ISSN 0974-763X

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Volume 14, No. 2 March, 2024

SPECIAL ISSUE

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SOUTH ASIAN JOURNAL OF MANGEMENT RESEARCH (SAJMR)

ISSN 0974-763X

(An International Peer Reviewed Research Journal)

Published by

CSIBER Press, Central Library Building

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)

University Road, Kolhapur - 416 004, Maharashtra, India

Phone : 0231-2535706, 2535707. Fax : 0231-2535708

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Chhatrapati Shahu Institute of Business Education and Research (CSIBER)

South Asian Journal of Management Research (SAJMR)

Volume 14, No. 2, March 2024

Editor: Dr. Pooja M. Patil

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Editorial Note

South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and disciplined.

Cross-functional, multidisciplinary research that reflects the diversity of the management science professions is also encouraged, the articles are generally based on the core disciplines of computer science, economics, environmental science, mathematics, psychology, sociology, and statistics. The journal's focus includes managerial issues in a variety of organizational contexts, including for profit and nonprofit businesses, organizations from the public and private sectors, and formal and informal networks of people. Theoretical, experimental (in the field or the lab), and empirical contributions are all welcome.The journal will continue to disseminate knowledge and publish high-quality research so that we may all benefit from it.

Dr. Pooja M. Patil
Editor

South Asian Journal of Management Research
(SAJMR)

Volume 14, No. 2 **March, 2024**

C O N T E N T S

Mainstreaming Climate-Smart Coffee in District Local Government Development Plans: A Case Study of Sheema District, Uganda

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Abstract

In Uganda, the tangible impacts of climate change, such as irregular rainfall and prolonged droughts, are adversely affecting coffee farmers and disrupting household livelihoods. To address these challenges, this study advocates for the integration of climate-smart agriculture (CSA) into development planning, emphasising the crucial mainstreaming of Climate-Smart Coffee (CSC) given the pivotal role of coffee in Uganda's economic growth. However, the study, reveals persistent challenges in mainstreaming CSC into District Development Plans despite widespread acknowledgment of its importance. Limited material and financial support pose obstacles, along with deficiencies in CSC resources, climate finance opportunities, information systems, and climate assessments at the district level. The study highlights the absence of mentions regarding the utilisation of climate microfinance and microinsurance for supporting CSC interventions. It underscores the necessity for extending the observed momentum in national development plans to the district level, emphasising policies supporting both CSC adaptation and mitigation. The study advocates for enhanced institutional capacity at all levels of District Local Government (DLG) and targeted capacity building, particularly focusing on women, youth, and people with disabilities. Moreover, collaborations with private sector partners engaged in CSC initiatives at district, national, and regional levels are recommended to strengthen CSC mainstreaming efforts. This comprehensive research aims to bridge the gap in understanding the relationship between climate change adaptation and local development planning, specifically within the agricultural domain, contributing valuable insights to inform policies, enhance smallholder farming practices, and advance agricultural extension education at the local governance level.

Keywords: Climate-Smart Coffee, Local Government Development Plans, Climate Change Adaptation, Agricultural Development, Sheema District, Uganda

Introduction:

The Government of Uganda's involvement with climate change began in 1992 and 1993 with the ratification of the United Nations Framework Convention on Climate Change (UNFCCC). This led to the formation of the National Adaptation Programmes of Action (NAPA) in 2007(Uganda-NCCA, 2021). Despite criticisms of its execution, NAPA served as inspiration for subsequent plans, including the National Climate Change Policy (NCCP) adopted in April 2015(NAP-Ag, 2018, Mungai et al., 2020). In the absence of a National Action Plan (NAP), the agricultural sector developed its own NAP, primarily focused on enhancing resilience to climate change impacts. However, the Inter-Governmental Panel on Climate Change (IPCC) emphasises the vulnerability of less developed nations, such as Uganda, to the consequences of climate change (IPCC, 2015, Mwe.go.ug, 2020). The study advocates for the integration of climate change considerations into development planning to achieve Sustainable Development Goals (SDGs) and national development plans.

Despite recent national initiatives and the imminent Climate Change Act, there exists a gap in understanding how DLGs integrate climate change, especially at the grassroots level. The Local Government Act of 1997 empowers DLGs to harmonise, coordinate, integrate, and execute programs/projects under district-approved development plans. However, there is insufficient drive for DLG integration of climate change initiatives. Sustainable development and climate change concepts are vital for Uganda's population, heavily reliant on agricultural sectors. Climate-Smart Agriculture (CSA) is crucial for poverty reduction and livelihood

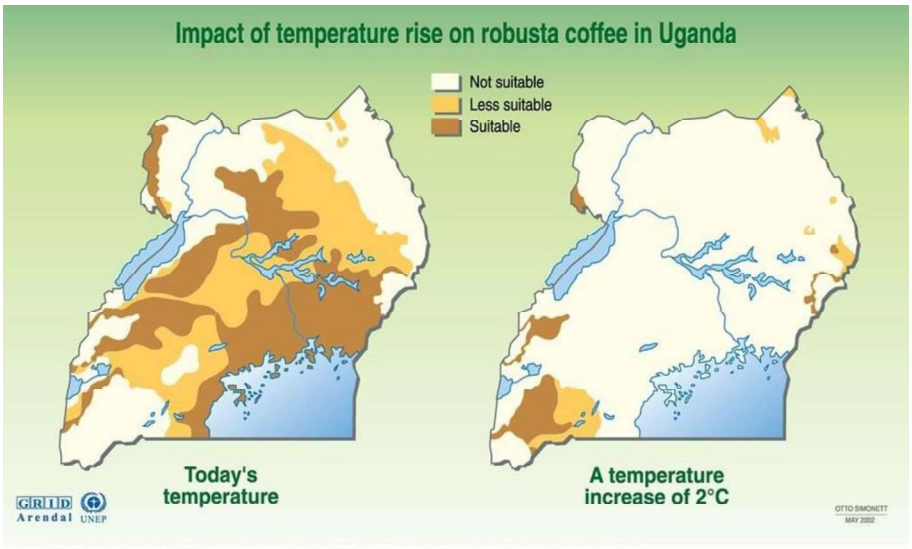
enhancement, yet the focus on national and technical adjustments often neglects DLG-level adaptation components like planningand budgeting.

The primary objective of the study is to explore the mainstreaming of Climate-Smart Coffee (CSC) in DLG development plans, with a specific focus on Sheema District. Specific objectives include investigating the enabling environment for addressing barriers to climate change adaptation in coffee, examining DLG capacity for implementing CSC activities, and exploring the integration of CSC in district agriculture extension programs and budgets.

Inspired by the opportunity to actively address climate change concerns, the study was conducted between June 2022 and January 2023 with the study aim of understanding how DLGs are mainstreaming CSC in their development plans. Findings are expected to significantly enhance governmental climate change adaptation policies, refine smallholder farming practices, and improve agricultural extension education. The study's potential influence on local and global government efforts in coping with climate change is noteworthy. Additionally, the findings contribute to narrowing the literature gap about district local government CSC mainstreaming andprovide a basis for future related studies.

