

ROLE OF AGRICULTURAL CO-OPERATIVES IN PROVISION OF EXTENSION AND AGRO-PROCESSING SERVICES TO SMALLHOLDER FARMERS. A CASE OF KAHAMA CO-OPERATIVE UNION, TANZANIA.

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Abstract

This study examines the role of Kahama Co-operative Union (KACU) in the provision of agricultural extension and agro-processing services to smallholder cotton and tobacco farmers in Shinyanga Region, Tanzania, during the 2019/2020 crop season, with the objective of assessing its contribution to farmer support, value addition, and the challenges limiting its performance. A qualitative case study design was adopted, with data collected through in-depth interviews with 30 purposively and randomly selected respondents and documentary review of operational and institutional reports, analysed using thematic analysis. The findings reveal that KACU played a significant role in improving farmers' access to advisory services, farm inputs, and production-related knowledge through extension support, while also successfully reviving cotton ginning operations through financing from the Tanzania Agricultural Development Bank. The Union enhanced value addition, job creation, and farmer market access through ginning activities, thereby strengthening rural livelihoods. However, its effectiveness was constrained by inadequate financial capacity, shortage of extension personnel, inconsistent cotton supply, and weak coordination with local government extension systems. The study recommends strengthened financing of cooperative-owned agro-processing industries, increased recruitment and deployment of extension officers to cooperative unions, and enhanced policy support to improve institutional collaboration. These findings imply that strengthening cooperative governance and financial sustainability is essential for improving agricultural productivity and achieving national industrialisation and agricultural transformation goals.

Keywords: Agricultural extension services, Agro-processing services, Co-operative Unions, Smallholder Farmers, Tanzania.

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INTRODUCTION

Tanzania is currently implementing the Third National Five-Year Development Plan (FYDP III) 2021/22–2025/26, which put forward some strategies to transform the country into a semi-industrialised nation by the year 2025 as stipulated in the Tanzania Development Vision (TDV) 2025 (Mbelle and Kabanda, 2018). One of the strategies laid down by the FYDP III is to improve the

performance of the agriculture sector which supports the livelihoods of most Tanzanians. To achieve the improvement of the agricultural sector, Tanzania is also implementing the Agricultural Sector Development Programme phase two (ASDP II) 2017/2018–2027/2028 which aimed at transforming the agricultural sector towards higher productivity, commercialisation level and smallholder farmer income for improved

livelihood, food security and nutrition (URT, 2017b). All these efforts are made because agriculture is a backbone sector of the Tanzanian economy, and its performance affects other sectors. According to URT (2016) the agricultural sector provides about 66.9 per cent of employment, contributes 23 per cent of GDP and 65 per cent of inputs to the industrial sector. Despite its significant contribution to economic development, the agricultural sector in Tanzania faces several challenges including low productivity of land, labour and capital due to inadequate agricultural extension services among other factors (URT, 2013). Another challenge hindering the performance of the agricultural sector in Tanzania is weak agro-processing industries for value addition. Most cash crops produced in the country have continued to be exported in raw form, mainly due to either inadequate or underperformance agro-processing industries particularly those located in rural areas (URT, 2016). To enhance agricultural performance in Tanzania, provision of strong agro-processing industries and adequate extension services in rural areas is mandatory among other factors. The essence of having strong agro-processing industries in a country is to increase crops value addition, create more employment opportunities as well as reduce rural-urban migration (URT, 2013). On other hand, provision of agricultural extension services to smallholder farmers is a critical and a leading factor for promotion of agricultural performance in developing nations (Joshi and Narayan, 2019). Agricultural extension involves those services aiming at advising farmers on appropriate agricultural technology adoption, capacity building on rural enterprise development and linking farmers to access both domestic and international market

