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SCHOOL-BASED COFFEE FARMING SCHEMES AND FUTURE YOUTH CO-OPERATORS POTENTIAL IN MBOZI DISTRICT, TANZANIA

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ABSTRACT: Coffee plays a critical role in Tanzania's economy, yet productivity levels remain low due to various challenges. Despite the strategic significance of coffee as a cash crop, efforts to build skilled, future-oriented agricultural actors remain insufficient. Schools, as institutions of knowledge transfer are essential in addressing this gap by preparing youth for agricultural development and fostering their interest in co-operatives to enhance sustainable coffee production. This study examines the involvement of secondary schools in coffee farming and the future of co-operative development in Tanzania, with a particular focus on Mbozi District. The study employed a case study research design to facilitate in-depth exploration of issues under investigation, selecting nine out of ten secondary schools engaged in school-based coffee farming schemes. Data were collected via interviews, observation and focus groups with students, teachers, and leaders of Agricultural Marketing Co-operative Societies (AMCOS). The collected data were analysed using content analysis. The findings reveal a shortage of qualified agricultural educators, leaving schools reliant on local expertise and external support. Resource challenges, such as outdated farming equipment and insufficient funding, also hinder practical agricultural training. However, students are highly motivated to participate in coffee farming, driven by financial incentives and cultural significance. Despite this passion, the study identifies a considerable gap in co-operative education, which limits students' understanding of co-operative models which is the key for future participation in coffee farming activities as well as in co-operatives. The study concludes that limited qualified staff, inadequate facilities, outdated tools, and insufficient co-operative education hinder sustainable innovation, knowledge transfer, and the future youth engagement potential in coffee farming and co-operatives. The study recommends that the government prioritize hiring or training qualified agricultural teachers to equip students with advanced skills in coffee farming. Likewise, the secondary schools should introduce internal reward systems, such as recognition awards for high-performing students. Moreover, the local governments, in collaboration with non-governmental organizations, should provide modern farming tools and necessary infrastructure, such as irrigation systems, tractors, and pest control equipment, to support practical learning among students. There is also a need for the schools to explore alternative funding strategies by forming partnerships with agricultural co-operatives, community members, and seeking grants from local governments for school-based agricultural projects.

Key words: Potential, School-based Coffee Farming Schemes, Youth Cooperators, Future

INTRODUCTION

Agriculture remains a cornerstone of economic development globally, particularly in developing countries, where it contributes significantly to employment, food security and foreign exchange earnings (Kumar, 2024). According to Pawlak and Kołodziejczak (2020), the agricultural sector plays a pivotal role in national economies, acting as a catalyst for industrial development and poverty reduction. Within the global agricultural economy, coffee stands out as one of the most valuable traded commodities, second only to oil (Lemma & Megersa, 2021; Gokavi & Kishor, 2020). It is a key livelihood source for millions of smallholder farmers and a driver of rural development in many low-income countries (Waarts *et al.*, 2021). The global coffee industry faces big challenges like climate change, unstable prices, and an aging group of farmers. These issues have encouraged growing interest in promoting youth involvement, innovation and education as means of securing the future of the field (Manubag *et al.*, 2023). In Sub-Saharan Africa, coffee is a key export crop for many countries, including Ethiopia, Uganda, Kenya, and Tanzania (Lemma & Megersa, 2021). Despite its economic importance, coffee productivity in the region remains low due to poor farming practices, inadequate extension services and limited access to inputs (Cheruiyot, 2022). Co-operatives have historically played a central role in addressing these challenges by providing smallholder farmers with access to credit, markets, training, and collective bargaining power (Mardiharini *et al.*, 2022). However, the aging membership of co-operatives and the lack of youth participation present risks to the sustainability of co-operative institutions. In Tanzania, coffee is among the most important cash crops, contributing approximately 5% of the country's total exports and generating around US\$ 100 million annually (Otieno *et al.*, 2019). Over 400,000 smallholder farmers rely on coffee cultivation for their livelihoods, with Arabica coffee from regions such as Kilimanjaro, Arusha, Songwe, Mbeya, and Ruvuma being particularly renowned for its high quality (Mhando & Mdoe, 2018). Nevertheless, Tanzania faces a stark gap between actual and potential yields, with average production ranging from 200 to 750 kg/ha compared to an optimal yield of about 3,000 kg/ha under improved management (Otieno *et al.*, 2019). This highlights an urgent need for the dissemination of improved agronomic practices, where education and knowledge transfer become critical. Educational institutions, particularly secondary schools, have a unique opportunity to drive agricultural transformation by equipping students with modern farming skills and encouraging innovation. Manubag *et al.* (2023) argue that as globalization, climate change, and technological shifts redefine agriculture, schools must prepare a future workforce that is skilled, adaptive, and entrepreneurial. By integrating practical agricultural training including coffee farming into school curricula, institutions can ignite students' interest in agribusiness and co-operatives, thus laying a foundation for a new generation of agripreneurs (Karani *et al.*, 2024; Ukonze *et al.*, 2024). Co-operatives, in particular, serve as a vital platform for youth engagement including students. They enable smallholder farmers, including youth, to pool resources, access markets, and gain technical knowledge (Hariance *et al.*, 2023). For students, participation in school-based co-operatives can foster hands-on learning, financial literacy, and leadership development. However, youth involvement in co-operatives remains limited. Across Africa, only about 27.9% of youth are engaged in co-operative organizations (ICA, 2017). Misconceptions that co-operatives are outdated, coupled with limited access to land,

