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Faculty of Tropical AgriSciences



**Economic and Social Impact of Commitment in Agricultural Cooperatives of
Small Farmers in Zambia**

Master's thesis

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Supervisor

Jiří Hejkrlik

Author

Ebenezer Donkor

Declaration

I hereby declare that this thesis entitled “Economic and Social Impact of Commitment in Agricultural Cooperatives of Small Farmers in Zambia” is my own work and all the sources have been quoted and acknowledged by means of complete references.

Prague, 12th May 2020

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Ebenezer Donkor

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Abstract

The first cooperative that was established in Zambia was in the year 1914. Nowadays, the Government of Zambia through local provincial authorities uses cooperatives as a means of reaching smallholder farmers in the country. There is, however, the problem of high heterogeneity within the cooperatives regarding members' commitment. The main objective of the study was to analyse how members perception about social attributes in the cooperative influence their commitment and determine the economic benefits (price, gross margin, access to market) of various groups of members within the cooperative. 215 rice farmers (72 active and 143 passive members) were purposively selected from the Limulunga and Mongu districts. Probit regression model was used to analyse the influence of social attributes on member commitment. Propensity score matching technique was used to estimate the economic benefits members obtain from been actively committed to the cooperative. The results of the study show that members' perception about the social attributes (acceptance, democratic voice, reciprocity, leadership competence and market incentives) in the cooperative and personal characteristics such as educational level and experience in cooperative have significant positive influence on member commitment to the cooperative. However, perception about trust in the cooperative have negative influence on member commitment. Both unmatched and all propensity score matching algorithms indicate that members who are actively committed to the cooperative reach significantly higher economic benefit (price of produce, market access, gross margin) than the passive members.

Key words: Price, Principal Component Analysis (PCA), Social attributes, Market information, Market outlets, GAP

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1.0 Introduction

Poverty as a challenge of sustainable development is a worldwide problem but the impact is severe especially in developing countries. Poor people are usually found in the rural areas and these people depend mostly on agriculture production. The difficulties of farmers particularly in the rural areas of developing countries requires more attention from various public and private sector stakeholders. Smallholder farmers are reported to produce about 70 percent of the world's food supply, however many of the poor of the world are smallholder households (Spoor 2015). Small-scale farmers face a lot of challenges that prevent them from taking advantage of market opportunities. Services such as effective extension and credit, which are important factors for production systems upgrade is limited to be accessed by small scale farmer (Reardon et al. 2009). Individual farmers no matter their sizes will find difficulties in supplying consistently larger quantities and high quality to supply locally large supermarket chains and do not have strong negotiation power to obtain higher price.

Cooperative serves as an avenue where government programs and non-governmental projects effectively reach the rural countryside to improve rural welfare and livelihoods. Agricultural cooperative as legal form of business has been regarded by government, researchers and professionals in international development organizations as solutions for reduction of poverty through creation of jobs, improve standard of living through food security and improve nutrition (Wanyama et al. 2009). Valentinov (2007) and Markelova (2009) indicated that farmer organizations such as cooperatives are platforms to reduce high cost of transaction.

Cooperatives can help to improve production, marketing, and livelihoods of the farmers in general (Bernard & Taffesse 2012). Figueiredo & Franco (2018) stated that with the evolving technology and innovations in the global market, cooperatives will be the sole legal business organizations with the capacity to exploit new opportunities for smallholder

farmers in a sustainable way. Farmer organizations also serve as a platform for building capacity, exchanging information and innovation in rural areas (Rao & Qaim 2011; Fischer & Qaim 2012). Narrod et al. (2009) indicated that even though there is evidence that individual smallholder farmers are unable to compete in high-value markets, there are various evidence that smallholder farmers successfully compete in markets through collective action and institutional support.

One major challenge of cooperative is the exhibition of free-rider behavior by the members. Fulton (1999) indicated that free-rider behavior in cooperative can be linked to the commitment of the members towards the cooperative. Overcoming free-rider problem is essential for cooperative management and the solution is commitment by the members towards the cooperative (Cechin et al. 2013). Commitment to the cooperative by the members leads to reduction of transaction cost in the dealings between the cooperative and the members because it lowers free-riding behavior of the members (Fulton 1999). Commitment can be defined as loyalty to the cooperative by the members even though the price that the cooperative provides is lower than that of the open market (Fulton 1999).

Cooperative socially impact on its members and the society in general. Cooperative is established bottom up on the pillars of trust and relationships and this social attributes existing in the cooperative improve the cooperative performance (Paldam & Svendsen 2000). Some studies found the growing importance of cooperative in building and maintaining social attributes such as acceptance by members, relational social capital (trust and reciprocity), and voice of members. Social attributes in cooperative leads to active commitment to the cooperative by the members and the commitment to the cooperative by members generally increases the productivity of the cooperative (Rudd 2000; Pretty & Ward 2001; Majee & Hoyt 2009; Ruiz Jiménez et al. 2010; Cechin et al. 2013; Verhees et al. 2015).

Several studies focus on participation of cooperative by smallholder farmers and assess the impact of cooperative by equating the participation with membership in the

cooperative and compare with non-cooperative members. In Costa Rica, coffee cooperative facilitated small-scale farmers to participate in a specialty market with higher prices (Wollni & Zeller 2007). Holloway et al. (2000) highlighted the positive role of cooperative marketing for smallholder producers in their study in Kenya, Ethiopia, and Zambia. Wollni & Zeller (2007), Fischer & Qaim (2012) and Mojo et al. (2017) studies revealed that participating in cooperative leads to improvement in the economic performance (household income, price, assets and adoption of innovation) of members

Membership of cooperative alone does not explain how members participate intensively in cooperative, therefore, it is important to analyze the intensity of participation by members and benefits of participating actively in the cooperative (Fischer & Qaim 2014). The success of any cooperative depends on the level of commitment to the cooperative such as group meetings and collective marketing by the members. Fischer & Qaim (2014) stated that because marginal benefits and costs are not same for all members in a group, commitment of members can vary.

Ruiz Jiménez et al. (2010), Cechin et al. (2013), Muthyalu (2013), Fischer & Qaim (2014), Verhees et al. (2015) and Gyau et al. (2016) studies focused on factors influencing intensity of commitment to cooperative members but did not pay attention empirically on how intensity of commitment impacts on the economic performance of the cooperative members. The aim of this study is to analyze the economic impact of been intensively committed to rice cooperative by smallholder rice farmers in the Western province of Zambia.

The rest of the study is organized as follows; chapter 2 describes relevant literature of this study, chapter 3 describes the aim of the study, chapter 4 describes data collection and methodological approach, chapter 5 is about the estimation of results of the study, chapter 6 presents discussion and proposal of recommendations from the study and chapter 7 concludes the study.

2.0 Literature Review

2.1 Agricultural Cooperatives and Transaction Cost Economies

Coase (1937) made an argument that make or buy decision is dependent on the alternative cost of the decision. Williamson (1991) stated that transaction cost answers the question “at what point would activities be made by the firm or bought by the firm (make or buy decision)?” Williamson (1987) defined transaction cost as cost such as search and information costs, bargaining and decision costs and policy and enforcement costs. Transaction cost analysis serves as an avenue to determine the boundaries of the firm that minimize the sum of production, distribution and transaction (Williamson 1971). Sykuta & Chaddad (1999) indicated that each transaction cost item is influenced by social institutions, legal institutions, political institutions and economic institutions. Some transaction costs

Three dimensions of transactions were highlighted by Williamson (1987). The dimensions of transactions include frequency, uncertainty levels and asset specificity. Transaction frequency refers to how frequent the transaction takes place. Uncertainty levels of transaction refers to both internal and external disturbances such as problems of inputs, outputs, transformational processes and shift in institutional environment (Williamson 1991; Menard 2006). Asset specificity focus on the value of an investment that is lost when use for alternative purpose (Menard 2006). Asset specificity is linked to how alternative users re-deploy asset to an alternative use without destroying its value (Williamson 1991). Example of asset specificity include brand name, physical asset and human asset (Menard 2006).

(Bonus (1986) and Staatz (1987) argues that cooperative economize transaction cost and develop countervailing power for the members. Bonus (1986) analyzed dairy cooperatives and the study found out that the dairy farmers depends on local milk processors and the dependent of the dairy farmers on the local processors led to opportunistic expropriation of the farmers quasi rent by the milk processors. Dairy

cooperative gave the farmers an opportunity to avoid the expropriation by internalizing the transaction of the milk processing (processing is under the farmers control).

The ability for the cooperative to achieve transaction cost was highlighted by (Staatz 1987). Staatz (1987) indicated that transaction cost is economized by cooperatives through: developing countervailing power in the form of market power; protection farmers from inherent risk in agricultural markets by providing members some revenue insurance; and quality control through forward and backward linkages. Farmers usually have high transaction costs because they have weak market power and information asymmetry when dealing with their trading partners (Hansmann 1988).

Bonus (1986), Staatz (1987) and Hansmann (1988) studies accept the fact that agricultural cooperative as an organization help to compensate for the disadvantageous position such as low price, high cost of inputs, high transaction, low negotiating power) in relation with their trading partners. Fischer & Qaim (2012) stated that motivation for collective action is to reduce transaction cost through exploitation of economies of scale. The transaction cost theory, therefore, is an incentive for farmers to form cooperatives.

2.2 Organizational Commitment

Meyer & Allen (1991) defined organizational commitment as a psychological state that will make an individual remain in an organization. In terms of cooperative as an organization, commitment can be defined as loyalty and emotional attachment to the cooperative by the members. In other words, members not exhibiting free rider behavior in the cooperative (Fulton 1999). The theory of planned behavior focus on individual intention as motivational factor that influence behavior. Ajzen (1991) stated that the stronger individual intentions to perform the behavior, the more likely the performance. Theory of planned behavior argues that readily accessible behavior, normative and control beliefs are important foundation for attitudes, subjective norms and perceived control.

Ajzen (1991) opined that when different belief are activated in the behavior contexts, they produce different attitudes and subjective norms which result in different intentions.

