

# Impact of the Consortium Approach to Food Value Chain Development on the Incomes of Smallholder Farmers in Uganda and Rwanda

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## Abstract

Agriculture, as one of the most important sectors in the East African Community (EAC) accounts for about 80% of the workforce, including smallholder farmers in rural areas. In spite of this, the EAC is characterized by low agricultural productivity and low incomes, and is rated among the poorest in Africa. The consortium approach under the Regional East African Community Trade in Staples (REACTS) project implemented by the Kilimo Trust is a response to address the gaps of low agricultural productivity and the low incomes of smallholder farmers and other actors in the value chain.

The paper assessed and analysed the effectiveness of the consortium approach as opposed to the conventional approach to food value chain development in improving the productivity and incomes of smallholder farmers in Uganda and Rwanda. A multi-stage/stratified random sampling method was used to select the value chain actors. Semi-structured questionnaires, key informant guides and focus group discussion guides were used to obtain information from the respondents. A total of 374 respondents were sampled from all the districts. Data collected were coded and analysed using the Statistical Package for Social Sciences,

descriptive statistics, inferential statistics and cost benefit analysis.

The result of the study provides evidence-based information on the effect of the consortium approach on the productivity and profitability of smallholder farmers with a view to promoting scalability and sustainability of the consortium approach in the EAC. The findings also revealed the critical success factors for the sustainability of the consortium approach; the strength, weakness, opportunity and threat (SWOT) for further development in the value chain.

**Keywords:** Agriculture, Consortium Approach, Smallholder farmers, Productivity, Income.

## **Introduction**

The East African region is characterized by low agricultural productivity and subsequently, food insecurity. The reasons for these are high population, small land sizes, environmental degradation, poor marketing structures, inadequate access to information, poor physical and institutional infrastructure and inappropriate government policies which hinder the sustainable development of rural areas. The region also has a diversity of farming systems, from the humid highlands of Uganda, to the coastal areas of Tanzania and Kenya and the dry lands of Sudan and Ethiopia.

According to Shepherd (2007), there is considerable scope for adding value to agricultural production. He argued that NGOs and other food value chain stakeholders sometimes approach agro-processing from a supply-led rather than a market-led perspective. That means, they decide to promote processing because of an abundance of raw materials rather than because of a clearly identified market for the processed products.

According to Louw et al. (2007), smallholder farmers can only have market power if they form co-operatives, which should be established with the help of government. His work showed that groups had the potential to secure better terms of trade such as better sourcing of

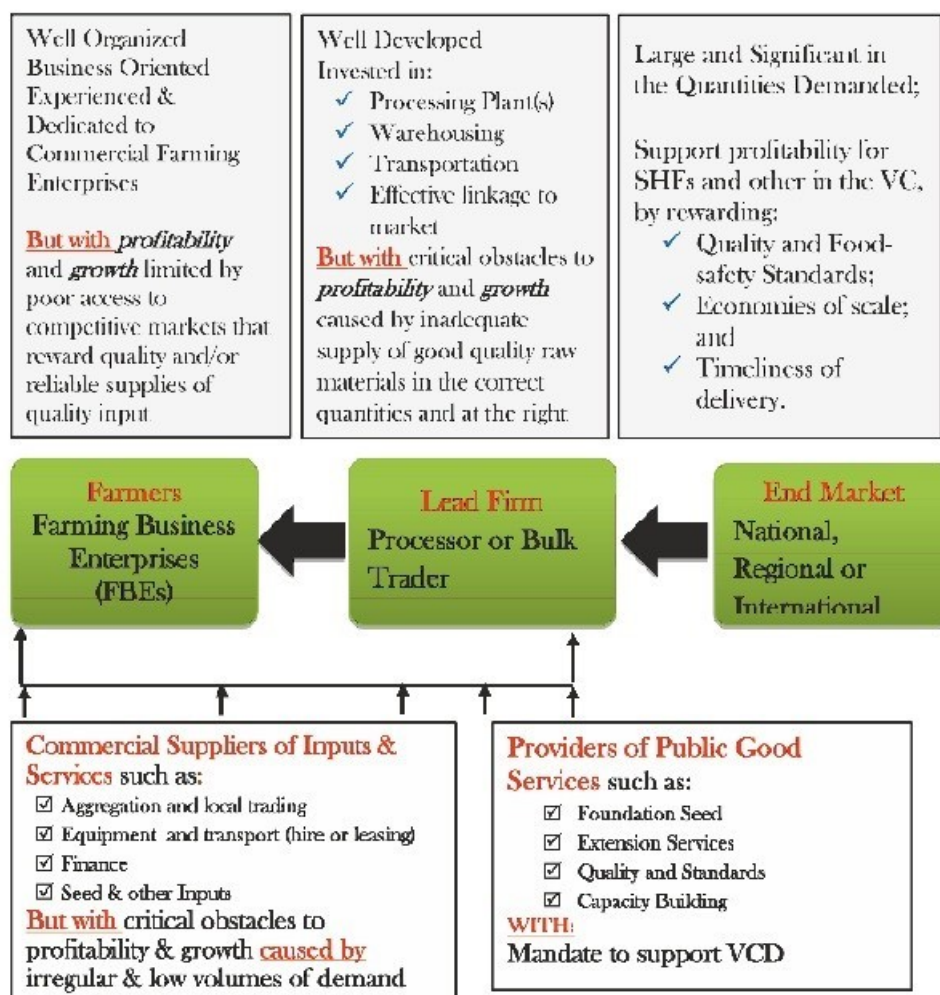
production inputs and prices, lower transaction costs, and greater access to training and other services.