(Feder *et al.*, 2011). Traditionally, agricultural extension is a public driven in developing nations. However, due to low financing capacity among most governments and increased demand of extension services in rural communities, it has widely recognised that agricultural extension should not viewed as public driven rather a combination of public, private and semi-public system which forms pluralistic system (Rutatora and Mattee, 2001; Wambura *et al.*, 2015). In this case, different private organisations including community-based organisations, non-governmental organisations as well as international development agencies should pair up their efforts with governments to enhance agricultural extension provision to rural communities. Co-operatives are community-based organisations, and since 1920s these organisations have remarkably contributed to supply of agricultural extension, running agro-processing industries and marketing farmers' produces in Tanzania. It is evident that agricultural sector had a tremendous performance when agricultural marketing co-operatives Societies (AMCOS) were vibrant in the country (Maghimbi, 2010). For instance, between 1950s and 1960s there were crops booms in all crops (coffee, cotton, tobaccos and cashewnuts) which were handled by co-operatives. Co-operatives including Victoria Federation of Co-operative Unions Limited (VFCU) established agro-processing industries for ginning cotton in Lake zone regions. VFCU also supplied low priced inputs such as cotton pesticides and seeds to members. The federation also bought loanable tractors to its members (Katundu, 2018). However, since 1976 when all AMCOS were abolished and re-established in 1982, they have not returned to their glorious time due to a number of

limitations (Maghimbi, 2010). Some of the current limitations of AMCOS include financial instability, strong competitions as a result of market liberalisation reforms, money embezzlement, price fluctuation in the international market, poor management of resources, and poor co-operative education among members and leaders. (Anania and Rwekaza, 2018). However, the government of Tanzania has been serious in making co-operatives regain their previous strengths so as to contribute to the current agenda of transforming the country into a semi-industrialised nation. Some of the efforts done by the government include issuing loans through the Tanzania Agricultural Development Bank (TADB) to co-operatives for reviving agro-processing industries. By August 2019, TADB had issued a total of TZS 147.2 billion to the agricultural sector including co-operatives in the country (*Habari leo*, 2019). In addition, by August 2020 the government through the Prevention and Combating of Corruption Bureau (PCCB) has managed to recover TZS 16.3 billion which was stolen from co-operatives (PCCB, 2020). Furthermore, as part of the measures to revamp the cotton industry among others, the government has agreed with stakeholders that a new cotton procurement system in which all buyers of seed cotton would only procure through the AMCOS. This system is not only aimed at reviving the co-operative sector in the country but also eliminates the use of agents who in most cases exploit smallholder farmers (KACU, 2020). These efforts by the government have resulted in some co-operatives, including Kahama Co-operative Union (KACU), being active in supporting the government's agenda of transforming the nation into a semi-industrialised nation. It is against this background that this study

assessed the role of KACU in the provision of agricultural extension and agro-processing services to smallholder farmers in the Shinyanga region in the crop season 2019/2020. Specifically, the study examines the contribution played by KACU in the provision of agricultural extension services to cotton and tobacco smallholder farmers in crop season 2019/2020; understands the role played by KACU in the revival and running of a cotton ginning plant in crop season 2019/2020; and establishes challenges of KACU in the provision of both agricultural extension and cotton ginning services. The practical problem addressed by this study is the gap between the potential role of cooperative unions in enhancing agricultural productivity and value addition, as emphasised in policy and theory, and the actual performance of KACU in facilitating agricultural extension and value chain integration in the local context.

METHODS

This study employed a qualitative case study research design to explore the role of Kahama Co-operative Union (KACU) in the provision of agricultural extension and agro-processing services to smallholder farmers. The case study approach was selected because it allows an in-depth examination of institutional practices, stakeholder experiences, and contextual factors that cannot be adequately captured through quantitative techniques. The study did not utilise empirical models, hypothesis testing, or quantitative variable measurement, as its objective was exploratory and interpretive in nature. This methodological choice is consistent with a qualitative research paradigm that seeks to generate rich, contextualised understanding rather than statistical generalisation.

