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SMALLHOLDER FARMERS' TRUST AND COMMITMENT INFLUENCE COLLECTIVE MARKETING OUTCOMES FOR THE RICE PRODUCER ORGANIZATIONS IN MID-WESTERN UGANDA

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ABSTRACT

The ability of a collective marketing arrangement to market smallholder produce comes from the unity and attributes of its members. This study determined the influence of trust and commitment of smallholder rice farmers on the collective marketing outcomes of collective marketing organizations of mid-western Uganda. A cross-section design, involving two surveys was used to obtain data from 361 smallholder rice farmers, who subscribed to farmer groups and associations that promoted collective bulking, storage and marketing of rice. The first survey captured farmers' perceptions of trust (integrity, benevolence and propensity) and commitment (affective, continuance and normative) while the second estimated farmers' participation in collective marketing and the intensity with which those who participated marketed their rice collectively. Using Double-Hurdle regression, this study showed the main drivers of participation in collective marketing to be integrity (β= 0.11; P<0.05) and benevolence (β= -0.13; P<0.05) in the domain of trust. Farmers who subscribed to farmer associations were also more likely to participate in collective marketing than counterparts subscribing to farmer groups (β= 0.64; P<0.001). Trust and commitment influenced the intensity of collective marketing. Particularly, farmers with higher integrity trust (β= 0.16; P<0.001) and propensity trust (β= 0.15; P<0.001), and affective commitment (β= 0.13; P<0.05) and continuance commitment (β= 0.12; P<0.05) collectively marketed more rice volumes. The revelation that members' trust, commitment and being subscribed to farmer associations attract more participation higher volumes of rice marketed collectively means that higher-level forms of organizations enhance trust and commitment towards collective marketing. Extension agents and policymakers should promote higher forms of farmer organizations that enhance the trust and commitment of members to their collective marketing arrangements.

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INTRODUCTION

Like for many other African countries, rice is one of the cereal crops of economic importance to Uganda (GoU, 2009; Bua and Ojirot, 2014). Rice has emerged as an attractive income-generating crop for smallholder households in Uganda due to its adaptation to both low

and upland areas (Hong et al., 2021). Its demand within the East African Community (EAC) region has been increasing and it is the most traded food crop within the region. In addition, the crop is second to maize as the most imported and exported food commodity across the borders of EAC countries (Alibu et al., 2016). Rice is increasingly demanded mostly in the urban areas of Uganda (GoU, 2009) because it reaches the urban spaces in ready to use forms that are also storable for a long time. Rice also perfectly fits urban lifestyles because lesser energy, time, and sauce is needed to get a meal ready compared to other food types such as banana (Monitoring African Food and Agricultural Policies (MAFAP) and FAO, 2013).

UBOS (2020) indicates that rice production has been increasing in the last 13 years. For example, the current production of 198,000 MT is higher by 18,000 MT (10% increase) from the 2005/6 base year value of 180,000 MT (UBOS, 2020). However, domestic rice production paces the current demand of 400,000 MT per year for rice rather slowly (Hyha et al., 2017). Uganda's rice demand is expanding rapidly because of population growth, urbanization and changes in urban and rural food preferences (MAAIF, 2012; UBOS, 2020). According to Kilimo Trust (2012) Uganda's rice supply gap is caused mainly by low productivity (31.6%), unreliable supply (19.5%), poor quality supply (8.4%), high competition (8.4%), price fluctuations (4.7%), poor roads (4.2%), and limited working capital (2.2%). The effects of preceding factors gravitate on rice heavily because 80% of the crop's production is done by smallholder farmers (MAAIF, 2012; UBOS, 2020) in remote rice-producing hubs situated in Eastern, Northern and Mid-Western Uganda (Hong et al., 2021).

Whereas smallholder farming systems are efficient ways of producing food (Poulton et al., 2010), smallholder farmers face many challenges because they incur high transaction costs when buying inputs and marketing output (Hong et al., 2021). Sizeable evidence (see: Fischer and Qaim, 2012; Kilelu et al., 2017; Ssajakambwe et al., 2019; Okelai et al., 2020) indicate that market imperfections can be overcome through organizing smallholder farmers into farmer organizations (groups or associations or cooperatives). Farmer organizations are owned by the farmers and serve the interests of their members through advancing economic benefits to all subscribing members (Olson, 2009). A farmer group (FA) is the most micro and it unites farmers in close neighborhoods not exceeding two villages (National Planning Authority, 2018). Farmers' organizations are an assemblage of large-scale farmers or groups of smallholder farmers. Farmer associations (FA) emerge out of united farmer groups and they ordinarily unite to form cooperatives. These organizations strengthen smallholder farmers' bargaining power (Kilelu et al., 2017).

However suited as it has been documented, collective marketing among smallholders has been challenging. For example, smallholder farmers organized under collective arrangements in Uganda have been reported to simultaneously subscribe to a collective marketing organizations while at the same time keep preferring to sell their produce through intermediaries, sometimes before the crops mature (Ekepu et al., 2017). In addition, it has been difficult to keep farmers committed to collective marketing as those organized in groups, trained and aggregated into formal marketing cooperatives quickly lose interest as external agency ends (National Planning Authority, 2018).

Nimmy et al. (2021) posit that social partners become committed to a given exchange arrangement if the relationship is beneficial compared to the alternative. The commitment of members working under a collective arrangement can also subside when promised or expected benefits do not accrue (Fischer and Qaim, 2014). Thus, it can be argued that the level of participation and commitment a member reflects towards collective marketing today trails experienced benefits in previous collective marketing encounters (Fischer and Qaim, 2014). Österberg and Nilsson (2009) argue that the commitment of members to collective action, such as collective marketing stems from an individual's encounter and calculation nested in what individuals think members of their group are doing regarding the purpose of the group. This implies that experienced gains that accrue through selling collectively can build or subside trust in collective marketing (Fischer and Qaim, 2014). However, little attention has been given to these socio-behavioral factors as vital impetus for sustainable collective marketing (Österberg and Nilsson, 2009).

In relationship to settings where an individual must commit own assets and interest to be promoted through collective processes such as collective marketing or supply chain, trust and commitment are important (Kwon and Suh, 2005; Ghosh and Fedorowicz, 2008;

Zaefarianet al., 2016). Trust fosters cooperation, reduces transaction costs (Claro et al., 2003; Palmatier et al., 2006) and establishes commitment (Geyskens et al., 1998). Long-term satisfaction creates trust and commitment to maintain the relationship. Moreover, reciprocity which cements collective marketing tends to express itself through trust and commitment (Molm et al., 2007; Farndale et al., 2011; Nimmy et al., 2021). Arguably, if trust and commitment are that important in expressing the underlying drivers of collective marketing, such as lowering transaction costs or determining the level of reciprocity in the arrangement, they ought to be exerting influence on participation and the intensity with which members collective market rice. Therefore, the aim of this study was to determine whether trust and commitment influence smallholder rice farmers' decisions to participate and the level of their participation in collective marketing through farmer organizations. This study focused on farmer associations and groups because cooperatives are just being revived, after their collapse in 1990s during Uganda's economic recovery processes (Kwapong et al. 2013; UNDP, 2016).