Baloyi (2010) showed that considerable changes would be required in smallholder farming operations if the economic benefits of increased incomes are to be fully realized. These changes entail producing good-quality, high-value crops on a large scale and accessing high-value markets. This will only happen if smallholder farmers have access to comprehensive and holistic agricultural support services.

The consortium approach to food value chain development (FVCD) is an approach that uses high quality knowledge and information on markets and demand characteristics to support market-driven formation of a win-win business consortia. Each consortium is anchored on an agri-business and SME as lead firm, and composed of sufficient actors along the entire value chain, including the end market players linked to the final consumers. It is a collaborative approach that ensures that smallholder farmers are integrated into agri-business in a manner that enhances their capacity building in good agricultural practices, improves their access to production inputs and finance and the creation of markets for their commodities. Figure 1 shows the distinguishing attributes of the approach.

### **The Consortium Approach: Distinguishing Attributes**

The consortium approach was used to deliver the objectives of the Regional East Africa Community Trades in Staples (REACTS) project. Formed in 2014 with an exit period of 2017, REACTS is an IFAD-sponsored, Kilimo Trust implemented project in Uganda, Tanzania and Rwanda in the EAC with the main objective of increasing farmers' incomes through regional trade in targeted rural areas. The objectives of the REACTS project were to enhance incomes and accelerate wealth creation for smallholder producers of food commodities through regional trade. The project covered the West Nile Region, the Northern Region of Uganda, the Eastern Region of Rwanda and the Arusha Region of Tanzania (IFAD Report, 2014).



**Figure 1:** Kilimo Trust consortium approach to value chain development (KTCA2VCD).

## Methodology

### Study Area

The study area for this work covers Uganda and Rwanda. In Uganda, a vast majority of the population in rural areas is linked with the agric-food sector for their livelihood (Gagnon 2012;

Banson et al., 2014). These agribusinesses, particularly small farmers, are under pressure to achieve economic sustainability. Likewise in Rwanda, agriculture is the main driver of economic growth. It contributes 34% to the GDP and employs 85% of the Rwandan population (Bizimana et al., 2012). The transformation of agriculture therefore will have the greatest impact on the economy in terms of poverty reduction and wealth creation in both countries.

