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Analysis of the Nature and Level of Social Capital in Smallholder Grain Farmers Marketing Groups in Kenya

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Abstract
Bridging and bonding social capital has been known to widen the benefits of collective action. Data drawn from 100 smallholder grain farmers groups in Mt. Kenya region was used to measure three dimensions of bonding social capital namely: relational, cognitive and structure. Social capital results indicated that the groups' bonding social capital was relatively high and equal as indicated by strong close connections, trust among members and sharing a common vision. However, the groups varied significantly ($p \leq 0.1$) in their level of bridging social capital where high performing groups in collective grain marketing had the highest average score (0.88), followed by average groups (0.44) and then low groups had the least (0.35). This indicates that bridging social capital could have had a positive and significant influence on group grain marketing performance. This shows that strong bridging social capital embedded within a group with strong bonding social capital fosters more successful collective action.
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1.0 Introduction

The availability of bridging social capital (linkages) to institutions and individuals has been known to improve their access to resources and opportunities giving them an added advantage to perform better than those without (Lawal *et al.,* 2009). Liang *et al.* (2015) adds that the availability of trust, close connections, reciprocity and cooperation among market agents could also add to strengthening their gains from services and goods produced.

Social capital has attracted diverse definitions, interpretations, forms and methods of measurement. Sander (2015) defined social capital as the total value of social networks (the people one knows) and the inclinations that arise from the networks to do things for others (norms and reciprocity). This creates value for the connected people in the networks and also for bystanders (free riders) as well. Dill (2015) adds to Sander's definition that social capital is social resources including networks for cooperation, support and mutual trust. Organization for Economic Co-operation and Development (OECD) (2001) has a similar definition where social capital refers to networks and shared norms and values that enhance cooperation and understandings within or among groups. What is common across all the definitions is issue of networks, cooperation and close social cohesion. Additionally, it shows social capital is embedded in social networks and groups of people with close connections (Lewis and Chamlee-Wright, 2008).

There is a general consensus among economists that the traditional types of capital; human, financial, natural and physical capital; partially determine the economic growth and performance of an individual or an institution (Lawal *et al.,* 2009; Dill, 2015). This is because these types of capital overlook the way economic actors interact and organize themselves to spur higher economic performance (Dill, 2015). This missing link is what Lawal *et al.* (2009) refers to as social capital. They also argue that, like any other type of capital, social capital can also be accumulated over time. Nilsson, Svendsen and Svendsen (2012) add that, some network resources like social capital, though not visible to the naked eye, could have some economic impact on the enterprises that are part of the networks.

Fischer and Qaim (2014) further argue that linking smallholder farmer groups to emerging high-value chains, umbrella bodies and supporting organizations have been viewed as pillars to strengthen their performance and enhance their sustainability. This not only provides opportunities for efficient information flows and capacity building but also offers a bridge for the groups to forge effective business relations in emerging markets (Fischer and Qaim, 2014; Ochieng, 2014).

2.0 Literature review

This section provides a review of social capital literature. History of social capital, its dimensions and embeddedness has been discussed. Additionally, the role of social capital in organizations has also been reviewed. The review informs methodologies applied to analyze social capital in this study.

2.1 Dimensions and Embeddedness of social capital

Conceptualization that economic behaviours are embedded in social capital was popularized by Granovetter (1985). Granovetter (1985) perceived and distinguished between structural and relational embeddedness of social capital. Nahapiet and Ghoshal (1998) define structural embeddedness as the presence of impersonal linkages or network ties among actors either people or units. Relational embeddedness is defined as the personal relationships people have developed between each other over time and whose key facets include trust and feelings of closeness. This is what Lewis and Chamlee-Wright (2008) refer to as bonding social capital in relatively small and homogeneous groups of people with a shared common identity and norms of reciprocity.

Trust and shared goals are important in governing repeated face to face interactions among members of a group. Structural embeddedness gives rise to bridging social capital which contributes to social change as people with different social structures cooperate and share resources (Lewis and Chamlee-Wright, 2008).

Granovetter (1985, 1992) argues that transaction cost economics and rational choice theory are not sufficient to explain people's participation in markets as they ignore their involvement in social networks which dissuade them from behaving opportunistically. On this view, Granovetter (1992) adds that there is need for research that considers how people's economic actions are influenced by and in turn influence social networks. However, a key concern in literature has been how to define, identify and measure social capital.

