CHAPTER V

SOCIAL CAPITAL AND POVERTY IN UGANDA

5. 1 Introduction

Like in most sub-Saharan African countries, poverty in Uganda is pervasive. Using the Household survey data-2002, Appleton and Sewanyana (2003) show that the proportion of the population whose incomes fall below the poverty line is 38 percent. Poverty is more rampant in the rural areas where 41 percent of the rural residents are below the poverty line as opposed to 12 percent of the urban residents. This outcome is despite using poverty lines allowing higher food prices and non-food requirements in the urban areas. Apart from the rural-urban differences, poverty also varies across regions, with the north being the most poor compared to other regions.

Also important to note is the fact that poverty is highest for those households whose head works in the agricultural sector. For instance poverty among households headed by crop farmers increased from 39 to 50 percent between 1999 and 2002 while poverty dropped from 47 to 38 percent for those households whose head works in non-crop agricultural sector (Livestock and Fishing) for the same period of time (Appleton and Sewanyana, 2003). Smallholder farmers dominate the agricultural sector in Uganda, and the sector continues to employ more than 80 percent of the population, earning 85 percent of the foreign exchange and contributing 40 percent of the GDP. Given the large rural-urban gap in poverty levels and the importance of agriculture to the entire economy and to the rural economy in particular, understanding the crucial factors that influence poverty and income inequality in rural communities is crucial for development policy making.

Poverty has devastating impacts on rural households. First, acts as a constraint to investment in land management technologies to curtail land degradation (Holden et al., 1998; Shiferaw and Holden, 1999). Chapter four of this study also

shows that poverty generally reduces adoption of soil conservation technologies. More so, because of poverty, rural households are not able to compete for productive resources such as high quality and productive land and are hence confined to marginal lands that cannot sustain their agricultural practices, which perpetuates land degradation and further poverty.

To avoid these devastating effects of poverty, identification of the determinants of poverty and the design of government policies to address the poverty problem have been identified as priorities by the government of Uganda since the mid 1990's (GOU, 1997). The government commitment to alleviate poverty has led to the culmination of the program for the modernization of agriculture (PMA) (GOU, 2000) and poverty eradication action plan (PEAP) (GOU, 1997, 2000b, 2004b). An important component of the Uganda anti-poverty policies focus on the provision of key services such as roads, education and agricultural extension among others. Equally important, however, is the social institutional framework through which the provision of such services may yield greatest benefits to society, but has however attracted minimum attention.

Earlier studies in Uganda attempted to explain poverty emphasising on the differences in financial, physical and human capital endowments and paying less attention to the role of social capital (Appleton, 1999; 2001; Okwi et al., 2000; UPPAP, 2000). However, since the seminal paper by Putnam (1993b) on the role of social capital in explaining why the level of income in the north was higher than that in the south of Italy, there has been growing interest in understanding the role of social capital in economic development and on household welfare. Putnam's findings suggest that the regions in Italy, in which the population had a greater degree of horizontal connections (north) as opposed to vertical connections (south), had more efficient governments.

Recent analyses have demonstrated that ownership of social capital by households has a positive and significant effect on household per capita

expenditure and/or incomes (Narayan and Pritchett, 1999; Grootaert, 1999; Grootaert et al., 1999; Tiepoh and Reimer, 2004; Whitely, 2000 and Maluccio et al., 2000). In many cases, the social capital impact was as strong as and sometimes stronger than human capital impact. For instance Narayan and Pritchett (1999) in Tanzania find the impact to be 4-10 times stronger, Grootaert (1999) find the impact twice as much in Indonesia, while Whitely (2000) find the impact as strong as that of human capital.

The mechanisms through which social capital embedded in social networks, trust and norms, is said to reduce poverty can be summarised as; i) it facilitates transmission of knowledge about technology and markets, reducing market failures in information and therefore reducing transactions costs (costs of obtaining information about technology, market, creditworthiness of contract parties among others). ii) Reducing problems of free riding and thereby facilitating cooperative action, iii) coordination and monitoring effective public services delivery, iv) ameliorating other conventional resource constraints such as market access or credit limitations and thus reduce vulnerability of households to poverty.

In Uganda, a diverse set of local formal and informal institutions with diverse objectives exist. These institutions include, community based organisations (CBO's), local village associations, elders associations, mutual self-help groups, churches, non-governmental organisations (NGOs), government structures such as local councils, cooperatives among others. These institutions have a diverse set of short-term and long-term objectives covering, monitoring and provision of public services, establishment of income earning activities, mutual assistance, and social support. Such institutions may therefore have a significant impact on poverty reduction. The types, objectives and structures differ across institutions, and different regions of the country, because of the ethnic and religious diversity of the population.