Literature Review

In the realm of climate change impacts on agriculture in Uganda and Africa, with a specific lens on challenges in Ugandan coffee production, this literature review delves into the integration of Climate-Smart Agriculture (CSA) particularly Climate-Smart Coffee into District Local Government (DLG) work plans, focusing on the rural context of Sheema District. The methodological approach encompassed well-defined study objectives, refined searches using boolean operators in Google Scholar, and source tracking via Harvard online reference. With the inclusion of 46 publications from 2001 to 2022, the review prioritises recent, methodologically rigorous articles published in English. Climate change, as defined by IPCC (2007), is characterised by a gradual alteration of the planet's climate primarily due to human activities. Africa faces significant challenges such as crop yield reduction, water scarcity, increased agricultural pests, and extreme weather events. Uganda, heavily reliant on agriculture, faces threats from climate change,impacting coffee production and posing risks to export revenues and food security. Smallholder coffee farmers, constituting over 90% of production (Jassogne, Läderach and Van Asten, 2013), grapple with challenges arising from climate variables affecting coffee plantations, with projections suggesting a reduction of suitable areas by 2050 (AFCA, 2012; Pham et al., 2019). Toaddress these challenges, Uganda has embraced Climate-Smart Agriculture (CSA) to enhance productivity, resilience, incomes, and food security while mitigating greenhouse gas emissions. CSA



Source: Otto Simonett, Potential impacts of global warming, GRID-Geneva, case studies on climatic change. Geneva, 1989.

practices, supported by international aid organisations and financial institutions, have been adopted for coffee farming, emphasising adaptation in the production system (MAAIF, 2018; CIAT, 2011). The literature underlines the critical role of District Local Governments in implementing climate change adaptation plans and the need for mainstreaming CSC into DLG planning to ensure effective implementation at the local level. Despite government policies addressing climate change, challenges persist in adaptation, particularly at local government contexts like Sheema district. The study identified institutional norms, resource constraints, an coordination challenges as barriers to mainstreaming CSA in DLG planning, emphasising the importance of aligning local policies with climate change adaptation efforts. The research gap addressed lies in the lack of documentation regarding the implementation of climate change mainstreaming, particularly the incorporation of CSC into DLG planning in Uganda, with a specific focus on Sheema district , a significant coffee production district. The study aims to provide insights into effective mainstreaming practices for sustainable agriculture and resilient farming systems.

Figure 1: Future climate change effects on Uganda's Coffee

Conceptualization

The conceptual framework guiding this investigation is outlined below, drawing on insights from the literature discussed earlier. The framework clearly emphasises that the integration of Climate- Smart Coffee (CSC) into District Local Government (DLG) plans is hypothesised to have a significant impact on the adaptability of coffee farmers, conceptualised as the dependent variable (DV). Therefore, to enhance the adaptation of coffee farmers, it is proposed that DLGs must ensure the effective integration of CSC into their development plans.

Conceptual Framework:

Independent Variable (IV): Integration of Climate-Smart Coffee (CSC) into DLG Plans Extraneous Variable (EV): Implementation of CSC Initiatives

Dependent Variable (DV): Coffee Farmers' Adaptability Explanation:

1. Independent Variable (IV): Integration of Climate-Smart Coffee (CSC) into DLG Plans

- This variable represents the proactive inclusion of CSC strategies and initiatives within the broader development plans formulated by District Local Governments. It encapsulates the commitment of DLGs to prioritise climate-smart approaches in their agricultural policies and programs.

2. Extraneous Variable (EV): Implementation of CSC Initiatives

- Acting as an intermediary factor, the implementation of CSC initiatives serves as a crucial link between the integration of CSC into DLG plans and the ultimate adaptability of coffee farmers. Successful implementation ensures that the intended climate-smart practices, technologies, and policies are effectively executed on the ground.

3. Dependent Variable (DV): Coffee Farmers' Adaptability

- This variable represents the key outcome of interest, reflecting the ability of coffee farmers to adapt to the challenges posed by climate change. It encompasses various dimensions of adaptability, including changes in farming practices, resilience to climate-induced stresses, and the overall capacity to sustain coffee production amid changing environmental conditions.

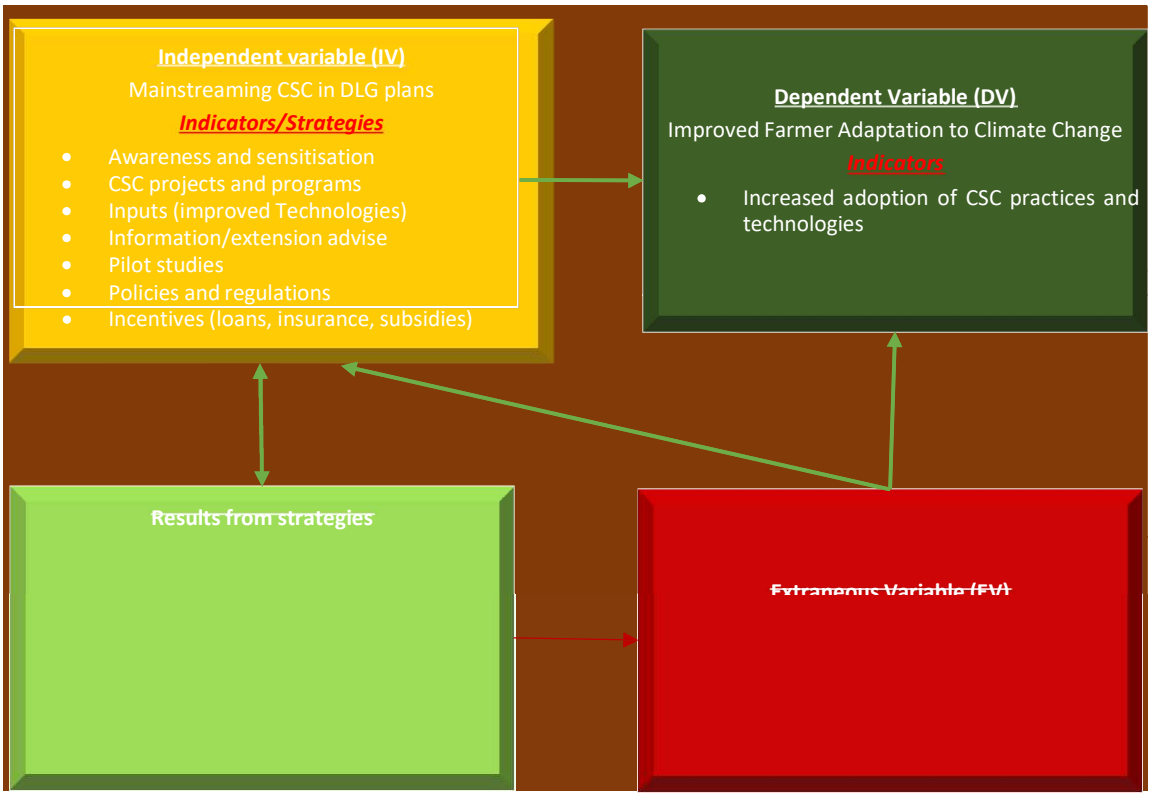
Hypothesis:

- H1: There is a positive correlation between the Integration of CSC into DLG Plans (IV) and the Implementation of CSC Initiatives (EV).
- H2: The Implementation of CSC Initiatives (EV) is positively associated with Coffee Farmers' Adaptability (DV)
- H3: The Integration of CSC into DLG Plans (IV) is positively linked to Coffee Farmers' Adaptability (DV).

Overall Proposition:

The conceptual framework suggests that the successful integration of Climate-Smart Coffee into DLG plans will positively influence the implementation of CSC initiatives. Subsequently, effective implementation is expected to enhance the adaptability of coffee farmers, ultimately contributing to resilient and sustainable coffee production systems in the face of climate change. Therefore, for improved coffee farmer adaptation, DLGs should prioritise and ensure the continuous integration of CSC into their development plans.

Figure 2: Conceptual Framework (Personal)



Methodology

The research was conducted in Sheema district, strategically selected due to its status as one of Uganda's major coffee-growing districts, primarily cultivating Robusta coffee. Positioned in the South Western part of Uganda, Sheema faces vulnerabilities to climate-related challenges, especially drought.

A hybrid approach combining primary data through an online survey and secondary data through desk collection was employed. Preliminary online meetings with district leaders in October 2022 secured permissions, while a subsequent online feedback meeting in January 2023 concluded the
results evaluation at the district level. Given the absence of a specific framework for Climate Smart Coffee (CSC) mainstreaming, the study adhered to the general mainstreaming framework from the

Food and Agriculture Organisation (FAO, 2013), specifically module 13. The study developed a customised set of CSC mainstreaming indicators based on this guidance.

To climate smart knowledge and monitoring. This guided me to create a set of individualised CSC mainstreaming indicators for the study.