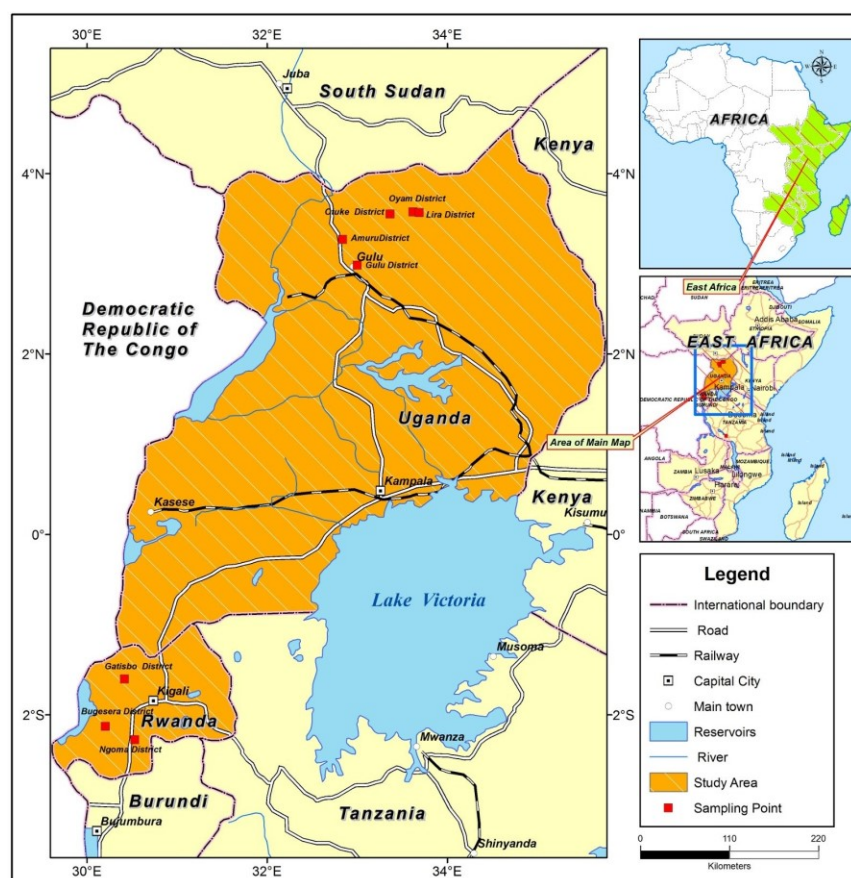
### **Sampling techniques in Uganda and Rwanda**

The multi-stage purposive cluster sampling technique was used in selecting the study area. Also 3 consortiums: Ngetta, Equator Seeds and BABC consortiums in the REACTS project in Northern Uganda and Eastern Rwanda were purposively selected. Lira, Otuke, Oyam, Gulu and Amuru districts in Uganda, and Ngoma, Gatisbo and Bugesera districts in Rwanda were selected (figure 2). In all, 374 smallholder farmers were randomly selected as respondents and 12 top managements of partner organizations (commercial inputs suppliers, lead firm/buyer, financial institutions and team leaders of the implemented project) were selected as key informants in interviews.

### **Method of data collection and analysis**

Primary data were collected from smallholder farmers through questionnaires, face-to-face one-on-one interviews, focus group discussions and researcher's observations. Data were also collected from key informants and stakeholders participating in the consortium. Quantitative data were collected from smallholder farmers using structured questionnaires.

The data were analysed using the Statistical Package for Social Sciences (IBM SPSS Statistics 20 and 22), MS Excel spreadsheet, cost benefit analysis and SWOT analysis. Descriptive (frequencies, percentages, means, and standard deviation) and inferential statistics (t-test and p-value) were used to ascertain the distribution of the variables in the study.



**Figure 2:** Map showing study area.

Source: Geographical Information System (GIS); Authors (2017).

## Results and Discussion

### Demographic and socio-economic characteristics of respondents

The results of the study reveal that of the 374 smallholder farmers interviewed, in the three consortia, a good majority were females as shown in Table 1.

Age, as one of the household characteristics, is important in describing the situation of a household and can provide a clue to the working members of the household. Age is expected to influence a farmer's investment, gender roles and decisions on the value chains in the consortia. The majority of respondents' mean age was found to be 43 years. Similar findings of age distribution were revealed by Nenganjwa (2005).

On marital status, findings show that the majority of the respondents were married, followed by the singles, widows, and the separated; the

*Consortium Approach to FVCD & Smallholders Incomes, Uganda & Rwanda* 29 divorced were the least. Similar findings were obtained by Aksoy et al. (2011) and Lwelamila et al., (2011). Compared to those who are single, married people have more family responsibilities and this makes them more involved in income-generating activities to enable them meet these family requirements. These findings imply that involvement in the consortia has been influenced by the responsibilities each individual shoulders in the family.