Conceptual framework for trust and commitment in collective marketing

Collective marketing can be explained using the Commitment-trust theory of relationship marketing by Morgan and Hunt (1994). Commitment-trust theory posits that trust directly enhances the commitment of teams through forming an affective connection between members and through providing a sense of security and reliability. Additionally, trust enables team commitment by enabling the exchange of resources, such as information, support, and recognition. Trust is concerned with the expectations, assumptions or beliefs about the likelihood of one's future actions to be beneficial, favorable or at least not detrimental to one's interest (Robinson, 1996). The construct of trust has three dimensions: integrity, benevolence and propensity. Integrity defines beliefs related to adherence to sound moral and ethical principles. Benevolence defines beliefs related to one's wanting to do good for the trustor. Propensity defines one's beliefs related to the likelihood that a person will trust. Trust and how trust develops is rooted in the social exchange theory and organizational justice theory. When perceiving that their organizations are socially responsible, members develop trust in their organizations (Mayer et al., 1995). Members develop an attitude and engage in behavior that serves to improve organizations' overall performance. Essentially, social exchange theory comprises two dimensions of the structure of reciprocity – direct vs indirect reciprocity and unilateral vs the bilateral flow of benefits between the parties involved in the exchange process. Unilateral exchanges involve the risk of not receiving benefits back in the future. This exchange promotes trust among parties in the network (Molm et al., 2007; Farndale et al., 2011). The belief of members that future actions of their organization are unlikely to be unfavorable invokes an emotional attachment or commitment (Nimmy et al., 2021).

Commitment refers to an individual's willingness to work positively within an organized setting and to continue supporting interests of the group one is affiliated to (Mowdayet al., 1982). Seminal research (Porter et al., 1974; Mowdayet al.,1982; Allen and Meyer, 1990) show that while commitment could be behavioural, normative and calculative, attitudinal commitment is accepted as the measure of commitment (Noraazian and Khalip, 2016). Attitudinal commitment focuses on assessing ones' attitudes, and feelings toward the organization they subscribe to (Noraazian and Khalip, 2016). Members of the organization express commitment to organizations through affective, normative, and continuance (Meyer et al., 2002; Abdullah, 2011). Affective commitment reflects the emotional ties developed primarily via positive work experiences. Normative commitment is concerned with the feeling of obligation towards the organization and is rooted in the norms of reciprocity. Continuance reflects commitment based on the perceived costs, both economic and social, of leaving the organization.

In this study both trust and commitment were expected to enhance collective marketing. Nimmy et al. (2021) suggests that the commitment and trust members have towards their collective marketing organization are good proxy indicators for how appropriate the transaction costs involved are to members.

This study assumed that a farmer faces two hurdles when marketing rice collectively. First, they must agree the market collectively. Once that decision is made (none zero decision), they would face another decision regarding the quantity of rice to sell. Trust, commitment and type of organization are jointly expected to influence both participation and collective marketing intensity,

Figure 1. Type of organization is important because higher forms of organization could come with higher bargaining power, which could enhance participation and intensity of collective marketing (Ekepu et al., 2017). Once members trust their organization and commit to marketing collectively, they stop incurring costs of double-checking information on prices for example, and delayed payment for sold grain or the effort spent in obtaining information on whether the buyer of produce is reliable (Ouma et al. 2010; Shiimi et al. 2012; Nangobi and Mugonola, 2018). Commitment (affective, normative, and continuance) and trust (integrity, benevolence and propensity) are thus expected to lead to higher participation in collective marketing and higher quantity of grain sold collectively (Hongmei and Mangxian, 2011). Thus, this study aimed to test the following hypotheses:

H1a: Trust enhances smallholder farmer participation in collective marketing of rice.

H1b: Commitment enhances smallholder farmer participation in collective marketing of rice.

H1c: Higher tier farmer organizations enhances smallholder farmer participation in collective marketing of rice.

H2a: Trust increases the volume of rice smallholder farmers market collectively.

H2b: Commitment the volume of rice smallholder farmers market collectively.

H2c: Higher tier farmer organizations enhances the volume of rice smallholder farmer market collectively.