Simmons & Birchall (2004) highlighted the individual and collective factors that influence members to be committed to their cooperative. From the collective point of view, the study opined that sense of community, shared goals and shared values are important factors for members to be actively participating in cooperative. In terms of the individual factors, their study mentioned that individuals are motivated by sense of rewards (benefits) and punishment (costs). Meyer & Alien (1991) defined the forms of organizational commitment as affective, normative and continuance. The various forms of organizational commitment presented in (Meyer & Alien 1991) framework are explained below;

- *Affective*: Affective commitment is more about the 'will' to remain in the organization. This form of commitment is the degree of emotional attachment a member has for the organization (Ruiz Jiménez et al. 2010). They feel that they belong in the organization and share in organization's objectives and that their own objectives are more easily attained via the organization (Ruiz Jiménez et al. 2010; Cechin et al. 2013).
- *Normative*: This form of commitment is more of perception of sense of obligation to remain in the organization. Meyer & Alien (1991) stated that socialization experience leads to this perception of obligation. Communication within the organization and making employees feel their loyalty is valued in the organization can create normative commitment in organization.
- *Continuance Commitment*: This form of commitment is related to member having no option that remain in the organization as a result of lack of choices. Continuance commitment is developed as a result of member awareness of the costs associated with leaving the organization (Meyer & Alien 1991; Ruiz Jiménez et al. 2010; Cechin et al. 2013).

2.3 Cooperatives and Social Capital

Coleman (1988) introduced the term social capital. Cooperative as an institution is known for its high level of involvement by its members in decision making and characterized by its member owned and controlled. Social capital is vital to formal institutions and governance in cooperatives (Valentinov 2007). Putnam (1993) defined social capital as any characteristics of social organization such as norms, networks and trust that lead to coordination and cooperation for mutual benefits. Social Capital is the relationships or interactions between members which encourage productive activities in a sustainable way (Coleman 1988). Social capital is vital in terms of access to information, better civic engagement , reduction of opportunist behavior, efficiency, reducing transaction cost and solving collective action problems (Coleman 1988; Putnam 1993; Fukuyama 1995).

Coleman (1988) indicated that social capital increase the investment on human and physical capital. In an experiment study conducted by Putnam (1993) he concluded that social capital may help improve the performance of government and the progress of the economy, whereas, deficit in social capital can result in the decline of social activities. Putnam (1995) opined that high level of social capital facilitates coordination, communication, incentive for cooperation in the future and reduce opportunistic behavior.

Chloupkova et al. (2003) did a comparative study on social capital in Denmark and Poland cooperative movements. The results of the study indicated that there was destruction in social capital in Poland and it can be attributed to the communist system limiting the development of various social organizations. Cooke et al., (2005) found positive relationship between social capital and performance of firms (innovation and business growth) by studying 455 small and medium size firms. Luo & Wang (2010) highlighted that the role of social capital is key for providing solution to collective action problems in Chinese cooperatives. Liang et al. (2015) also stated that social capital serves as informal institutional framework with cooperation, collective action, decision making and shared information.

Social capital can be conceptualized and measured in a specific forms according to (Guiso et al. 2004). Chloupkova et al. (2003) used membership in voluntary organization, trust and civic participation as indicators of social capital at macro level. Putnam (1993) used networks, norms and trust to measure social capital. Bhandari et al. (2009) operationalized social capital as trust, norms, relationships and networks, friends, membership, civic engagement and information flows.

Trust is essential in cooperative. Hansen et al. (2002) highlighted that as individuals seek to achieve their economic goals in cooperative, other also try to achieve social gains. The study highlighted that in pursuing their collection of goals, trust develop among members of the cooperative, and between the members and the managers. Hansen et al. (2002) operationalized trust as the process by which one believes that members in a group are trustworthy. Cohesion in cooperative or any group is built on the level of trust or social relationship the members have with each other. Cohesion in the cooperative is built as a result of members positive feeling with each other and the group as a whole (Hansen et al. 2002).

2.4 Factors that Influence Intensive Commitment in Cooperative

Members of cooperative decide to be committed to the cooperative or not based on several factors. Factors that influence members of cooperative to be actively committed to the cooperative are the demographic, socioeconomic, institutional factors and the members perception about the cooperative social attributes.

Farm size is considered as one of the farm characteristics that influence members decision to participate intensively in cooperative. Ruiz Jiménez et al. (2010), Cechin et al. (2013), Muthyalu (2013) and Fischer & Qaim (2014) used farm size as one of the variables that influence intensity of commitment in cooperative. Farmers with larger size of land can get advantage from access to input and output market as well as access to information in cooperative (Fischer & Qaim 2014). However, farmers with larger farm size economize

transaction cost and have economies of scale so they have low incentive to participate intensively in cooperative. Cechin et al. (2013) and Fischer & Qaim (2014) therefore, stated that the incentive for farmers with larger farm size to participate intensively in cooperative is low because they do not lack economies of scale and do not suffer high transaction cost.

Another factor that has influence on intensity of commitment to cooperative is diversity of crops. Farmers with higher diversity may face difficulties in access to information and input for specific crops, hence incentive to participative intensively in cooperative (Fischer & Qaim 2014). Fischer & Qaim (2014) however, stated that cooperative members who cultivate more than one crop do not find any advantage by selling through the cooperative if the cooperative is dealing with only one crop because they will have to look for market for the other crops.

Age of farmer is usually used as a proxy for experience in farming and it has influence on intensity of commitment to cooperative. Muthyalu (2013), Fischer & Qaim (2014) and Gyau et al. (2016) found negative relationship between age of farmer and intensity of participation in cooperative but the relationship was not statistically significant. In terms of the relationship, their results may also be attributed to the fact that older farmers are not strong enough to participate in the activities of the cooperative. This means that younger members are more active in cooperative as compared to the older farmers.

Members experience in cooperative may affect the level of intensity in participating in cooperative. Farmers who have spent more years in cooperative knows the benefit intensive participating in cooperative than new members. Cechin et al. (2013) and Ruiz Jiménez et al. (2010) studies highlighted positive relationship between experience in cooperative and intensity of commitment in cooperative.

Gender or sex of a farmer is one of the factors that intensity of commitment to cooperative. It is assumed that cooperative is not gender biased so whether a member will participate intensively in cooperative or not may not be dependent on the gender. Gyau et al. (2016) found positive relationship between a member been a male and intensity of

commitment in cooperative. Fischer & Qaim (2014) contrary, found positive relationship between a member been a female and intensity of commitment in cooperative.

The level of education of cooperative members has influence on intensity of participation. Cechin et al. (2013), Muthyalu (2013) Fischer & Qaim (2014) and Gyau et al. (2016) used educational level of household head or farmer as an influencer of intensity of commitment to the cooperative. There is positive relationship between education and participation as well as intensity of participation in cooperative (Cechin et al. 2013; Muthyalu 2013; Fischer & Qaim 2014). Farmers with high level of education knows the benefits of participating intensively in cooperative, hence participate in collective marketing, training and meeting in the cooperative as compared to farmers with low level of education.

Whether a farmer will participate intensively in cooperative or not can be influenced by distance to regional market. Farmers who are closer to regional market may decide to sell their produce at the regional market rather than to the cooperative. Fischer & Qaim (2014) found positive relationship between distance to collective center and intensity of commitment (selling through the cooperative).

Relational forms of social capital such as trust and reciprocity are used as factors that influence intensity of commitment to cooperative by studies like (Fehr & Gächter 2000; Ruiz Jiménez et al. 2010; Cechin et al. 2013; Liang et al. 2015; Verhees et al. 2015; Gyau et al. 2016). Trust as a relational dimension of social capital and cognitive dimension of social capital such as shared vision had significant positive relationship with intensity of participation in cooperative (meetings and training) (Liang et al. 2015). Their results can be explained by experimental study done by Fehr & Gächter (2000) which indicated that individuals have the will to take actions towards shared goals when there is trust. Liang et al. (2015) stated that members who share common understanding of collective action and mission are more likely to participate intensively in cooperative.

Training of cooperative members play important role for members of cooperative to be committed to the cooperative. Qualitative study conducted by Birchall & Simmons (2004) and Ruiz Jiménez et al. (2010) indicated that benefits such as valuable learning experience, provision of appropriate level of information and open learning environment motivates members to be actively committed to the cooperative. Verhees et al. (2015) also indicated that capacity building of the members leads to commitment of members to the cooperative. Gyau et al. (2016) found significant relationship between knowledge and adoption of innovation on members commitment to the cooperative.

Involvement in the cooperative by the members is a key factor for the members to be actively committed to the cooperative (Cechin et al. 2013). Members ability to be involved in the activities of the cooperatives influence members to be actively committed to the cooperative. Verhees et al. (2015) stated that members involvement in the cooperative is important because it reduces members apathy towards the cooperative.

Members of cooperative would be committed to the cooperative actively when they perceive they have voice or opinion in the cooperative and their opinions are respected. Studies such as Cechin et al. (2013) and Verhees et al. (2015) found significant positive influence of members perception about voice in the cooperative and active commitment. Members of cooperative are committed to the cooperative when they feel they can share their views in the cooperative and such views are valued in the cooperative.

Members perception about the cooperative leadership competence have significant influence on commitment to the cooperative. Studies such as Ruiz Jiménez et al. (2010) and Cechin et al. (2013) used members perceived leadership competence as an influencer of intensity of commitment to cooperative. Ruiz Jiménez et al. (2010) opined that when members of cooperative believe in the leadership of the cooperative, they tend to bring their entire harvest to the cooperative because they believe the cooperative is beneficial for them.

Market connections such as members perception that the price the cooperative offers is higher relatively to the other market outlets influence members commitment to the cooperative. If members perceive that they are not benefiting from the cooperative in terms of access to relevant market information as well as satisfaction of the price the cooperative offers, their level of commitment towards the cooperative tend to be low. Cechin et al. (2013) and Gyau et al. (2016) found that members perceived benefit about the cooperative such as market connections influence members to be actively committed to the cooperative.