credit, and decision-making, contribute to this trend (ILO, 2012a; Okafor *et al.*, 2023). To overcome these barriers, there is a need to rebrand co-operatives as innovative, inclusive, and viable career pathways. Secondary education can play a transformative role in reshaping perceptions and fostering engagement. According to Roy (2023) and Zaremohzzabieh *et al.* (2022), when students are given real-world co-operative experiences and leadership opportunities, they are more likely to view co-operatives as relevant to their futures. Encouraging youth participation also contributes to intergenerational renewal, promotes organizational innovation, and ensures the long-term sustainability of the co-operative movement (Battilana & Casciaro, 2012; Hartley, 2011). Thus, this study assessed students' engagement in school-based coffee farming and their potential to become future co-operators.

METHODOLOGY

Research Approach/Design: A case study approach was employed as the research design. The design was selected because it is intensive, and provides the detailed description and analysis of a particular individual, group or event. The most common complaint about case studies is that it is difficult to generalise from one case to another. To support analytic rather than statistical generalisation, this study employed a multiple case study (MCS) approach. The approach is an explanatory descriptive strategy useful for answering “how” and “why” questions in contrast to who, what, how many, etc. Multiple case studies follow the replication and not the sampling logic approach (Yin, 2004). Thus, each case study, represented by the schools in this study, was treated as a distinct case, thereby qualifying the research as MCS.

Study Population: The study was conducted in Mbozi District, Songwe Region. The reason for choosing the District was that it is the only area in the region practicing secondary schools coffee production schemes. While the same scheme is practiced in Mbeya Region, out of ten schools engaging in coffee production activities nine are in Mbozi District. They include Ndugu, Nzovu, Itumpi, Nanswilu, Itepula, Shaji, Msense, Msia and Itumpi secondary schools. These schools have experience in engaging in school-based coffee production. The school-based coffee production program in these schools has been introduced and supported by the City Coffee Company. The company provides support in terms of farm inputs such as seedlings, fertilizers as well as creating favourable marketing environment to students engaging in coffee production. The rationale for focusing on secondary schools producing coffee is that such activities are involving youngsters who are likely to become future co-operative members if they are groomed to understand and practice co-operation principles. A total of nine (9) secondary schools were involved in the study. The rationale for such number is that the study aimed at capturing detailed and sufficient information regarding students' engagement in coffee production activities.

Data Collection, Data Sources and Collection Procedures: The study collected primary data including the study participants' social demographic profiles. Key informant interviews were done to clubs' patrons/ matrons and AMCOS leaders to assess if youth (students) are being prepared to take up coffee farming and co-operative activities by attending formal and practical coffee production training at school and practices the same after completing their studies. Likewise focus group discussions were conducted to teachers, matrons/ patrons of clubs as well as extension officers who are assisting students in coffee farming activities to assess various variables concerning schools' engagement in making future youth farmers and co-operators.