On educational attainment, findings from the study reveal that the majority of the smallholder farmers in all the consortia had primary level education. Similar findings were reported by Chang'a et al., (2010), Chagunda et al., (2010), Omondi & Meindert (2011) and Evans (2013).

The study also revealed that March-July is the main planting season for the Ngetta consortium and October-January for the Equator Seeds consortium in Uganda, while for BABC consortium in Rwanda it is November-March as shown in Table 1; the reasons for these periods are the availability of rain, lower pest infestation and good germination rate of crops during the various seasons.

Land is a critical factor endowment of any production activity and more particularly so in agriculture. Land ownership before and after by respondents in the consortium ranges from leased/borrowed, to inherited and self-owned. Findings from this study have shown that the source of land owned by the respondents in the consortia is varied. The majority of lands are self-owned. The minimum and maximum land owned in the consortia ranges from  $\frac{1}{4}$  acre to 60 acres. In the Ngetta consortium, the land ranges from  $\frac{1}{4}$  acre to 31 acres; in the Equator consortium it is from 2 acres to 60 acres, and in the BABC consortium it is between  $\frac{1}{4}$  acre and 17.25 acres.

**Table 1: Demographic and socio-economic characteristics of respondents (%)**

	<b>Ngetta Consortium n=156</b>	<b>Equator Consortium n=40</b>	<b>BABC Consortium n=178</b>
<b>Gender</b>			
Male	41.7	65.0	29.4
Female	58.3	35.0	70.6
<b>Marital Status</b>			
Single	7.7	7.5	2.8
Married	84.6	75.0	93.2
Divorced	1.3	0.0	0.6
Separated	1.9	2.5	0.6
Widow	4.5	15.0	2.8
<b>Educational Attainment</b>			
No Formal	17.5	15.4	5.6
Adult Literacy	1.9	10.3	2.2
Primary	51.2	64.1	81.5
Secondary	22.4	10.3	7.3
Advanced Level	4.5	0.0	0.0
University/Tertiary	2.6	0.0	3.4
<b>Source of Farm Land</b>			
Self-owned	55.1	52.6	78.6
Inherited	37.8	47.4	16.3
Leased/Borrowed	7.1	0.0	5.1
<b>Main Planting Season</b>			
March – July	98.1		
October – January		95.0	
November – March			100
<b>Total Land Owned (Acres)</b>			
Minimum	0.25	2	0.25
Maximum	31.0	60.0	17.3
Mean	5.5	14.0	2.7
<b>Source of Land</b>			
Self owned	55.1	52.6	78.6
Inherited	37.8	47.4	16.3
Leased/ Borrowed	7.1	0.0	5.1

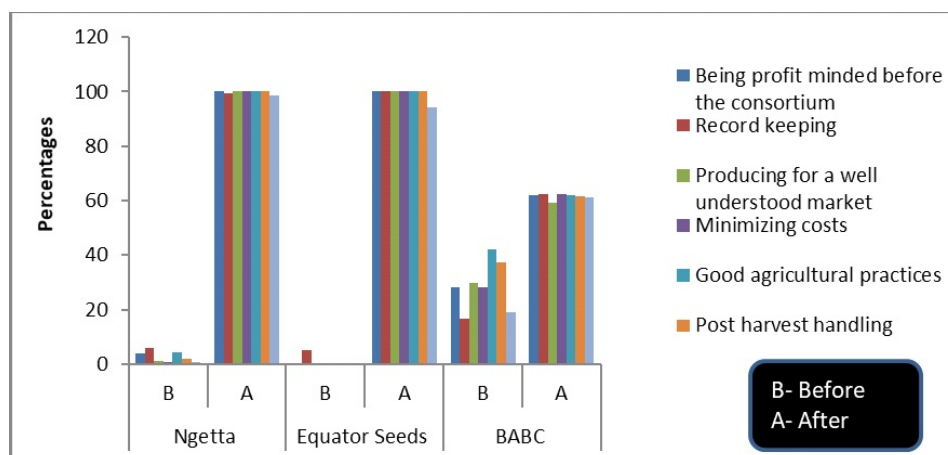
*Source:* Authors' computation based on survey data, 2017).