2.5 Empirical studies on Roles and Economic Benefits of Cooperative to Farmers

The assessment of impact of intensity of commitment to cooperatives has not been tapped yet in literature, hence it can be assumed that the economic impact of cooperative will be higher for those members who participate intensively in cooperative. However, several studies have done the impact of cooperative on the economic performance of smallholder farmers. Ruiz Jiménez et al. (2010) indicated that empirical studies need to be conducted on importance of commitment to cooperative by member farmers. Fischer & Qaim (2012), Getnet & Anullo (2012), Abate et al. (2013) and Mojo et al. (2017) studies on the impact of cooperative on the economic performance of cooperative indicates that cooperative improves economic performance of member farmers and as such members who are actively participate in the cooperative will have higher performance as compared to the members who participate passively.

Grashuis & Ye (2019) gave insights about the various economic performance that cooperatives provide in existing literature. The economic indicators of cooperative that are commonly used includes price of produce, input adoption, productivity and yield, gross margin, product quality and market access and the impact of cooperatives on these indicators was analyzed by employing propensity score matching technique (PSM), difference in differences model and endogenous switching regression (Grashuis & Ye 2019).

Mojo et al. (2017) used propensity score matching and switching regression model in their study of determinants and economic impacts of coffee cooperative membership in Ethiopia to analyze the impact of cooperative membership on economic performance of farmers. The study revealed that membership of cooperative has significant positive relationship with economic performance which was measured in household income and assets. However, the significance of cooperative membership was only for the endogenous switching regression model while the propensity score matching showed insignificant impact of cooperative membership on economic performance of the farmers. The study again revealed positive spillover effects of cooperative on the non-members of the cooperative.

One important argument made by some authors is that collective action such as cooperative is more beneficial to smallholder farmers as compared to large scale farmers. Fischer & Qaim (2012) found significant increase in income of cooperative members who undertake collective marketing by adopting propensity score matching technique in their study of determinants and impacts of collective actions on Kenyan smallholder banana farmers. The study of Fischer & Qaim (2012) also revealed that collective action leads to adoption of new innovation such as plantation management. Fischer & Qaim (2012) highlighted that small farmers benefit more in participating in cooperatives in terms of increase in income. Getnet & Anullo (2012) added that cooperatives improve the livelihood of smallholder farmers in Ethiopia via increased income, more savings and reduced costs of inputs by adopting the stratified matching and Kernel matching technique even though the estimates were not statistically significant. Furthermore, Ito et al. (2012) used treatment effects in their study of distributional effect of agricultural cooperatives and concluded that agricultural cooperative is an important avenue for farmers to their economic status. Ito et al. (2012) study also revealed that the economic benefits arising from cooperative are only significant for small farmers.

Wollni & Zeller (2007) found significant impact of cooperative membership on the price members receive for their coffee in a study conducted in Ethiopia by employing two

stage model. Hanisch et al. 2013 and Jardine et al. (2014) studies also found significant influence of cooperative on the price that farmers receive for their produce by using difference in differences and ordinary least square (OLS) regression models respectively. Getnet et al. (2018) confirms the instrumental role that cooperatives play for farmers to receive higher price in Ethiopia. In as much as cooperatives serves as a platform for farmers to receive higher price, Fischer & Qaim (2012) indicated that the price advantages of collective marketing to smallholder farmers is small in magnitude.

The benefits of agricultural cooperatives are not just limited to the members only but the community at large. Passive members may not need to be active members before they benefit from the cooperative. According to Zeuli & Deller (2007), cooperatives contribute to the development of community by way of social bonding, ensuring economic stability and long term growth. Mather & Preston (1980) also highlighted that the main benefits of cooperatives to the rural community are; additional income to the community as a result spending in the local community by the cooperative members; stronger community due to social capital that cooperative provides; and the provision of goods and services to non-members in the community. It may be assumed that despite the passive members exhibiting free riding behavior they benefit from the cooperative because of been members of the cooperative. Cooperative and collective action among smallholder farmers is important for sustaining the equitable use of resources and contribute to rural community as “school of democracy”. Wanyama et al. (2009) found out that cooperatives have significantly impacted on the rural development through mobilization and distribution of financial capital, creating of employment and generation of income, an avenue for training and education of rural folks as well as set up solidarity schemes to deal with issues such as illness, social welfare and other socio-economic challenges.

2.6 Challenges of cooperatives

Despite the numerous benefits that cooperative provides, cooperative as an institution also face some challenges. Studies emphasizing on the disadvantages of cooperative as an institution opines that cooperative is associated with number of incentive problems (Valentinov 2007). According to Valentinov (2007) some of the problems that are associated with cooperatives include:

- Common property problem – the problem arising from the fact that the contribution by the members as an equity may not be proportionate to the distribution of resulting benefits.
- Horizon problem – this can be explained that the benefits from the investment of members can only be recouped only over the time of horizon of that membership in the cooperative thereby causing biasness towards short term investment.
- Monitoring problem – The management of the cooperative is allocated to specialist who are not necessarily members of the cooperative.
- Influence cost problem – Opinion leaders in the cooperative who have opposing views and interests may engage in costly lobbying of activities that may not be beneficial to the cooperative.
- Decision problem – as a result of the larger number and heterogeneity of the cooperative members makes reaching consensus in decision making difficult.

Valentinov (2007) highlighted that these problems is visible in every cooperative regardless of the sector. However, Cook (1995) stated that they are common in US agricultural cooperatives.

One key challenge of cooperative is the inactive participation of the members which influence the competitive power of the cooperative (Ahmed & Mesfin 2017). Again, Fischer & Qaim (2012) opined that inactive participation in cooperative by the members in collective marketing (members free-riding) leads to inefficiency of the cooperative. Free-rider problem in cooperative can be linked to the level of commitment that members have

for their cooperative and the free-rider problem results in market failures (Fulton 1999). Baka (2011) concluded challenges that face cooperatives in Kenya are poor leadership or management, political interference and financial management of the cooperatives. Fulton (1999) stated that commitment of members to the cooperative could also lead to underperformance of the cooperative leadership. Members usually exhibit free-riding problems because usually it takes a longer period for the managers of the cooperative to give them payment for their produce.

2.7 Agricultural Cooperatives in Zambia

2.7.1 History of Cooperatives Movement in Zambia

The first cooperative that was established in Zambia was the North Rhodesia farmers' cooperative in the year 1914. There were about seven agricultural cooperatives, one labor recruitment cooperative, one consumer cooperative, and one rural credit cooperative in 1947 (Chabala & Ojezmark 1994). The cooperatives ordinance was enacted in 1948 in Zambia for registration of various types of cooperatives. In the period of 1947 to 1964, there was a substantial increase in agricultural production because of the formation of marketing cooperatives by the primary cooperative societies.

As a result of the collapse of the various farming cooperatives in 1969, a research was conducted, and cooperative development plan was documented. It was recommended in the cooperative development plan that a feasibility and viability study should be conducted before the formation of any cooperative and the cooperative ordinance in 1948 needed to be amended (Chabala & Ojezmark 1994). The cooperatives act 1972 was enacted in 1972 and in 1973 the Zambia cooperative federation (ZCF) was established as the "mother body" of cooperative to ensure development of cooperatives in Zambia. All cooperatives in Zambia are affiliated to the "mother body" Zambia cooperative federation. The cooperative movement in Zambia finally operated in four levels namely; Zambian

cooperative federation (ZCF); provincial cooperative unions (PCUs), the district cooperative unions (DCUs) and primary cooperatives (PCs).

In the period of 1993 to 1999, there was declination in the members of cooperatives as a result of liberalization of the economy. The competition power of the cooperatives was weak as compared to the private. According to Moonga & Mgemzulu (2005), the cooperatives were not accustomed and prepared for the competition that was brought about as a result of the trade liberalization. In 1998, another cooperative act was enacted, and the government campaigned for the reawakening of the cooperative movement. The campaign led to massive registration of cooperatives in 1999 (ILO 2000).

2.7.2 Current Government and Donor Support to the cooperative Movement

For the government of Zambia to pay attention to the agriculture sector, in the fifth national development plan (FNDP) of Zambia, the government set up a program for cooperative development between 2006 and 2010. The main objective and strategies for the cooperative development program in the FNDP are highlighted in Table 1 below.

Table 1. Zambian Cooperative Development Program

Objectives	Strategy
To create an enabling environment for the development of autonomous, transparent, viable, and demand-driven cooperatives and other farmer organizations that will contribute to economic growth and poverty reduction.	<ol style="list-style-type: none"> 1. Develop a legal and institutional framework to facilitate re-orientation and reformation of cooperative organizations 2. Develop the capacity of cooperative members, so they can take advantage of the current socio-economic environment. 3. Promote development of business-oriented cooperatives and farmer organizations in order to enhance their capacity to access financial resources. 4. Promote partnerships between cooperatives and other sectors of the economy. 5. Encourage and promote participation of women in business-oriented cooperatives and farmer organizations.

The government of Zambia through the department of cooperative is responsible for formulation of cooperative policy and development cooperatives. The department of cooperative is responsible for adherence of cooperative legislation as well as implementation and administration of policies for cooperative development (Lolajih 2009). The government of Zambia through the department of cooperative provides training and infrastructure to the cooperatives.

The Zambian cooperative federation (ZCF) as the “mother body” of cooperatives in Zambia coordinates the activities of cooperatives and act as the “mouthpiece” for the cooperative movement. The Zambian cooperative federation (ZCF) serves as an institution for lobbying for the cooperatives in terms of getting assistance from donor institutions and policy compliance matters (Lolajih 2009). Zambian cooperative federation aids with the procurement of inputs at a cheaper cost, access to markets and facilitates access to infrastructure such as storage sheds and solar milling plants (Lolajih 2009). The government of Zambia through the department of cooperatives and ministry of agriculture provide input subsidies (farmer input support program (FISP)) to farmers who only belong to cooperatives or other farmer organizations. The members of the cooperative get access to the subsidies through e-voucher which they present to their various cooperative officers for the inputs.

Due to the change of policy on cooperatives as a result of the economy liberalization in the 1990s, many international organizations were discouraged to be involved in the cooperative movement in Zambia. Nevertheless, there are projects undertaken by international and local donor organizations in Zambia with the objectives of creating employment, raising the income of the rural people and enhancing food security. Some of the donors that are involved in the cooperative movement includes; Swedish international development agency (SIDA), food and agricultural organization (FAO), international labor organization (ILO), USAID, the Netherlands development organization (SNU), world bank, CIDP, PPCR, WWF, E-SAPP, UNICEF and Czech Development Agency (Lolajih 2009; Paos 2019).