Using an online questionnaire, quantitative data analysis, and inductive reasoning, the study targeted district technical, administrative, and political staff to capture insights into mainstreaming CSC in District Local Government (DLG) plans Data collection, conducted in November 2022, involved both secondary and primary sources. A semi-structured online questionnaire was employed for primary data collection, while document analysis was utilised for secondary data. Sampling involved convenient and purposive sampling, ensuring active involvement in coffee and climate change initiatives. The Raosoft online random sampling calculator determined a sample sise of 105, allowing for potential withdrawals. Questionnaires and document analysis served as primary instruments for data generation. The semi-structured questionnaire was deployed through Survey Monkey, while document analysis focused on Budget Framework Papers (BFWPs) and reports from the district production department.

After data cleaning and sorting, SPSS Version 21 facilitated analysis, presenting findings descriptively through percentages, charts, and tables. Member checking, external reviews, and a reliability test were employed to ensure data accuracy and credibility, with a Cronbach's Alpha value of 0.841 indicating reliability. Stringent ethical guidelines, including informed consent and anonymity assurances, were adhered to, following University-approved protocols. However, challenges in gathering participants and time constraints emerged as limitations, emphasising the need for further detailed investigations into CSC mainstreaming in DLG plans.

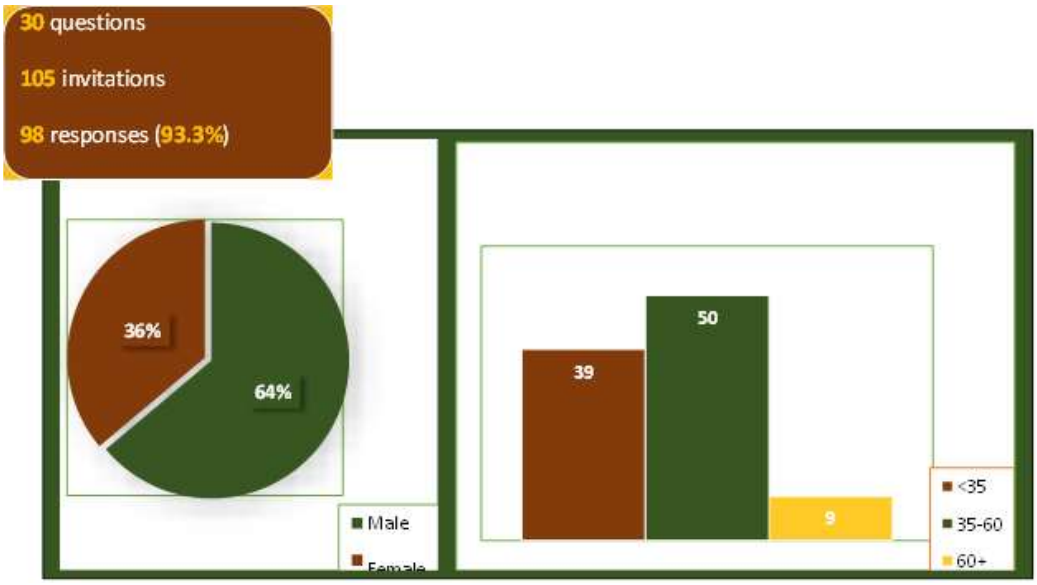
Result area	Indicators
Availability of an enabling environment for addressing the social, economic, policy, regulatory and institutional barriers to climate change	1. Availability of district climate change ordinances and bi-laws 2. Availability of climate smart incentives and subsidies 3. Climate change rural credit (climate loans) 4. Climate change risk management (rural insurance to dealwith climate shocks) 5. Availability and provision of climate resistant coffee varieties
Capacity building (information, information and knowledge networks)	1. Provision of enhanced climate service andagrometeorological info regarding coffee 2. Information and understanding of climate risk, coffee climate change investor info 3. CSC capacity building activities, (AEOs, farmer, training oftrainers, exposure visits) 4. CSC learning platforms (farmer field schools, demo gardens, radio/TV programs) 5. Provision/availability of coffee climate curriculum development
Projects on CSC (Focus on projects identified in the Program of Action)	1. Soil and water management projects (rain water harvesting,irrigation, fertiliser, IPM) 2. Projects on climate-smart coffee agroforestry 3. CSC implementation/project timelines (biannual, annual ormore) 4. Funding sources for climate smart projects 5. Implementation agencies/partners for climate smartprojects 6. "no-one-size-fits-all" CSC approaches (specific to farmer type)
Iterative learning system, beyond M&E	1. Coffee Agro-green businesses, CSC and fair-trade shows andexpos 2. Agriculture sector budget for CSC pilots and scale up 3. CSC stakeholder engagements and feedback process (privatesector and CSOs) 4. Clear strategies to monitor and evaluate CSC projects 5. Clear strategies to disseminate information about CSC (infofor future sector planning)

Table 1: Framework for Assessing CSC Mainstreaming (personal, 2022)

Results and Analysis

Respondents Biodata

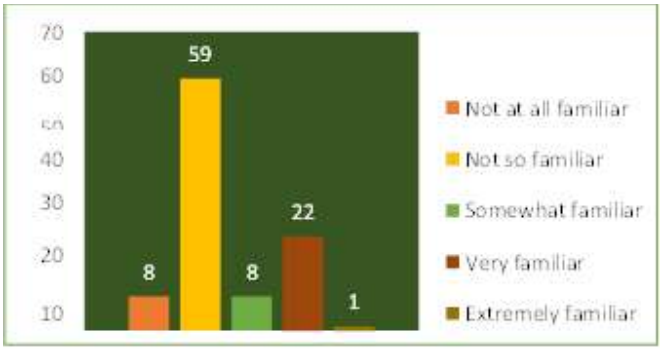
Figure 3: Gender and Age of the Respondents
In total, 98 respondents (36% female), majority being 35-60 years old participated in the survey. The respondents were both technical and administrative Officers of Sheema District Local Government.



Objective One – Findings

Familiarity with CSC roles and responsibilities
The success of any intervention is very dependent on the capacity of stakeholders understanding their roles. By understanding their responsibilities, they can efficiently perform their assigned tasks and effectively fulfil their responsibilities to the best of their ability. Figure 6 shows that majority of the respondents represented by 60.2% are not so familiar with their roles.

Figure 4: Familiarity of Respondents CSC Roles



CSC as a good addition

In addition to comprehending their roles, stakeholders must recognise the significance of CSC. Examining Table 4 reveals that only 1.0% express disagreement regarding CSC's merit as a valuable addition to the agriculture extension system. The overwhelming consensus among respondents is a positive affirmation, indicating widespread support for integrating the CSC model into the district coffee extension system. However,

it is crucial to highlight that the successful incorporation of this model heavily relies on the availability of district funds, primarily sourced from conditional grants provided by the central government. The absence of external assistance could present challenges in translating these favourable intentions into tangible outcomes.

Table 2: CSC as a Good Addition to the District Agriculture Extension

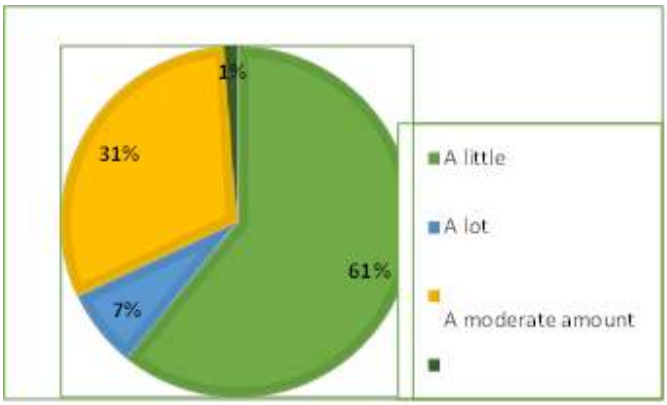
Goodadditi on		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	51	52.0	52.0	52.0
	Disagree	1	1.0	1.0	53.0
	Neither agree nor disagree	3	3.1	3.1	56.1
	Strongly agree	43	43.9	43.9	100.0
	Total	98	100.0	100.0	

Score 'strongly disagree' was 0

Integration of CSC model

The key goal was to find out if CSC is mainstreamed in the DLG workplans. A specific question on the extent to which CSC has been integrated in the district workplans and budgets was asked. ut of the 97 respondents who answered this question, majority (59) said that CSC has been integrated but to a little extent while 30 respondents said that the model has been integrated to a moderate extent.