2.2 Role of social capital in organizations

Social relations tend to exist among people in an organization. Therefore, the influence of social relations on an organization's activities has been the main theme in most studies on social capital. How social capital influences an organization's conduct, structure and institutions have been one of the key questions of social theory. There is a broad consensus in literature that social capital is a valuable asset which holds a promise for explaining the performance at various levels (Granovetter, 1992; Moran, 2005). However, social capital is not as separable from an organization as financial capital or physical capital nor is it as mobile as human capital. But, it is firmly bound within the firm's organization, strategy and development (Nahapiet and Ghoshal, 1998; Walker, 1998). As a result social capital can be a firm's long lasting source of competitive advantage (Adler and Kwon, 2002). Consequently the influence of social capital on performance of individuals, small groups, large organizations and nations has attracted wide scholarly attention over the years (Walker, 1998; Moran, 2005; Popp *et al.,* 2013).

Popp *et al.* (2013) concluded that social capital, especially trust, creates opportunities to be more innovative and work collaboratively to solve complex issues for mutual gain of the actors. When a group of people trust each other, it is easier for them to engage in collaborative activities for mutual gain and at lower transaction costs (Nilsson *et al.,* 2012). Nilsson *et al.* (2012) also add that, though agricultural markets may exist in different parts of the world, there are always strong connections among collective action members with regard to collection of agricultural products. Coleman (1990) noted that social capital's influence comes from closed networks of personal relations that foster collective action among individuals in a group. This is because such individuals are able to reinforce their norms of exchange, easily monitor each other, and enforce sanctions. This helps to create cohesion, constrain exploitative behavior, reduce uncertainty in exchange and promote cooperation.

Different types of capital in farmer groups and other organizations are said to influence performance. Literature shows social capital is one of the important types of capital in an organization. However, social capital has been relatively overlooked yet it could also explain the differences in performance among farmer groups. Additionally, very little is known about the level of bonding and bridging social capital within the farmer groups involved in collective grains marketing in Kenya. Therefore, to fill this knowledge gap, this paper provides an analysis of the levels of social capital among grains marketing farmer groups in Mt. Kenya region of Kenya.

3.0 Methodology

3.1 Research design

Simple random sampling using a table of random numbers was used to select a sample of 100 groups from a population of 273 registered smallholder grain farmers groups in the Mt. Kenya region of Kenya as at December 2016.

Face to face interviews were used to collect quantitative and qualitative data from each farmer group. Respondents' feedback was recorded in a structured questionnaire partially adopted from World Bank's Social Capital Assessment Tool (SOCAT) at organization levels (World Bank, 2011). Respondents representing each group included both leaders and members, with each group having between five and twelve participants. This helped reveal the consensus views of a group's members. Interview for each farmer group was guided by a moderator and one observer who worked collaboratively. The moderator's main role was to facilitate the interview through asking the questions, probing key issues and systematically focusing the interview to the main issues of interest. The observer's main role was to record data into the questionnaire.

3.2 Indicators of social capital

Three indicators of level of relational, cognitive and structure were used to proxy bonding social capital for a farmer group. A likert scale with five pre-coded items (1 if strongly disagree; 2 if disagree; 3 if neutral; 4 if agree; 5 if strongly agree), for ranking 6 statements, was used to measure the level of bonding social capital in each group in terms of the three indicators. Each group member was expected to give a view of what they believed was the status of the group in terms of the social capital statements. Each member wrote their view (score based on the likert items) on a card and the consensus view was taken as the view of the majority of the members. There were two statements to measure the level of trust between members and their leaders, while an extra statement captured aspects of changes in the level of trust in each group over a period of the last three years as at the time of the survey. Upon explaining what a vision was, the members were asked to give their rank on how they felt members shared into the vision of the group. Finally, coming from the same locality (village) and having close relatives within the same group were used as indicators of close connections. The statements are as stated in the section that follows.

a. Trust

- Members in this group trust the leaders with making decisions that are for members benefit?
- Members in this group trust the leaders with the groups' assets and members' money?
- Trust in the last three (3) years has improved?

b. Group vision

- Majority of the group members understand where they would like to see the group achieve in the next 10 years?

c. Close connections

- Majority of the group members are close relatives?
- Majority of the group members come from this village?

Different proxies were used to estimate the level of bridging social capital in smallholder grain farmer groups from the Mt. Kenya region of Kenya. The proxies were: linkage (ties) to Non-Governmental Organizations (NGOs), Projects, government institutions, and membership or linkage with a farmers Community Based Organization (CBO) or bulk buyer. These ties were direct or indirect including membership ties, information relations, communication ties and business cooperation. The score was zero (0) for no linkage, 1 for direct linkage and 2 for indirect linkage. Indirect linkage referred to where a group got assistance or resources from a given support actor only through another actor. On the other hand, direct linkage referred to where a group and a support actor worked together as a formal team or informally and actively pursued opportunities of mutual gain either through a collaboration, partnership and membership. Direct linkage was therefore considered better than indirect linkage.