Verifying empirically the impact of social capital on household poverty is a much more difficult task than what may appear at first sight. The reason is that there is a causality problem, with some literature suggesting that the causality actually runs from household poverty to social capital. For instance, when joining associations involves actual cash contributions, poor households will choose those associations that are highly beneficial to them and/or those that do not require any contributions. Secondly, if social capital is considered a consumption good like in non-mandatory social groups pursuing leisure activities, such leisure activities are considered luxury. Demand for leisure therefore is expected to increase with income. This leads to a reverse causation from welfare to social capital. Before drawing any conclusions about the poverty-social capital relationship, it is therefore important to follow a methodology that effectively controls for the endogeneity of social capital.

In the literature the impacts of social capital on measures of well-being are well established. On the other hand, economic literature on social capital formation is limited. Alesina and La Ferrara (2000) in USA and Christoforou (2004) in Europe and Hedad and Malucio (2003) in South Africa show that group participation as a measure of social capital is determined by a host of factors such as education, homogeneity of communities, trust and other household characteristics. Studies of this nature are important to generate policies in support of social institutional building and thus poverty reduction. Research towards a causal understanding of the processes through which social capital is formed would therefore be a great contribution to policy making in Uganda

However, the empirical literature on determinants of social capital and that on impact of social capital on economic outcomes are not properly linked. Using a purposefully collected rural data set in Uganda, this study intends to contribute to an understanding of the causal relationship between social capital as measured by group participation and household level poverty. Specifically we examine;

i) The importance of social capital in explaining the level of household poverty in Uganda.

ii) The importance of poverty and other determinants in the decision to participate in agrarian groups.

Following this introduction, the rest of the chapter is organised as follows; in the next section, a conceptual framework linking poverty and social capital is discussed. Section three discuses the analytical framework to be used while section four discuses the empirical model used to estimate the determinants of poverty and social capital formation (group participation). Data sets, and variables used in the analysis are discussed in section five and econometric results are presented and discussed in section six. Section seven on the other hand provides the conclusions and policy implications.

5.2 Conceptualising the link between social capital and poverty

The proper conceptualization of social capital remains illusive without a generally acceptable definition of social capital. Table 5.1 presents key definitions commonly encountered in the literature as summarized by Hedad and Maluccio, (2003). More recently, Dasgupta (2005) argues that social capital means interpersonal networks and nothing more. Apparently, all the definitions highlighted tend to suggest that individual social interactions are at the core of social capital. Also clear from these definitions is the fact that social capital generates externalities and that the mechanism that derives social capital has to do with information transmission, establishment of trust and development of norms of collaboration.

To understand the channels through which social capital operates, we follow a framework suggested by Collier (2002). Collier classifies social capital based on economically beneficial results from three types of externalities it generates. First, social capital facilitates the transmission of knowledge about the behaviour of others, reducing the problem of opportunism through repeat transactions that

establish trustworthiness and reputations. Secondly, it facilitates the transmission of knowledge about technology and markets, reducing market failures in information. Lastly, by relying on norms and rules, social capital reduces the problem of free riding, thereby facilitating cooperative action. We therefore expound on these channels in our discussion taking into consideration the literature on the subject.

Table 5.1: Common definitions of social capital in the literature

Source	Proposed definition of Social Capital
Barr (2000)	Net work of relationships between the agents within an economy
Coleman (1990)	Authority relations, relations of trust, and consensual allocations of rights establish norms
Collier (1998)	Social capital is first a subset of the process which generates externalities namely those which are generated by social interaction, including only those which either are themselves durable or the effects of which are durable
Fukuyama (2000)	An instantiated informal norm that promotes cooperation between two or more individuals
Glaeser, Laibson, and Sacerdote (2000)	Individual social capital as a persons social characteristics-including social skills, charisma, and the size of his rolodex-which enable him to reap market and non-market returns from interactions with others
Knack and Keefer (1997)	Defines "Putnam-esque" groups as those that "instill in their members habits of cooperation, solidarity and public spiritedness" and "Olsonian" groups as those that serve as distributional coalitions".
Narayan and Pritchett (1999)	The quantity and quality of associational life and related social norms
Putnam (1995)	Features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual for mutual benefit
Uphoff and Wijayaratna (2000)	*Structural* social capital includes "roles, rules, procedures and precedents as well as social networks that establish ongoing patterns of social interactions" *Cognitive* social capital includes, "norms, values, attitudes and beliefs that predispose people to cooperate".
World Bank website (2001)	The norms and social relations embedded in social structures of societies that enable people to coordinate action to achieve desired goals
Woolcock and Narayan (2000)	The norms and networks that enable people to act collectively • "the *communitarian* perspective equates with local organizations such as clubs, associations and civic groups • the network perspective "stress the importance of vertical as well as horizontal associations between people and of relations within and among such organizational entities such as community groups and firms • The institutional view argues that the vitality of community networks and civil society is largely a product of the political, legal and institutional environment • the synergy view attempts to integrate the compelling work emerging from the networks and institutional camps