Data Analysis: This study adopted a qualitative approach whereby data collection and analysis are an iterative process. This involved simultaneous process of inquiry and analysis. Data analysis was done using content analysis and the data were generated from FGDs and KIs. Data which were gathered through field notes and recordings were transcribed prior to its analysis. The responses and opinions of the interviewees were coded and categorised where a data base for categorising, sorting and retrieving data were prepared. The categorisation was done according to the topics in the interview guide and the research purpose (objectives) and guiding theory. The categorised data were screened, coded, condensed and transformed. The purpose of data reduction was very helpful in editing the data and making it more presentable (Mezmir, 2020). Finally, the case studies set in form of qualitative interpretations and descriptions were documented.

FINDINGS AND DISCUSSION

Availability of Qualified Staff in Coffee Farming Practices: The availability of qualified staff is a critical factor in the effectiveness of coffee farming education and practices. The study sought to establish the extent to which schools are equipped with professionally trained personnel in this area, revealing notable gaps in expertise. Almost all schools (8 out of 9 schools) involved in the study lack qualified staff in coffee farming practices, relying heavily on local knowledge, experience, and occasional external support. The schools reported having no professional agricultural teachers or staff specializing in coffee farming practices. Instead, teachers with local expertise, supplemented by periodic training and advice from the City Coffee Company and local extension officers, guide students. One of the key informants in one of the schools indicated that:

“Our school currently does not offer a formal agriculture subject. Instead, we draw upon our local experiences and expertise to teach our students since we are all coffee producers.” (KI1, Feb, 2025).

This highlights that students in such schools receive less structured and standardized education in agricultural practices. The reliance on local experience limits the ability to impart practical innovations in coffee farming. In contrast, Myovizi Secondary School stands out, with three qualified agricultural staff members possessing professional knowledge of coffee farming practices. This has enabled students to engage in hands-on, practical learning, making the school a model for advancing agricultural education among the schools studied. Under the guidance of these staff members, students are well-supported in performing scientific coffee farming practices. According to Njoroge *et al.* (2014), when agriculture is part of the school curriculum, students gain valuable insights into sustainable agricultural production, including organic farming and biological pest control. This finding contrasts with the current study, where many schools lack agricultural subjects and specialized staff. A study by Okiror *et al.* (2017) further highlighted the lack of practical agricultural skills among teachers and their limited exposure to modern farming practices. This hinders the capacity of schools to adopt modern agricultural production methods, a trend reflected in the schools from the current study. Padhy and Jena (2015) emphasized that better-educated farmers are quicker to adopt profitable innovations. The study shows that an educated farmer has a greater expected payoff from innovations and a lower perceived risk. This underscores the importance of formal agricultural education, which is currently lacking in most schools with coffee production projects.

Student Motivation Levels in Coffee Farming Activities: Student motivation to engage in coffee farming varies across the schools but is generally high, driven by observed benefits,

financial incentives, and cultural factors. The studied secondary schools reported high levels of student motivation. Factors contributing to this include witnessing peers' success and financial gains from coffee farming. Incentives and rewards provided by City Coffee Company, such as monetary awards and internship opportunities, also play a role. For example, one of the club matrons during key informant interview said that:

“Last year, one student earned 4 million TZS from selling coffee to AMCOS. This student was also sent to America for specialized training related to the program and is now set to be employed by the City Coffee Company. Additionally, students who sell their coffee through AMCOS receive preferential treatment, including a higher price per kilogram compared to other sellers” (KI2 Feb, 2025).

This demonstrates that the financial support and professional opportunities provided by the City Coffee Company motivate students to work harder and invest more of their energy, time, and resources in coffee production so that they can receive the same benefits. This could lead to improved skills and greater focus on their agricultural pursuits. Additionally, the cultural background and family involvement in coffee farming play a significant role in reinforcing its perception as a viable and profitable venture. Many students come from families that have long been engaged in coffee farming, often passing down skills and knowledge through generations. This deep-rooted familiarity with coffee production helps to sustain its importance as the primary cash crop in the study area. Alston *et al.* (2020), indicated that parents or guardians have a key role in influencing students' decisions to become future agriculturalists which aligns with the study findings. Among the studied secondary schools, Nzovu Secondary School exhibited moderate motivation among students. While students are motivated within the school environment, parental rigidity towards adopting improved coffee varieties and disbelief in their profitability affects some students' overall passion for coffee farming, especially at home. For example, one of the KIs firmly but wrongly stated:

“The improved coffee variety provided by City Coffee Company (Compact Coffee Variety) yields a maximum of 2 kilograms per plant and has a shorter lifespan, while our local varieties may produce up to 30 kilograms per plant” (KI3 Feb, 2025).