Figure 5: CSC Integration in Workplans and Budgets



Money required vs reserved to finance CSC annual activities

A question about the money that the district requires and how much is actually allocated to finance annual CSC activities was asked. Overall, majority (58.2%) of the respondents said the district needs over UGX 10M to fund annual CSC activities. On the other hand, more than 50% of the respondents do not know how much the district reserves to finance annual CSC activities, whereas 15.3% reported that nothing is reserved. Figure 8 shows that CSC is not well budgeted, this was even supported by 93.9% of the respondents who expressed their dissatisfaction about this allocation. Only 6.1% were satisfied with this budget.

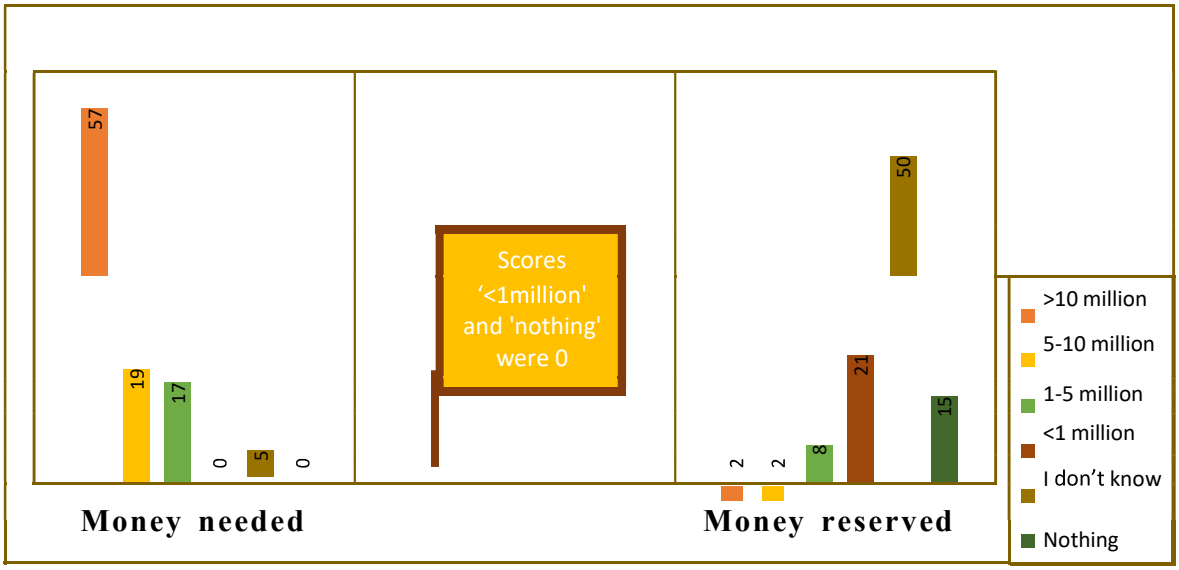


Figure 6: Funds to Finance Annual CSC Activities

CSC Committees

As already disclosed by the limited integration of CSC above, it is not surprising that a measurable number of respondents (73 out of 96) that answered this question said that CSC committee/s do not exist while 13 respondents were not sure. Only 10 respondents said that CSC related committee at the district exist.

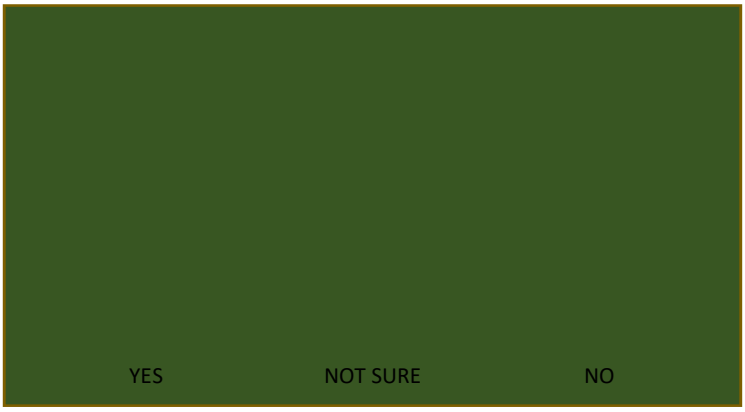


Figure 7: Existence of CSC Committees

CSC Policies and Regulations

CSC mainstreaming depends on the effectiveness of law enforcement, supervision and monitoring. Over 85% of the respondents said that there are no CSC policies and regulations at all, while 11.2% said that the existing policies are not sufficient. No respondent reported that the existing CSC policies were sufficient.

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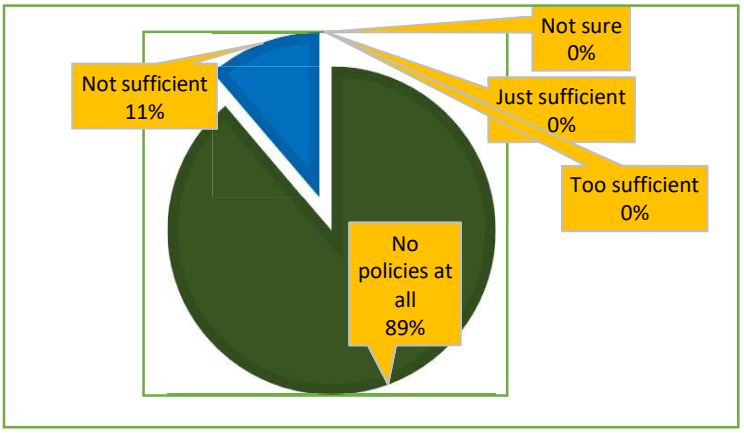

Figure 8: CSC Policies and Regulations

CSC Incentives

For successful mainstreaming, CSC regulatory measures need to be linked to economic incentives such as certification, access to climate change rural credits, or subsidised climate change equipment and advantages in the insurance markets. For instance, short-term financial support needs to be frequently combined with voluntary community-based programs to encourage farmer participation. Over 60% of the respondents reported that CSC incentives do not exist. Nevertheless, a promising number of respondents (36 out of 98) representing 36.7% reported that CSC incentives are in place. Majority (24 out of 36) of the respondents who said that CSC exist, scored free distribution of drought resistant coffee varieties highest. On the other hand, CSC insurance and CSC credit/loans ranked lowest with each scoring sero.