Adopted from Hedad and Maluccio (2003)

First and most important for this study, major emphasis will be placed on the transfer of knowledge about technology and markets. Social capital may reduce levels of poverty through positive externalities of knowledge transfer about adoption of agricultural technologies leading to increased agricultural productivity, and therefore household incomes. Diffusion of innovations are facilitated by linkages among individuals. Studies that show the importance of social capital in knowledge transfer and diffusion of technologies include Narayan and Pritchett (1999), Isham (2000) and Reid and Salmen (2000). Chapter 3 of this thesis also shows that social capital enhances adoption of traditional technologies such as terracing, fallowing and less of the other technologies. These studies show that social participation in-group activities, interconnectedness with the social systems, are positively associated with early adoption of technologies.

As Collier (2002) argues, the transmission of knowledge can occur through pooling in the case of networks and clubs or through copying which requires one-way interactions. He argues further that copying tends to be distributionally progressive, except where barriers of social segmentation are high. Such segmentation may include gender, income or ethnic divide among others. Research on adoption of innovations suggest that village level spillovers played a role in individual adoption decisions (Foster and Rosenzweig, 1995) but they do not examine the role that social capital may play in mediating village level effects. Such adoption of technologies/innovations is expected to increase agricultural productivity and hence household incomes.

Social capital may reduce market failures in information, which lowers transactions costs and provides a great range of market transactions in output, labour, credit and land leading to higher household incomes. This can be information about prices, products and behaviour of other members among others. For example, considering the credit market, there are two mechanisms through which social capital can lead to reductions in transactions costs. Social

capital could lead to a better flow of information between creditors and borrowers and hence reduce adverse selection and moral hazard problems in the credit markets. Secondly, social capital also expands the range of enforcement mechanisms for default on obligations in an environment in which recourse to the legal systems is costly or impossible.

Secondly, in his thesis, Collier (2002) also argues that the poor have a lower opportunity cost of time and a lower stock of financial and physical capital than the rich. Since social interaction is time intensive and social capital can often substitute for private capital, the poor may choose to rely more on social capital than the better off. Collier's argument suggests that social capital may ameliorate other resource constraints such as farm equipment, credit, and other inputs important in the production process that would have otherwise been obtained in the market, thus reducing the vulnerability of the masses to poverty. As Putnam (1993a) puts it, "in rural agrarian households, social capital allows each farmer to get his work done with less physical capital in form of tools and equipment because of the borrowing and lending of these tools in the communities".

Third, social capital may also facilitate greater cooperation in the direct provision of services that benefit all members of the community and hence improve household well-being. Work by Ostrom (1990; 2000) suggest that the ability of local groups to cooperate plays a significant role in avoiding the negative consequences of the excessive exploitation of assets that would result from purely individualistic behaviour in open access situations. For instance, Ahuja (1998) shows that in Ivory Coast, the degree of land degradation was worse in more ethnically heterogeneous villages. This result suggests that it is the difference in social factors that may affect the effectiveness of community controls because heterogeneous communities tend to have less cohesion and therefore trust.

Lastly, Alesina and La Ferrara (2000) argue that social capital measured, as participation in associations is highly correlated with political participation and the latter has critical implications for policy choices. Social groups bring out voices of the poor against marginalisation by the wealthy and educated elites. Putnam's work in Italy also concludes that the regions of Italy in which the populations had greater degree of horizontal connections, had more efficient governments. The possible mechanism through which these horizontal connections work is through efficient monitoring of government provision of services and hence better household welfare.

On the other hand literature on determinants of group participation is not well developed. Alesina and La Ferrara (2000) develop a model that links group participation with income inequality, cluster variations in economic activity, race and ethnic origin. The results show that lower trust reduces participation in open groups. Other important factors determining group participation in the literature include, education, age, marital status, and sex (See Alesina and La Ferrara, 2000; Christoforou, 2004).