## Effectiveness of the Consortium Approach versus the Conventional Approach on Incomes of the Smallholder Farmers

### Skills and knowledge acquisition

Training is one of the most important aspects of the consortia. The respondents reported that before the implementation of the consortium approach, only a few had skills and knowledge pertaining to profit seeking, record keeping, producing for a well understood market and the techniques for minimizing cost of production with good agricultural practices, post-harvest handling and financial literacy. After introducing the consortium approach, all (100%) the respondents from the Ngetta and the Equator consortia have received training on these skills and knowledge as shown in Figure 3.



**Figure 3: Distribution of respondents according to skills and knowledge acquired before and after the consortium approach.**

Source: Authors' computation based on survey data, 2017.

### Impact of the consortium on mean harvest, gross margins and total revenue

As shown in Tables 2 - 4, respondents from Ngetta reported that the mean harvests from an acre of land cultivated with sunflower before and after the consortium approach were 0.2034MT and 0.4641MT respectively. The gross margins before and after the consortium were 85USD and 12USD

respectively. The gross margins before indicate that farmers made a loss of 85USD, but after the consortium a profit of 12USD was realized. The mean revenue before and after the consortium was 66.7USD and 166.7USD respectively. The p-values for mean harvest, gross margins and mean revenue show that there was a significant difference (see Table 2).

**Table: 2 The effectiveness of Ngetta consortium on mean harvest, gross margins and mean revenue per acre for sunflower**

Variable	Before	After	P- value
Mean harvest per acre (MT)	0.2034	0.4641	0.000**
Gross margins per acre (USD)	85	12	0.000**
Mean revenue per acre (USD)	66.7	166.7	0.000**

*Source:* Authors' computation based on survey data, 2017.

Respondents from the Equator consortium reported that the mean harvests from one acre of land cultivated with beans before and after the consortium approach were 0.4964MT and 0.839MT respectively. The gross margins before and after the consortium were 15USD and 471USD respectively. The gross margins before indicated that farmers made a loss of 15USD but after the consortium, a profit of 471USD was realized. The mean revenue before and after the consortium was 58.3USD and 544.4USD respectively. The p-values for mean harvest, gross margins and mean revenue show that there was a significant difference as shown in Table3.

**Table 3: Effectiveness of Equator consortium on mean harvest, gross margins and mean revenue per acre for beans**

Variable	Before	After	P- value
Mean harvest per acre (MT)	0.4964	0.8395	0.005**
Gross margins per acre (USD)	15	471	0.000**
Mean revenue per acre (USD)	58.3	544.4	0.000**

*Source:* Authors' computation based on survey data, 2017.

Respondents from the BABC consortium reported that before and after the consortium approach the mean harvests from one acre cultivated with maize were 0.797MT and 0.8893MT respectively. The gross margins

before and after the consortium were 124USD and 150USD respectively. The gross margins before indicate that farmers made a loss of 124USD but after the consortium, a profit of 150USD was realized. The mean revenues before and after the consortium were 125USD and 357.1USD respectively. The p-values for mean harvest, gross margins and mean revenue show that there was a significant difference as shown in Table 4.

**Table 4: Effectiveness of BABC consortium on mean harvest, gross margins and mean revenue per acre for maize**

Variable	Before	After	P- value
Mean harvest per acre (MT)	0.797	0.8893	0.000**
Gross Margins per acre (USD)	124	150	0.000**
Total Revenue per acre (USD)	125	357.1	0.000**

Source: Authors' computation based on survey data, 2017.

### **Cost-Benefit/Profitability Analysis**

In all the three consortia assessed, farmers were at a loss before the consortium approach; however after the consortium, farmers made profits as shown in Figures 4 - 6. The explanation for this is that farming before the consortium was not done using best agricultural practices. The practices before the consortia included the following:

- majority of the respondents replanted from previous harvests
- there was no proper record keeping
- cost of production was not minimized
- no reliable market
- produce were sold through middlemen
- low market prices were offered (e.g 1Kg of sunflower seeds was sold at 0.21USD, 1Kg of beans was sold at 0.42USD while 1Kg of maize grains was sold at 0.17USD).