The target population comprised KACU management staff, union-level extension officers, leaders of Agricultural Marketing Cooperative Societies (AMCOS), and smallholder cotton and tobacco farmers operating within KACU's jurisdiction. Purposive sampling was used to select key informants, including KACU officials and experienced cooperative leaders, based on their roles and knowledge of union operations. Simple random sampling techniques were used to select farmer respondents to ensure representation of diverse experiences and perspectives. A total of 30 respondents participated in the study. Primary data were collected through semi-structured, in-depth interviews, which allowed respondents to freely describe their experiences with extension services, ginning operations, and institutional challenges. Secondary data were obtained through documentary review of KACU annual reports, strategic plans, financial statements, government policy documents, and sectoral publications. Data triangulation was achieved by systematically comparing interview findings with documentary evidence. This involved cross-checking reported practices, timelines, and performance outcomes from interviews against written records, enabling the validation of findings and the identification of consistencies and discrepancies between data sources. Data were analysed using thematic analysis. The analytical process followed a structured sequence of steps. First, audio-recorded interviews were transcribed verbatim, and all transcripts and documents were read repeatedly to achieve familiarisation with the data. Second, open coding was conducted to identify meaningful units of text relevant to the study objectives. Third, related codes were grouped into categories, which were

then refined into broader themes. Fourth, the themes were reviewed, interpreted, and linked to the conceptual framework of cooperative-based extension and value chain integration. Finally, the results were synthesised and presented in narrative form, supported by direct quotations from participants. Ethical considerations were strictly observed throughout the study. Informed consent was obtained from all participants after explaining the purpose of the research, the voluntary nature of participation, and the right to withdraw at any time without consequences. Participants were assured of confidentiality and anonymity, and no personal identifiers were included in transcripts or reports. All data were securely stored and accessed only by the researcher. Relevant permissions to conduct the study were obtained from appropriate institutional authorities prior to data collection.

RESULTS

Historical Perspective and Current Profile of KACU:

The study found that KACU has a long history since its formation. However, this paper presents some of key historical perspective in relation to the current status of its operations. It was found that KACU was established and registered in 1994 with registration number 5493. Its establishment was mandated to assist primary societies in production, processing and marketing of produce. Its head office is located in Kahama Town. Before its establishment, KACU was part of Shinyanga Region Co-operative Union (SHIRECU). In other word, members and properties such as buildings, land and cotton ginning plant of today's KACU was previously owned by SHIRECU. Among other reason which pushed for the formation of KACU was to bring the union's services closer to farmers who involved in cultivation

of both cotton and tobacco. As a result, on 20th of April in 1994, members of SHIRECU saw the need to register a new co-operative union which would provide services to farmers of Kahama and Bukombe districts. This happened before establishment of Geita region which excluded Bukombe as part of Shinyanga administrative district. When KACU was formulated, it had 89 affiliated primary societies in which 66 societies involved with cotton farming and 23 societies involved with tobacco farming. Currently, KACU is operating in Kahama, Ushetu and Msalala districts. It has a total of 116 affiliate primary societies with a total of 18,662 smallholder farmers. The union has also 59 primary societies with 12,496 members dealing with cotton farming, 42 societies with 4,493 members involving in tobacco farming and 15 societies with 1,673 members farming both tobacco and cotton. As per audited financial statements for the year ended March 31st, 2019, KACU's assets valued TZS.1.870 billion which consists land and buildings, plant and machinery, and office furniture and equipment. By October 2020, the union had a total of 139 employees of whom 14 are permanent, 20 work under three months bases contract and 105 are casual workers. The organisation structure of the union consists of the general meeting as supreme organ, board members and management team. The management team is headed by general manager who is assisted by the operations manager, the chief engineer and the chief accountant. The union vision is to become a strong co-operative union that provide good supervision and management skills to its primary co-operative societies and community, and improve the economic wellbeing of farmers and community development in Kahama, Ushetu and Msalala districts.

Provision of Agricultural Extension Services to Cotton Smallholder Farmers:

The study found that during the 2019/2020 crop season, KACU played important role in provision extension services to cotton smallholder farmers at both national and union level.