Nonetheless, this view was challenged by the district extension officer, who argued that the productivity of the improved coffee variety supplied by the company largely depends on timely and adequate treatments. According to the officer, if provided with the necessary care and resources at the right times, the improved variety has proven to be highly productive, even more so than the traditional local variety. The research findings support this claim, indicating that the improved variety, with proper inputs such as fertilizers, pest control and irrigation, yields significantly better results than the local variety, which often lacks access to these resources. The differing perspectives among the study participants are largely due to variations in agricultural practices. The Compact Coffee Variety, while not inherently less productive, requires more precise management, including timely irrigation, fertilization, and pest control, to achieve optimal yields. As noted by the district extension officer, a delay in these practices can significantly impact productivity. Studies also support that new coffee varieties, when properly managed, can lead to higher yields and greater profitability (Kahsay *et al.*, 2023; Van der Vossen *et al.*, 2015). High motivation is a strong indicator of the long-term sustainability of coffee farming initiatives and the success of agricultural co-operatives. However, external influences, such as community perceptions and support, are also crucial. Research shows that a positive attitude on agriculture as a career is the most significant predictor of students' intentions to pursue it in the future. Students who see agricultural

careers as beneficial to both themselves and their communities are more likely to consider agriculture as a viable career path (Roy, 2023; Zaremohzzabieh *et al.*, 2022).

Availability of Facilities and Equipment for Coffee Farming: The lack of adequate facilities and modern equipment was the common challenge across the schools despite its necessity for effective and modern coffee farming practices in the study area. The studied schools lack sufficient tools such as hoes, irrigation systems, and modern farming equipment. Students often bring tools from home and farming practices rely on traditional methods. Only one school possess some facilities including a water pump, generator and pesticide sprayers which aid in farming activities but still lacks comprehensive modern equipment like tractors and advanced irrigation systems. For example, one KI argued that;

“The school has a water pump for irrigation, a generator for pumping water during electricity outages, and pesticide sprayers to simply coffee farming activities. However, these resources are insufficient to support all farming activities, so students always volunteer resources from home, such as hand hoes” (KI4 Feb, 2025).

This demonstrates that the school has some resources for supporting agricultural activities which are valuable for simplifying tasks related to coffee farming. Despite having these resources, they are not sufficient to cover all farming activities which requires students to volunteer their resources. On other hand students’ volunteerism and commitment reflects a culture of student involvement and willingness to contribute to school farming projects. The shortage of facilities and equipment in the school-based coffee project may have negative impacts in efficiency and productivity of coffee produce and affect their practical learning experiences. It can also lead to reduced output, and lower quality in coffee production. Additionally, it may hinder the development of key skills, making it difficult for students to achieve a high level of competence. This may ultimately discourage them from pursuing opportunities in the coffee industry and affect current and future workforce readiness in the sector. Literature highlights the role of modern technology in enhancing coffee business management and ensuring sustainable growth in the coffee industry (Kittichotsawat *et al.*, 2021). These findings align with those of Guido *et al.* (2020), who noted that inadequate facilities limited farmers’ use of inputs, affecting coffee quality. Similarly, Ronalds *et al.*, (2023) found that a lack of effective coffee production systems and management practices led to lower coffee yields.

Funding Availability for Sustainable Coffee Farming Activities: Limited funding and resource availability pose a major challenge to the sustainability of coffee farming activities in the studied schools, despite external support from organizations like City Coffee Company. The studied schools face significant funding constraints that hinder the sustainability of their coffee farming activities. These schools rely heavily on external support, primarily from City Coffee Company, which provides essential farming inputs such as seedlings, fertilizers, and pesticides. While this assistance is crucial, it is insufficient to meet the full needs of the schools’ coffee farming projects. Additionally, there are delays in the delivery of these resources, which interrupt the continuity of farming operations. As a result, schools struggle to maintain consistent productivity and growth in their coffee farming initiatives. For example, one of the KIs stated during an interview:

“This year, we do not have any form one students participating in the coffee farming school club. This is because the necessary inputs from City Coffee Company have not yet arrived at our school. Although our students are eager to join the club, we

currently lack internal funds to support their coffee farming activities at home due to our reliance on City Coffee Company for these resources.” (KI5 Feb, 2025).