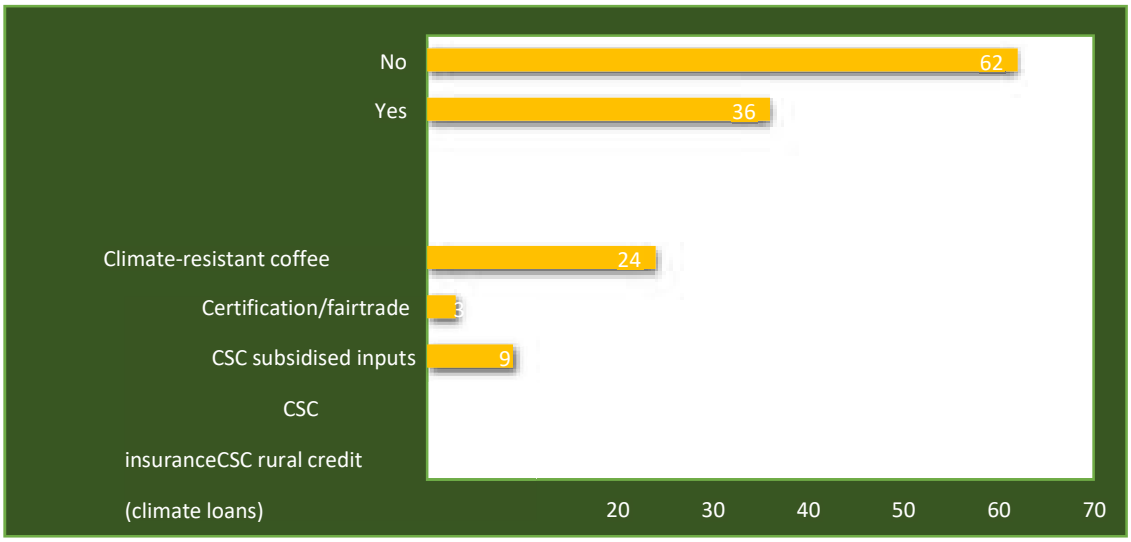

Figure 9: Availability and Types of CSC Incentives

Table 3: Open Ended Remarks on the Status of an Enabling Environment for CSC

Coffee is one of the major priority enterprises of the district, it is a big source of income for majority of smallholder farmers.
There is need to put in more money to fight climate related issues in coffee production The district has no sector budget and workplan for CSC inclusion
Lobbying for budget and more funding is required.
I am not involved much in planning for CSC. Integration of CSC activities in district work plan budget.
Climate change adaptation budget should be specific to enterprises and farmer levels The CSC model need to be incorporated in the district budget and programs
There is progress of including CSC in our budget and workplans but funding is little. As district, there is provision of information about climate change to coffee farmers. There are a few CSC specific advisors.
Streamline regular district coffee-climate change meetings. More technical knowledge on CSC is needed

Sentiment analysis (JSON): positive (47% confidence)

Objective Two – Findings

Sources of CSC information

To ensure the integration of CSC, it is imperative that farmers have access to diverse sources of information. A survey generating 300 responses sought to identify the primary source of CSC information. The findings indicate that district agriculture extension services and radio garnered the highest number of responses, whereas TV and factory sources received the fewest responses. Notably, the results underscore the crucial role played by farmers in rural areas in disseminating agriculture and coffee climate information.

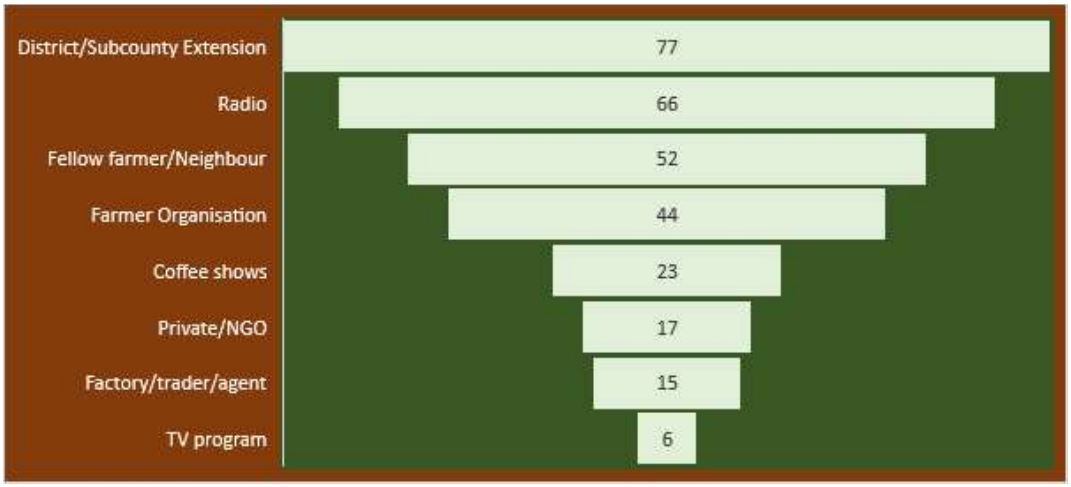

Figure 10: Sources of Information for CSC

Extent to which farmers are informed

Effective communication in Climate-Smart Agriculture (CSA) fosters dialogue on science-based solutions for climate change in farming. It is crucial that farmers are well-informed about climate change, particularly in coffee production. When assessing the level of information among farmers on Climate- Smart Coffee (CSC) issues, the majority of respondents indicated that farmers are moderately informed. Only 2% of the respondents reported that farmers are not informed at all.

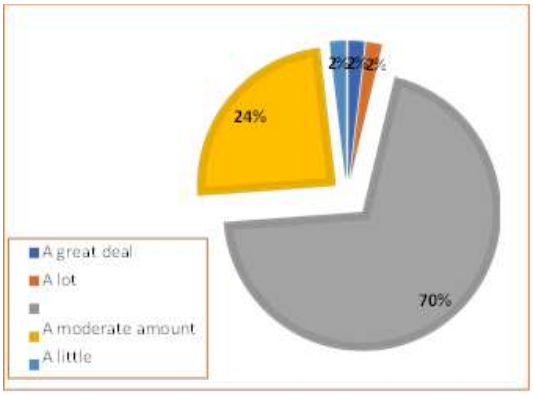

Figure 11: Famers Informed About CSC

CSC Stakeholder Trainings

Capacity building in climate change is crucial for preparing communities and empowering farmers to adapt successfully to its effects. Respondents ranked the frequency of Climate-Smart Coffee (CSC) training programs in the district on a scale of sero to five, representing none to the highest frequency, respectively. The training of Agricultural Extension Officers (AEOs) received the highest ratings, indicating its prominence, while training of trainers in CSC was rated the lowest. Notably, there were no specific farmer study exchange visits focused on CSC.

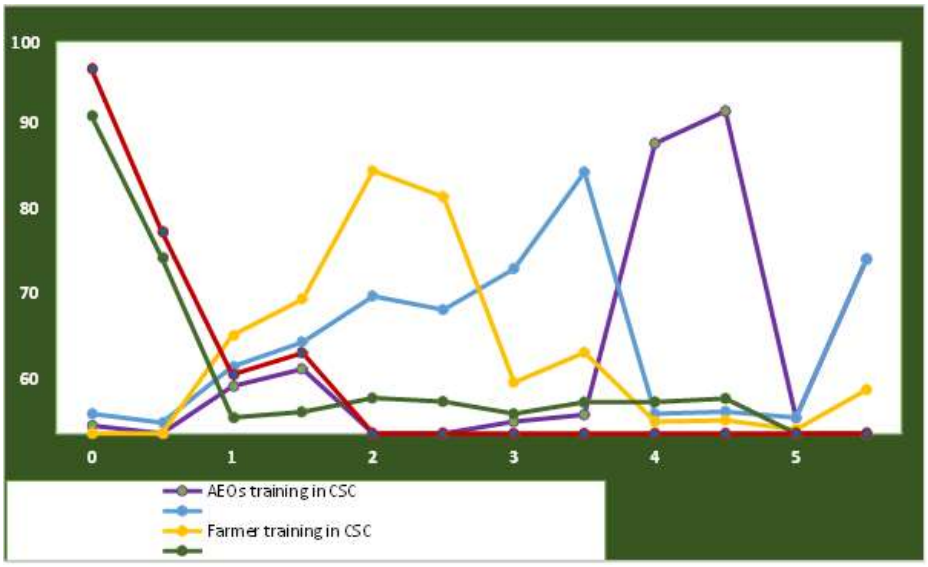

Figure 12: CSC Stakeholder Trainings

CSC Specific curriculum

Another crucial aspect of Climate-Smart Agriculture (CSA) mainstreaming is the existence of a climate change curriculum or training package. This curriculum is designed to expound on key concepts related to adaptation, mitigation, and climate vulnerability. The training package provides an overview of the challenges posed by climate change in agriculture. Furthermore, it equips farmers and Agricultural Extension Officers (AEOs) with practical knowledge through technical information, real-world examples, and best practices. Respondents were asked about the existence of a specific Climate-Smart Coffee (CSC) curriculum or training package, and all 98 respondents answered negatively. This implies that the district does not currently rely on a dedicated CSC curriculum when conducting CSC training sessions.

