

FACTORS AFFECTING INCOME GENERATION AMONG SMALLHOLDER FARMERS WITH AGRICULTURAL COOPERATIVE MEMBERSHIP IN ZAMBIA

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Abstract. This study analysed the effects of cooperative member characteristics on income generation among smallholder farmers in Chibombo district of Central Zambia using logistic regression from a sample size of 398 co-operative members. The aim of the study was to analyze factors affecting income generation among small-holder farmers with membership in agricultural cooperatives, and to identify factors that increase their income. Data were collected in May 2020 using a questionnaire. The empirical data indicated that income increased when there were increases in the cultivated area, primary education and cooperative membership period of 5–10 years but decreased with marriage, being widowed and a farming experience period of 5–10 years. The other factors had no significant effect. Thus, the study concludes that increasing cultivated area, duration of cooperative membership and attending at least primary education would better income generation among cooperative members.

Keywords: agricultural co-operative, smallholder farmers, member incomes

INTRODUCTION

Zambia's rural population has been rated as experiencing high poverty levels (Central Statistical Office, 2015) and agricultural cooperatives have been considered an important vehicle for improving farmer incomes in a bid to reduce poverty as the heavy economic reliance

on copper mining has not helped overcome it (Chisanga and Chapoto, 2015). The agricultural sector remains the most critical and important option in the fight against rural poverty due to its massive potential for increasing employment and eliminating hunger since approximately 67 per cent of the most active population in the country depends on the sector with smallholder agriculture being the main source of livelihoods and employment (Central Statistical Office, 2015). Thus, improvements in the sector are more likely to affect a considerable segment of the country's population (Lolojih, 2009; Ministry of Commerce, Trade and Industry, 2019) especially through cooperatives (Birchall, 2005). Studies on agricultural co-operatives have been widely undertaken on co-operative performance, ownership and governance, and finance, among others (Ahmed and Mesfin, 2017; Abate et al., 2014; Abebaw and Haile, 2013). Cooperatives are understood to provide the capacity to raise the scale of business performance and incomes for smallholder farmers at a higher than farm-gate level in the marketing chains (Johnson et al., 2002; Jones, 2004; Barham, 2007). Although co-operative membership has been found to improve access to better commodity prices, membership heterogeneity has been found to cause uneven distribution of the benefits and operational inefficiency (Jia and Huang, 2011). However, in spite of the known problems associated with cooperatives, they are still considered as an important vehicle

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for taking development and industrialization to the rural poor (World Bank, 2003; 2008; Chirwa, 2012) through access to high value markets (Markelova et al., 2009).

RESEARCH PROBLEM

Although cooperatives are considered as instruments for raising rural incomes, the real impact in rural Zambia is not understood due to poverty levels that have remained high. It is hypothesized that cooperatives, as business institutions, should promote social innovations and entrepreneurship for learning business skills which can drive members out of poverty (Novkovic, 2008) and developing resilience against it (Borda-Rodriguez and Vicari, 2014). Since poverty is high in rural Zambia, there are real questions as to whether cooperatives are meeting the income improvement objective among its members. Thus, the study sought to address the following questions: (a) are there member income improvements among members? (b) are there any factors associated with income changes among cooperative members? (c) if yes, what factors could be associated with income improvements and non-improvements? Based on these questions, the objectives were to isolate income improvements among cooperative members and identify factors responsible for such improvements among cooperative members in the Chibombo district of Zambia.

MATERIALS AND METHODS

The study was conducted in Chibombo district in Central Zambia in May 2020 on a population of 83,600 using a sample size of 398 small-holder farmers belonging to cooperatives selected using the Yamene (1967) equation. Members of cooperatives were purposively sampled using Snowball sampling technique. A questionnaire with questions on farmers' characteristics and whether farmers had experienced income improvements since joining cooperatives were administered. Binary data were collected and summarized for each farmer, and a correlation matrix was run to isolate strongly correlated variables. A logistic regression was finally run using STATA software on the selected variables. Income change data were collected as (0,1) with 0 being non-improvement and 1 being improvement after joining cooperatives for the dependent variable. For the selected independent variables, age was captured as (0,1) with 1 being 35–59 years and 0 being all the other years.