This highlights that the school has not allocated a budget to support coffee farming activities, revealing a broader issue: none of the studied schools have dedicated budgets for coffee farming or developed alternative funding mechanisms. As a result, they remain highly dependent on City Coffee Company for inputs and resources. The school has not allocated a budget for coffee farming, and, more broadly, none of the schools studied have designated funds or alternative financing methods to support coffee-related activities. Consequently, they remain heavily reliant on City Coffee Company for necessary inputs and resources. This dependence on external funding jeopardizes the long-term viability of their coffee farming programs, as these efforts would likely be abandoned if City Coffee Company withdrew its support without a sustainable plan to empower students. Research indicates that agricultural projects funded externally are more sustainable when they empower communities to manage them independently (Hofisi & Chizimba, 2013). Furthermore, findings suggest that true self-reliance is achievable through mobilizing local resources with minimal dependence on outside support (Mazibuko, 2007). The findings align with Ronalds *et al.*, (2023), who argued that coffee management involves the use of various inputs, which come with significant costs. Therefore, the availability of funds is crucial for purchasing necessary inputs, such as improved seeds, fertilizers, and other supplies that positively impact coffee management practices. Similarly, Tadesse *et al.*, (2020) emphasized that an effective supply of agricultural inputs, including improved varieties, fertilizers, and insecticides, can boost the productivity and quality of coffee, but this requires consistent funding.

Provision of Co-operative Education and Training: Co-operative education and training, a key principle of the co-operative movement, plays a crucial role in fostering an understanding of the co-operative business model. However, this area remains significantly underdeveloped in the study areas. The educational focus is primarily on technical skills related to coffee production, leaving a substantial gap in students’ comprehension of co-operative business structures, principles, and the potential benefits of these systems. Among the schools studied, only Shaji Secondary School has tried to introduce students to co-operative education. In 2022, students from Shaji participated in a study tour to a primary Agricultural Marketing Co-operative Society (AMCOS), which provided a brief overview of how co-operatives work in practice. However, this was an isolated event with no follow-up activities or continuing education efforts to deepen students’ knowledge. The absence of ongoing training meant that this limited exposure was insufficient to equip students with a solid understanding of co-operative principles and practice. Co-operatives, as business entities owned and operated by a group of individuals for their mutual benefit, are vital to local economies, especially in agricultural sectors like coffee production. However, the lack of structured education on this subject means that students in these schools have minimal exposure to the values and mechanisms of co-operative organizations. Without proper training, students are less equipped to understand how co-operatives function, how to participate in them, and the advantages they offer in terms of shared ownership, risk reduction, and collective bargaining. The overall lack of co-operative education severely limits students’ ability to recognize the long-term benefits of co-operative involvement. This diminishes their capacity to see co-operatives as viable and empowering business models, which in turn affects their motivation to join or establish co-operatives in the future. Consequently, the potential for these students to become future cooperators who actively participate in co-operative organizations and

contribute to their growth is significantly hindered. Literature supports the importance of co-operative education to youth due to its potential to address their disengagement, and its contribution towards unemployment reduction (ILO, 2012b). Education about the rights, responsibilities, and benefits of co-operative societies can enhance youth participation in co-operative activities, encourage them to patronize co-operative products and services, and contribute to the achievement of co-operative goals. Similarly, Cruz (2021) proposes that introducing youth to the value of cooperation can spark their interest in co-operatives and help sustain their legacy. Kayabaş (2020) highlights that the lack of education and awareness hinders co-operative development, making it essential to raise awareness in schools through co-operative education designed to improve, adopt, and sustain co-operatives. While direct co-operative education is lacking, most schools in the region had some form of linkages between students and co-operative institutions, primarily through the facilitation of City Coffee Company. The students in the study areas are linked to AMCOS through such company, allowing them to sell their coffee produce to these co-operatives. This provides some exposure to co-operative operations. Only one school in particular, benefits from advice and support from co-operative members and leaders, indicating a more active relationship. However, most schools lack broader networks with other coffee stakeholders beyond City Coffee Company and AMCOS, limiting students' broader understanding of co-operatives.