However, after the consortium, farming was practised as a business, good agricultural practices were adopted, farmers acquired the skills to be business-minded and they learnt that it is not about the price offered but about profit making. Record keeping was done to enable them determine

the best price to sell commodities. Farmers began to understand whether the a business was good or not. Improved seeds were then planted; the cost of production was also minimized through the use of family labour, and collective action was put into accessing production inputs and marketing of produce.

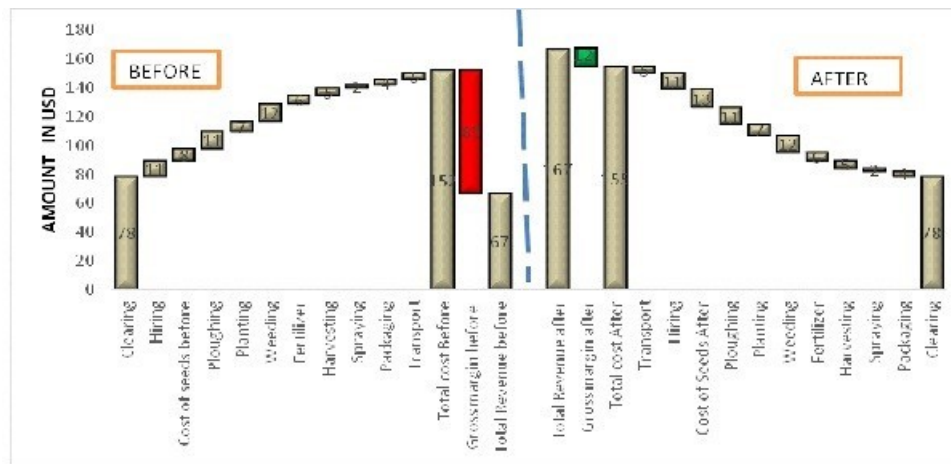


Figure 4: Cost-benefits/profitability analysis of Ngetta consortium for sunflower per acre.

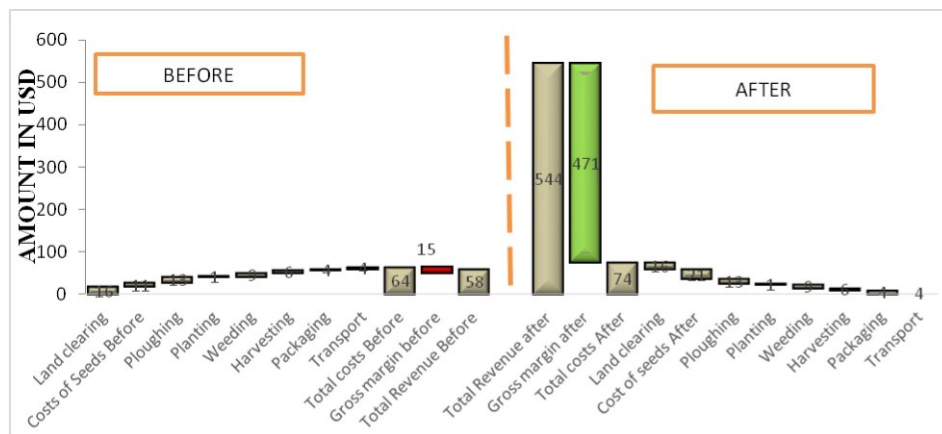


Figure 5: Cost-benefits/profitability analysis of Equator consortium for beans per acre.