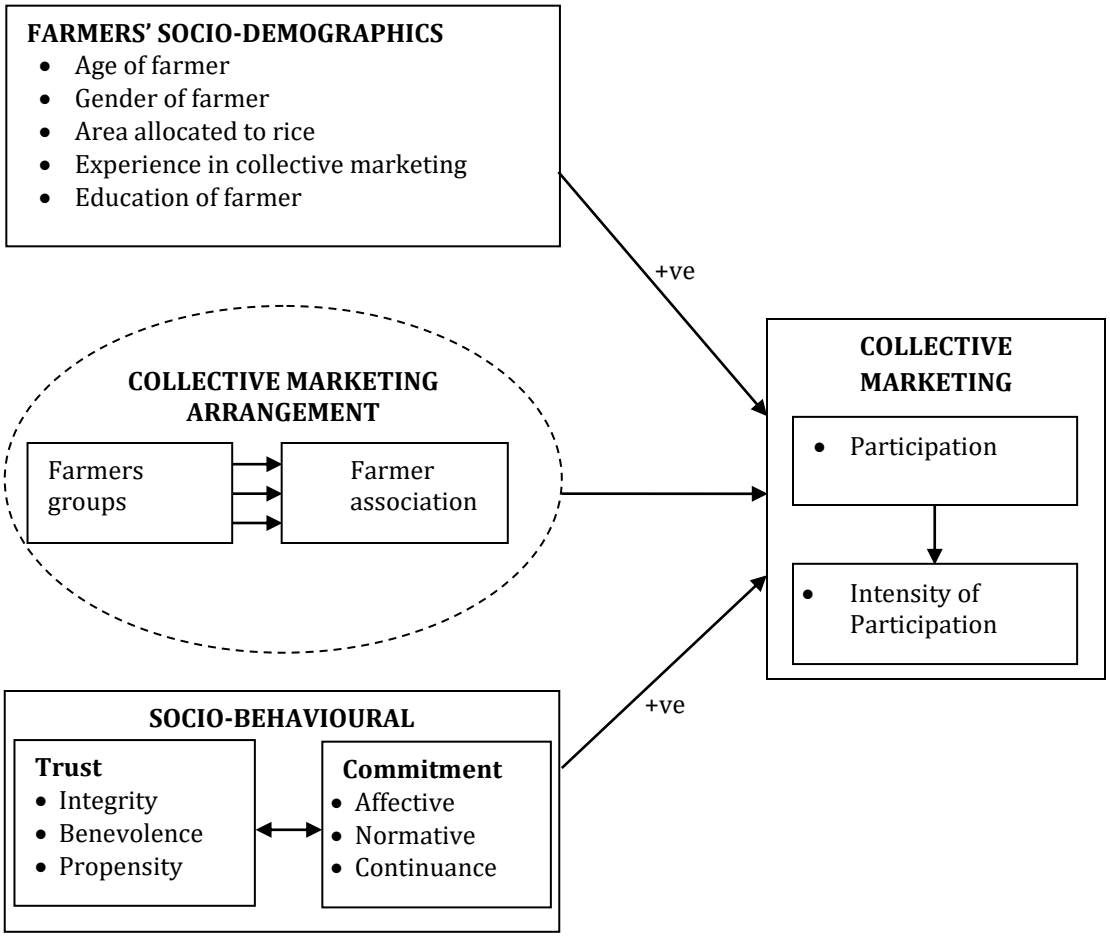

Figure 1. Conceptual framework for trust and commitment on collective marketing.

In addition, previous research (Ekepu et al., 2017; Nangobi and Mugonola, 2018; Okelai et al., 2020; Akite et al., 2021) show the importance of farmers' characteristics (sex, age, education, gender, farming experience, and land allocated to a crop) on participation and extent of participation of farmers in collective action interventions, with their influence varying from one farmer's conditions to another. These

factors are re-introduced in this study to evaluate whether they significantly affect participation and the intensity of participation of farmers in collective marketing of rice. It is assumed that these factors in the presence of commitment and trust could differ in how they influence participation and intensity of collective marketing.

A members' age, size of land allocated to rice and marketing experience can reflect farming expertise and are linked to repeated transactions which in turn reinforces trust and builds networks that a farmer needs to facilitate market information exchange (Gabre-Madhin, 2001; Ouma et al., 2010; Nangobi and Mugonola, 2018). Age may also be related with farming experience; thus it may be expected to have a positive or negative influence on collective marketing. With increased years of farming experience, a farmer may have accumulated marketing capacity directly or may have developed trust in the option of collective marketing (Nyikahadzoi et al., 2011). Shiimi et al. (2012) posit that experience can also reflect the ability to better negotiate market transactions independently. Thus, in this study socio-demographic factors, type of farmer organization, and trust and commitment were expected to increase participation and level or intensity of participation in collective marketing.

MATERIALS AND METHODS

The study was conducted in Uganda in two rural districts that were purposively selected because they were among the largest smallholder rice producing areas of the mid-western hub (MAAIF, 2016). Typically, rural districts of Uganda are exposed to extreme poverty, mainly because household agriculture is focused on producing food for own consumption and rice is promoted within rural areas with high production potential for the crop as a commercial crop (National Planning Authority, 2018; UBOS, 2020). The mid-western hub is one of the most important rice producing regions of Uganda, which is predominated by smallholder farms. Bugambe, Buhimba and Kiziranfumbi sub-counties in Kikuube district and Rugashaari, Burora and Mabaale sub-counties in Kagadi district were purposively targeted due to the fact that they had the most active farmers' organizations that were carrying out collective marketing (MAAIF, 2016). In addition, ever since 2004, when President Yoweri Museveni launched the Upland Rice Project, rice cultivation has boomed among smallholder farmers in Mid-western Uganda. At the core of rice production are the New Rice for Africa (NERICA) varieties introduced in Uganda in 2002 as one of the government's strategies to achieve its overarching development goals of reducing poverty and improving food security (Kijima and Sserunkuuma, 2013). Commonly cultivated varieties include, NERICA 4 released in 2002, and NERICA 1 and NERICA 10 that were released in 2007. Following the rapid acceptance of rice production by smallholder farmers, the country's rice production shifted from being dependent on large irrigation schemes to small-scale led. The emerging concern has been, however, to find plausible ways to efficiently and sustainably support rice farmers' participation in markets (Hong et al., 2021).

Study design and sample selection

Using a cross section study design, two surveys of farmers' perceptions on their collective marketing arrangement were conducted. The first captured farmers' perceptions of trust and commitment in the collective marketing organizations. The second survey was aimed at following up survey respondents to establish whether they participated in collective marketing and if they did, how many kilograms of rice were aggregated from individual farmers to be collectively marketed. This design was the most appropriate given that the study aimed at identifying factors that influenced the collective marketing, which involved one's decision to participate and the intensity of that participation (Cragg, 1971). The unit of analysis and the groups from whom data were obtained, was an individual rice farmer. Through assistance from the chairperson of farmers' organizations, names of rice farmers in each organization were compiled to constitute the sampling frame of 852 rice farmers (198 members to FG and 669 members to FA). The targeting of farmers who subscribed to collective marketing arrangements was deemed relevant because the farmers' experiences about collective marketing were not likely to be an evenly occurring event across the rice farming population, but can depend on their membership status to organizations that promoted collective marketing. All the 198 members to FG were enrolled on this study and an equivalent number (198) of farmers from FA, which was done in order to obtain comparable data. This sample was adequate for a social study, such as the present where variables cannot be

manipulated. Under such conditions, variable relationships that are largely correlated with a sample size above 30 participants are considered acceptable' instead of variable relationships are largely correlates with a sample size above 30 participants considered acceptable (Norman, 2010; Inverson, 2003; Saunders et al*.,* 2003; Basheka, 2009). In addition, Sangthong (2020) suggests that if Likert-type or rating type of scale are used with an intent to compare outcomes between groups within populations, a minimum of 100 samples for each group should be used. Equal sample sizes were selected based on the suggestion of Teddlie and Yu (2007), that to gain an understanding of how similar variables from two data sources compare, the sample sizes of the compared groups need to be closely the same. Sampling from FA was by simple random sampling, using individual lists of members for each of the six (6) FA. Participants drawn from each association were proportionate to the total membership of each association relative to targeted sample size of 198.

Data collection

Finally, data used in this study were obtained during the peak of the rice-growing season in December 2018 for 4 weeks and for three weeks in January 2019 during the peak of the marketing season using a pre-tested interview schedule. Data was obtained from 171 rice farmers who subscribed to farmer groups and 190 members to farmer associations. This represented a response rate of 91% of the targeted 396 farmers, which was considered to be adequate (Huang and De Simone, 2020). The questionnaire was piloted (n = 18 smallholder rice farmers) among farmers who subscribed to Budaka farmers' association in Kitoba sub-county, Hoima district. Pre-test sites were 16 Km from the nearest main study sub-county of Bugambe in Kikuube district, which was deemed to be far enough to avoid contaminating the main sample. Information obtained helped to clarify the wording of the questions and to ensure that the items used to measure trust and commitment conformed to reliability.