3.3 Analytical framework

Based on literature review and conceptual framework the selected variables were adequate to capture the key levels of social capital in the farmer groups. To measure the levels of social capital separate indices for bonding and bridging social capital were generated using Principal Component Analysis (PCA). The PCA multivariate statistical techniques were used to reduce the number of variables (score for each statement) in the data set to a lower dimension to reveal simplified structures that underlie it. That is, PCA creates uncorrelated indices or components from an initial set of *n* correlated variables. Following Wu (2012) each index component was a linear weighted combination of the initial variables. This is demonstrated in a model using a set of variables X_1 to X_n in *Equation 1*.

Model specification:

$$\begin{array}{ccccccccc} \boldsymbol{PC_1} & = & \boldsymbol{b_{11} * X_1} & + & \boldsymbol{b_{12} * X_2} & + & \ldots & + & \boldsymbol{b_{1n} * X_n} \\ \vdots & & \vdots & & \vdots & & \ldots & & \vdots \\ \boldsymbol{PC_m} & = & \boldsymbol{b_{m1} * X_1} & + & \boldsymbol{b_{m2} * X_2} & + & \ldots & + & \boldsymbol{b_{mn} * X_n} \end{array} \quad \ldots\ldots\ldots\ldots\ldots\ldots \textit{EQUATION 1}$$

Where: b_{mn} represents the weight (coefficients for the PCA rotated components) for the m^{th} component and the n^{th} variable.

First, Statistical Package of Social Analysis (SPSS) software was used to measure sample adequacy was measured using Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sampling Adequacy. The KMO value should be greater than 0.5 for a satisfactory factor analysis to proceed, while a significant Bartlett's Test value indicates that there some relationships between the variables included in the analysis (Field, 2005; Yong and Pearce, 2013). Additionally, communalities after extraction should probably be above 0.5 (Field, 2005; Yong and Pearce, 2013). Field (2005) added that, the average communality should be above 0.6 for sample size greater than 250, in this case the sample size was 400 observations. Table 1 indicates that the sample was adequate to run a PCA multivariate statistical analysis shown a KMO value of 0.570 while the Bartlett's Test of Sphericity was also significant with a p-value = 0.000. The average communality (5.064/6=0.844) is greater than 0.6 (Table 2). For example, over 71% of the variance in *members trust leaders decisions* is explained while over 98% of the variance in *members understand group vision* is explained. This further show that all the variables were robust enough to

be included in the analysis therefore PCA was suitable for further analysis.

TABLE 1: KMO AND BARTLETT'S TEST OF SAMPLE ADEQUACY

Kaiser-Meyer-Olkin Measure of Sampling Adequacy:		0.570
	Approx. Chi-Square:	343.782
Bartlett's Test of Sphericity	Degrees of freedom:	15
	Significance:	0.000

TABLE 2: COMMUNALITIES EXTRACTION VALUES OF THE SIX BONDING CAPITAL INDICATORS

	Initial	Extraction
Members trust leaders decisions	1.000	0.714
Members trust leaders with assets	1.000	0.793
Trust has improved in last 3 years	1.000	0.968
Members understand group vision	1.000	0.988
Members are close relatives	1.000	0.772
Members come from same village	1.000	0.829

Extraction Method: Principal Component Analysis.

Then, a pairwise correlation test was carried out to check whether the variables were correlated. All the variables had a correlation score of below 0.5 showing weak correlation between the variables as shown in Table 3.

TABLE 3: PAIRWISE CORRELATION TEST FOR INDICATORS OF BONDING SOCIAL CAPITAL

	Trust leaders decisions	Trust leaders with	Trust improved	Vision	Close relatives	Close village
Trust leaders decisions	1					
Trust leaders with assets	0.4677	1				
Trust improved	0.3679	0.2659	1			
Vision	0.2040	0.1505	0.0986	1		
Close relatives	-0.0349	-0.0299	-0.1469	0.1517	1	
Close village	-0.0704	0.0220	0.0020	0.1240	0.3784	1

Then, all the six variables were included in the PCA matrix which was rotated using orthogonal varimax (Kaiser off) technique to standardize the coefficients. Components with eigenvalues of more than one were selected as they account for the most variance. The scores for the index were then predicted based on rotated factors. The conbach's alpha α was computed to check whether the selected items were related to one latent factor using the 'scale reliability coefficient' which should preferably be above 0.5 in order to accept (Nelson, 2007; Wu, 2012). In this case it was 0.5211 hence all the six bonding capital variables were accepted for further analysis as shown in Table 4.