3.0 Research Aim

Being formal member of the cooperative alone does not mean that members are committed to the cooperative and they benefit from it. The member benefits as well as long-term success of cooperative depend on how members are committed to the group activities.

Important question that needs to be asked is that “do members of cooperative who are actively committed to cooperative have higher economic benefit than members with passive commitment?” Previous studies also indicate that apart from the personal characteristics of members, the social attributes in cooperative influence members commitment. Therefore, it is important to analyze how members perception about cooperative social attributes in the cooperative influence their level of commitment.

The main objective of the study is to determine the economic benefits (price, gross margin, access to market) that members obtain for been committed their cooperatives. Specifically, the objectives of the study are:

1. To describe the difference between active and passive committed members in the cooperative in terms of market outlets and non-economic benefits.
2. To analyze the influence of social attributes in the cooperative on intensity of commitment to rice cooperatives by smallholder farmers.
3. To determine the impact of intensity of commitment to rice cooperative on economic performance of smallholder rice farmers.

This study defines cooperative social attribute as members perception about the cooperative functions such as level of acceptance in the cooperative, market connections, leadership competence, having a voice in the cooperative, capacity building (education, training and information) and perception about trust and reciprocity of relationship in the cooperative.

3.1 Hypotheses

Following Ruiz Jiménez et al. (2010), Cechin et al. (2013) and Verhees et al. (2015), the first hypothesis of this study is that;

H_{1a}: Social attributes such as (acceptance, voice, trust, reciprocity, market connections and leadership competence) have relationship with commitment to cooperative.

Following Wollni & Zeller (2007), Fischer & Qaim (2012) and Mojo et al. (2017), the second hypothesis is that;

H_{1b}: Achieved positive economic benefits are related to the level of members commitment in the cooperative.

4.0 Methodology

This study used quasi-experimental design. Full experimental design select respondents randomly. In full experimental design, it is possible to manipulate and control the respondent. In this study it is not possible to randomly assign the members to groups (treatment and control) because they already belong to the groups. Quasi experimental design is the manipulation of independent variables to observe the effect of dependent variable. Quasi experimental design can be used when it is not possible to randomize the respondents. Quasi-experiments usually have desirable features because study conditions may be more representative of real-world situations as compared to randomized experiments (Luellen et al. 2005). To find the cause and effect of the cooperatives, comparative form of experimental design was used in this study. The comparison was based on treatment group and control group. In order to deal with the problem of no randomization (risk of selection bias), propensity score matching technique was used to match the treatment and the control group.

4.1 Study Area

The study was conducted in the Mongu and Limulunga districts in the Western province. The Western province of Zambia is the largest administrative province in Zambia. The total land area of the province is 126386 Km² (WPI 2017). The province shares boundaries with Central province in the east, North-western province in the north and to the south-east with the Southern province. There are 16 districts in the province with Mongu been the capital of the province. The total population of the province according to the 2010 population census was 881524 inhabitants (WPI 2017).

The two districts are among the major rice production regions of the province and rice cooperative dominated districts in the province. The province can be associated with intensive rice production because of the floodplains in the area. Mongu rice is a popular rice for entire Zambia and it is cultivated and packaged in the Western province of Zambia. There

has been external support from the Japanese government on rice production in Mongu in the Western province of Zambia. The Japanese government disseminate NERICA rice variety to support rice cultivation in the province.

Several cooperatives have been established in different sectors such as agricultural, fisheries, livestock, multipurpose, youth, local development, dairy and credit and saving cooperatives. The Government of Zambia through local provincial authorities uses cooperatives as a means of reaching smallholder farmers in the province. In the year 2018/2019 the government with the help of donor support through the cooperative department installed 8 solar milling plants for cooperatives in different districts in the province. The province has 1501 registered cooperatives with the agricultural and multipurpose cooperative specializing on legumes, cereals, cashew, small livestock and vegetable production (Paos 2019).

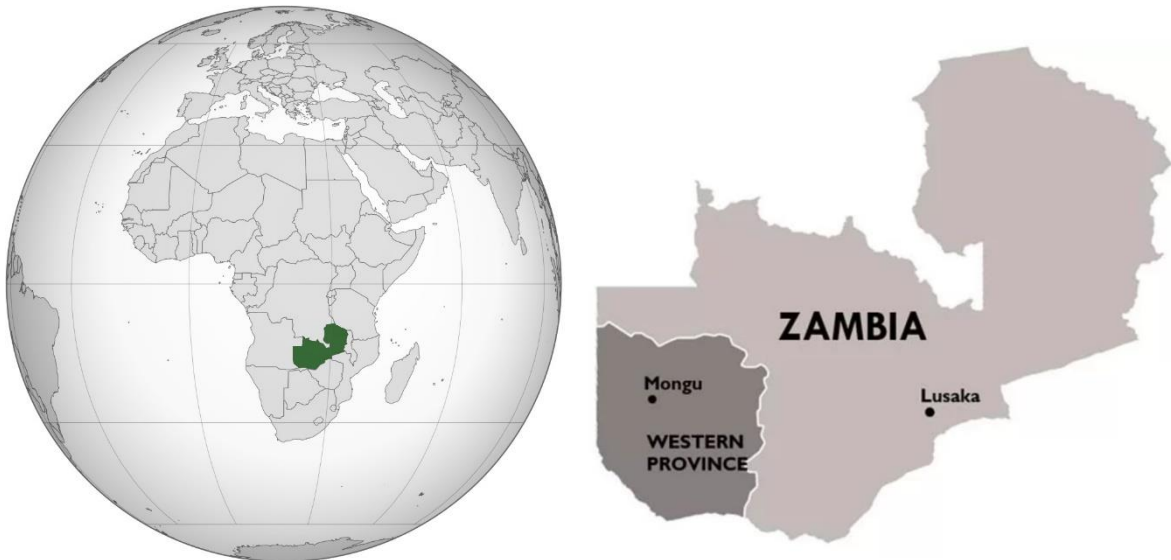


Figure 1. Map of Study Area

4.2 Target group and sample size

The target group for this research were active and passive members of rice cooperatives. The sample size was 215 (72 active and 143 passive) respondents. The sample size was calculated by using the formula;

$$(z^2 * p * (1 - p)/e^2) / (1 + (z^2 * p * (1 - p)/e^2 * N)).$$

Where Z is z score which 1.96 for 5% confidence interval, e is margin of error, p is percentage picking a choice, expressed as decimal (50%) and N is the population (approximately 1000 for rice cooperative members in the province according to Mr. Paos Munzele, the province cooperative chief officer). Using percentage of 5% and margin of error of 6%, the sample size was supposed to be 211 so sample size of 215 is a representative of the population.

4.3 Sampling Technique

Non-Probability sampling technique, specifically the purposive technique, and snowballing were used to select the farmers who are active and passive members of cooperative for this study. Most of the cooperative members were living far from the cooperative center and due to that chairmen and secretaries of the cooperatives contacted the members for the data to be collected. Again, Caritas Czech Republic Mongu branch arranged meetings for some cooperatives in the various cooperative centers for data to be collected from the members. Data was collected from members purposively whether a member is an active (sell through cooperative) or passive (does not sell through the cooperative).

4.4 Type and Source of Data

The target group for this research were active and passive members of cooperatives. Data collection was on the social and demographic factors such as age, gender, educational level, farm size, etc. of members that influence intensity of commitment in cooperatives. Members perception about social attributes in the cooperative such as relational social capital (trust and reciprocity), voice, acceptance and capacity building as well as the economic aspects of the members' production such as the quantities, cost of production, price were collected. The economic data was collected for the 2017/2018 farming period in Zambia. The data was collected through face-to-face interviews, using a structured questionnaire on electronic Nestforms application between the period of August and September 2019. The data was collected by the author with the help of trained administrators and translators from Caritas Czech Republic Mongu. In addition, data was collected from some key informant (Mr. Paos Munzele, the District Chief Cooperative Officer in the Western province of Zambia) and other cooperative members with a qualitative interview approach which was aimed at a better understanding of the local context in which the targeted farmers operate.

4.5 Data Analysis

Objective one was achieved by adopting simple descriptive statistics such as charts and mean to describe the market channels that the cooperative members sell the rice. Also, Mann-Whitney U test was used to test the significance in difference between the active and passive members non-economic benefits. The non-economic benefits were measured as a 5-point Likert scale with 1 been strong disagreement and 5 been strong agreement to the statement. Non-parametric test was used because the normality test (Shapiro-Wilk and Kolmogorov) showed that the perception variables deviates from normal.

Objective two which is the influence of members perception about cooperative social attributes on intensity of commitment to cooperative was achieved by using probit regression model. The probit regression model was similarly used by Cechin et al. (2013),

Muthyalu (2013), Fischer & Qaim (2014), Verhees et al. (2015) and Gyau et al. (2016) to analyze factors that influence members commitment to cooperative as well as assignment of propensity scores for the matching.

4.5.1 Dependent Variables for Probit Model

Commitment has been defined by other researchers such as Cechin et al. (2013), Fischer & Qaim (2014), and Gyau et al. (2016) as binary based on the attendance of meetings, participation in group activities and collective marketing by members. Based on key informant interview conducted with Mr. Paos Munzele (the chief cooperative officer in the Western province of Zambia), the major commitment problem in the cooperatives is collective marketing because the members participate in meetings and cooperative activities. However, commitment to cooperative cannot be defined by just collective marketing since some members may decide dormant and just sell through the cooperative after harvesting their produce.

This study therefore, defined active committed members of cooperative as members who sell all or part of their rice through the cooperative and attend more than 50% of the cooperative meetings and the passive committed members as members who attend more than 50% percent of the cooperative meeting but does not sell through the cooperative. The dependent variable for the probit model was degree of intensity. The degree of intensity was measured as binary, that is, 1 for active and 0 for passive members of cooperative. Inspiration was taken from Muthyalu (2013), Fischer & Qaim (2014) and Gyau et al. (2016) to measure intensity of commitment to the cooperative as a binary variable.