To ensure reliability, Cronbach alpha was used and only question items with coefficients that were greater than 0.70 were retained. No composite Cronbach alpha was greater than .90, which meant that the total number of items used to measure each construct were adequate (Tavakol and Dennick, 2011). Trained interviewers administered the schedule in Runyoro (the native language of the respondents) and scored farmers' response on a pre-coded questionnaire. The interviewers were trained for three days in a central location prior to their participation in both the pretesting and main data collection activities. The training orientated the interviewers to the direction and gist of each question and the right recording. Runyoro was used because the study area was dominated by Banyoro (UBOS, 2016). The interview was conducted in Runyoro and responses recorded on a pre-coded questionnaire. The training of interviewers, use of native language and pre-coded schemes were intended to minimize inter-rater errors, which accrue when different interviewers are used to question and record responses.

Measures

The independent variables were trust and commitment assessed on a six-point rating scale that included 1= strongly disagree, 2= disagree, 3= somewhat disagree, 4= somewhat agree 5=agree, 6= strongly agree. Given that the respondents were all drawn from a pool of farmers who belonged to collective marketing, the midpoint of the rating scale was eliminated to overcome the likelihood of the scale point resulting into a dumping ground of opinions, especially when the respondents are not motivated to respond or want to select a more socially acceptable response particularly when their true feelings are negative (Chyung *et al.,* 2017). Trust had three dimensions, that is, integrity measured using 9 scale items, benevolence (8 items) and propensity to trust (6 items). Three dimensions were also used for commitment, where affective commitment was measured with six items, normative commitment with seven items and continuance commitment measured using six items, Table 8 and 9. The dependent variable was measured at two levels. The first level was about whether the farmers sold/marketed rice collectively or not (No = 0 and Yes = 1). The second level aimed at gaining a fair understanding of the intensity at which farmers who had sold rice collectively did so. Collective marketing intensity (CMI) was a computed variable, via the formula below:

$$CMI = SD_n/AT_{set} \quad \text{(i)}$$

Where SD_n is the amount of rice a farmer had sold through collective arrangement and AT_{set} is the average threshold for farmer groups and farmer associations. Average threshold volume was computed using the formula:

$AT_{set} = \sum(T_1 + T_2 + \ldots\ldots + T_n)/n$ ..... (i)

Where T_1 is the threshold set by the first farmer group (or farmer association for the case of Average threshold for farmer associations) through the second set threshold to T_n, which is the threshold set by the n^{th} farmer group or farmer association and n is the total number of farmer groups or associations whose threshold is summed. Given that farmer groups are relatively smaller compared to farmer associations, farmer marketing through groups were likely to peg their individual volumes marketed collectively against a relatively lower threshold. However, a single collective marketing threshold for farmers groups and for associations was pursued to permit the comparison of marketed volumes within like-structured arrangements. The final value for either collective marketing arrangement was a fairly comparable ratio.

Data mentioned in Table 1 shows the expected average threshold volume to be sold collectively for farmer groups as 177.1 kg per member and 312.5 kg for farmer associations. The utility of mean threshold values normalized the intensity of FG and FA, which made it possible to include the marketing intensity of farmers in FG and FA in a single model.

Table 1. Means for rice bulking history and set threshold volume.

			Bulked Rice by Group or Association (2015 to 2017)			
Organization	Threshold[a]		Maximum good season		Minimum bad season	
Farmer Groups						
FGs	Bags	Kg	Bags	Kg	Bags	Kg
Kyakabaale	2.0	250.0	8.0	1,000.0	2.0	250.0
Rumogi	1.5	187.5	6.0	750.0	1.0	125.0
Kihuura	1.5	187.5	6.0	750.0	1.0	125.0
Tukoorehamu	1.0	125.0	5.0	625.0	0.0	0.0
Twanzane	1.0	125.0	5.0	625.0	0.0	0.0
Nyamigisa	1.5	187.5	6.0	750.0	1.0	125.0
Average	1.4	177.1	6.0	750.0	0.8	104.2
Farmer associations						
Ageeteraine	2	250	9	1,125.00	2	250
Katweyambe	5	625	20	2,500.00	5	625
Rukiga	2	250	20	2,500.00	3	375
Bweranyangi	2	250	10	1,250.00	2	250
Karama	2	250	9	1,125.00	2	250
Mukabara	2	250	10	1,250.00	2	250
Average	2.5	312.5	13.0	1,625.0	2.7	333.3

- *[a]Minimum expected volume a member is supposed to market collectively: Particularly members working under each farmer organization (farmer group or farmer association) set every season the amount of rice each member is expected to pool for collective marketing. This is important for keeping members focused on the goal of ensuring that the farmer organizations they subscribe to attain its collective marketing goals.*
- *The rice is bulked in an unprocessed form and weight per bag is 120-130kgs ≈ 125 Kgs per bag. The bags are significant in collective marketing because individual and group targets are pegged on number of bags..*
- *Price of unprocessed rice was 1,000/= per kg.*
- *Threshold was high for organizations that hired land communally and those whose members allocated larger proportion to land rice production. Groups that allowed a certain proportion of rice to be retained for food within members' households tended to assign a low volume to be marketed.*
- *The prevailing market price greatly influences the quantity of rice that is bulked. If it is high/good farmers opt to bulk less and sell individually and if otherwise, they bulk.*
- *Across all organizations there were farmers who did not sell any rice collectively*

In addition, socio demographic factors were accessed as supplementary information to pursue the influence these situational variables had on collective marketing. This included age of the farmers measured in years, highest education attained in years of schooling, sex of the farmer in terms of male or female, total accessible land size in acres, land allocated for rice production in acres, and experience in rice marketing in years of marketing rice.

Ethical Issues

Before data collection, all of the respondents were informed of the purpose of the study, and their rights as participants. They were also assured that the information they would share would be treated confidentially. By design, participants' names were not captured in the instrument to ensure that the responses remained anonymous. Each farmer who participated in the study gave a written consent to use the information given for the purposes of completing reports and academic papers.