5.3 Analytical framework

Our premise of analysis is that social capital defined as membership in agrarian associations or groups increases household incomes and therefore reduces poverty. This suggests that poverty measured by household per capita expenditure is a function of social capital such that;

$$Y = f(S, Z) \text{.....} 5.1$$

Where Y represents per capita household expenditure, S is the social capital variable measured in terms of group membership and Z is a vector of other independent variables. This formulation is in line with earlier studies Grooteart

(1999) in Indonesia, Grooteart and Narayan, (2004) in Bolivia and Narayan and Pritchett (1999) in Tanzania.

On the other hand however, income levels can influence or determine many indicators of social capital. For instance, if membership in some associations requires membership fees or monthly/annual subscriptions, this would suggest that the higher the incomes the greater the ability to join some of these associations. Secondly, social capital can be considered as an input into the household production function and can therefore be modeled similar to human capital and other household asset endowments (Grooteart, 1999; Grooteart and Narayan, 2004). However, social capital can also be partly consumption good. This is more so in non-mandatory social groups pursuing leisure activities. Since leisure is a luxury good, demand for leisure increases with income, this leads to a reverse causation from welfare level to social capital. This suggests that;

$$S = g(Y, X).....5.2$$

Where X a vector of other independent variables and all other variables remain as defined above. This formulation is also in line with earlier studies such as Alesina and La Ferrara (2000) in the USA, Christoforou (2004) in European countries and Haddad and Maluccio (2003) in South Africa that examined determinants of group memberships.

This formulation suggests a two-directional/two-way causality link between income and social capital. There is therefore need for an empirical model that takes into account the possible endogeneity and/or simultaneity problem between social capital and household income. The model used in this study is presented and discussed in the next sub-section.

5.4 Empirical model to analyse the determinants of poverty and group participation

The presence of possible endogenous regressors would require specifying a system of simultaneous equations. The method of least squares is not appropriate because the endogenous variables are correlated with the disturbance terms. Applying OLS models without correcting for endogeneity may therefore lead to biased and inconsistent estimators leading to incorrect inferences. More so, our social capital variable is a discrete choice variable, defining membership to agrarian associations (member = 1, non-member = 0), suggesting the use of a two-stage estimation involving discrete and continuous dependent variables.

Following Alvarez and Glasgow (1999) the non-recursive two-stage choice model of this nature may be specified as follows;

$$S^* = \gamma_1 Y + \beta_i X_i + \varepsilon_1 \text{.....(5.3)}$$
$$Y = \gamma_2 S^* + \alpha_i Z_i + \varepsilon_2 \text{.....(5.4)}$$

Where Y is the continuous per capita household expenditure variable, S* is the binary choice social capital variable, X and Z are vectors of independent variables, ε_1 and ε_2 are the error terms for equations (5.3) and (5.4) respectively and $\gamma_1, \gamma_2\ \alpha_i, \beta_i$ are the parameters to be estimated. However, we do not directly observe the latent variable S* instead we observe the choice made by an individual which takes value 1 if member of a group and 0 if non-member, such that,

$$S = \begin{cases} 1 & if \quad S^* > 0 \\ 0 & if \quad S^* \leq 0 \end{cases} \text{.....(5.5)}$$

Thus the reduced form equations would thus be written as,

$$S = \pi_i X_i + \pi_i Z_i + v_1 \text{.....(5.6)}$$
$$Y = \lambda_i X_i + \lambda_i Z_i + v_2 \text{.....(5.7)}$$

To avoid biased coefficients and inference problems associated with endogeneity and given the nature of one of the dependent variable used in this model, two estimation procedures are suggested in the literature. First is the two-stage probit least squares (2SPLS) approach (Maddala, 1983; Alvarez and Glasgow, 1999). To implement the 2SPLS approach, the reduced form equation for the continuous variable (equation 5.7), is estimated using OLS, while the reduced form of the binary choice variable (equation 5.6) is estimated using a probit model. The parameters from the reduced form equations are then used to generate a predicted value for each endogenous variable and these predicted values are then substituted for each endogenous variable as they appear on the right hand side of the respective equations (5.3 and 5.4). Then the equations are re-estimated using the predicted values from the reduced form equations serving as instruments on the right hand side of the original model equations.

The advantage of using the 2SPLS approach is that it can be applied to either a binary dependent variable with a continuous endogenous regressor on the right hand side or a continuous dependent variable with a binary endogenous regressor on the right hand side. However, according to Green (2000) and Alvarez and Glasgow (1999) the major draw back of 2SPLS is that the standard errors produced are biased and their correction is difficult. This implies that statistical inference would not be legitimate. One solution is to use the consistent 2SPLS parameter estimates along with bootstrapped standard errors.