4.5.2 Independent Variables for Probit Model

Studies such as Ruiz Jiménez et al. (2010), Cechin et al. (2013), Muthyalu (2013), Fischer & Qaim (2014) Verhees et al. (2015) and Gyau et al. (2016) were used as reference for including variables that influence members to be actively committed to their cooperative or not. Based on Cechin et al. (2013) and Verhees et al. (2015) studies, members perception about social attributes existing in the cooperative such as trust, reciprocity of relationship, acceptance, voice, capacity building (information, training and education), leadership competence and perception about market connections that cooperative provides were used as independent variables. The members perception about the social attributes existing in the cooperative was measured as a 5-point Likert scale with the scale of 5 been the highest - indicating strong agreement to the perception statement and 1 been lowest indicating strong disagreement to the perception statement.

However, apart from the social attributes that influence the level of commitment in the cooperative, some personal and demographic characteristic of the members may also influence commitment. Inspiration from Ruiz Jiménez et al. (2010), Cechin et al. (2013), Muthyalu (2013), Fischer & Qaim (2014) and Gyau et al. (2016) the personal and demographic characteristics such as age of member, gender, educational level of member, farm size, number of crops cultivated, distance to cooperative center were included in the model as control variable.

Objective three which is economic performance was estimated quantitatively and used T-test to see significant in differences between economic performance of members. However, there are two main form of biasness in comparison of active members of cooperative to other members who are passive. There may be difference in characteristics between active and passive members of cooperative such as educational level, age, experience, farm size, etc. which may have effect on their economic performance. Bias of unobservable characteristics such as (farmers in the community active participation in social gathering) that will lead to selection bias in the study. These forms of biasness are solved

by adopting propensity score matching technique firstly used by Rosenbaum & Rubin (1983) to match the active and passive members and estimating the average treatment effect on the treated (ATT) on active cooperative members.

Balancing scores can be used to group the treated (active members) and control group (passive members) in level playing field so that comparison will be easier in terms of estimating the impact of intensity of commitment to cooperative by members. Inspiration was taken from similar studies done by (Wollni & Zeller 2007; Fischer & Qaim 2012; Mojo et al. 2015, 2017).

The main aim of PSM is to estimate treatment effect by suitably comparing treatment farmers with controlled farmers that are similar as the treated farmers. PSM is a two-stage approach matching estimator. In the first stage, propensity scores or covariates $P(x)$ were generated from a probit regression model, which shows the probability of farmer to participate intensively in cooperative. The variables that were selected for matching were used as an exogenous (treatment independent) and dummy variable intensity of participation was used as an endogenous (treatment dependent). A control group by matching active members to passive members of coops according to their propensity score was formed. The impact of intensity of commitment to cooperative on the outcome variables (Y) using matched observations of active and passive members of cooperative was estimated. Empirically, ATT is represented as;

$$ATT = E_{(P(X)|C=1)} \{E[Y_1 | C=1, P(X)] - [E Y_0 | C=0, P(X)]\};$$

where $Y(1)$ and $Y(0)$ are the outcomes for the treated with treatment (active members); and control group farmers without treatment (passive members) respectively; while $C=1$ is for treated farmers and $C=0$ control farmers. The difference between the two outcomes refers to the treatment effect on the treated (ATT).

Stata version 13.0, SPSS version 25 and Microsoft excel version 2016 were used to analyze and process the data.

4.5.4 Outcome Variables for PSM comparison

Impact indicators are variables that indicates the effect or impact of the treatment variable (active commitment). Evaluation of the impacts of a treatment on the performance of an individual or organization can be done using several approaches. The evaluation can be done by either objective way by measuring the output of the farmers or subjective by using different scales to ask the performance level.

Price was used by Wollni & Zeller (2007) and Shumeta & D’Haeseb (2016) as an outcome of small holder farmers who participate in cooperative. Price is the average price members sold their crops within the farming 2017/2018 farming period in Zambia and was measured in Zkw.

Following Getnet & Anullo (2012) and Ito et al. (2012) farm gross margin of smallholder farmers was used as an outcome variable. Gross margin was measured as the value of harvested produce in the 2017/2018 farming period minus the total variable cost incurred for producing the rice in the period in Zkw.

Access to market was also used as an outcome variable following (Wollni & Zeller 2007; Bernard & Spielman 2009; Fischer & Qaim 2012). Access to market was measured as the percentage of the harvested produce that were sold by the rice farmers in the 2017/2018 farming period.

4.6 Limitations of the Study

There were some limitations of this study. Firstly, the data on the economic performance of the cooperative members could not be 100% accurate. This study acknowledge that the respondents did not have written down information such as income for the year, the quantity harvested, cost of production, etc. and as such provided an approximated figure. The approximate figure affects the reliability of the data and may lead

to over or under estimation of the economic performance indicators. Secondly, there was a language barrier between the respondents and administrators. Data was collected by the help of translators, but the accuracy and reliability of the data may not be perfect. Again, some data were collected by trained administrators without supervision and as such can influence the reliability of the data.

The study acknowledges that commitment could have been measured by not just selling through cooperative but other measures such as participation in training and meetings. However, the leadership of the cooperative led data administrators to the respondents and as such it was difficult to get members who were not attending meetings and trainings.

Some measures taken to increase the reliability and accuracy of the data. Pilot testing was done for a week together with the translators and training administrators. These measures were done to check if members will understand the questions and for the administrators to get used to the questions. Apart from the survey data collection, personal interviews was done with the leadership of the cooperatives and some of the members to triangulate the data collection.

4.7 Principal Component Analysis (PCA) on Perception on Social Attributes in the Cooperative

Principal component analysis (PCA) was used to ensure that the perceived social attributes in the cooperative are independent of each other and the perception statements corresponds reliably to the perception indicators. Factor loading greater than 0.5 indicates the convergent validity so variables with factor loading less than 0.5 needs to be dropped (Birol et al. 2009; Gyau et al. 2016). Also following Gyau et al. (2016), Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO-MSA) was conducted to test the appropriateness of the factor analysis. Kaiser-Meyer-Olkin (KMO) measure greater than or equal to 0.5 is acceptable (Gyau et al. 2016).

The principal component analysis indicates that the members perception about cooperative social attributes can be used in the model. Factor loading for perception statement greater than 0.5 is acceptable (Birol et al. 2009; Cechin et al. 2013; Gyau et al. 2016). All the perceived social attributes have a factor loading more than 0.5 for each of the perception statements. Factor loadings less than 0.5 were eliminated from the component analysis. Perception statement (leader creates atmosphere of trust in cooperative) which belonged to the leadership competence was moved to the acceptance component because it has variance like that of the acceptance statements based on the principal component analysis. All the factors have KMO values more than 0.5 which is an indication of appropriateness of the factor analysis (Gyau et al. 2016). The factor loadings for the perceived social attributes variables as well as their KMO values are highlighted in Table 2 below.

Table 2. Factor Loadings on Social Attributes in Cooperative

Factors and Items	Factor Loadings
Acceptance (KMO=0.65)	
Perception that Cooperative leader creates an atmosphere of trust in the cooperative	0.70
Perception that there is an atmosphere of acceptance in the cooperative	0.70
Perception that Members share their needs with each other	0.68
Perception that Members share their limitations and concerns with each other	0.65
Voice (KMO=0.50)	
Members openly and willingly share their views in the cooperative	0.77
Cooperative meetings are interesting	0.75
Market connections (KMO=0.61)	
You receive higher price for your main product over last 3 years	0.80
You are able to access higher quality inputs at a lower price over last 3 years	0.67
Access to relevant market information have improved over the last 3 years	0.60
Capacity Building (KMO=0.66)	
Opportunity for further training has increased over the last 3 years	0.70
Service from extension agents have improve over the last 3 years	0.63
Access to information about good agricultural practices has improved over the last 3 years	0.56
Leadership Competence (KMO=0.65)	
Perception that cooperative leader is respected in the wider community	0.79
Perception that cooperative leader creates atmosphere of trust in the cooperative	0.72
Perception that cooperative leader has excellent leadership skills	0.77
Trust (KMO=0.50)	
Most people in my cooperative have trust in me	0.73
Most people in my cooperative can be trusted.	0.50
Reciprocity (KMO=0.53)	
To help somebody is the best strategy to be certain that s/he will help you in the future	0.57

If someone does a favor for me, I am ready to return it
 The way I treat others depends much on how they treat me

0.64
 0.71

4.8 Testing for Multicollinearity of Variables

Correlation was performed to check multicollinearity of the independent variables that were used in the probit regression model. The Pearson correlation matrix indicates that there is no multicollinearity between the variables used in the probit model. The Table 3 below shows the Pearson correlation matrix and none of the variables were equal to or more than 0.8.

Table 3. Pearson Correlation Matrix

Variable	a	B	c	D	e	f	g	h	i	j	k	l	m	n
Gender (a)	1.00													
Age (b)	-0.04	1.00												
Education ©	0.17	-0.1	1.00											
Farm size (d)	0.17	0.15	0.08	1.00										
Distance (e)	0.22	0.0	0.03	0.36	1.00									
Diversity (f)	0.07	0.0	0.09	0.18	0.03	1.00								
Experience (g)	0.00	0.25	0.06	0.19	-0.04	-0.01	1.00							
Capacity building (h)	0.19	0.01	-0.04	0.11	0.13	0.09	0.03	1.00						
Acceptance (i)	0.07	0.03	0.07	0.08	0.10	0.04	-0.02	0.14	1.00					
Voice (j)	0.15	0.06	0.05	0.04	0.06	-0.08	0.05	-0.01	0.06	1.00				
Leadership competence (k)	0.01	0.10	0.03	0.18	0.18	0.07	0.00	0.00	0.04	0.17	1.00			
Market connections (l)	0.09	0.14	0.06	0.08	0.08	-0.04	0.04	0.10	0.04	0.06	0.14	1.00		
Trust (m)	0.06	-0.08	-0.07	0.07	0.10	0.08	0.00	0.22	0.07	-0.09	0.16	-0.09	1.00	
Reciprocity (n)	-0.04	-0.01	-0.01	-0.03	0.04	-0.11	0.01	0.10	0.06	0.15	0.02	0.02	0.13	1.00

4.9 Summary of Variables Used in the Study

Table 4 indicates the summary of variables that were used to perform the probit regression model. Comparatively, before matching, the active members have stronger perception about the cooperative social attributes than the passive members. Perception about acceptance in the cooperative, voice, capacity building, market connections,

leadership competence and reciprocity of relationship are relatively higher for the active members as compared to the passive members. However, the passive members have higher trusting and trustworthy behavior perception than the passive members.