Marital status was captured at three different levels. The married were captured as 1 and the otherwise as 0. The separated were captured as 1 and the otherwise as 0, whereas the widowed as 1 and the otherwise as 0. For education, those without education were captured as 1 and the otherwise as 0, whereas the primary educated as 1 and the otherwise as 0. On farming experience, those with 5–10 years were captured as 1 and the otherwise as 0. On off-farm income, farmers with off-farm income were captured as 1, whereas those without as 0. On land ownership, farmers with own land were captured as 1 and those without as 0. On size of cultivated area, farmers cultivating above 2 hectares were captured as 1 and those with 2 hectares or less as 0. On paid up membership, farmers with paid up membership were captured as 1 and the non-paid as 0. Lastly, on cooperative membership duration, farmers with 5-10 years were captured as 1 and the otherwise as 0. Variables such as gender, farm size, and secondary and tertiary education were left out because they were highly correlated with some of the selected independent variables. The analysis involved testing the null hypotheses that regression coefficients were significantly different from zero against the alternative that they are significantly different from zero. Farmer factors with coefficients significantly different from 0 were concluded to affect income of farmers. Among these factors, those with positive coefficients were concluded to improve farmer incomes, whereas those with negative ones were concluded not to improve incomes.

RESEARCH FINDINGS AND DISCUSSIONS

Table 1 shows the 13 variables used in the study.

Based on the mean, the table shows that respondents in the study were mostly of the age 35-59 years and were mostly married. On level of education, most respondents had primary education and most had 5–10 years of experience in farming. Respondents also had mostly off-farm incomes, had their own land, were paid up cooperative members, and had indicated improved incomes after joining cooperatives. On the contrary, most members indicated that cooperative membership was mostly not of the 5–10 years, and cultivated 2 hectares or less of their farms.

The logistic regression outputs are presented in Table 2, and they reveal that

Table 1. Description of research variable outcomes

Variable				Min	Max
AGE (35-59 or otherwise)	388	0.619	0.486	0	1
MRDOW (married or otherwise)	388	0.750	0.434	0	1
SEPOW (separated or otherwise)	388	0.008	0.088	0	1
WDWOW (widowed or otherwise)	388	0.093	0.291	0	1
NEDOW (no education or otherwise)	388	0.039	0.193	0	1
PEDOW (primary education or otherwise)	388	0.608	0.489	0	1
EXP (5-10 years of experience or otherwise)	388	0.768	0.423	0	1
OFINC (off farm income or otherwise)	388	0.575	0.495	0	1
OWNLD (own land or otherwise)	388	0.979	0.142	0	1
CULTAREA (cultivated area – above 2 ha or otherwise)	388	0.461	0.499	0	1
PUPCOOPM (cooperative paid up members – yes or otherwise)	388	0.876	0.330	0	1
MEMDR (membership duration – 5–10 years or otherwise)	388	0.278	0.449	0	1
INCIMP (income change – increased or otherwise)	388	0.724	0.447	0	1

Source: own elaboration.

Table 2 shows the regression results which indicate that membership duration, cultivated area, experience, primary education, no education and marriage had an effect on income improvement since their coefficients were all significantly different from 0. Farming experience of 5–10 years, cooperative membership period of 5–10 years and cultivated area above 2 hectares were found to affect income at 1% level of significance, whereas primary education was found to significantly increase farmer incomes at 5% of level significance and no education and marriage at 10% level of significance. Thus, farming experience, cooperative membership and cultivated area were found to be the most significant factors affecting member incomes in cooperatives followed by primary education, whereas marriage and no education were found to be the least affecting factors. Of these factors, membership duration, cultivated area and primary education were found to increase incomes among cooperative members. On the contrary, experience, lack of education and marriage were found to decrease incomes of cooperative members. The table also reveals that age, marriage separation, death of spouse, off-farm income generation, owning land and being a paid up cooperative member were not found

to affect incomes of cooperative members since their coefficients were found not to be significantly different from 0.

The effect of cultivated area on income seems to agree with the hypothesis in ICA (2018) which argues that membership to cooperatives increases sharing of knowledge on production skills, leading to increased sales and incomes. Furthermore, agricultural cooperative membership allows for knowledge and technological transfer owing to not only the spill-over effects but also because collective action promotes innovation and learning among members of the agriculture co-operative (Chagwiza et al., 2016). The effect of cultivated area could also be attributed to effective input use as argued by Kuteya et al. (2016). In addition to this, Chibbompa (2018) states that the current farm support has more beneficiaries than the previous system (Imboela, 2005). However, Kuteya and Kabwe (2015) argue that income improvements could only be better in good rainfall seasons since in poor seasons sales could be poor (RALS, 2015) due to risks of poor rainfall (Siegel and Alwang, 2005).