Analysis

Broadly, three stages were used. Analysis in the first two stages were performed in SPSS version 16 whereas the third stage was performed in STATA. The first stage involved the use of frequencies and means to describe farmers' perceptions regarding trust, commitment and collective marketing. In the second stage, principal component analysis (PCA) was used to extract the variables, particularly for the dimensions of trust and commitment that were used in the regression. The third stage involved the use of double-hurdle regression to estimate the factors that were likely to enhance collective marketing among rice farmers. Particularly, the study developed a simple model of collective marketing participation, following, the assumption of Cragg (1971). The use of double-hurdle is common is agricultural studies where the dependent variable has staged attributes (Fischer and Qaim, 2014; Nangobi and Mugonola, 2018; Mulugo et al., 2020). Farmers' collective marketing outcomes were considered to occur after they overcome two linear hurdles. The double-hurdle of Cragg (1971) suited this study because it involves a two-stage regression (Fischer and Qaim, 2014). The first stage is a probit modeling of the factors influencing a dependent variable of two possible decision outcomes whereas the second is a truncated model which accounts for variations in the non-zero outcomes (intensity of collective marketing). In this study double-hurdle was applied first to model participation decision and then amount the farmer marketed collectively. This model also accommodates variables such as socio-demographic factors that would compound the problem of selection bias due to non-random assignment of the treatment (i.e., collective marketing participation). With non-random assignment, rice farmers may self-select to join or not join or vary the intensity of collective marketing due to factors specific to individuals, such as age, education attainment, sex, land allocated for rice production, and experience in rice marketing. Failure to address the situational factors may result in inconsistent estimates and lead to spurious results or biased conclusions (Gerber, 1998; Heckman, 1979). Such factors if not included in the model may affect both participation and intensity to market rice collectively, which can result in a big magnitude of the error terms. In such a case, both participation in collective marketing of rice and the intensity of marketing collectively are estimated using the model specified below (Cragg 1971):

Model specification

$Y_p = \beta_0 + \beta_{sd}$/Socio-demo/$_{sd} + \beta_t$/Trust/$_t + \beta_c$ /*Commitment*/$_c$+ Ɛ ….. (*i*)

Where: Y_p = farmer participation in rice collective marketing (*If participated in RCM = 1; otherwise = 0)*

[Trust]$_t$ = Vector of trust (Integrity, benevolence and propensity = 1st factor extracted by PCA)

[Commitment]$_c$ = Vector of commitment (Affective, normative and continuance = 1st factor extracted by PCA).

β_0 = Constant

β_t = Co-efficients of trust factors

β_c = Co-efficients of commitment factors

Ɛ = Error term

$Y_i = \beta_0 + \beta_{sd}$/Socio-demo/$_{sd} + \beta_t$/Trust/$_t + \beta_c$ /*Commitment*/$_c$+ Ɛ ….. (*ii*)

Where Y_i = farmer's intensity of rice collective marketing (continuous variable expressed as ratio of amount of rice marketed collective to the average threshold set by FGs and FAs). Table 2 shows the hypothesized direction of the co-efficients of the dependent variables.

RESULTS AND DISCUSSION

Description for participation

Most farmers in farmer groups did not participate in collective marketing whereas almost all those belonging to farmer associations did participate, Table 3. Participation was highest for farmer association as indicated by higher mean of 1.99 (that is close to 2) for association whereas that of farmers groups was 1.33. Given that these means significantly differed, Table 4 means that the participation of farmers in FAs in collective marketing was significantly higher than that of farmers in FGs. This can suggest that farmers' associations or put the other round higher tier organizations attracted the highest participation for collective marketing of smallholder rice. High transaction costs and lower bargaining power for FGs, which are lower levels of organization can cause the low participation of farmers in collective marketing through farmer groups (Hellin et al., 2009; Ekepu et al., 2017).

Table 2 Prior direction of the relationship between socio-demographic, trust and commitment on participation and intensity of collective marketing of rice

Variable	Expected relation with participation in and intensity with which members market rice collectively	
	Prior sign	Source
Socio-demographics		
Education (years)	(+)	Ekepu *et al.*, 2017; Nangobi and Mugonola, 2018; Okelai *et al.*, 2020; Akite *et al.*, 2021
Gender (female =0, male =1)	(+)	
Age of farmer (year)	(+)	
Farm organization (FG =1, FA =2)	(+)	
Land allocated to rice (acres)	(+)	
Collective marketing experience (year)	(+)	
Trust		
Integrity	(+)	Mayer *et al.*, 1995; Molm *et al.*, 2007; Farndale *et al.*, 2011; Nimmy *et al.*, 2021
Benevolence	(+)	
Propensity	(+)	
Commitment		
Affective	(+)	Mayer *et al.*, 1995; Molm*et al.*, 2007; Farndale*et al.*, 2011; Nimmy *et al.*, 2021
Normative	(+)	
Continuance	(+)	

Table 3. Mean score for participation in collective marketing by organization.

Participation in rice collective marketing	N	Mean (no = 1, yes =2)	Std. Dev.	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Farmer group	171	1.33	0.47	0.04	1.26	1.40
Farmer association	190	1.99	0.10	0.01	1.97	2.00
Total	361	1.68	0.47	0.02	1.63	1.73

Table 4. ANOVA of participation in collective marketing.

		Sum of Squares	Df	Mean Square	F	Sig.
Participation in collective marketing * Farmer organization	Between Groups	38.747	1	38.747	347.936	.000
	Within Groups	39.979	359	.111		
	Total	78.726	360			

Description for participation intensity

Table 5 summarizes the intensity of collective marketing in farmer groups and farmer associations. In the second row, the results show that on average, a farmer in FGs sold 57.8 kg of rice collectively, which is equivalent to 32.6% of the threshold mark. So, collective marketing

figures obtained for FGs compare much lower with those of FAs whose average marketed volume was 302.3 kg. The average marketed volume for FAs was equivalent to 96.7% of the threshold value for FAs. This suggests that farmers under FAs were able to market rice volumes expected to be sold collectively. Given that both the lower and upper marketed rice through FAs were higher than that of FGs, the results point to the likelihood that relative well-resourced farmers, thus having relative larger land allocated to rice production, opt to market rice through associations. In addition, farmers in association also engaged in group hiring of land particularly for rice production, which could also have influenced their collective rice marketing decisions than their counterparts subscribing to groups. This could have practical implication as group marketing could also be improved through enhancing controlled access to production resources, such as land. This is particularly important given that in Uganda most of wetlands are protected lands.

Table 5. Descriptives of Intensity of marketing.