Provision of Extension Services at National Level:

It was found that KACU was given mandate by the government through the ministry of agriculture, livestock and fisheries to supply cotton pesticides to smallholder farmers in the country. The role was previously assumed by Tanzania Cotton Board (TCB). However, during the 2019/2020 crop season the government saw the need for co-operatives to champion the process and KACU was found to be suitable to carry out the role. In order to carry out the role, KACU used the following steps: First and most important was to identify the actual requirement of cotton pesticides in the country. This step was facilitated by co-operative stakeholders of Tanzania mainland including assistant co-operative officers, district co-operative officers, union leaders and AMCOS' leaders. This team enhance the collection of pesticides requirement from individual farmers country wide. It was estimated that the actual cost for supplying cotton pesticides amounted TZS 8 billion. The second step involved seeking a loan from financial institution in order to finance the supply of inputs. The National Microfinance Bank (NMB) agreed to finance the business. The third step involved finding suppliers through tendering procedures in which Petrobena Company Limited (PCL) and Bajuta Company Limited (BCL) were successful awarded the tender. NMB issued a Letter of Credit (LC) within 180 days to assure suppliers that payment will be done within a specified time. Then, KACU, NMB

and TCB set a sinking fund of TZS 100 per kilogram of cotton sold after harvest to facilitate repayment of loan. The idea intended to smoothen the loan repayment process rather than depending on direct repayment from farmers who previously defaulted. Finally, PCL successfully managed to supply insecticides amounting TZS 4 billion and BCL supplied cotton insecticides costing TZS 3.99 billion as indicated in Table 1.

Table 1: The Costs of Supplying Insecticides

Items	Petrobena	Bajuta
Types of Insecticides	Ruruka (150 grams), Ruruka (100 grams), Tegata (80mls)	Banofos (500mls), Banofos (250mls), Banofos (100mls),
Total Costs (TZS)	4,000,000,000	3,999,999,600

Source: KACU (2020)

By October 2020, KACU managed to repay back the loan of TZS 8 billion with interest of TZS 132,000,000 to NMB.

Provision of Agricultural Extension at Union Level: The study found that KACU also play significant role in provision of cotton extension services to primary societies which include provision of right knowledge and technology on best farming practices, and facilitate the supply of cotton inputs. To start with the former role, KACU had six (6) extension officers who provided extension services to cotton smallholder farmers. One of their daily responsibilities was to visit smallholder farmers and advise them according on various aspects of farming cotton. This is reflected in the quote captured from one respondent who said that:

“...We are advising farmers on proper farming technique including planting, weeding, pest management, harvesting

and storage..... we are also ensuring that farmers are getting seeds and pesticides on right time in each crop season...” (Field Interview Data)

The caption implies that KACU's extension officers are doing their best to inform cotton farmers on various ways of farming methods and technology so as to improve cotton production. It has also found that the common method used by extension officers to disseminate knowledge and technology to the farmers is agricultural extension participatory approach. To facilitate this approach, KACU provides motorcycle to each extension officer to smoothen transport mechanism in the rural areas. Extension officers on other hand are required to compile monthly report on activities conducted in the rural areas and submit to the management for recording keeping and other managerial issues. Moreover, according to the KACU's insecticides supply report of 2020, it was revealed that during 2019/2020 crop season, the union facilitated the supply of cotton insecticides costing TZS 139,700,400 to its members. This also implying that KACU is full responsible to ensure that smallholder farmers are getting cotton inputs at required time.

Provision of Agricultural Extension Services to Tobacco Smallholder Farmers:

It was found that KACU plays both direct and indirect role in order to facilitate the provision of agricultural extension to tobacco smallholder farmers. Direct role involves provision of right knowledge on best practices of tobacco farming such as time planting, plant spacing,

appropriate weeding techniques, appropriate nutrient management, pest control, proper harvesting and postharvest techniques. This role is usually done by KACU's extension officers in collaboration with buyers' extension officers. Every companies which buy tobacco usually have their own extension officers who work with KACU's officers to disseminate right knowledge and technology to smallholder farmers. The methods used to transfer knowledge and technology include agricultural extension participatory approach. On other hand, KACU also play indirect role which focus on provision of tobacco inputs to smallholder farmers. In this role KACU act as linkage agent who facilitate connection of three parties: primary societies, the buyers and financial institutions who mainly full participate in supply of inputs through contract farming. Tobacco farming is a purely contract farming of which all three parties must be involved. In Kahama, Ushetu and Msalala districts the buyers who involved in tobacco contract farming include Alliance One Tobacco Tanzania Limited (AOTTL), Japan Tobacco International Services (JTILS), Grand Tobacco Limited (GTL), Magefa Growers Limited (MGL) and Petrobena East Africa Limited (PEAL) while financial institutions include Azania, NMB and Co-operative Rural and Development Bank (CRDB) as indicated in Table 2.