TABLE 4: BONDING SOCIAL CAPITAL INDICATORS CONBACH'S ALPHA (A) FOR SCALE RELIABILITY

Test scale = mean (unstandardized items)	
Average interitem covariance:	0.1889
Number of items in the scale:	6
Scale reliability coefficient:	0.5211

3.4 Description of variables

TABLE 5: DESCRIPTION OF VARIABLES, THEIR MEASUREMENT AND EXPECTED SIGNS

Variable	Description	Measurement and codes
	Dependent variable (Time varying): 2013 -2016	
PCVCS	Per capita value of grains sold (monetary) $=\left[\frac{Total\ value\ of\ cereals\ sold\ in\ year\ t}{Number\ of\ group\ members\ in\ year\ t}\right]$	Kenya shillings (KES)
	Social capital indicators	
BOND_CAPIT	*Bonding social capital.* (Likert scale) Level of social capital: - Trust - Common ties - Group vision *Likert items used:* 1=strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree	Index
BRIDG_CAPIT	*Bridging social capital.* Direct, indirect or no linkage to NGOs, Projects, Government departments and farmer CBOs	Index

4.0 Results and discussion

The results for bonding and bridging social capital characteristics of farmer groups in the three clusters are shown in Table 6. Analysis of variance (ANOVA) F-test results were used to test if there was significant difference across the three clusters of farmer groups. Cluster means and standard deviations were also computed.

TABLE 6: FARMER GROUPS' LEVEL OF BONDING AND BRIDGING SOCIAL CAPITAL

	Farmer group clusters					
	Overall	High	Average	Low	ANOVA	
Variable	N=100	N=31	N=55	N=14	F-test	P-value
Cognitive bonding social	3.65 (0.73)	3.74 (0.77)	3.62 (0.71)	3.57 (0.76)	0.37	0.69
Structural bonding social	2.67 (1.22)	2.53 (1.12)	2.79 (1.29)	2.46 (1.18)	0.66	0.52
Relational bonding social	5.45 (0.76)	5.60 (0.88)	5.44 (0.65)	5.18 (0.85)	1.51	0.23
Bonding social capital	3.76 (1.72)	3.52 (1.59)	3.94 (1.80)	3.55 (1.71)	0.69	0.50
Bridging social capital	0.56 (0.51)	0.88 (0.60)	0.44 (0.38)	0.35 (0.45)	10.49***	0.00

Note: *** represents significance level at 1%; Figures before parenthesis are means; Standard deviation is in parenthesis.

4.1 Bonding social capital

Analysis of variance (ANOVA) F-test results show that cognitive (having a shared and well understood group vision); structural (close connections in a farmer group like coming from the same village and having close family members); and relational (trust among members and leaders in the group) bonding social capital were not significantly different across the three clusters. The three indicators of bonding social capital were further combined using PCA to show the overall level of bonding social among the farmer groups. Analysis of variance results for bonding social capital further confirm that there was no significant (F=0.69, p=0.50) difference across the three clusters as shown in Table 6.

The level of a shared vision was relatively above average for majority of the groups with an overall mean of 3.65. Most of the groups disagreed that they had close connections in the group with the mean for all groups being 2.67. Level of trust in leaders' decisions, trusting leaders with group assets and a rise in level of trust in the group over the last four years was also not significantly different across the three clusters. This shows that farmer groups in in the Mt. Kenya region of Kenya had relatively the same level of bonding social capital despite the variation in marketing performance. Bonding social capital is therefore like a necessary condition before any meaningful collective action takes place. The findings concur with Pretty *et al.* (2011) who pointed out that success in

collective agricultural activities stems from developing bonding social capital among farmers with a common interest.

4.2 Bridging social capital

Bridging social capital relatively distinguishes the three clusters of grains farmer groups in the Mt. Kenya region of Kenya as it was significantly (F=10.49, p=0.00) different as shown in Table 6. The average score for all the groups was 0.56. This was way lower than that for high performing groups which was 0.88 while that for average and low performing groups was lower than the overall mean at 0.44 and 0.35 respectively as shown in Figure 1.