CSC Specific Practices Promoted

The integration of Climate-Smart Coffee (CSC) necessitates the endorsement of coffee-climate- specific practices that go beyond conventional Good Agricultural Practices (GAPs). These specialised practices are designed to enhance farmers' resilience to evolving weather patterns and facilitate sustainable increases in yields. A query regarding the existence and nature of CSC practices being advocated by the district was posed. A significant majority, comprising 91.8% of the respondents (90 out of 98), affirmed that the district actively promotes CSC-specific practices. Conversely, a minority of respondents (9 out of 98) indicated that the district does not endorse any specific CSC practices.

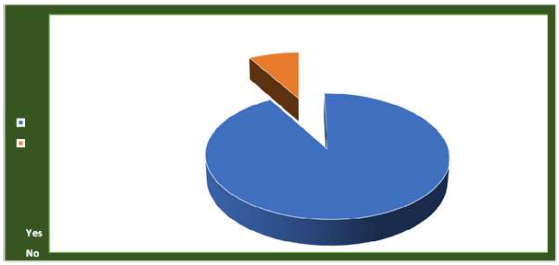

Figure 13: CSC Specific Practices Promoted by the district

Type of CSC practices being promoted

While over 90% of the surveyed participants acknowledged the promotion of Climate-Smart Coffee (CSC) practices, delving into the specifics of the practices proved essential. Predominantly, respondents cited Good Agricultural Practices (GAPs), indicating potential technical confusion between general GAPs and those tailored to climate-centric approaches. However, some respondents highlighted distinct CSC practices, including micro-scale irrigation, provision of climate-resistant coffee planting materials, coffee-agroforestry initiatives, and the encouragement of organic fertiliser usage.

Frequency of AEOs -farmer reach

To be considered mainstreamed, farmers should be getting regular CSC technical backstopping and support from AEOs to stay current on the rapidly changing climate trends in technology, science and a variety of other climatic issues that have an impact on coffee farming operations. Majority of respondents said that AEOs reach out to farmers only a few times a month.

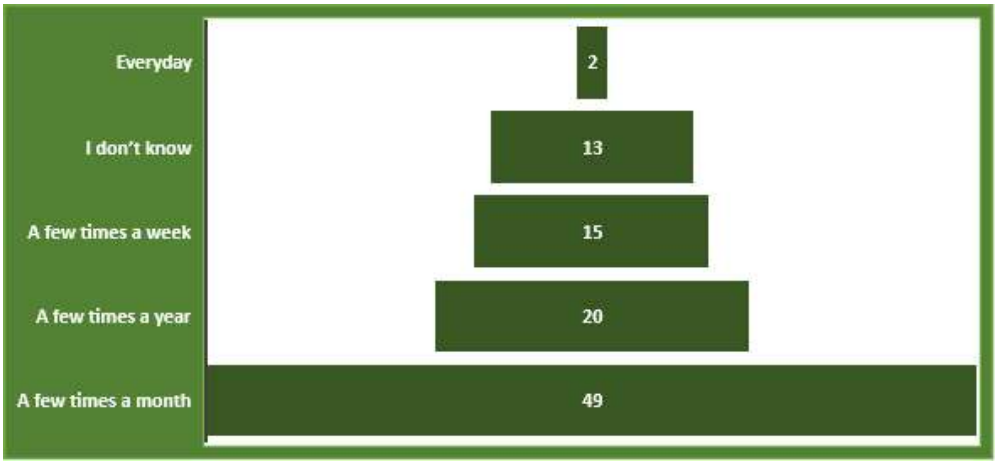

Figure 14: Frequency of AEOs -Farmer Reach

Views about frequency of AEO-farmer reach

A significant number of respondents (i.e., 74 out of 98 represented by 75.5%) reported the above reach was not enough implying a gap in the rate of farmer reach by AEOs on CSC issues. The remaining 24.5% said that rate is just enough. No respondent said that reach was too much.

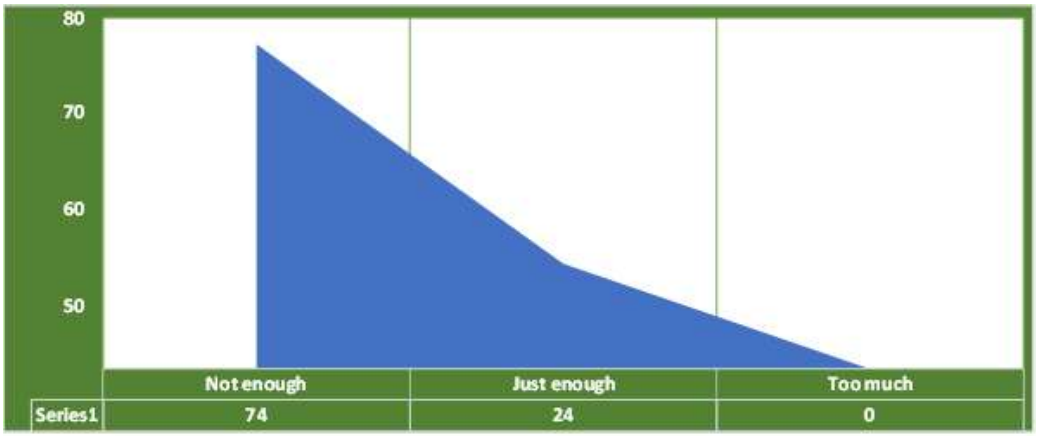

Figure 15: Views about Frequency of AEOs -Farmer Reach

Confidence of AEOs in Delivering CSC Extension

Although not directly linked to the indicators of CSC/agriculture mainstreaming, a high confidence of AEOs in delivering the climate change messages reflects that they have received adequate training and subsequently implying that the district has or is on the road to CSC mainstreaming. Table 6 shows that the respondents are somehow happy with the confidence of the AEOs, whereby more than half said that the AEOs are some somewhat confident. Regardless, only 17.6% reported that the AEOs are very confident.

Table 4: Confidence of AEOs in Delivering the CSC Extension Services to Farmers

Response options		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely confident	4	4.1	4.1	4.1
	Not at all confident	2	2.0	2.0	6.1
	Not so confident	21	21.4	21.4	27.5
	Somewhat confident	54	55.1	55.1	82.6
	Very confident	17	17.3	17.3	100.0
	Total	**98**	**100.0**	**100.0**	

Table 5: Open Ended Remarks on the Status of Capacity Building in CSC

AEO-farmer technical backstopping and support in CSC issues is very limited
Capacity building of AEOs and all farmer trainers in CSC issues is highly needed
1. Support the establishment of CSC demonstration plots. 2. Support study exchange visits Support in putting up CSC demos. Support media/radios to deliver CSC messages to farmers. Some AEOs and farmers have received training in CSC especially from private sector Farmers are very positive to learn new CSC technologies
Farmers who are adapting to CSC are seeing great impact in their coffee farms AEO
farmer ratio is currently very big in the district
AEOs have limited experience in delivering CSC extension services.
The district has not incorporated CSC its budget and workplans Climate
change effects in coffee are becoming rampant
Training curriculum and materials for CSC need to be developed. They should have messages and pictures that are easily understandable. Document and share CSC successes The district has limited resource envelope. The district is facing challenges of low revenue. Mainstreaming requires willingness of the farmers
Sentiment analysis (JSON): Neutral (65% confidence)

Objective Three – Findings

CSC specific programs/projects

Another major indicator of CSA mainstreaming is the planning, budgeting, implementation and monitoring of CSA specific programs, projects and initiatives. More than 50% of the respondents reported that the district is implementing CSC programs and projects. To get evidence-based data on these results, an open-ended question was asked about the examples of CSC programs that the district is implementing. Results include use of solar in coffee production system, small scale micro irrigation systems, intercropping coffee and bananas, conservation agriculture, crop diversification, seasonally appropriate planting dates and agroforestry. Findings from the desk reviews also revealed coffee climate change information and early warning system is one the off- farm CSC-related services being promoted by the district (Uganda's NAPA from 2007).

Timeline for CSC programs/projects

Similarly, the majority of CSC programs in the district has relied on short-term initiatives i.e., 1-3 years of execution whose effects on long-term resilience are occasionally difficult to discern. However, the district persisted that it is advocating for the international community to provide funding for long-term adaptation and working to ensure local budgetary allocation.