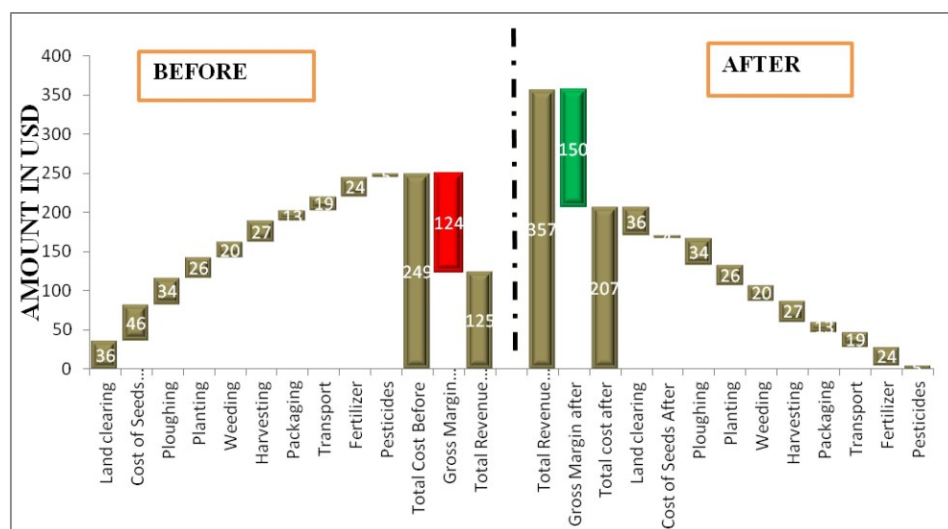


Figure 6: Cost-benefits/profitability analysis of BABC consortium for maize per acre.

### Critical Success Factors for Sustainability of Consortium Approach

The critical or key success factors of the consortium approach involves strong capacity training on required skills and knowledge that enhance the adoption of the 'farming as a business' concept and market orientation for farmers as referenced from results. These two points are key, and are given to farmers in the form of training and as part of the module used in the Kilimo Trust Farmers Business School (KTFBS). Table 5 reveals the comparison of the key attributes of the before and the after of the consortium approach in food value chain development.

Table 5: Comparison of Key Attributes/Success factors of the Conventional Approach (Before) and the Consortium Approach (After) in Value Chain Development

Attributes	Conventional Approach (Before)	Consortium Approach (After)
Transaction Terms	Short-term transactions (individually)	Long-term transactions(group)
Market Decision	Made on price/role of personal bargaining	Made on value/joint-decision making
Partnership	Many	Fewer are selected
Interdependence	Low	High
Production	Supply-driven and low	Demand-driven and high

Attributes	Conventional Approach (Before)	Consortium Approach (After)
Communication	Limited	Open
Coordination	Limited	Strong
Level of Investments	Avoided /low level	Higher level
Information	Proprietary	Shared
Improvement	Unilateral initiatives	Continuous joint activities
Activities	Separate	Engaged
Goals	Disharmonious (conflicting) goals	Compatible / common goals
Opportunism	Behave opportunistically	Mutual trust
Incentives	Adversarial attitudes	Common, mutual attitudes
Acting	Act only in own interest	Act for mutual benefits
Orientation	Win-Lose	Win- win

### **Strengths, Weaknesses, Opportunities and Threats of the Consortium Approach**

The SWOT analysis of the Kilimo Trust Consortium approach to food value chain development for improving the incomes of smallholder farmers is shown in Table 6.

**Table 6: SWOT Analysis of the Kilimo Trust Consortium approach**

<b>Strengths</b>		<b>Weaknesses</b>	
1.	Market first orientation and market certainty before production.	1.	High dependency on the lead firm/buyer/off-taker in the consortium.
2.	Business stand of making profits from all actors.	2.	Low source of income diversification.
3.	High demand to attract market.	3.	Lack of trust due to limited transparency among partners on transactions.
4.	Optimization of economies of scale.	4.	Low volume storage capacity at the farmers' cooperative collection centre.
5.	Joint decision making is high and price determination through negotiation.		
<b>Opportunities</b>		<b>Threats</b>	
1.	Well organized approach that attracts investors like banks and leverages a lot of financing for the value chain which help farmers invest money.	1.	Advocacy of governments in Uganda and Rwanda giving out free inputs with low quality standard could threaten the approach because farmers tend to diversify.
2.	Ease of scaling up the approach is high.	2.	Government rules on food security for example Rwanda first harvest last season was sold to the government store before consideration of bulking to the buyer in the consortium.

Opportunities		Threats	
3.	Demand driven rather than supply driven .	3.	Fellow farmer: Low carrying capacity of available storage facility, improvising this by renting, high rate is given to farmers.
		4.	Buyer: farmers demand of exorbitant prices on produce. Low quality and quantity of produce from farmers especially in post-harvest handling.
		5.	Financial Institution: Delay in payment from the buyer after the off taking farmers produce.
		6.	Pests and disease infestations or outbreak.
		7.	Changing Climate, drought is a threat to the approach.
		8.	Poor infrastructures such as bad road, and unavailability of transport facilities.