Table 2: Parties involved in Tobacco Contract Farming 2019/2020

Sn	Buyer's Companies	Tobacco Quantity Under Contract (Kgs)	Percentage of Quantity under Contract	Total Loans from CRDB/NMB/AZ ANIA (USD)	No. of AMC OS involved
1.	AOTTL	4,336,000	58.52	4,270,034.75	24
2.	JTILS	1,950,000	26.32	2,335,149.22	6
3.	GTL	564,000	7.61	100,367.50	8
4.	MGL	310,000	4.18	213,937.20	3
5.	PEAL	250,000	3.37	126,780.00	1
Grand total		7,410,000	100.00	7,046,268.67	42

Source: KACU (2020)

The buyers usually specify the quantity, quality and the price of tobacco while primary societies on behalf of smallholder farmers agree to deliver stated requirements at a future crop season. Using contracts, primary societies can easily get fund to finance agricultural inputs from banks. KACU ensures that all contracts mutually benefit all parties. Furthermore, the union also involving in compiling the total requirement of inputs from all primary societies and send to the Tanzania Tobacco Joint Enterprises (TTJE).

Table 3: Tobacco Inputs in 2019/2020 Crop Season

Sn	Type of Inputs	Unit	Quantity Requested	Quantity Supplied	Percentage Supplied
1.	NPK 10:18:24	Bag	62,465	53,415	85.51
2.	CAN 27% N	Bag	16,174	12,980	80.25
3.	Urea 46% N	Bag	15,669	11,249	71.79
4.	Bamidac/Confidor/Moprid	Packet	55,471	43,015	77.55
5.	Bamethrine/Modeci	Bottle	86,931	69,947	80.46
6.	Sakasi Super	Litre	6,098	5,058	82.95
7.	Jute Twine	Kg	25,380	15,120	59.57
8.	Polythene Sheet	Metre	276,92	160,864	58.09
9.	Cotton Twine	Balls	6,100	4,989	81.79
Average Percentage of Quantity of Inputs Supplied					75.32

Source: KACU (2020)

TTJE receives all inputs from all unions in the country and find the supplier through tendering system. Once the supplier is ready to supply the inputs, KACU verify the order and permit the supplier to deliver them to

primary societies. Table 3 indicates that the supplier managed to supply an average of 75.23 per cent of all tobacco inputs requested by KACU. This implies that smallholder farmers did not get all inputs required and that might have some implication in production of tobacco in the 2019/2020 crop season.

Role of KACU in Revival and Running of Agro-processing Industry (Ginnery): The study found that the union owns a cotton ginning plant located at Mhongolo industrial area in Kahama Township. It has 16 double roller gins and a weigh bridge of 80,000 kgs. The plant also has the capacity of producing about 6 bales of lint cotton per hour which is equivalent to 144 lint bales per day and that is equivalent to 73,440kgs of seed cotton per day. The cotton plant has a modern facility with 14 godowns with average capacity of 150 tonnes of goods per godown. Transportation of seed cotton, other raw materials and finished products is done either using its own transport or hired trucks from outside. The plant site is connected to TANESCO national power grid system. The ginnery is however provided with standby generators for power requirement during power shortage or emergency cases. However, the plant has stopped working since the 2013/2014 crop season due to stiff competition from private ginners and fluctuation of cotton production as major raw materials of the plant over past years. To respond to the current government's agenda of industrialisation and revival of the co-operative sector, KACU secured TZS 3.15 billion for revival of cotton ginning plant before beginning of the 2019/2020 crop season. The loan was used to repair machines and procurement of raw material. The plant has started re-working in the 2019/2020 season after procured 2,268,670 kgs of cotton