Bootstrapping is a statistical technique where the sampling distributions for the parameter estimates of interest are simulated through an iterative process (Mooney and Duval, 1993; Mooney, 1996). The advantage of bootstrapping is

that it allows for the creation of confidence intervals for statistics where sampling distributions are unknown or in the case of the 2SPLS, are difficult to estimate.

Secondly, Rivers and Vuong (1988) developed what they termed as the two-stage conditional maximum likelihood (2SCML) approach to obtain consistent and asymptotically efficient estimates for the probit equation. It therefore mitigates the problems of incorrect standard errors directly and no need of bootstrapping in this case. The limitation of this approach however is that unlike the 2SPLS, which allows the dependent variable to be either binary or continuous, the 2SCML approach assumes interest in only the structural parameters of the probit equations. To estimate the probit coefficients and their variances following in the 2SCML method requires to first estimate the reduced form of the continuous variable equation, obtain the residuals from the reduced form regressions and add these residuals to the probit equation for the binary choice variable as an additional variable with a corresponding parameter to be estimated.

To identify the determinants of poverty, this study, uses both the 2SPLS approached with boot strapped standard errors and compare the results with those of a 2SPLS without bootstrapped errors. On the other hand, to identify the determinants of group participation, results from the 2SPLS approach and those generated by 2SCML approaches are compared.

Before model implementation, the independent variables were first scrutinised for possible correlations since multi-colinearity is a common problem with such data sets. A number of variables that were believed to be strongly correlated with others were dropped. The Huber-White sandwich estimator was also used to correct for possible heteroscedasticity of unknown form (White, 1980). The next sub-section presents and discusses the measurement of the variables used in the analysis.

5.5 Definitions and measurement of Variables

- ***Controlling for the effect of Poverty***

Per-capita household expenditure is used to represent poverty. The major assumption is that consumption expenditures are negatively related with poverty. Thus factors that increase consumption expenditure would reduce poverty. This is one of the most widely used approaches (Geda et al., 2001; Mukherjee and Benson, 2003).

To compute the per capita household expenditure, data from Uganda National Household Survey (UNHS, 2002) are used. Our household expenditure variable is made up of four components that include: total food consumption expenditure whether purchased or from home production, total non-food expenditure on durable and non-durable goods, and non-consumption expenditure such as taxes. The welfare indicator is expressed in real terms normalised using 1989 as the base year. Using per capita expenditure in this case assumes (i) everyone in the household receives an equal allocation of items consumed irrespective of age and gender. (ii) Everyone has the same needs irrespective of age and gender, (iii) the cost of two or three or more people living together is the same as if they lived separately (Mukherjee and Benson, 2003).

- ***Controlling for the Social Capital effect***

Our hypothesis to be tested in this case is that social capital increases household incomes and therefore reduces poverty. We further hypothesise that the impact of group memberships on poverty depends on the type of group in which a particular household participates.

As a result of the diverse definitions of social capital, one major criticism of the notion of social capital is that it is very difficult to measure, hence difficult

to use in empirical analysis. There are various proxies or indices that have been used to measure social capital in the literature. Key among these are membership in local associations and networks (Narayan and Pritchett, 1999; Alesina and La Ferrara, 2000; Grootaert, 1999; Grootaert et al., 1999), indicators of trust and social norms (Heddad and Maluccio, 2003) and indicators of collective action. This survey did not collect information on trust and social norms, however collected information on associational life of households and communities in the study areas that can be used to assess the impact of social capital on poverty.

In this study, one critical component of social capital, namely, participation in associational activities such as religious, youth, women, savings, burial groups is used. Use of participation in group activities is motivated by Putnam (1993b), who argues that participation in social groups may lead to the transmission of knowledge and may increase aggregate human capital and the development of trust which improves the functioning of markets. Putnam (1993b) argues that associations instil in their members habits of cooperation, solidarity and public –spiritedness". Gronovetter (1985) argues that group participation may also create strong internal solidarity and trust, commonly referred to as bonding in the social capital literature.