		N	Mean	Std. Dev.	Std. Error	95% C.I for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Quantity collectively marketed rice	FG	171	57.8 kg	87.06	6.58	44.65	70.93	.00	264.00
	FA	190	302.3 kg	139.27	10.10	282.39	322.25	.00	750.00
Threshold	FG	171	177.1 kg	.000	.000	177.10	177.10	177.10	177.10
	FA	190	312.5 kg	.000	.000	312.50	312.50	312.50	312.50
Intensity of rice collective marketing	FG	171	.326	.492	.038	.252	.401	.00	1.49
	FA	190	.967	.446	.032	.904	1.03	.00	2.40

Most farmers in FGs who collectively marketed did so around the threshold, Table 6, *row 4 and 5 column 3*). The intensity of majority of the farmers in FA (82.14%) was reasonable above the set average threshold by over 25%. This means that farmers in FGs accept to market collectively, also achieve the required volume of rice expected to be sold collectively. For the members of the FAs, they mostly marketed collectively and at a higher volume than the set threshold volume of rice. It could be possible that due to closeness of the farmers in groups, their collective marketing goal once they accept to sell collectively is driven by the need to adhere to threshold. Fischer and Quaim (2012), suggest that the social ties are often less tight in larger groups, such as association, which could also have been behind the high conformance of collecting marketing intensity to threshold volume of FGs. This could imply that the low magnitude of the set threshold volume marketed collectively through FGs, conforms members to marketing low volumes. Farmers in associations could on contrary have interest in optimizing the opportunity to increase own income through rice sales. Larger groups tend to have more individuals who aim to freely ride on the group's structures (Kileluet al., 2017). This implies that while marketed intensity for farmer association could be largely due to economic calculations that of farmer groups can be inclined to keeping ties with peer networks.

Descriptives of trust and commitment

Overall, although trust and commitment were above the threshold score point of the scale, that is 3, for both farmers in FG and FA, farmers' level of trust and commitment were highest among farmers who operated under FA, Table 7. The average score for FG was in the range of 4 whereas comparable scores of FA were all above 5. This suggests that farmers of both organizations had high trust in the integrity, good will for each other and proactively helped each other to market their rice. They also expressed strong belongingness, obligation, and interest to continue marketing collectively. This implies farmers associations are better positioned to market rice, which could be due to the fact that associations are relatively larger units of collective marketing that can easily mobilize for the necessary resources such as store, transport and the quality expectations of the market. In addition, the reliability of the construct that measured trust and

commitment of the main sample was re-estimated. The Cronbach alpha coefficients between 0.70 and 0.90 indicated that measure of trust and those of commitment were reliable (Tavakol and Dennick, 2011). Further principal component analysis (PCA) was performed to reduce the data on trust and commitment into parsimonious structure,

The PCA results for trust showed a Kaiser-Meyer-Olkin (KMO) value of 0.881 and Bartlett's test of sphericity (χ = 2846; P<0.000), Whereas that for commitment KMO was 0.92 and Bartlett's test of sphericity (χ = 3364; P<0.000), Table 9. This confirmed the sampling adequacy and suitability of the data for factor analysis (Leech et al. 2005). Extracted factors for commitment explained 54.2% of total variance in the principal components while that of trust was 44.5%. Specifically, the explained variance for extracted factors ranged from 31.2% (for benevolence) to 6.3% (integrity) for trust and between 41.9% (continuance) to 5.5% (affective) for commitment. In addition, convergent validity was confirmed, given the factor loadings for the extracted variables that ranged from 0.528 to 0.763 for commitment and 0.590 to 0.754 for trust, (Hair et al. 2006).

Respondent characteristics

Majority of the farmers were aged 30 to 50 years and were mostly married male, Table 10. Most farmers had studied up to some level of primary education and most of them had land-holding size above 4 acres, of which 1 to 2 acres were allocated for rice production. Most farmers had marketed rice collectively for a period of 3 to 4 years, Table 8, which meant high prevalence of collective marketing experiences.

Table 6. Cross tabulation of collective marketing intensity and farmer organizations.

CMI[b] (Sold/threshold)	Descriptor	Farmer organization		Total
		FG (n = 171)	FA (n = 188)	
0	Number of cases	114	2	116
	% within CMI category	98.3%	1.7%	100.0%
	% of Total sample	31.8%	.6%	32.3%
< 0 ≤ 0.75	Number of cases	13	74	87
	% within CMI category	14.94%	85.06%	100.00%
	% of Total sample	3.60%	20.50%	24.10%
< 0.76 ≤ 1	Number of cases	19	46	65
	% within CMI category	29.2%	70.8%	100.0%
	% of Total sample	5.3%	12.8%	18.1%
< 1 ≤ 1.25	Number of cases	15	17	32
	% within CMI category	46.9%	53.1%	100.0%
	% of Total sample	4.2%	4.7%	8.9%
< 1.25 ≤ 2	Number of cases	10	46	56
	% within CMI category	17.86%	82.14%	100.00%
	% of Total sample	2.77%	12.74%	15.51%
> 2	Number of cases	0	3	3
	% within CMI category	.0%	100.0%	100.0%
	% of Total sample	.0%	.8%	.8%

[b] Collective marketing intensity = CMI, Categories developed using simple coding system relative to 1 = the sold upto the set threshold (less than 1 = sold below the threshold and greater than 1 sold above the threshold[1].

[1]Introduction to SAS.UCLA: Statistical Consulting Group. from https://stats.oarc.ucla.edu/sas/modules/introduction-to-the-features-of-sas/ (accessed August 22, 2021).

Table 7. Description of farmers' level of trust and commitment to their organizations

Factors[a]	Variable descriptive		Scored average				Measure of dispersion	
	No.# items	Cronbach's alpha	FG Mean	FA Mean	sample Mean (1-6)	SD	Minimum	Maximum
Trust								
Integrity	9	0.784	4.83	5.42	5.14	0.756	2.11	6.00
Benevolence	8	0.807	4.98	5.52	5.26	0.650	2.00	6.00
Propensity	6	0.776	4.61	5.30	4.97	0.833	1.50	6.00
Commitment								
Affective	6	0.786	5.09	5.60	5.37	0.433	2.50	6.00
Normative	7	0.862	4.94	5.59	5.29	0.800	1.86	6.00
Continuance	7	0.835	4.72	5.63	5.06	0.842	1.00	6.00

Table 8. Extract components and loadings of trust.

