resource Management (NRM) committees promoting sustainable land management practices.

Table 4 compares baseline and mid-term data on the occurrence, frequency, and impact of bush fires in both project and non-project communities. The data show a slight reduction in the incidence, frequency, and severity of bush fires from baseline to mid-term. Correspondingly, the proportion of cashew farms experiencing severe yield and productivity losses (over 50%) declined significantly, while moderate yield reductions increased, reflecting improved resilience and management practices.

Table 4: Comparison of baseline and mid-term values on bush fire occurrence and impact.

Indicators	Baseline values			Mid-term values		
	Treatment	Control	Average	Treatment	Control	Average
Farms affected by bush fire						
Number of farms	1.4	1.4	1.4	1.3	1.3	1.3
Number of incidences	1.1	1.1	1.1	1.2	1.5	1.4
% of farms affected	49.4	47.7	48.6	45.7	49.0	47.4
Effect (reduction) on yield and productivity						
High (by over 50%)	49.6	53.7	51.7	37.5	41.4	39.5
Moderate (30 – 50%)	24.8	28.4	26.6	30.2	29.7	29.9
Low (up to 20%)	13.6	10.5	12.1	31.3	28.9	30.1
No effect	12.0	7.4	9.7	1.0	0.00	0.5

Production and Yield of Cashew

In project communities, the average production of raw cashew nut (RCN) per farm was 69.6 kg during the major season and 30.2 kg during the minor season. In comparison, farmers in non-project communities produced an average of 55.9 kg in the major season and 20.7 kg in the minor season. Consequently, the average annual RCN production per farm was 99.8 kg in project communities and 76.6 kg in non-project communities. This higher yield in project areas reflects the positive impact of the DISCA-VC intervention, which enhanced farmers' access to improved seedlings, financing, and knowledge and skills related to cashew cultivation.

Regarding productivity changes in 2024, the majority of farmers (50.6%) reported an increase compared to the previous season, while 46.9% noted no change, and only a small fraction (2.5%) experienced a decline (see Table 5).

The average quantity of RCN sold per farmer in 2024 was 71.8 kg in project communities, compared to 64.5 kg in non-project communities. Most cashew farmers sold their produce to aggregators (47.6%), followed by sales in open markets (28.3%), cooperatives (15.1%), companies (6.6%), and NGOs (2.4%). Unsold RCN was typically consumed, processed, or retained for replanting in subsequent seasons.

Table 5 presents baseline and mid-term production data, demonstrating an overall improvement in cashew production volumes.

Table 5: Comparison of baseline and mid-term values on cashew production.

Indicators	Baseline values			Mid-term values		
	Treatment	Control	Average	Treatment	Control	Average
Total production (yield)						
Total annual yield in tons	12.5	9.6	11.1	19.0	12.1	15.6
Perceived change in productivity (%)						
Unchanged	18.5	27.4	23.0	45.6	48.1	46.9
Increased	45.7	38.7	42.2	50.9	50.4	50.6
Decreased	9.9	6.5	8.2	3.5	1.5	2.5
Can't remember	1.2	1.6	1.4			
None	24.7	25.8	25.3			

Natural Resources Management

The most widely recognized natural resource management issues among the surveyed communities include deforestation and afforestation (93.3%), environmentally degrading farming practices (92.1%), protection of water bodies (51.4%), erosion prevention and cover cropping (19.3%), mulching and soil conservation (15.6%), minimum or zero tillage (13.7%), and the safe use of agro-chemicals (6.3%).

A notably higher proportion of respondents in project communities (82%) acknowledged the presence of Natural Resource Management (NRM) platforms and byelaws compared to those in non-project communities (39%), highlighting the contribution of the DISCA-VC Project in establishing community structures that support environmental sustainability.

Finance and Income Sources

Table 6 presents the percentage distribution of main income sources by community type. For most farming households, food crops remain the primary source of income. However, cashew farming represents a more significant income source in project communities, reflecting the impact of the DISCA-VC Project in promoting cashew cultivation and consequently increasing income through cashew sales.

Table 6: Percentage disaggregation of household main income source by community type.

Community type	Main source of income (%)							
	Cashew farming	Food crops	Labor	Livestock/ fisheries	Other cash crops	Petty trading	remittances	Total
Participant	17.4	57.5	1.3	2.3	13.3	7	1.2	100
Non-participant	4.9	69.9	0.7	2.8	12.6	7.7	1.4	100

A higher proportion of households in project communities (50.6%) are members of Village Savings and Loan Associations (VSLAs) compared to those in non-project communities (19.1%), demonstrating the DISCA-VC Project's contribution to improving access to financial services. All VSLA members reported receiving share-outs, with an average amount of SLE 1,881.00 and a median of SLE 1,650.00. The majority (80.3%) used their share-outs to cover family expenses such as food, shelter, clothing, medical care, childcare, and school fees. Other uses included investment in cashew farming (63%), other agricultural activities (55.1%), non-farm businesses (47.2%), health emergencies (11.8%), loan repayments (6.3%), transfers to spouses (2.4%), and asset or infrastructure development (2.4%).