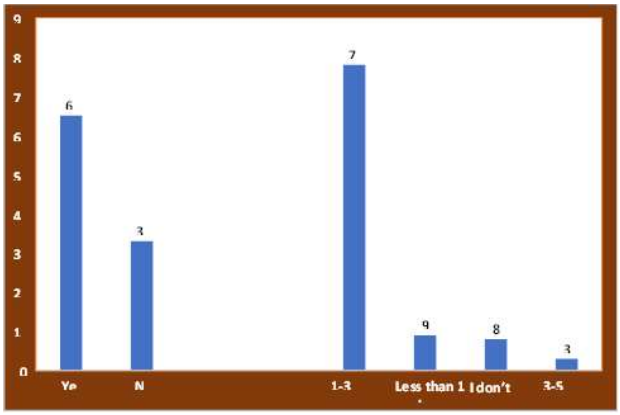

Figure 16: CSC Projects and Programs Implemented by the district

CSC Partnerships

Networks and partnerships at national and international level are an important resource used in institutionalisation of CSC planning. In Sheema, most of the funds for coffee climate-related initiatives come from the national government working and interacting with established/ongoing development initiatives with assistance from donors and development organisations. International organisations like International Institute of Tropical Agricultural Research (IITA) and government organisations like National Agricultural Research Organisation (NARO) appeared in document analysis for advocating funding and research into improved, drought resistant and disease-free seed varieties.

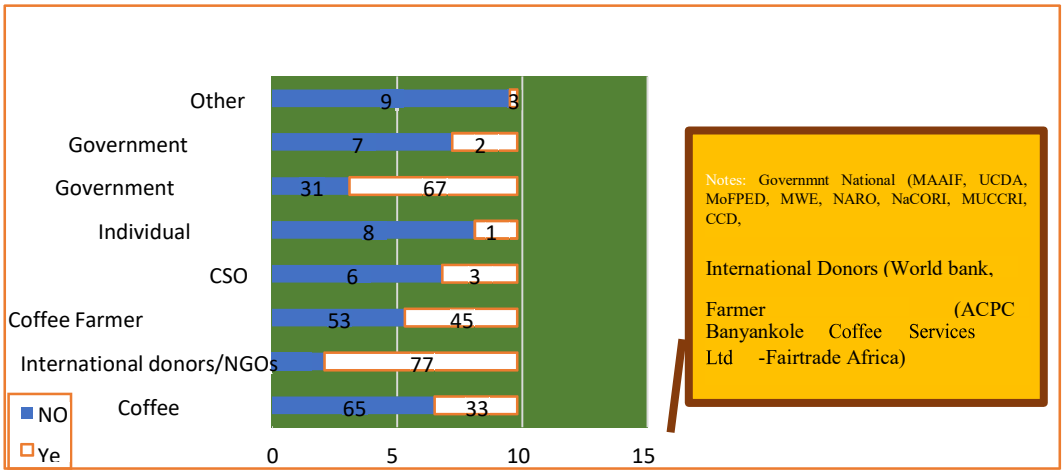

Figure 17: Partnership/s in CSC

Women and youth involvement

It is crucial that all men, women and youth are involved in planning and execution of CSC for sustainable development. Generally, majority of the respondents reported good involvement of women and youth in design and delivery of CSC programs.

Figure 18: Women and Youth Involvement

Monitoring of CSC programs/projects

For sustainable CSC management, there is need for continued monitoring, documentation and sharing of experiences of CSC activities. Figure 21 shows that, there is widespread support for this parameter, although the means are still minimal

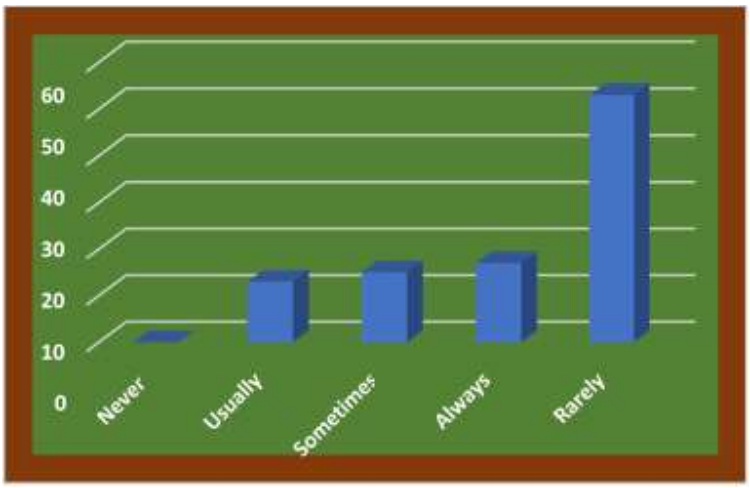

Figure 19: Follow-up of CSC Activities

Table 6: Open ended remarks on the status of projects/programs on CSC

The coffee extension is greatly improving. It has the best-developed value chain and linkage among actors when compared to other district priority enterprises. The coffee productivity has increased tremendously due to increased and improved service delivery by the public extension workers and newly trained CCBFs CSC requires a robust system for routine follow up and monitoring.
There is need more patterners working on climate change projects in coffee. Multistakeholder support, planning, consensus on CSC program implementation is criticalThe CSC programs implemented in the district are inclusive of all men, women and youthMost projects are for general management of coffee but not climate specific There are some gaps in delivery CSC projects
Need more coffee patterners working with extension workers
Women and youth encouraged to participate in CSC activities. But coffee is still considereda male dominated enterprise Create working groups, for specific climate change coffee issues
Increase private sector participation and leverage on their resources in CSC
Sentiment analysis (JSON): positive (93% confidence)

Correlation Analysis

Table 7: Correlation Analysis

Correlations						
		Independent				
Dependent		Regulations	Money reserved	Incentives	CSC Committee	Partnerships
Familiarity with CSC objectives and Roles	Pearson Correlation	1.000	.306**	-.017	-.067	.085
	Sig. (2-tailed)		.002	.866	.509	.403
	N	98	98	98	98	98
CSC Integration	Pearson Correlation	.306**	1.000	-.284**	.047	.216*
	Sig. (2-tailed)	.002		.005	.644	.033
	N	98	98	98	98	98
Practices Promoted	Pearson Correlation	-.017	-.284**	1.000	-.060	.063
	Sig. (2-tailed)	.866	.005		.559	.538
	N	98	98	98	98	98
CSC source of info	Pearson Correlation	-.067	.047	-.060	1.000	-.101
	Sig. (2-tailed)	.509	.644	.559		.324
	N	98	98	98	98	98
CSC project timeline	Pearson Correlation	.085	.216*	.063	-.101	1.000
	Sig. (2-tailed)	.403	.033	.538	.324	
	N	98	98	98	98	98
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

From the analysis, all variables analysed do not have a linear relationship with each other i.e., there was no zero (0) Pearson Correlation. The results also indicate that perfect linear relationships exist between;

- Familiarity with CSC objectives and policies and regulations setCSC integration and money reserved to finance CSC initiatives CSC practices promoted and availability of incentives;
- Source of CSC information and existence of CSC committee
- CSC project timeline and level of partnerships

This implies for example improve integration of CSC, the district needs to increase on the money reserved for CSC activities; increased partnerships will directly increase the time of CSC projects promoted at the same time sources of CSC information will increase with increase in CSC committees.

Implications for Hypotheses Testing:

The results provide support for the hypotheses theorised earlier, suggesting that factors such as financial commitment, partnerships, and the existence of CSC committees are integral to the successful integration of Climate-Smart Coffee into DLG workplans. The identified correlations offer insights into potential strategies for enhancing CSC integration and effectiveness in Sheema District.