Item description	Factor loadings		
	Benevolence	Propensity	Integrity
I fulfill my promise to other farmers (group members) TB3	.754		
I care about group members when marketing our products TB2	.715		
I am always ready to help others in time of need TB1	.694		
I am open to all others in our marketing group T6	.603		
Rice farmers leaders stick to their words when they communicate T7	.538		
I am always ready to help others in time of need TB4	.533		
I find the needs of my friends important TB5			
I consider the priorities of other farmers TB6			
I feel I negotiate joint expectations justly T5			
The typical person in this group is sincerely concerned about the problems of others TP4		.681	
People usually tell the truth, even when they know they will be better off by lying TP6		.671	
In this group most people stand behind their convictions TP3		.651	
Most people will act as ''Good Samaritans'' if given the opportunity TP5		.642	
I would make personal sacrifices for our group TB8		.598	
Most people in this group do not hesitate to help a person in need TP1		.569	
In this group most people speak out for what they believe in TP2		.536	
There is a lot of warmth in the relationships between the farmers and group managers TB7			
Whenever we make an important decision, I know it will be concerned about people like me T8			
I treat my fellow farmers fairly T3			.720
I do not mislead other farmers T2			.695
I am honest to all other group members T4			.590
Sound principles seem to guide this group's behavior when marketing rice collectively T1			
We share ideas on matters affecting the group T9			
Eigenvalue	7.175	1.602	1.460
% variance explained	31.2%	7.0%	6.3%

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Only attributes with absolute factor loadings > 0.5 are included.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.881; Approx. Chi-square = 2846. Bartlett's Sphericity Test: df = 253; P < 0.000

Table 9. Extract components and loadings for commitment

	Factor loadings		
Item description	Continuance	Normative	Affective
Too much of my life would be disrupted if I left my farmers group (CC1)	.763		
I am concerned about the future of the group (CC6)	.691		
I believe I have too few options to consider leaving collective marketing (CC3)	.620		
This farmers group and collective marketing activities deserve my loyalty (CN4)	.606		
Even if it were to my advantage, I do not feel it would be right to right for me to quit participating in collective marketing activities (CN2)	.591		
One of the reasons I continue to participate in collective marketing activities is that I could not obtain the same benefits from available alternatives elsewhere (CC4)	.560		
It would be very hard for me to quit participating in collective marketing activities even if I wanted to (CN7)			
I will feel guilty if I don't participate in collective marketing activities at all for a while (CN5)		.680	
I owe a great deal to this group (CN6)		.664	.511
I feel the obligation to remain with my farmers group (CN1)		.655	
One of the major reasons I continue to work with other farmers is that leaving would require considerable personal sacrifice (CC5)		.591	
I would feel guilty if I left this group now because of my sense of obligation to it (CN3)		.591	
Right now, participating in collective marketing activities is a matter of necessity as much as desire (CC2)		.585	
I identify with the values that are promoted by the group (CN7)			
Participating in collective marketing activities means a lot to me (CM3)			.692
I am very happy to continue participating in collective marketing activities for many years to come (CM4)			.687
I feel a strong sense of belonging to this farmers group (CM1)			.606
I feel I am emotionally attached to this farmers group and collective marketing activities (CM2)			.594
If I were to relocate to another community, I would still participate in collective marketing activities as much as I currently do (CM5)			.567
I really feel as if this group's problems are my own (CM6)			.528
Eigenvalue	8.371	1.375	1.092
% of variance explained	41.9	6.9	5.5

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Only attributes with absolute factor loadings > 0.5 are included.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.920; Approx. Chi-square = 3364. Bartlett's Sphericity Test: df = 190; P < 0.000

Table 10. Cross tabulation of collective marketing intensity (CMI) and socio-demographics of respondents

	Age				Gender		Education				Marital status		
CMI	20 – 30	31 – 40	41 – 50	51 – highest	Female	Male	Primary	O'level	A'level	Post-secondary	Single	Married	Previously married
0	26	33	29	28	29	87	62	28	3	23	14	97	5
< 0 ≤ 0.75	13	23	27	24	35	52	53	15	6	13	6	74	7
< 0.76 ≤ 1	16	25	15	9	22	43	42	15	2	6	8	54	3
< 1 ≤ 1.25	6	10	8	8	10	22	20	9	1	2	1	29	2
< 1.25 ≤ 2	12	10	22	12	28	28	46	2	2	4	5	44	7
> 2	0	1	1	1	0	3	1	2	0	0	0	3	0
Total	73	102	102	82	124	235	224	71	14	50	34	301	24

Table 11. Cross tabulation of collective marketing intensity (CMI) and rice production.

	Total area under cultivation (acre)					Area under rice production (acres)			Experience in rice CM (years)			
CMI	< 1	1.01 – 2	2.01 – 3	3.01 – 4	> 4.01	< 1	1.01 – 2	2.01 – 3	1.01 – 2	2.01 - 3	3.01 – 4	> 4.01
0	0	4	22	7	83	33	80	3	4	22	77	13
< 0 ≤ 0.75	0	5	8	2	72	15	69	3	5	8	61	13
< 0.76 ≤ 1	1	7	9	6	42	23	41	1	8	9	36	12
< 1 ≤ 1.25	0	3	3	1	25	7	25	0	3	3	21	5
< 1.25 ≤ 2	0	3	9	5	39	17	37	2	3	9	42	2
> 2	0	0	0	0	3	0	3	0	0	0	3	0
Total	1	22	51	21	264	95	255	9	23	51	240	45

Factors influencing the participation of rice farmers in collective marketing

Overall farmers' participation in rice collective marketing was influenced by trust one had in the collective marketing arrangement and the type of organization subscribed to. Farmers in FA were significantly more likely to market collectively (ß= 0.64; p≤ .001), Table 12. In the category of trust an increase in the levels of integrity was found to positively and significantly enhance participation in collective marketing (ß= 0.11; p≤ 0.05). The influence of good will (benevolence) on collective marketing was significant but negative (ß= -0.13; P<0.05).

Table 12. Factors influencing collective marketing participation and extent of participation of rice farmers in collective marketing: results of the Tobit Model

Variable	Participate or no participate in CM		CMI sold volume/threshold volume	
	Coef.	Std. Err.	Coef.	Std. Err.
Rice farmer characteristics				
Education (primary = 1 thru masters = 7)	-0.021	0.020	-0.013	0.017
Gender (F = 0, Male = 1)	-0.068	0.052	0.003	0.041
Age of farmer (years)	-0.010	0.020	0.030	0.016
Farm organization (FG = 0, FA = 1)	0.637***	0.060	-0.048	0.049
Land allocated to rice (years)	0.050	0.082	-0.106	0.067
Collective marketing experience (years)	-0.030	0.050	-0.090	0.050
Trust				
Integrity (6-point scale mean)	0.108*	0.049	0.160***	0.044
Benevolence (6-point scale mean)	-0.127*	0.060	-0.002	0.051
Propensity (6-point scale mean)	0.028	0.040	0.146***	0.033
Commitment				
Affective (6-point scale mean)	0.097	0.065	0.132*	0.059
Normative (6-point scale mean)	0.026	0.061	0.047	0.055
Continuance (6-point scale mean)	0.167	0.055	0.120*	0.051
Constant	-0.282	0.312	-4.224***	0.306
No. of observations	361		361	
Wald chi^2	278.59***		166.82***	
Log likelihood ratio	-226.29		-226.29	
Pseudo R^2	0.38		0.440	