- ***Other explanatory variables***

In selecting our potential regressors, we were guided by the results of the poverty profile of the UNHS, 2002/03, results of the Uganda poverty participatory assessment project (UPPAP) and the literature on determinants of poverty. The set of regressors that we choose as possible determinants of poverty, their definition as well as their expected signs of influence are given in Table 5.2. The variables were therefore chosen if there were strong theoretical reasons and according to the literature. A key challenge however in the choice of these variables is identifying only the exogenous variables**.**

Table 5.2: Definition of variables used in the analysis

Variable	Definition	Values/measure	Model 1	Model 2
Non-Farm Inc.	Non-farm income	Uganda shillings	+	+/-
Livestock	Livestock in Tropical Livestock Units (TLU)	Average TLU for common livestock in Uganda is cow = 0.9, Oxen = 1.5, sheep or goat = 0.2, calf = 0.25	+	-
Agro-ecology	Defined by productivity potential	Dummy (Highland=1 and others=0)	+	+
Dist S. Road	Distance from plot to seasonal road	Kilometres	-	+
Agric extension	Access to agricultural extension information	Dummy (1=if household had access to an extension agent in 2002, 0=if not)	+	-/+
Education	Education for household head	Number of years	+	+
HH-age	Age of household head	Number of years	+	+
Sex	Sex of household head	1=Male and 0=Female	+	+
HH-size	Size of household	Number of household members	-	----
Social time	Time spent in organisation activities	Hours	+/-	----
Origin of ins	Whether institution one is member of is local or foreign initiated	1 if local and 0 if foreign	+	----
Ethnic Dom.	Proportion of dominant ethnic group in the village	Proportion of dominant ethnic group in the village	+/-	+/-
Farm size	Size of a farm a household owns	Acres	+	----
Marital Status	Whether married or not	Dummy (married=1 and not married=0)	----	+

Model 1: Determinants of poverty; Model 2: Determinants of group participation;

5.6. Results of the econometric analyses

5.6.1 Determinants of poverty

As mentioned earlier, this study uses household expenditure as the measure of poverty among farmers. This section presents results on the determinants of poverty as measured in terms of household expenditure. The estimates of the second stage equation for poverty as well as the estimates of the second stage equation for poverty with bootstrapped standard errors are presented in Table 5.3. Though the results are closely related, inference is different for some variables. The results of the second stage equation for poverty with bootstrapped standard errors are therefore discussed in this case because as earlier discussed in section 5.3 they present more legitimate standard errors. The Wald test suggests that the null hypothesis that social capital is exogenous is rejected at 5 percent level of significance and therefore justifies the use of the 2SPLS.

Table 5.3: Second stage results of determinants of poverty

	2SPLS		2SPLS With Bootstrapped Errors	
Variable	**Coeff.**	**P-level**	**Coeff.**	**P-level**
Social capital	0.2325***	0.0010	0.2325***	0.0000
Education	0.2255***	0.0000	0.2255***	0.0000
HH-size	-0.3776***	0.0000	-0.3776***	0.0000
HH-age	0.3342***	0.0000	0.3342***	0.0000
Dist S. Road	-0.0297***	0.0010	-0.0297**	0.0350
Non-Farm Inc.	0.0182**	0.0460	0.0182	0.1770
Livestock	0.0357***	0.0000	0.0357***	0.0000
Sex	-0.0330	0.4330	-0.0330	0.4040
Agro-ecology	0.1981***	0.0000	0.1981***	0.0000
Extension	0.0807***	0.0090	0.0807**	0.0140
Farm size	0.0217***	0.0090	0.0217***	0.0070
Origin of ins.	-0.1432***	0.0020	-0.1432***	0.0000
Constant	8.6526***	0.0000	8.6526***	0.0000
Regression Diagnostics				
Number of Obs.	1695		1695	
R-Squared	0.1613		0.1613	
Prob > F/ Prob > Chi2	0.0000		0.0000	
Replications			100	

Notes: *, **, and *** represent the level of significance at 10, 5 and 1 percent respectively

Most variables have the expected signs and are consistent with expectations, save for a few cases discussed latter. For instance, we find that an increase in the level social capital stock and its use significantly increases the level of household expenditure. In fact the impact of social capital on poverty is equal in magnitude to that of education. These findings support those in earlier studies (Narayan and Pritchett, 1999; Grootaert, 1999; Tiepoh and Reiner, 1999; Grootaert and Narayan, 2004) that found social capital to be positively related to household income and welfare.

Also, returns to investment in social capital are higher for those households in production related institutions than those in social institutions, though membership to either institution produces positive welfare benefits (Appendix 6). These findings suggest that in Uganda where poverty analysis focuses on other forms of capital ignoring the social structures through which poverty reduction policies and programs operate could be missing a large part of the poverty puzzle. The pathways that explain this linkage as earlier highlighted could be sharing of information among members, the reduction of opportunistic behaviour as a result of social pressure and facilitation of collective decision-making (Grootaert, 1997; Collier, 2002). Each of these pathways could easily translate into improved household income and welfare.