seed valued TZS 2,044,844,996 from smallholder farmers. By 2nd October 2020 when the plant was official re-inaugurated by government officials, it has processed a total of 2,575 bales of lint cotton and 710,347kgs of cotton seeds. At the end of the season KACU was expecting to process 859,145 kgs of cotton lint (equivalent to 4,747 bales of cotton lint) and 1,341,010 of processed cotton seeds. The union was also expecting to realise a profit of TZS 169,070,548.96 after selling both cotton lint and seeds. Re-working of the plant not only has economic benefits to smallholder farmers but also successful produced 821 direct and indirect jobs to a number of people including technicians, casual workers, transporters and food vendors. Due to the economic significance realised on revival of cotton ginning plant so far, the management of KACU has prepared business plan which intend to secure fund from TADB for expansion of existing ginning plant as well as invest in oil mill in upcoming crop seasons. The plan is to expand the capacity of the plant from the present 16 double roller gins and install additional 11 double roller gins to make a total of 27 gins. This would result into new ginning capacity of 10 (200kg) lint bales per hour which is equivalent to 240 lint bales per day assuming 3 shifts per day (working 8 hours per shift). On the other hand, the oil mill will have the capacity to process 50 tonnes of cotton seeds per day. The factory will also include a small but effective laboratory where tests for oil quality will be carried out. The objective is to utilise all cotton seeds produced by the ginnery to be used as raw material by oil mill for production of edible oil and its by-products.

Challenges of KACU in Provision of Agricultural Extension and Ginnery Services: In provision of both agricultural

and extension services, the study found that KACU faces three main challenges: low cotton production to feed the cotton ginning plant, low financial capacity to finance both agricultural extension services and agro-processing industry activities, and poor linkage between KACU's and Local Government Authority' (LGA) extension officers.

Low Cotton Production: It was found that KACU still faces low cotton production to feed its cotton ginning plant. In the 2019/2020 crop season for example, KACU planned to procure 4 million kgs of cotton seeds from its operating area (Kahama, Ushetu and Msalala districts), however it procured only 2,268,670 kgs equivalent to 56.7 per cent of the expectations. The procurement was even done beyond KACU's operation area whereby Kishapu and Nyang'wale districts were also involved. This challenge was partly caused by weather condition but also low motivation of smallholder farmers to cultivate cotton against other crops such as paddy which become more popular in the areas where cotton was dominant cash crop. One respondent was noted saying that:

"...Many smallholder farmers are losing their interest in cultivation of cotton as cash crop and shifting to other crops such as paddy..." (Field Interview Data)

The above caption brings the message that some of smallholder farmers have gain interest in other crops including paddy which can be used as both food and cash crop. Another reason which demotivates smallholder farmers might be regular price fluctuation of cotton in the world market.

Low Financial Capacity: KACU like many other co-operatives in the country is facing inadequate fund to accommodate its daily

responsibilities. For instance, KACU has only 6 (six) agricultural extension officers who work in 116 primary societies which have 18,662 smallholder farmers. This means that 1 extension officer serves 3,110 farmers. The ratio is far below the World Bank' recommendation of 1 extension officer to 500 farmers (World Bank, 2006 cited in Busungu et al., 2019). KACU could employ as many extension officers as possible to meet the demand of smallholder farmers, however that is impossible due to limited financial capacity. Also, as we have seen in subsection 3.3 that KACU has a plan to expand the capacity of cotton ginning plant as well as investing in oil mill production, but the plan might slowly be implemented because the fund to finance these investments comes from external sources.