Before matching, comparatively, the active members are older than the passive members. In terms of education, the active members have higher level of education as compared to the passive members. The active members have a bigger rice farm than the passive members. The active members are located (Km) far from the larger regional market (Mongu) as compared to the passive members.

Table 4. Variables for Determinants of Intensity of Commitment in Cooperative.

Variable	Description	Measurement	Active (N=72) Mean	Passive (N=143) Mean	Mean difference
Independent Variables					
Acceptance	Member perception about been involved in the cooperative.	5-point Likert scale Average	4.79 (0.36)	4.21 (1.24)	***0.58
voice	Perception about having a voice in the cooperative.	5-point Likert scale Average	4.74 (0.67)	3.76 (1.54)	***0.97
Capacity building (education, training and information)	Member perception about increased access to information, training and education in the last 3 years.	5-point Likert scale Average	4.42 (0.67)	4.16 (0.76)	**0.26
Leadership competence	Members perception about the leadership competence of the cooperative	5-point Likert scale Average	4.73 (0.43)	3.94 (1.45)	***0.78
Trust	Members perception about trust and trustworthy behavior in the cooperative.	5-point Likert scale Average	4.51 (0.71)	4.73 (0.52)	***-0.22
Reciprocity	Members perception about reciprocity of relationship existing in the cooperative in the last 3 years	5-point Likert scale Average	4.60 (0.68)	4.38 (0.79)	*0.21
Market connections	Member perception about increased accessed to market connections in the cooperative in the last three years	5-point Likert scale Average	3.96 (0.63)	3.45 (1.01)	***0.50

Control Variables					
Age	Age of household head	Years	50.76 (12.61)	49.43 (14.91)	*1.33
Education level	Educational Level of household head	Years of formal education	9.88 (2.21)	7.87 (4.33)	*2.00
Farm Size	Size of land owned	Ha	2.73 (2.83)	2.15 (1.90)	***0.57
Diversity	Number of additional crops cultivated by member in addition to rice	Number of additional crops cultivated	2.69 (1.46)	2.74 (1.31)	*-0.05
Experience	Number of years of been a cooperative member	Number of years	5.25 (4.47)	4.12 (5.09)	1.13
Distance to market	Distance to nearest regional market	km	11.83 (12.28)	7.43 (9.52)	***4.40
Gender	Sex of member	1 for male, 0 female	Male-37 Female-35	Male-94 Female-49	

Note: ***, **, and * represents significance level at 1%, 5% and 10% respectively

Table 5 below highlights the economic performance indicators that were used in this study. The active members have higher economic performance than the passive members in terms of price of produce, gross margin and access to market before matching.

Table 5. Economic Performance Indicators

Variable	Description	Variables	Active (N=72) Mean	Passive (N=143) Mean	Mean difference
Price	Average price of output	Zkw/50 KG bag	200.55 (44.19)	166.73 (47.98)	***33.83
Gross margin	Gross margin from farm activities	Value of harvested crops– farm Variable cost (Zkw)	1410.71 (1365.35)	-3598.01 (705.12)	***5008.72
Access to Market	Percentage of produce sold from harvest	Percentage of harvest sold	69.35 (20.84)	54.20 (30.59)	***15.15

Note: ***, **, and * represents significance level at 1%, 5% and 10% respectively

5.0 Results

5.1 Description of Difference Between Active and Passive Members

5.2 Market and Distribution Channels

Figure 2 indicates the percentage of rice that members sell through each market channel in the Western province of Zambia. Greater percentage of active members rice is sold through the cooperative and middlemen as the second channel. However, the passive members sell greater percentage of their rice through spot market and wholesale market.

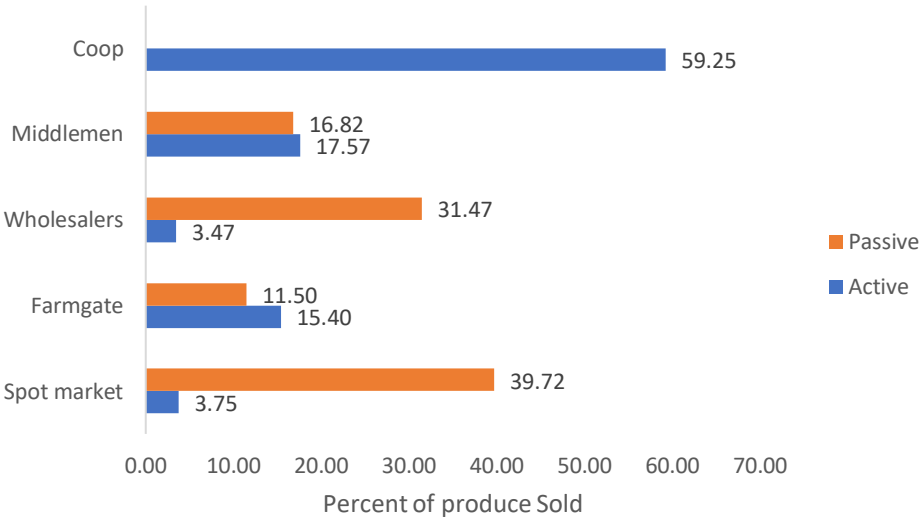


Figure 2. Market Distribution Channels

5.3 Difference in Terms of Non-Economic Benefits

Table 6 below shows results of the non-economic benefits of the active and passive members. The Mann-Whitney test indicates that the active members have higher significant non-economic benefits in terms of access to information about good agricultural practices, access to extension services, and training as compared to the passive members. However, access to market information and access to training were not statistically significant.

Table 6. Non-Economic Benefits

Variables	Active (N=72)	Passive (N=143)	Mann Whitney	Mean difference
	Mean	Mean		
Perception about access to Good agricultural Practices	4.61 (1.00)	4.36 (1.03)	4117	***0.25
Perception about access to extension services	4.47 (0.96)	3.97 (1.22)	3702.5	***0.50
Perception about access to relevant market information	4.00 (1.42)	3.87 (1.29)	4650	0.13
Perception about access to trainings	4.60 (0.82)	4.45 (0.92)	4702	0.15

Note: *** represents 1% significant level

5.4 Influence of Perceived Social Attributes in the Cooperative on Intensity of Commitment

5.4.1 Determinants of Intensity of commitment

The determinants of intensity of commitment to cooperative was tested with probit regression model as shown in Table 7. The goodness-of-fit tests show that the covariates selected give a good estimate of conditional density of intensity of commitment. The independent variables are jointly statistically significant with Wald $\chi^2 = 74.85$, $p > 0.00$. The Pseudo R^2 of 0.4 indicates a good fit model.

Table 7. Probit Model Results of Determinants of Intensity of commitment to Cooperative

Intensive	Coefficient	standard Error	Z
Capacity building	0.45	0.18	**2.46
Acceptance	0.57	0.15	***3.79
Voice	0.41	0.10	***4.16
Leadership competence	0.51	0.13	***3.93
Market connections	0.30	0.13	**2.27
Trust	-0.58	0.21	***-2.94
Reciprocity of relationship	0.31	0.20	**1.61
Gender	-0.01	0.24	-0.04
Age	-0.01	0.01	-1.05
Education	0.09	0.03	***3.05
Farm size	-0.04	0.05	-0.83
Distance to market	0.02	0.01	1.16
Number crops additional to rice	-0.03	0.08	-0.37
Experience in cooperative	0.06	0.02	***2.04
Constant	-9.44	1.83	***-5.16

Wald χ^2 (16)	74.85
p-value	0.00
Pseudo R2	0.40
Log pseudolikelihood	-82.48
Number of observations	215.00

Note *** and ** represents 1% and 5% respectively; robust standard error reported

All the perceived social attributes (capacity building, acceptance, voice, leadership competence, market connections, and reciprocity of relationship) have significant positive influence on intensity of commitment to the cooperative by the members. However, trust have significant negative influence on intensity of commitment to the cooperative by the members.

In terms of the personal characteristics used as control variables, only educational level of member and experience in cooperative have significant positive relationship with intensity of commitment in cooperative and the relationship is significant at 1%.

5.5 Intensive Commitment in Cooperative Economic Impact Estimation Results

The average price at which members sold their rice, market access (percent of produce sold from harvest), and gross margin were used as impact variables in this study. The estimates of the propensity score matching technique are presented and discussed in this section.

5.5.1 Propensity Score Matching Estimation Results

The density of propensity scores of the treated (active members of cooperative) and control (passive members of cooperative) have been depicted in Figure 3. The substantial overlap in the distribution of propensity scores indicates that the condition of common support has been fulfilled (Fischer & Qaim 2012; Mojo et al. 2017). Most of the active members are comparable to the passive members. 9 members were out of the support

region and as a result the sample size was 206 (active members were 64 and the passive members were 142) for the estimation of the average treatment effect on the treated (ATT).