The results suggest that government poverty reduction programs need to take into consideration existing social structures. To have an efficient public intervention process and given the different impacts of different policy variables on incomes/poverty levels of different groups, government needs to do the following. First, understand the nature and objectives of the existing social institutions through which poverty reduction programs may be channeled. This may help identify different intervention programs for different social groups. For instance, the result that returns to investment in social capital are higher for those households in production related institutions than those in social institutions suggests an intervention strategy that would enable existing social institutions to

offer services as those in production related associations over and above the social objectives would also enhance their performance.

Secondly, government should work with existing social institutions for the design and delivery of projects. For instance, government extension and micro-finance services may exploit the existence of such institutions. The advantages of this approach that encourages interaction between policy makers and social institutions are i) it improves beneficiary targeting, ii) reduce project costs, iii) enhance sustainability and strengthen social organizations. Lastly, government should invest in social capital and also facilitate an enabling environment to foster and strengthen the social capital in the country. This could be done through direct investments e.g. through provision of financial support, supply of equipment (e.g. tractors), infrastructure development (e.g. Silos), training and capacity building for local organizations or indirectly by providing an enabling environment for their performance (legal framework).

Being a member of a local community oriented organization however, reduces household expenditure and therefore increases poverty. This is contrary to other authors who suggest that organizations that find their roots in the communities tend to be more effective in achieving associational objectives than externally imposed organizations. One possible explanation for this outcome is that local associations tend to be homogeneous in their nature (same characteristics such as level of education, ethnic group, levels of income and general exposure to the outside world). Such associations tend to reinforce conservatism and are likely to enjoy limited success to ways of acquiring and generating new skills and knowledge. Therefore access to a variety of heterogeneous ties offers a highly effective way of assessing and generating a broad range of new knowledge and therefore, critical for innovation. Grootaert, (1999) finds that potential pool of knowledge to be shared among rural farmers in Indonesia is higher among heterogeneous associations.

The education variable is found to be positively and significantly related to household expenditure and therefore reduces poverty. This outcome can be explained by two factors, first, the higher the level of education attained the greater the opportunities for gainful employment and therefore better household welfare. Secondly better-educated households have better access and ability to process new information (information on extension, credit facilities, family planning, hygiene, markets among others) and therefore use such information for their own benefits. From the policy perspective, provision of quality education for rural households therefore would be crucial in the fight against poverty. Continued government support for free primary education, adult literacy programs and other productivity enhancing training opportunities could be of paramount importance in poverty reduction.

Ownership of physical assets captured in this study by farm size and total livestock a household owns were found to improve household welfare. The impact of increasing both livestock and farm size on household expenditure is positive and significant at one percent. In rural Uganda, which is a focus of this study, higher earnings depend on asset ownership, particularly land, because land is a fundamental productive asset, a means of generating wealth, and acts as a cushion against shocks and reduces vulnerability of the population to poverty. Deininger (2003) shows that land in Uganda constitutes 50-60 percent of the total asset endowments of the poorest households. Interventions to modify the rules that determine access to land and the way land is distributed among members of a community may have an impact on efficient utilization of land, incidence of poverty and the level of inequality. This can be achieved through land laws that would encourage equitable land distribution. On the other hand, livestock assets are a source of cash for investment in other forms of capital and an insurance against uncertainties, and hence the positive relationship with household expenditure.

Household size was found to have an inverse relationship with household expenditure and by implication, a positive relationship with poverty. This is a common finding in the literature (Grooteart, 1999; Lanjouw and Ravallion, 1995; Datt and Jollife, 1999). This finding suggests that larger households are likely to be poorer than small households, other factors constant. This relationship could be explained by two factors. Chapter three of this thesis has already shown that, in the study area, the poor also tend to have more children. This simply means more dependants and hence lowers per capita expenditure. Other factors constant, an extra child reduces per capita expenditure of the household. Children contribution to productive labour is low and therefore the labour supply effect would not be felt. This is especially so in Uganda, where the introduction of free universal primary education has reduced children labour supply for basic home chores and farm management.