Poor linkage between KACU's and LGA's extension officers: It was found that LGA's extension officers hardly work with KACU's extension officers. Study noted that KACU's extension officers have never collaboratively with LGA's extension officers. During interview one extension officer said that:

"...I have never worked with LGA's extension officers..... but we usually working with buyers' extension officers..." (Field Interview Data)

The above caption indicates that there is no linkage or collaboration between private extension officers including co-operatives and those who are employed by LGA. When government and private extension officers are given opportunity to collaborate with each other will enhance officers to exchange experience, methods and knowledge of delivering extension services toward improvement of extension services in the rural areas.

DISCUSSION

The findings of this study demonstrate that agricultural cooperatives, particularly cooperative unions such as KACU, continue to play a critical intermediary role in the provision of agricultural extension and agro-processing services to smallholder farmers in Tanzania. This role aligns with cooperative development theory, which emphasises collective action as a mechanism for addressing market failures, service delivery gaps, and power asymmetries faced by smallholder producers. The evidence from KACU confirms that cooperatives remain relevant institutional actors in contexts where public extension systems are constrained by limited resources. The study's finding that KACU supplements government extension services through its own extension officers is consistent with earlier studies in Tanzania which highlight the emergence of pluralistic extension systems involving public, private, and cooperative actors (Rutatora & Mattee, 2001; Wambura et al., 2015). Similar observations were reported by Feder et al. (2011), who argue that farmer organisations can effectively complement state extension systems by providing more context-specific and timely advisory services. The participatory extension approaches adopted by KACU also mirror findings from Busungu et al. (2019), who found that locally embedded extension delivery enhances farmer trust, learning, and adoption of recommended practices. Furthermore, the study reveals that cooperative-led training and advisory services have improved farmers' knowledge of agronomic practices, pest management, and post-harvest handling. This finding is consistent with previous empirical studies showing that cooperative-based capacity-building initiatives contribute to improved farm productivity and product quality (Joshi & Narayan, 2019; Maghimbi,

2010). Compared to studies that focus solely on public extension, the KACU case demonstrates that cooperatives can provide more continuous and production-cycle-oriented support, particularly for cash crops such as cotton and tobacco. The revival of the cotton ginning plant under KACU ownership provides further evidence of the role of cooperatives in promoting agro-processing and value addition. This finding aligns with Katundu (2018), who notes that cooperative-owned processing facilities can enhance local industrialisation, employment creation, and farmer participation in value chains. However, similar to observations by Maghimbi (2010), the study finds that cooperative agro-processing remains vulnerable to fluctuations in raw material supply, competition from private processors, and financial constraints. While KACU's success in securing financing from TADB reflects improved access to institutional credit, the sustainability of such investments depends on stable production volumes and effective management. The challenges identified in this study including limited financial capacity, shortages of extension personnel, and weak coordination with local government extension officers are consistent with long-standing structural problems documented in Tanzania's cooperative sector. Previous studies have shown that inadequate capitalisation and human resource constraints undermine cooperatives' ability to deliver services efficiently and equitably (Anania & Rwekaza, 2018; Wambura et al., 2015). The extension officer-to-farmer ratio observed in KACU is significantly below international recommendations, a challenge also reported in other developing-country contexts (Feder et al., 2011). The weak collaboration between cooperative extension officers and LGA-employed extension staff

reflects institutional fragmentation within Tanzania's extension system. Similar coordination challenges have been reported in earlier studies, which note that lack of formalised collaboration frameworks reduces knowledge sharing and leads to duplication or gaps in service provision (Rutatora & Mattee, 2001). This finding contrasts with policy intentions that promote integrated extension delivery and highlights an implementation gap between policy design and practice. Overall, the findings of this study corroborate existing empirical evidence that cooperatives can effectively bridge extension and agro-processing service gaps in rural areas. However, the KACU case also extends the literature by demonstrating how financial capacity, staffing levels, and institutional coordination mediate the effectiveness of cooperative-led service delivery. These findings underscore the need for sustained policy and financial support to strengthen cooperative institutions if they are to contribute meaningfully to agricultural transformation and rural industrialisation in Tanzania.