## **Conclusion and Recommendations**

This study revealed that the consortium approach has been more effective compared to the conventional approach in addressing the constraints faced by smallholder farmers which include inadequate or lack of knowledge of good agricultural practices, lack of access to credit, lack of access to quality production inputs, poor post-harvest practices and inefficient markets and commodities that did not meet the requirements of a competitive market. The evidence-based findings from this study have shown the effectiveness of the consortium approach in increasing productivity and incomes of smallholder farmers in the project areas studied. Similarly, the results of the consortium approach indicate that farmers have increased access to quality production inputs, credit and capacity building (good farming skills and knowledge).

The impact recorded in production and in incomes of smallholder farmers can be attributed to the concepts that underlie the consortium approach which are: farming as a business, market orientation, access to quality production input, collective action which has helped actors in good decision making and the availability of markets, i.e. the buyer partnering in the consortium and providing market for farmers.

The SWOT analysis of the consortium approach justified that there are sellable strengths and opportunities that outweigh the weaknesses and threats of the approach, therefore the consortium approach should be scaled up to include other commodities.

A major lesson learnt from the evidence gathered in this study is that decision making seems to be faster using the consortium approach. Evidence of the opportunities and gaps also help in the adoption of recommendations that will enable all actors in the value chain to be faster and also the sending of constant success messages of the Regional East African Community Trades in Staples (REACTS) project.

The REACTS project was a pilot project in Rwanda and Uganda from 2014-2017. The outcome of the assessment study indicated that the approach is effective in increasing production output, productivity and the income of smallholder farmers, thus, the programme should be extended to 3-5 years. Also the programme should be upscaled to incorporate more farmers producing the traded commodity in other districts that are not part of the pilot project. In addition, other commodities should be integrated into the consortium. The provided funds by donors should be used to strengthen certain phases of the value chain, for instance the warehousing receipt system.

Farmers should be trained on climate-resilient agriculture. In Ngetta and Equator consortia of Uganda, there is the need to increase the level of farmers' access to finance since farmer business organizations and cooperatives are registered and there is the availability of ready buyers for commodities. There should be provision for financial credit advance for inputs supplied to farmers with the payment arrangement financed by banks. Farmers should have a diversified source of income which would help to reduce the rate of side-selling through middlemen and enable farmers to improve on post-harvest handling. Farmers should be constantly sensitized and mobilized into groups/cooperatives so that training can be easy and their voices can be heard.

Buyers should have access to working capital to address the problems of delays in the payments to farmers. Buyers of each consortium should be linked to many cooperatives to avoid buying low volumes when an unexpected setback affects the production output of farmers.

Contracted financial institutions involved in the consortium should be considerate on the interest on loans given to farmers and keep them to at least 15% per year. In addition to these, village savings loan associations (VSLA) should be encouraged because the interest rate on money accessed is lower than that of financial institutions, that is at 10% and at the end of the



year the returns are shared among members of the association which is better than the financial institution option.

Government should align their policy objectives to incorporate smallholder farmers in a manner that will promote the commercialization of farming business. Government should provide infrastructure that link production to markets, for example good roads. Government should also ensure the enhancement of resources for extension services for more effective and wider coverage. Government, NGOs and industries should support climate-smart programmes or technologies to develop a much wider range of varieties and hybrids that are better adapted to the changing environment and to combat drought. The choice of the varieties to be promoted must be determined by agro-processors.

The Kilimo Trust, as the implementing partner, should strengthen its monitoring and evaluating activities in each phase implemented within the consortium. More diligence is required when choosing or selecting a lead-firm/off-taker/buyer in the consortium to reduce farmer disappointment after production.

The accountability level and transparency of each actor's activities should be improved upon so that the level of trust among all partners will be increased. There should be more advocacy and constant sharing of the success stories of the adoption of the consortium approach from beneficiaries; this will encourage other farmers to embrace the training and inculcate the practices advocated by the consortium approach.

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