*** = $p \leq .001$; ** $p \leq .01$; * $p \leq .05$; *CMI = collective marketing intensity*

The findings in this study are in conformity with previous studies, such as (Ekepu et al. 2017; Nimmy *et al.*, 2021) that suggest that enhancement of trust of the farmers increases their participation in collective marketing. This is vital given that for an individual to commit own assets and interest to be attained through third-party arrangements such as collective marketing, one must have developed trust that the arrangement is the best option (Ghosh and Fedorowicz, 2008; Zaefarian et al., 2016). In addition, when trust prevails, collective care received from members can be reciprocated and lower incidents of free riders are expected (Molm et al., 2007; Farndale et al., 2011; Nimmy et al., 2021). This explains why farmers with high trust in their collective marketing arrangement were more likely to participate in collective marketing of rice than less trusting counterparts. The pseudo R^2 of 0.38 implies that an increment of 11% and reduction of 13% of integrity and benevolence respectively among farmers in FA increases the probability of the farmers to market rice collectively by 38%. This could be explained by the fact that farmers in FA normally have stronger structures to sustainably support collective marketing. Ndaula *et al.* (2020), also observes that interventions implemented within social systems could experience a dissonance between what people say and how they act, because actual behaviour tends to be governed by what one thinks other members of equal status are doing. This could mean that farmers can belong to the groups and at the same time do not market collectively due to thoughts or actions one picks from peers being interpreted that one's peers are not selling collectively.

Factors influencing the intensity of rice collectively marketed

Overall, the intensity or the size of volume of rice a farmer marketed collectively was influenced by trust and commitment farmers had in their collective marketing arrangements. Results of truncated regression show that under trust, the intensity of collective marketing of rice was positively and significantly influenced by integrity (β= 0.16; $p \leq .001$) and farmers' propensity to trust (β= 0.146; $p \leq .001$), Table 12. Trust exists when one party has confidence in an exchange partner's reliability and integrity (Morgan and Hunt, 1994; Caceres and Paparoidamis (2007). Higher integrity reduces the conflict and destructive behaviors and encourages steady information flows

(Ülbeği and Yalçın, 2019). Given that propensity defines the stability of an individual towards trust, propensity can be the most relevant trust for relationships involving uncertain outcomes. Possession of propensity alters one's interpretations of others' actions (Colquitt *et al.*, 2007). Individuals with a high propensity are honest, comply with agreements, help others, and do not cheat (Colquitt *et al.*, 2007).

For farmer commitment, the feeling of strong belongingness (affective) (β= 0.13; $p\leq .05$) and the feeling of remaining in the group (continuance) (β= 0.12; $p\leq .05$) positively and significantly influenced collective marketing intensity. This means that members who get a strong attachment to their marketing arrangements and the feeling that switching to alternative marketing arrangements leads to incurring of costs already incurred in their present arrangement increased their marketed rice intensity. This is in agreement with previous studies that suggest that commitment binds the loyalty of members to their organizations (Nimmy *et al.*, 2021). These findings concur with those of Fischer and Qaim (2014), who particularly, in their study among banana farmers in Kenya, found group members with greater general trust in the mechanisms of collective action to have sold higher quantities. Essentially, the findings specify that if farmers' trust and commitment to their organizations are favourable, such farmers are then likely to increase the intensity with which they collectively market rice. This is in agreement with experimental research that shows that individuals take action towards shared goals when they trust that other group members will do the same and vice versa (Fehr and Gachter, 2000; Fischer and Quaim, 2014). In Zimbabwe, many farmer groups disintegrated due to the absence of trust among members (Masakure and Henson, 2005). Beyond leading to commitment, trust reduces transaction costs by generating expectations, a flow of information and a common understanding that enables smallholders to act together more effectively in their pursuit of shared objectives (Nyikahadzoi *et al.,* 2011). The findings of this study practically show that building trust among rice farmers sets the pace for a healthy environment for farmers to commit themselves to collectively market their rice. As such processes that are being undertaken to build a new generation of producer organizations should be participatory and democratically engaging to the smallholders because such processes build trust among members (Shi-feraw *et al.*, 2011; Taddese*et al.* 2020). In addition, higher-tier organizations were found to be more trusted by the farmers, implying that policy instruments that improve the incentive for the union of farmers groups to form higher-level organizations, that is associations and eventually cooperatives, can improve the marketing of smallholder farmers' rice. However, upgrading strategies that merely change the name of a farmer group to an association or cooperative has not overly made the resultant 'higher form' association or groups more sustainable (National Planning Authority, 2018). Thus, it is vital to ensure that emerging associations and cooperatives structurally upgrade the bargaining power base of the organizations.

CONCLUSION AND RECOMMENDATIONS

This study demonstrates that the factors that determine participation differ from those that influence the intensity of rice marketed collectively. The use of democratic and participatory processes when creating new farmers' organizations can increase the trust of farmers in collective marketing arrangements as well as their participation. The findings of this study clearly show that associations offer more incentives for farmers to participate in collective marketing. However, once farmers accept to participate, the organizational type under which one subscribes stops to matter and thus does not influence the volume farmers eventually sell collectively. Thus, the intensity of collective marketing becomes dependent on the level of trust and commitment a farmer has about the collective marketing arrangements. Whereas the finding points to the practical need to promote collective marketing through farmers' associations, it also keeps the practical potential of farmer groups as collective marketing options open provided farmers' trust and commitment to FGs is stimulated. Therefore, policy and extension programs aimed at boosting the intensity of collective marketing are likely to be those that improve the integrity and honesty of the associations. Such can be achieved through promoting participatory and democratic governance of farmer collective marketing arrangements and through the offering of short-term subsidies, such as input, export and food subsidies. The public can also invest in common facilities such as stores used by farmers' organizations in their collective marketing functions. These will increase members' attachment to collective marketing arrangements, which

increases switching costs to alternative marketing options high.

Limitations of the study

This study collected data from subjects who were enrolled in collective marking arrangement, which could limit the generalization of results. For example, the trust held by the farmers may not be totally independent of the influence of the strength of the implementation plan and the collective marketing teams in the selected organizations. Although attempts were made to control the problem through enrolling participants from farmers groups and farmer organization, the variations in trust may inherently have been carried from the weaknesses or even strengths associated with the implementation fidelity or management of FAs and FGs. It is from this context that the results could potentially be less generalised to programs that may have used a different implementation fidelity or theory of change. Future studies could use a longitudinal design where non-intervention communities are used as comparison groups.

In addition, the use of purposive criteria to conduct this study in Mid-western Uganda and among farmers who subscribed to groups and associations limits the ability of this study to be generalized beyond its scope because the sample is not a true random sample. In Uganda alone, changes in social-cultural contexts, even if collective marketing were to be done in Mid-western Uganda, may bring new contexts that could amend the applicability of this study.

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