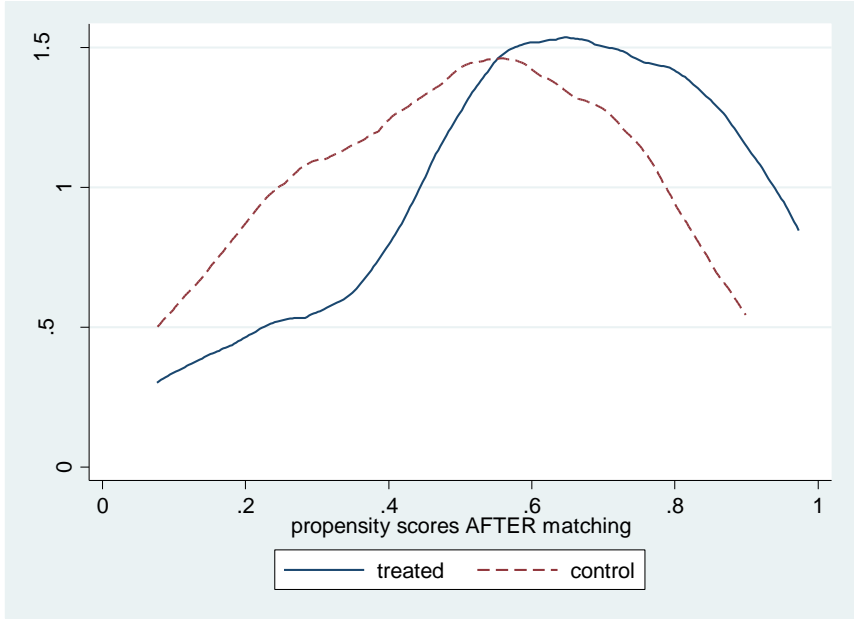


Figure 3. Propensity Score Distribution

Table 8 shows that both the unmatched and all the three algorithms of PSM estimates indicate significant positive impact of intensity of commitment to cooperative on the price members sell their rice, market access, and gross margin. The members who are actively committed to the cooperative sell their rice at higher price as compared to the passive members. Active members earn more than the passive farmers after deducting the total variable cost that was used in production of the rice in the 2017/2018 farming period in Zambia. The active members sell greater percentage of the rice they harvested compared to the passive members.

Table 8. PSM Estimates of Economic Impacts

Variable	Matching Algorithms	Treated	Controls	ATT	Bootstrapped S.E.	z
Price (ZKw)	Unmatched	200.55	166.73	33.83	6.777	***4.99
	Nearest Neighbor	200.78	173.91	26.88	17.84	*1.76
	Radius	200.78	167.45	33.32	11.91	***2.67
	Kernel	200.78	168.79	31.98	13.48	**2.33
Market Access (% sold)	Unmatched	69.35	54.20	15.15	4.01	***3.78
	Nearest Neighbor	68.65	49.59	19.05	8.94	**2.13
	Radius	68.65	48.31	20.33	8.15	**2.50
	Kernel	68.65	48.85	19.79	7.34	***2.70
Gross Margin (ZKw)	Unmatched	1410.71	-3598.01	5008.72	1391.97	***3.60
	Nearest Neighbor	756.85	-3004.35	3761.20	2321.13	*1.63
	Radius	756.85	-2988.19	3745.05	2390.19	*1.65
	Kernel	756.85	-3023.39	3780.25	1827.18	**2.06

Note: ***, **, and * represents 1%, 5% and 10% significance levels respectively; 1 USD=14.77 ZKw

6.0 Discussion

This study investigates the economic benefits that rice farmers achieve as a result of being committed to their cooperative. Furthermore, the study analyzes the influence of members' perception about cooperative social attributes on commitment as well as the market outlets used by members and non-economic benefits that members gain from cooperative.

The active members sell greater percentage of rice through cooperative on the average. It can be assumed that active members see the cooperative as a market which provides them secure fixed price and the cooperative offers higher price as compared to the other market outlets. Even though the active members sell through the cooperative they sell some quantity through the other channels because they need money for transactive and precautional motives of money. In an interview with the members of the cooperative, *"they indicated that it takes longer days for the cooperative to offer payment for their produce as compared to the other market channels"*. Comparative to the active members, the passive members prefer to sell greater percentage of the rice through the spot market. The passive members believe that selling through the other channels help them sell their rice quicker as compared to the cooperative.

The results indicates lack of entrepreneur spirit in terms of cooperative serving mainly as an instrument for reaching markets. This can be explained by the known fact confirmed also by (Baka 2011) that management of cooperatives lack leadership skills and innovative ways to get liquidity to run the cooperative. It was interesting to find from interview with the leadership that *"they are ignorant on the importance of selling through the cooperative"*.

Also, the government using cooperative as a means for farmers to get access to input subsidies has led to passive behavior in the cooperative. It can be opined that the passive members are existing in the cooperative without any economic justification to be actively involved in the cooperative but to get access to government input subsidies as

found by other researchers such as (Francesconi & Wouterse 2015; Michalek et al. 2018). In most African countries, farmers exist in the cooperative because government and NGOs provide them with benefits and input subsidies but not because of economic justifications of participating in cooperative. Francesconi & Wouterse (2015) highlighted that incentives provided by MiDA and other NGOs led to formation of many cooperatives in Ghana with artificial rent seeking as their sole objective.

In terms of non-economic benefits, the active members benefit more than the passive members apart from trust. Desire for members' capacity to be built in various forms such as workshops, seminars, exposure visits, etc., motivate members to be active. In an interview with the members, they indicated that *"they love the social cohesion they get as a result of participating in the cooperative"*. Passive members also enjoy some of the non-economic benefits in the cooperative. The active members are affectionately committed to the cooperative because they have gone beyond just existing in cooperative because of socialization experience to alignment of the cooperative objectives to their personal objectives (collective marketing). The non-economic benefits that the passive members enjoy may influence them to be normatively committed to the cooperative (existing in the cooperative because of socialization experience) as explained by Meyer & Alien (1991) in the theory of organizational commitment.

From the probit model, perception about the capacity building of the members have influence on intensity of commitment to the cooperative and the result is in line with (Gyau et al. 2016). The cooperative members get access to education, training and information from the provincial cooperative officers and ministry of agricultural officers. Knowledge gained from the cooperative such as information about marketing and prices as well as good agricultural practices influence members to know the importance of selling through the cooperative. Some of the active members highlighted that *"selling through the cooperative would help the cooperative to be sustainable in the future while they also achieve higher price"*. As it was found by other researchers such as Birchall & Simmons (2004) and Ruiz Jiménez et al. (2010), valuable learning experience, provision of appropriate level of

information and open learning environment motivates members to be actively committed to the cooperative.

The results of acceptance influencing commitment in cooperative is consistent with (Ruiz Jiménez et al. 2010; Cechin et al. 2013; Verhees et al. 2015). It can be opined that when members perceive they are accepted in the cooperative, they feel emotionally attached and dedicated to the cooperative and as such reduce apathy on the part of the members in the cooperative. Members who perceive that they are accepted in their cooperative think about the long-term success of the cooperative and as such forgo their short terms gains. Birchall & Simmons (2004) study highlighted that collective shared goals, shared values and sense of community have significant influence on intensity of participation in cooperative.

Trust and reciprocity of relationship that exists in cooperative has significant influence on whether a member will be committed to the cooperative or not. The finding of positive relationship between reciprocity and commitment is consistent with (Liang, Huang, Llu & Wang 2015). The relationship between trust and intensity of commitment to cooperative is negative in this probit model and it is in line with (Gyau et al. 2016). It can be explained that positive reciprocity of relationship makes members feel the sense of belongingness in the cooperative and as such becomes loyal to the cooperative. The negative relationship between trust and commitment in the probit may be attributed to the fact the passive members on the average have higher trust in the other members of the cooperative as compared to the active members. This may be assumed that if in the long run the passive members continue to freeride in the cooperative, the active members may cease not to sell through the cooperative as was noted in the interview with some of the members, thereby, rendering the cooperatives ineffective.

The significant positive relationship between members perception about having voice or opinion in the cooperative and intensity of commitment to the cooperative is similar to previous studies such as (Cechin et al. 2013; Verhees et al. 2015). This can be explained that when there is open communication in the cooperative, the members express

their feelings which in turn reduce free riding behavior in the cooperative. It is assumed that members who believe their voice is respected in the cooperative becomes loyal to the cooperative and as such sell their produce to the cooperative even when the price that the cooperative offers is lower than that of the cooperative competitors as indicated by other researchers like (Fulton 1999; Cechin et al. 2013).

It can be opined from the probit results that members tend to sell their produce to the cooperative when they perceive the management of the cooperative is efficient and performing. Members perception that their leader is respected in the wider community, has excellent leadership skills and the leader creates atmosphere of trust in the cooperative, influence them to become affectionately committed to the cooperative and do not demonstrate free rider behavior in the cooperative. High level of perception about the leadership competence influence members to bring all their harvest to the cooperative because they believe the cooperative is beneficial to them as found by Ruiz Jiménez et al. (2010).

The model also indicates that when members have strong perception that cooperative can link them to market, they tend to be committed to the cooperative. It is assumed that members who perceive that cooperative connects them to market believe that cooperative is beneficial to them in terms of getting access to higher price, and other output and input market linkages. Provision of market connection by cooperative to the members leads to the desire for joint marketing or bulking and pooling of resources by the members. Also, the passive members believe that cooperative can connect them to the market, but it takes longer period before the cooperative offers' payment for their produce. The positive relationship between intensity of commitment and market connection is consistent with (Cechin et al. 2013; Gyau et al. 2016).

In terms of the control variables (personal characteristics of members), years of education of members and years of been a member of cooperative (experience) have significant relationship with intensity of commitment to the cooperative. A year increase in educational level has the probability of 9% for a member to be committed to the

cooperative and a year increase in experience in cooperative has tendency of 6% for a member to participate intensively in cooperative. It is assumed that highly educated and experienced members know the benefits of selling or bulking through the cooperative as found by other researchers (Cechin et al. 2013; Muthyalu 2013; Fischer & Qaim 2014).

The unmatched and all the three algorithms of PSM estimates indicate significant positive impact of active commitment to cooperative on the price members sell their rice, market access, and gross margin. The results show that even though that participation in cooperatives offer economic benefits to members as found by other researchers such as Getnet & Anullo (2012), Ito et al. (2012), Fischer & Qaim (2014), Mojo et al. (2017), and Getnet et al. (2018), the benefits that members who undertake collective marketing achieve is greater than the members who do not do collective marketing. This confirms known fact by the International Cooperative Alliance (ICA) that for cooperative to benefit the members, members should be economically participating in the cooperative (more importantly bulking or collective marketing of produce in the cooperative). Without the members' economic participation, both active and passive members achieve only non-economic and social benefits in the cooperative.