CONCLUSION

This study has demonstrated that KACU plays a strategically important role in supporting smallholder cotton and tobacco farmers through the provision of agricultural extension services and the operation of agro-processing facilities, particularly cotton ginning. The findings show that cooperative-based extension has improved farmers' access to agronomic knowledge, farm management practices, and production-related support, while ginning operations have contributed to local value addition, employment creation, and improved market access. However, the effectiveness of these interventions has been constrained by persistent institutional and operational

challenges, notably limited financial capacity, shortages of qualified extension personnel, inconsistent crop supply, and weak coordination with public extension systems. The findings carry important policy implications. They underscore the need for stronger institutional and financial support for cooperative unions to enable them to deliver reliable and high-quality extension services and to sustainably operate agro-processing facilities. Policy interventions should prioritise increased access to affordable credit for cooperative-owned processing infrastructure, deliberate capacity-building programmes for cooperative management and extension staff, and clearer frameworks for collaboration between cooperatives and government extension services. Strengthening governance structures within cooperative unions is also essential to enhance accountability, improve resource mobilisation, and ensure the long-term sustainability of cooperative-led agricultural services. At a broader level, the study reinforces the policy lesson that cooperative-based models can serve as effective vehicles for agricultural transformation and rural industrialisation when supported by coherent institutional frameworks and adequate resources. Integrating cooperatives more firmly into national agricultural and industrial development strategies can enhance smallholder participation in value chains and improve resilience of rural livelihoods. Notwithstanding these contributions, the study has several limitations. It was based on a relatively small sample size and focused on a single case study of KACU, which limits the generalisability of the findings to other regions and cooperative contexts. The qualitative design, while rich in depth, did not

allow for quantitative measurement of impacts. Future research should therefore consider comparative studies across multiple cooperative unions, incorporate larger samples, and employ mixed-methods approaches to quantify the economic and productivity impacts of cooperative-led extension and agro-processing. Further research is also needed to explore the long-term sustainability of cooperative-owned processing facilities and the evolving role of cooperatives within Tanzania's agricultural policy framework.

RECOMMENDATIONS

In light of the study findings, policy interventions should prioritise strengthening institutional and financial support for cooperative unions as key actors in agricultural extension and agro-processing. Government and development partners should expand access to affordable, long-term financing for cooperative-owned processing facilities, particularly ginneries, to ensure sustainable operation and modernisation of equipment. In addition, national agricultural and cooperative development policies should formally integrate cooperative unions into the public extension system through clearer frameworks for coordination, joint planning, and performance monitoring. These measures would enhance the capacity of cooperatives to deliver reliable advisory services and to deepen their role in agricultural value chain development. At the operational level, cooperative unions such as KACU should invest in strengthening internal governance, management capacity, and human resource development. Targeted training programmes for cooperative leaders, extension personnel, and union staff are necessary to improve service delivery, financial management, and accountability. There is also a need to

improve crop aggregation systems through better incentives for farmers, transparent pricing mechanisms, and improved logistics, in order to stabilise raw material supply for agro-processing plants. These interventions align directly with the study's objectives of assessing adoption and performance of cooperative-based extension and agro-processing functions and with the theoretical foundation that emphasises the role of strong institutions in enhancing organisational effectiveness. This study contributes new knowledge by providing empirical evidence on how a cooperative union simultaneously operationalises agricultural extension and agro-processing functions within a single institutional framework at the local level. Unlike previous studies that have often examined extension services and agro-processing as separate interventions, this study demonstrates that their integration within a cooperative structure can create synergistic effects on farmer support, market access, and local value addition. It also brings to light the specific institutional constraints—particularly financial limitations and human resource gaps—that mediate the effectiveness of this integrated model in practice, which had previously been underexplored in the Tanzanian context. Future research should build on these findings by conducting comparative studies across multiple cooperative unions and regions to assess variations in performance and institutional capacity. There is a need for mixed-methods studies that combine qualitative insights with quantitative impact assessments to measure productivity gains, income changes, and efficiency of cooperative-led extension and agro-processing. Further research should also explore the long-term sustainability of cooperative-owned processing facilities

under different financing and governance arrangements, as well as the evolving role of cooperatives in the implementation of Tanzania's agricultural and industrial development strategies.

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