Small-land holdings could work against income generation. RALS (2012) states that 64 per cent of

Table 2. Regression results

Variable	Coefficients	P-value	Observation
Intercept	2.466	0.039	**
AGE (35-59 or otherwise)	0.007	0.980	ns
MRDOW (married or otherwise)	-0.745	0.066	*
SEPOW (separated or otherwise)	19.363	0.998	ns
WDWOW (widowed or otherwise)	-0.237	0.684	ns
NEDOW (no education or otherwise)	-1.140	0.058	*
PEDOW (primary education or otherwise)	0.538	0.046	**
EXP (5-10 years of experience or otherwise)	-0.990	0.007	***
OFINC (off farm income or otherwise)	-0.322	0.231	ns
OWNLD (own land or otherwise)	-0.634	0.575	ns
CULTAREA (cultivated area – above 2 ha or otherwise)	1.335	0.000	***
PUPCOOPM (cooperative paid up members – yes or otherwise)	-0.401	0.314	ns
MEMDR (membership duration – 5–10 years or otherwise)	1.071	0.001	***
Chi-square	66.273		
Observations	388		

*** $p < 1\%$, ** $p < 5\%$, * $< 10\%$, ns – $p > 10\%$.

Source: own elaboration.

smallholder farmers in Zambia own less than 2 ha of land, while 30 per cent own from 2 ha to under 5 ha and only about 6 per cent own more than 5 ha. The Crop Forecast Survey (2011) indicated that 54 per cent of the smallholders cultivated all the land they owned, while 41 per cent cultivated less than they owned and 4 per cent cultivated more than they owned. Hichaambwa and Jayne (2014) state that smallholder farmers in Zambia own less than two hectares of land. Considering that there is a direct relationship between land and agricultural production and productivity, land size limitations explain the low levels of income among smallholder farmers especially in countries where the agriculture sector predominates (Deininger and Ohinto, 1999). Since the land constraint is cross-cutting among agricultural co-operative members and non-members, its impact on low productivity is easily felt by both groups.

The insignificant effect of off-farm incomes could be synonymous with the need for alternative sources of funding from cooperative membership (Nurudeen and Olumuyiwa, 2021). Moreover, Akwabi-Ameyaw (1997),

Sitko et al. (2012) and Mason et al. (2013) all argue that most agricultural co-operatives in Zambia and Africa are formed with the view to accessing government support. Co-operatives are generally seen as cost-effective channels through which benefits including subsidies, credit and training to a group of farmers may be undertaken more effectively and efficiently (Chirwa and Kydd, 2005). In addition, dealing with cooperatives allows for the government to support, although they tend to be turned into political tools for canvassing votes (Mason et al., 2016). Mason et al. (2013) found that access to farming inputs under government support had positive effects on increasing yield and incomes throughout Zambia, but the extent to which the programme's benefit was attributable to co-operative membership remains unclear because of it being used as a conduit for accessing subsidies offered by the government. Other studies such as IFAD (2018) observed that government support tends to have lower positive effects on agricultural production, productivity and incomes. Experience in cooperative membership also entails having training opportunities

that see inexperienced farmers improve on their skills and knowledge and various other capacity building efforts (OECD, 2016). King and Ortmann (2007) contends that the best way to adapt in a beneficial fashion may be through the sharing of ideas, information, and knowledge among farmers, as well as the incorporation of outside knowledge from other organisations in the private and public sectors such as government agencies, not-for-profit organisations, and international development agencies. Therefore, an agriculture co-operative developed to improve access to new ideas and methods is likely to have substantial gains in both the short and long term. It can also result in forced commercialization of small-holder agriculture (Bernstein, 2010) which leads to reduction in government support dependence in the long run (Akwabi-Ameyaw, 1997) and increases advocacy for infrastructure and policy improvement (Kuteya and Kabwe, 2015; OECD, 2016). However, there are arguments that income improvements among cooperative members could be attributed to government support rather than farmer initiative in cooperatives (Sitko et al., 2012; Mason et al., 2013; Kuteya et al., 2016). Cooperatives have also been identified as sources of income improvements through use and adoption of improved agricultural technologies as observed by Lolojih (2009).

CONCLUSION

The study concludes that farmer incomes improve among cooperative members who, generally, are in the following categories: large cultivated area, 5–10 years of cooperative membership, and primary education. Thus, higher than primary education is not necessarily critical in raising farmer incomes among cooperatives members. However, incomes tend to be lower in the following farmer categories: 5–10 years farming experience, widowed and married, but it remains more or less unchanged under the other marriage categories. Age, off-farm incomes, being paid up members and land ownership do not necessarily affect incomes of members. The study recommends primary school educated members to join cooperatives to raise their incomes. Moreover, farmers need to increase land under cultivation.

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