Strategies for Retaining Students as Future Farmers and Cooperators: The retention of students as future farmers and cooperators is critical to maintaining the long-term viability of coffee farming and the sustainability of AMCOS. Youth are pivotal to the growth and development of AMCOS, making it imperative for schools to engage them actively in farming activities. However, studied schools lack deliberate strategies to nurture students as future farmers and cooperators, often relying on external incentives. For instance, City Coffee Company provides monetary rewards, internships, and employment opportunities as motivational tools. While such incentives can spark initial interest, sustainable self-reliance is more likely to be achieved through the mobilization of local and own resources (Mazibuko, 2007; Njau *et al.*, 2019). This aligns with broader findings in cooperative development literature, which emphasize building internal capacities and fostering intrinsic motivation over dependency on external support systems (Johnson, & Johnson, 2008; Osterloh *et al.*, 2002; Njau *et al.*, 2019). These studies suggest a positive relationship between intrinsic and extrinsic motivation and that outside intervention in the form of rewards may strengthen intrinsic motivation if it is perceived to be supportive of intrinsic motivation. Out of nine schools four of them benefit from external incentives, relying on City Coffee Company's support to encourage students to pursue careers in coffee farming. In contrast, the remaining schools do not have specific retention strategies and depend entirely on these external incentives. This over-reliance on outside support highlights the absence of structured, internal approaches to agricultural education. These incentives are effective in the short term but their sustainability is questionable, especially if corporate sponsorship diminishes or fluctuates. It was clear that students' cultural backgrounds and family ties to coffee farming play a considerable role in maintaining their interest in farming. In these communities, coffee farming is a cultural identity passed down through generations. These findings align with Zaremohzzabieh *et al.* (2022), who found that students with agricultural backgrounds are more positive about farming careers than those from urban settings. However, cultural inheritance alone may not be enough to ensure long-term engagement, as students increasingly explore other career options through technology and education. Ochieng (2020)

observed that as rural youth are exposed to non-farming opportunities, they tend to shift away from agriculture towards government or private sector employment and self-employment. While external incentives from companies like City Coffee can help retain students, the approach would be more effective if paired with internal strategies at the school level. Schools without such external support struggle even more to retain students in farming, demonstrating the need for a balanced approach combining both internal and external efforts. Nonetheless, Njau *et al.* (2019) found that incentives in co-operatives and supporting organizations in Tanzania are not only insufficient but also largely ineffective, with some entirely lacking. As a result, the lack of adequate incentives may discourage active youth engagement, limiting co-operative growth and potential innovations driven by young entrepreneurs.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions: The study reveals key challenges and opportunities in implementing coffee farming and enhancing co-operative education and training in secondary schools. The study reveals a lack of qualified agricultural staff resulting to inconsistent and limited knowledge transfer, limiting innovation and comprehensive coffee farming education. While student motivation is driven by cultural and financial incentives, it heavily relies on external support, raising concerns about sustainability of the school-based coffee farming schemes and the coffee sector in general. Inadequate basic farming facilities such as hand hoes, sprayers, and outdated farming equipment further hinder the effectiveness of farming activities. The absence of structured co-operative education also limits students' understanding of co-operative business models and has implication on the future sustainability of the co-operative sector especially agricultural co-operatives.

Recommendations: Basing on the results from the study area, the study recommends the following; First, secondary schools in the study area should prioritize hiring or training qualified agricultural teachers to equip students with advanced coffee farming skills. Additionally, secondary schools are advised to introduce internal reward systems, such as recognition awards for high-performing students, for the purpose of fostering motivation, sustain engagement, and prepare students to become active members of the agricultural workforce and co-operatives. Local governments, in collaboration with non-governmental organizations, should provide modern farming tools and infrastructure, including irrigation systems, tractors, and pest control equipment, to support practical learning. Schools are also encouraged to explore alternative funding strategies by forming partnerships with agricultural co-operatives, local businesses, and community members, alongside seeking grants from local governments and individuals willing to support youth-based agricultural initiatives. Finally, the government of Tanzania is advised to consider incorporating co-operative education into the curriculum to empower students with knowledge of the principles, practices and benefits of farming and cooperative systems, ensuring long-term impact and sustainability in the coffee farming sector.

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