Due to stronger negotiating power of the cooperative on the market, farmers can benefit from higher price for their rice as found by other researchers such as (Wollni & Zeller 2007; Rommel et al. 2013; Getnet et al. 2018). The higher price received by the active members may be attributed to the fact that they sell greater portion of their produce on the average to the cooperative. Higher gross margin for active members can be explained either by reduction in variable cost of production at same level of output or increased output at same variable cost of production and all these can be achieved in cooperative through economization of transaction cost. The significant impact of active participation in cooperative on gross margin is similar to (Getnet & Anullo 2012; Ito et al. 2012). In general, active commitment to cooperative has significant positive influence on access to market (percent of produce sold) by smallholder rice farmers and the results is in line with (Wollni & Zeller 2007; Bernard & Spielman 2009; Fischer & Qaim 2012). The active members are

less exploited in terms of price by trading partners (cooperative linkage to output market)
and as such motivates them to sell some percentage of their produce to the cooperative.

7.0 Conclusion and Recommendation

The main aim of this study was to analyze the economic impact of active commitment to cooperatives. The commitment in cooperative was defined as active and passive with the active been members who attend meetings in cooperative as well as sell all or part of their produce through the cooperative whereas the passive members only attend meetings of cooperative but do not sell through the cooperative. 215 rice farmers who are members of cooperative in the Western province of Zambia were purposively and snowballed selected from the Limulunga and Mongu districts. Structured questionnaire on nest form application was used to interview the rice farmers who are members of cooperative to obtain data on their perception about cooperative social attributes, household and farm characteristics and data on their economic performance.

Both the active and passive members benefit from the cooperative non-economically even though the non-economic benefits of the active members are significantly higher than the passive members.

Social attributes such perceived acceptance, market connections, capacity building, voice, leadership competence, trust and reciprocity significantly influence intensity of commitment to cooperative by rice farmers. The hypothesis H_{1a} social attributes such have influence on commitment to cooperative is accepted.

The members who are actively committed to the cooperative achieve higher economic benefits than the members who are passive and their membership is rather formal. All the economic impact indicators (price of rice, access to market, and gross margin) were statistically significant based on unmatched and all propensity score matching algorithms. Therefore, the alternate hypothesis H_{1b} stating that achieved positive economic benefits are related to the level of members commitment in the cooperative is accepted.

Based on the results of this study, the following recommendations are made;

- Awareness on the importance of selling through cooperative should be created by way of education and training among the cooperative members.

- Since selling through cooperative yields members with higher price and have greater gross margin than other members who do not sell through cooperative, members should be encouraged by the leaders of the cooperative to sell their produce through cooperatives.
- To be able to provide more members with this marketing services, the management should be trained and encouraged to seek for more market opportunities as a main cooperative activity.
- Future studies should take into consideration participation in meetings, trainings as well as selling through cooperative to better understand the issue of members commitment from different dimensions.

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Appendices

1. Questionnaire for data collection

MEMBERS QUESTIONNAIRE

These questionnaires have been designed to execute a research purposely for academic work. The principal objective is to analyse the economic and social performance of farmers' groups and their determining factors in participation of agricultural cooperatives. All information provided will be used solely and exclusively for academic purpose and all respondents will remain anonymous to the public domain. Information provided would be used to make sound empirical analysis and suggest policy recommendations that would help improve market access and farmer's socio-economic well-being and standard of living in the region. The entire interview will take 30 minutes of your time and you are kindly requested to provide honest and genuine answers within your possible best.

Interview date...../...../20.....

A. Demographic and Socio-Economic Data

Filled by enumerator:

1. GPS coordinates
2. Name of province
3. Name of ward/community

4. What is the percentage of your production that you sell through the cooperative?
.....(0-100%)
5. What is the percentage of attended meetings out of total number of coop meetings?... (0-100%)

6. Name of the cooperative
7. Gender [1] Male [0] Female
8. Main product (Rice, Cassava)

Filled with respondents:

9. Age of respondent in years
10. Years of education of respondent.....
11. Do you own television, radio and mobile phone? [] No [] Yes
12. What is your total land holding (in hectares)?
13. How many of the agricultural land do you cultivate [in hectares]?
14. What is the distance from your farm to the nearest bigger regional market centre where you can sell your products? [km]
15. Do you agree that the cooperative can bring you economic and non-economic benefits?

[] Strongly Disagree [] Partly Agree [] Neither agree nor disagree [] Partly Agree [] Strongly Agree

Economic Benefits of cooperative

Cost of inputs

16. Labor

- a. Please indicate the quantity of labour (in man days) that you utilized in the first season of your farming operations.....
- b. Please indicate the quantity of labour (in man days) that you utilized in the second season of your farming operations.....
- c. What is the cost per unit (ZK) of labour in the first season?
- d. What is the cost per unit (ZK) of labour in the second season?

Seeds

- e. Please indicate the quantity of seeds (KG) that you utilized in the first season of your farming operations.....
- f. Please indicate the quantity of seeds (KG) that you utilized in the second season of your farming operation.....
- g. What is the cost per unit (ZK) of seeds in the first season?
- h. What is the cost per unit (ZK) of seeds in the second season?

Fertilizer

- i. Please indicate the quantity of fertilizers (KG) that you utilized in the first season of your farming operations.....
- j. Please indicate the quantity of fertilizers (KG) that you utilized in the second season of your farming operations.....
- k. What is the cost per unit (ZK) of fertilizers in the first season?
- l. What is the cost per unit (ZK) of fertilizers in the second season?

Insecticide

- m. Please indicate the quantity of pesticide (litters) that you utilized in the first season of your farming operations.....

- n. Please indicate the quantity of pesticide (litters) that you utilized in the second season of your farming operations.....
- o. What is the cost per unit (ZK) of pesticide in the first season?
- p. What is the cost per unit (ZK) of pesticide in the second season?
- Herbicide
- q. Please indicate the quantity of herbicide (litters) that you utilized in the first season of your farming operations.....
- r. Please indicate the quantity of herbicide (litters) that you utilized in the second season of your farming operations.....
- s. What is the cost per unit (ZK) of herbicide in the first season?
- t. What is the cost per unit (ZK) of herbicide in the second season?

Revenue

17.

- a. What quantity of produce were you able to harvest in season 1?
- b. What quantity were you able to sell in season 1?
- c. What was the price of your produce in season 1?
- d. What quantity of produce were you able to harvest in season 2?
- e. What quantity were you able to sell in season 2?
- f. What was the price of your produce in season 2?

Market Access

18. Please indicate your level of agreement with this statement. I am confident that after harvesting my produce I will get buyers to buy.

Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

19. How many days do you spend to sell your produce?

.....

20.

- a. What percentage of your produce do you sell through cooperative? (out of 100%)
- b. What percentage of your produce do you sell through stable contacts with some middlemen? (out of 100%)
- c. What percentage of your produce do you sell through bulk stations? (out of 100%)
- d. What percentage of your produce do you sell through wholesalers? (out of 100%)
- e. What percentage of your produce do you sell through farm gate? (out of 100%)

Innovation and Diversification

21. Please indicate the degree to which you can get access to technologies (Example Rice milling machine) to process your produce after harvesting. On scale of 1 to 5 with 5 been 100% processing your produce and 1 been 0% processing.

5 4 3 2 1

22. Please indicate your level of agreement in terms of access to quality and high yielding varieties of seeds in your farming operation. On a scale of 1 to 5 with 5 been less difficulty in getting access and 1 been extreme difficulty in getting access.

5 4 3 2 1

23. How many other crops you produce in addition to your main crop?

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Social Benefits of cooperatives

Please indicate your level of agreement with the statement related to trust in your community.

Trust Statements

24. Most people in my community, farmer association or cooperative can be trusted.
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
25. Most people in my community, farmer association or cooperative have trust in me
 Strongly Disagree Partly Agree agree nor disagree Partly Agree Strongly Agree

Reciprocity Statements

26. If I work hard, I expect it will be repaid
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
27. To help somebody is the best strategy to be certain that s/he will help you in the future
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
28. If someone does a favor for me, I am ready to return it
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
29. The way I treat others depends much on how they treat me.
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

Voluntary and Open Membership

30. Cooperative functions according to the cooperative principles of democracy and transparency.
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
31. Cooperative meetings are interesting and attended with excitement?
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
32. Members openly and willingly share their views in the cooperative?
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
33. Members share their limitations and concerns with each other?

- Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
34. Members share their needs with each other
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
35. Members forgot their self-interest for the good of the group
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
36. Members reach decisions with ease and are satisfied with it
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
37. I attend all the meetings of the cooperative
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
38. I consider myself as active member of the cooperative
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
39. My leader has excellent leadership skills
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
40. Our leader is respected in the wider community
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
41. Cooperative leader has the biggest impact on how the cooperative looks like today
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
42. Cooperative leader always consult the members before important decision
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
43. Cooperative leader creates an atmosphere of trust in the cooperative
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
44. Cooperative leader allows the members to express dissenting point of views
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

Education, Training and Information

- a. Access to information about good agricultural practices has improved over the last 3 years.
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

- b. Service from extension agents have improve over the last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- c. Access to relevant market information have improved over the last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- d. Opportunity for further training has increased over the last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- e. You have better chance to mutually share experience with other farmers than 3 years ago
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

Economic Benefits

Indicate your level of agreement or disagreement with these statements

- 45. The yield of your product (per hectare, beehive or animal) has increased in the last 3 year because of the membership in cooperative.
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 46. Your income has increased in the last 3 years because of the membership in cooperative
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 47. You are able to access higher quality inputs at a lower price over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 48. You receive higher price for your main product over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 49. You have now more business contacts than 3 years ago
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 50. Purchase of your products is now more secure and stable over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 51. You don't have to dedicate so much time to marketing and selling over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
- 52. You have reduction in the costs of production in the last 3 years

- Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
53. You have better access to credit and saving services over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
54. You have better access to process your production over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
55. You have better access to storing of your production over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
56. Your bargaining power on the market has improved over last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree
57. Service from input suppliers has improved over the last 3 years
 Strongly Disagree Partly Agree Neither agree nor disagree Partly Agree Strongly Agree

Thank you