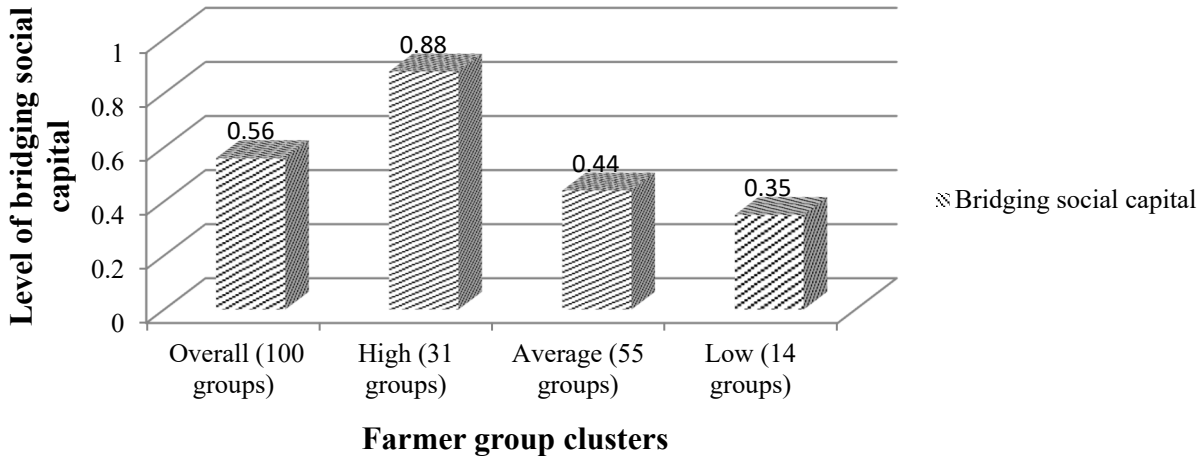

FIGURE 1: FARMER GROUP'S LEVEL OF BRIDGING SOCIAL CAPITAL

The high score for high performing groups could be due to the relatively high direct and indirect linkages with NGOs, projects, government institutions, bulk buyers and membership to farmers CBOs. Majority of the high performing farmer groups had a direct linkage with the Ministry of Agriculture (MoA), umbrella farmer group associations or farmer Community Based Organizations (CBOs) and select Non-governmental Organizations (NGOs) working with farmer groups in the region. These organizations were said to foster linkages with bulk grain buyers, and enhance access to inputs and trainings. This shows that having strong bonding social capital backed up with an equally strong bridging social capital fosters more collective action in relation to collective marketing of grains as compared to having strong bonding capital with weak bridging social capital. This makes bridging social capital like a sufficient condition for success in fostering higher performance in collective marketing. The results concur with Pretty *et al.* (2011) who concluded that for people to gain the most from social capital there is a need for a balanced mixture of bonding, bridging and linking social capital. This also agrees with Van and Adekunle, (2012) who concluded that bridging social capital can strengthen farmers' access to knowledge, resources and adoption of agricultural innovations. However, the findings differ with Ruben, and Heras, (2012) who argue that if bridging social capital is stronger than bonding social capital, collective action in agriculture become more feasible.

5.0 Summary, conclusion and recommendations

5.1 Summary

To sum up, farmer groups in the Mt. Kenya region of Kenya have relatively strong bonding social capital. This is shown by relatively similar and high level of relational, cognitive and structure dimensions of bonding social capital. This could be because most of the groups were founded and bound by the principle of mutual trust and reciprocity. Bridging social capital measured by external linkages with different actors was statistically different across the three farmer group clusters. High performing groups had the highest average score (0.88), followed by average groups (0.44) and then low groups had the least (0.35).

5.2 Conclusion

1. Bonding social capital is the foundation of any meaningful collective action. As a result, farmer groups were similar in terms of having relatively equal and strong bonding social capital regardless of their success in fostering collective action.
2. High levels of bridging social capital embedded within a group with strong bonding social capital fosters higher performance in terms of collective marketing of grains.

5.3 Recommendations

1. Groups can further be strengthen their bonding social capital through focusing on building more internal cohesion in form of trust among members and leaders, working as a team to achieve a shared vision and abiding by set group rules.
2. To strengthen bridging social capital across all the farmer groups, it is important for the groups to spread their tendrils and link with new actors along the value-chain, especially with those that link them to new lucrative markets.
3. **Future research: -** Future research can consider measuring the change in the level of bridging and bonding social capital in the farmer groups and compare its effects with the effects from other forms of capital in the groups like physical and financial capital.

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