In 2024, more cashew farmers in project communities (49.4%) received loans compared to those in non-project communities (26.6%), further highlighting the role of the DISCA-VC Project in enhancing financial access through VSLAs. The majority (91.1%) of these loans were sourced from VSLAs. The average loan amount per farmer was SLE 975.10, with a median of SLE 800.00. Most borrowers (77.2%) used the loans to cover family expenses, followed by cashew farming investments (70%), other farm businesses (53.7%), non-farm enterprises (32.5%), health or emergencies (27.6%), loan repayments (15.4%), asset or infrastructure acquisition (4.1%), social activities (3.3%), transfers to spouses (1.6%), and a small proportion (0.8%) remained unspent.

Household Food Security

Respondents reported that the period from October to January, corresponding to the harvest season, is when households experience the highest levels of food security. Conversely, the planting season, from May to August, is noted as the time of greatest food insecurity. The average number of months of adequate household food provisioning (MAHFP) was four months in project communities, compared to three months in non-project communities. Additionally, a higher percentage of respondents in project communities (33.1%) reported no experience of hunger due to lack of food in the past month, compared to 25.2% in non-project communities, underscoring the positive impact of the DISCA-VC Project on household food security.

Focus group discussions (FGDs) and key informant interviews (KIIs) identified common coping strategies during periods of food scarcity, including rationing food, consuming alternative staples such as millet, sorghum, cassava (gari, fufu), potato, banana, plantain, and yam; obtaining loans to purchase food; engaging in manual labor to generate income; receiving remittances from friends and relatives; seeking food assistance from neighbors or relatives; selling personal property; and utilizing personal savings.

Cashew Aggregators

The survey interviewed a total of 100 cashew aggregators, with 51 from project communities and 49 from non-project communities. The average duration of involvement in the cashew business was 3.4 years (median of 3 years), with most aggregators having approximately two years of experience. Only 16% of aggregators had formally registered their businesses. A majority (66%) reported receiving entrepreneurship training through the DISCA-VC Project.

According to FGD and KII responses, key challenges faced by cashew aggregators include inadequate storage and processing facilities, limited financial resources, poor transportation infrastructure, insufficient availability of raw cashew nuts (RCN), unstable market prices, high interest rates and collateral requirements for loans, pest infestations, lack of skills in storage and pest management, and weak business management capabilities. Only 14% of aggregators reported access to processing facilities.

In 2024, the average quantity of RCN purchased per aggregator was 391 kg in project communities and 381.7 kg in non-project communities. The majority (94%) of aggregators purchased RCN at the farm gate, followed by market traders (39%), cooperatives (21%), illegal imports (8%), processing centers (3%), and legal imports (1%). The average purchase price of RCN in 2024 was SLE 30.00 per kilogram.

Most aggregators (61%) sold RCN in 2024, with average sales quantities of 282.8 kg and 198.7 kg per aggregator in project and non-project communities, respectively. The average sales price was SLE 40.00 per kilogram. Additionally, the average quantity of RCN processed per aggregator was 100.1 kg in project communities, compared to 66.4 kg in non-project communities. All deshelling operations were performed manually. The average quantity of good kernels obtained after deshelling was higher in project communities (90.5 kg) than in non-project communities (55.9 kg). Similarly, the average quantity of good kernels sold post-deshelling was 82 kg in project communities versus 51.8 kg in non-project communities. The average price for good kernels stood at SLE 50.00 per kilogram.

Regarding working conditions, 80% of aggregators rated their safety as average, while 20% rated it as good. Only 17% of aggregators were members of cashew-related VSLAs, with 64.7% of these members residing in project communities, suggesting the DISCA-VC Project's role in enhancing financial service access. VSLAs have contributed to improving aggregators' financial management, price negotiation, financing options, and client access.

Awareness of cashew value chain regulations was limited, with only 29% of aggregators reporting familiarity, of whom 51.7% were from project communities. These knowledgeable aggregators generally support regulatory implementation. Value addition prior to sale was practiced by only 16% of aggregators, half of whom were in project communities, reflecting generally low profit margins within the sector.

II.   Conclusion

Cashew farming and aggregation provide a vital source of livelihood in agrarian communities. The DISCA-VC Project, operating in the Port Loko, Kambia, Bombali, and Tonkolili districts, offers a significant opportunity for livelihood diversification and alternative income generation. Cashew farming is increasingly established as a major alternative livelihood within the project communities, as demonstrated by the rapid expansion of cashew cultivation and the positive spillover effects observed in neighboring areas.