Discussions

The study aimed to investigate the mainstreaming of Climate-Smart Coffee (CSC) into the development plans of District Local Governments (DLGs), focusing on Sheema District in Uganda. The findings reveal challenges in fully integrating CSC into local development plans. Despite national policies and frameworks emphasising climate change adaptation, the translation to effective local-level planning remains a hurdle. The District Development Plans (DDPs) lack comprehensive incorporation of CSC, indicating a gap in understanding and implementation at the district level. Existing national policies, such as the National Climate Change Policy and guidelines for the agricultural sector, set the framework for climate change adaptation. However, the study identifies a disconnect in translating these policies into practical actions at the district level. The lack of specific laws, plans, or policies for CSC in the coffee industry exacerbates the challenge. Despite recognising the importance of integrating climate change into development plans, Sheema DLG's specific efforts for CSC are limited. The findings align with broader challenges in African countries, where turning national policies into local actions remains a complex task. The study suggests that the influence of Uganda's adaptation policies may be externally driven, fulfilling reporting obligations to international bodies rather than addressing local priorities. Concerns extend to budgetary allocations, where the district falls short in dedicating funds specifically for CSC. The budgeting process, often guided by indicative planning figures, lacks the necessary focus on CSC mainstreaming. The absence of a designated budget line for CSC activities and insufficient financial support from the central government further hinder effective mainstreaming. The study highlights the critical need for enhanced capacity building at the district level to facilitate successful CSC integration. The current institutional focus on environmental management over the systematic planning, implementation, and evaluation of CSC activities poses a barrier to effective mainstreaming.

Efforts to mainstream CSC face challenges in institutionalising a training plan or curriculum specifically for Climate-Smart Coffee. The technical capacity of Agricultural Extension Officers and the confidence to provide CSC-specific advice to coffee farmers are identified gaps. Inadequate extension services, even when technically capable, contribute to limited adoption of CSC practices among smallholder farmers. Despite these challenges, the study recognises positive aspects, such as the Sheema district's commitment to improving institutional capacity for CSC mainstreaming. Initiatives like collecting weather information using Geographic Information System (GIS) in collaboration with relevant offices demonstrate ongoing efforts. However, the absence of an institutionalised training plan for CSC remains a notable limitation. Effective mainstreaming requires channelling the momentum of CSC at the national level into DLG plans. District planning authorities should consider CSC a crucial initiative for climate change adaptation, integrating reliable information, assessment tools, and context-specific practices. Strengthening the agriculture extension system and ensuring AEOs possess adequate knowledge of CSC are crucial for successful mainstreaming.

The study emphasises the essential role of engagements and partnerships for CSC mainstreaming, involving the private sector and various stakeholders. Collaborations with organisations like Café. Africa Uganda and Ankole Coffee Producers Co-operative Union Ltd demonstrate external support for CSC interventions. However, the study calls for a more comprehensive engagement process, emphasising the need for all stakeholders to own the CSC-Plan. Noteworthy CSC practices and projects in the district, such as coffee-agroforestry and conservation agriculture, aim to enhance livelihoods and reduce greenhouse gas emissions. However, recommendations for additional CSC practices like water harvesting and solar energy are proposed. The study advocates for targeted and prioritised CSC practices, supported by strong extension services and private sector involvement. The study recognises the presence of funding opportunities but highlights the need for long-term instruments to support coffee farmers in understanding and benefiting from CSC interventions. The engagement of the private sector is crucial, and efforts to create markets, and microfinance for CSC programs are encouraged.

Matthews et al. (2012) underscore the pivotal role of District Local Government (DLG) planning as a critical success factor for mainstreaming climate change, providing a platform for resource mobilisation and cooperative partnerships in addressing climate-related issues. The imperative to integrate Climate-Smart Coffee (CSC) into development plans at the local government level is emphasised, recognising the significance of local policies and strategies in guiding and supporting effective adaptation efforts (Burton et al., 2006). This study reveals a gap in the realisation of this imperative, particularly in the context of Uganda, where coffee farming holds paramount importance for national development. Despite the acknowledged importance of coffee to Uganda's development, the call for mainstreaming CSC into DLG plans has not materialised adequately. The

study identifies a lack of tangible evidence of climate considerations related to coffee in DLG plans, despite a seemingly high appreciation of the relevance of the CSC model within the district's agriculture extension system. Despite the existence of the climate change coffee policy, there is a notable absence of full integration of CSC into local government development planning. Institutional capacity gaps emerge as a critical challenge, particularly the insufficient budgetary support for local governments' endeavors in mainstreaming climate-smart agriculture, with constrained budget allotments for CSC mainstreaming. The study observes a deficiency in budget allocations to CSC, insufficient to address the key priorities associated with climate-smart agriculture. The conclusion drawn from the data on CSC mainstreaming in Sheema District Local Government suggests that DLG climate change mainstreaming in Uganda remains a challenging endeavor. Moreover, the study underscores the necessity for a strong momentum of Climate-Smart.
Agriculture (CSA) at the local level, aligning with the vigor seen in national development plans. This emphasises the need for a coordinated and synchronised effort across different levels of governance to ensure that climate change considerations, especially those related to crucial sectors like coffee farming, are seamlessly integrated into planning processes. The study urges a more concerted focus on strengthening DLG capacities, aligning budget priorities, and fostering a robust regulatory framework to facilitate the effective mainstreaming of climate-smart initiatives in agricultural practices at the local level in Uganda.

Implications for Theory and Practice

The implications drawn from the data underscore the need for a comprehensive re-evaluation and adaptation of existing strategies to effectively address the challenges and opportunities associated with mainstreaming climate-smart initiatives, particularly in the context of agricultural practices at the local government level in Uganda. The findings highlight the pivotal role of District Local Government (DLG) planning as a cornerstone for successful climate change mainstreaming, emphasising the necessity for theoretical frameworks and practical guidelines that explicitly recognise and integrate climate considerations at the local government level. Furthermore, the study emphasises the gap between the existence of a climate change coffee policy and its integration into local government development planning, suggesting a need for refined theoretical models and practical tools for policy implementation at the local level. The identified institutional capacity gaps, especially the lack of sufficient budgetary support, underscore the necessity for approaches focusing on enhancing the capabilities of local institutions, including frameworks for effective budget allocation, resource mobilisation, and strategic planning for climate-smart agriculture. Additionally, the study advocates for a robust regulatory framework, indicating the need for theoretical models guiding the formulation and implementation of policies at the local level, ensuring alignment with broader national objectives. The call for a more concerted focus on strengthening DLG capacities points to the importance of strategies guiding capacity-building initiatives at the local level, encompassing frameworks for training, knowledge exchange, and skills development tailored to the specific needs of DLGs engaged in climate change mainstreaming. Overall, these implications highlight the multidimensional nature of climate change mainstreaming and call for an integrated and adaptive approach to theory and practice.

Recommendations

Based on the implications drawn from the data, a set of comprehensive recommendations emerges to guide climate change mainstreaming efforts, particularly in the domain of agricultural practices at the local government level in Uganda. Firstly, there is a pressing need for an overhaul and adaptation of existing strategies and policies to effectively tackle the challenges and capitalise on opportunities related to mainstreaming climate-smart initiatives. Recognising the pivotal role of District Local Government (DLG) planning, it is imperative to develop and implement theoretical frameworks and practical guidelines that explicitly acknowledge and integrate climate considerations at the local government level. To bridge the gap between the existence of a climate change coffee policy and its integration into local government development planning, refined theoretical models and practical tools for policy implementation at the local level are recommended. Addressing institutional capacity gaps, particularly the inadequacy of budgetary support, necessitates the formulation and implementation of theories and practices focused on enhancing the capabilities of local institutions. This includes the development of frameworks for effective budget allocation, resource mobilisation, and strategic planning tailored to climate-smart agriculture. Furthermore, a robust regulatory framework is essential, demanding the creation of theoretical models guiding the formulation and implementation of policies at the local level to ensure alignment with broader national objectives. To fulfil the

call for a concerted focus on strengthening DLG capacities, there is a need for strategies and practices guiding capacity- building initiatives at the local level. This involves the development of frameworks for training, knowledge exchange, and skills development tailored to the specific needs of DLGs engaged in climate change mainstreaming. Overall, these recommendations advocate for an integrated and adaptive approach to theory and practice, emphasising the multidimensional nature of climate change mainstreaming and the necessity for coordinated efforts across various governance levels.

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