The DISCA-VC Project has made substantial contributions to the cashew sector, including the introduction and widespread adoption of improved cashew varieties, increased production and productivity, formation of natural resource management committees, enhanced access to financial services, strengthened farmer skills and knowledge, and improved linkages between farmers, aggregators, and markets. Collectively, these achievements underscore the project's strong potential to meet its goals, objectives, and intended outcomes.

References

[1]. Adenle, A. A., Azadi, H., & Manning, L. (2018). The Era Of Sustainable Agricultural Development In Africa: Understanding The Benefits And Constraints. Food Reviews International, 34(5), 411-433.
[2]. Boadi, S. A., Owusu, K., & Obour, P. B. (2025). Impact Of Cashew Cultivation On Food Security, Sovereignty, And Income Diversification In Jaman North District, Ghana. Geojournal, 90(1), 36.
[3]. Chappa, L. R. (2025). Assessing Stakeholder's Willingness To Adopt Agroforestry For Land Reclamation In Gold Mining-Affected Areas.
[4]. Costa, S., & Bocchi, S. (2017). Manual For Small-Scale Cashew Cultivation In Sierra Leone. Milan, Italy.
[5]. De Marinis, P. (2020). Participatory Evaluation Of Agricultural Development Programs As A Tool For Improved Sustainability In Development Cooperation.
[6]. Díez, M. A., Izquierdo, B., & Malagón, E. (2016). Increasing The Use Of Evaluation Through Participation: The Experience Of A Rural Sustainable Development Plan Evaluation. Environmental Policy And Governance, 26(5), 366-376.
[7]. Fay, M. (2012). Inclusive Green Growth: The Pathway To Sustainable Development. World Bank Publications.
[8]. Gangle, G. R., & Bhatnagar, P. (2023). An In-Depth Examination Of The Interplay Between Economic And Ecological Factors In Biodiversity Preservation. Recent Advances In Biodiversity Research, 1.
[9]. Gupta, S. R., Dagar, J. C., & Teketay, D. (2020). Agroforestry For Rehabilitation Of Degraded Landscapes: Achieving Livelihood And Environmental Security. Agroforestry For Degraded Landscapes: Recent Advances And Emerging Challenges-Vol. 1, 23-68.
[10]. Kanu, B. S., Salami, A. O., & Numasawa, K. (2014). Inclusive Growth: An Imperative For African Agriculture. Afr. J. Food Agric. Nutr. Dev, 14(3).
[11]. Karalliyadda, S. M. C. B., Navodya, H. A. H., & Jayakody, J. D. T. D. (2025). Agroforestry For Sustainable. Agroforestry For A Climate-Smart Future, 73.
[12]. Lei, K., Pan, H., & Lin, C. (2016). A Landscape Approach Towards Ecological Restoration And Sustainable Development Of Mining Areas. Ecological Engineering, 90, 320-325.
[13]. MC, S. C., Chandran, R., Sahib, P. R., & Achuthan, K. (2024). Sustainable Livelihoods Through Cashew Cultivation: Insights From Smallholder Farmers In The Southern Region Of India. Discover Sustainability, 5(1), 340.
[14]. Pantera, A., Mosquera-Losada, M. R., Herzog, F., & Den Herder, M. (2021). Agroforestry And The Environment. Agroforestry Systems, 95(5), 767-774.
[15]. Peprah, C., Peprah, V., Acheampong, D., & Morgan, A. K. (2025). Cashew Production: A Conduit To Attaining Sustainable Development Goal One In Rural Farming Communities Of Ghana. Cogent Food & Agriculture, 11(1), 2535763.
[16]. Sierra-Baquero, P., Catarino, S., Costa, G. J., Barai, A., Correia, Z., Ferreira, M. R., ... & Monteiro, F. (2024). Insights Into The Cashew Production System In Guinea-Bissau: Implications For Agroecosystem Sustainability. Frontiers In Sustainable Food Systems, 8, 1439820.
[17]. Sisto, R., Lopolito, A., & Van Vliet, M. (2018). Stakeholder Participation In Planning Rural Development Strategies: Using Backcasting To Support Local Action Groups In Complying With CLLD Requirements. Land Use Policy, 70, 442-450.
[18]. Sobola, O. O., Amadi, D. C., & Jamala, G. Y. (2015). The Role Of Agroforestry In Environmental Sustainability. IOSR Journal Of Agriculture And Veterinary Science, 8(5), 20-25.
[19]. Turay, F., Lahai, P. M., Luseni, M. M., Carpenter, P. A., Bayon, M. S., & Kallon, V. F. (2020). Cashew (Anacardium Occidentale L.) Production, Processing Facilities And Quality Assessment In Kafubulum Chiefdom, Sierra Leone. International Journal Of Environment, Agriculture And Biotechnology, 5(4), 1019-1029.
[20]. Yamane, T. (1973). Statistics: An Introductory Analysis.