Secondly, the inverse relationship can also be explained by the economies of household size in consumption. Size economies in consumption exist if the cost per person on certain expenditures such as rent, durable and non-durable goods are lower. Size economies and labour supply are expected to increase household expenditure. However, Lanjouw and Ravallion (1995) show that these factors can only positively influence household expenditure after a certain critical level of expenditure has been reached. Lanjouw and Ravallion (1995) estimate this critical value of size economies in consumption to be 0.6 for Pakistan. The age of the household head is positively related to household expenditure. This finding suggests that households headed by older people other factors constant; tend to be better off than those headed by younger people. This is again as expected since older household heads would have accumulated productive assets such as land as opposed to the younger generations, still struggling to build their homesteads.

Access to road infrastructure is expected to reduce household poverty, because of improved access to input and output markets, non-farm opportunities as well

as services such as education, health facilities, among others. As expected therefore, the results show a negative relationship between distance to seasonal road and household expenditure. This finding suggests that the further away from seasonal road a household is the poorer it becomes. Intervention in the provision of roads infrastructure is a key component in the poverty reduction policy. Agricultural extension is expected to positively influence household income through its impact on agricultural productivity. The results show a positive and significant impact of access to extension services on household expenditure. Interventions in the provision of extension services to the poor therefore would improve productivity of poor farmers and enhance household welfare. Detailed discussion on the direction and implementation of such extension program was covered in chapter four of this dissertation.

An agro-ecological zone dummy variable was introduced to control for agro-climatic effects on household welfare. As noted before, Uganda's agro-ecologies are broadly categorized into two major classifications, as uni-modal and Bi-modal rainfall zones by Ruecker et al. (2003). This classification was based on the average length of growing period, rainfall pattern, maximum annual temperature and altitude. The results show that households based in the bi-modal rainfall zones are generally better off than households in the uni-modal rainfall zones. This result seems to suggest that favourable climatic conditions such as long growing periods, rainfall patterns among others in the bi-modal zones partly explain differences in poverty levels, earning capacity and agricultural output. Birungi et al. (2006) and Okwi et al. (2005) have also shown empirically that such environmental factors are key in explaining household welfare differentials throughout the country.

This section has shown that among other factors, social capital is very important for poverty reduction. We therefore need to come up with appropriate policies to generate and facilitate the functioning of social capital. To learn about such potential policies, requires an understanding of the factors that may influence

group participation as a measure of social capital used in this study. In the following section, guided by the literature discussed in section 5.2, we present and discuss results to explain the determinants of group participation.

5.6.2 Determinants of group participation

In this section, the determinants of group participation are discussed. As highlighted earlier, group participation is our measure of social capital. Results of the 2SPLS are presented along with results of the 2SCML approach (Table 5.4). The results from 2SCML approach are very close to those calculated under the assumption of normality of the estimators. The results of the 2SCML approach are therefore discussed in this case because as earlier discussed in section 5.4 they present more legitimate standard errors. The Wald test suggests that the null hypothesis that household expenditure is exogenous is rejected at 5 percent level of significance and therefore justifies the use of the 2SPLS and 2SCML approaches.

Table 5.4: Estimate of the second-stage equation of determinants of group participation

	2SPLS		2SCML	
Variable	**Coeff.**	**P-level**	**Coeff.**	**P-level**
HH-Expenditure	0.6798***	0.0000	0.6882***	0.0000
Education	0.0898	0.2730	0.0853	0.2990
HH-age	0.2953**	0.0240	0.2956**	0.0240
Non-Farm Inc.	0.0439*	0.0550	0.0438*	0.0560
Livestock	0.0302	0.1950	0.0310	0.1850
Sex	0.3246***	0.0080	0.3200***	0.0090
Extension	0.0132	0.8690	0.0118	0.8830
Ethnic dom	-0.4625	0.1580	-0.4615	0.1600
Dist S. Road	0.1807***	0.0000	0.1802***	0.0000
Marital status	0.1411***	0.0060	0.1345***	0.0090
Constant	-7.2337***	0.0000	-7.2913***	0.0000
Regression Diagnostics				
Number of Obs		1695		1695
Log likelihood		-805.6497		-805.0183
LR chi2(10)		117.81		119.07
Prob > chi2		0.0000		0.0000
Wald Test of exogeneity				
Chi2(1)				10.21
Prob > chi2				0.0014

Notes: *, **, and *** represent the level of significance at 10, 5 and 1 percent respectively

The results show that household expenditure is positively and significantly associated with the formation of social capital or group participation. A further examination shows that the impact of household expenditure on participation in these groups is greater for those who join social institutions (Appendix 7). These findings suggest that individuals with higher incomes are more likely to join the associations as a leisure or consumption good more than their poor counterparts. Also literature suggests that relative status derives social engagements. In rural Uganda, income can therefore be seen as a proxy for relative status. Others suggest that the poor lack the incomes to afford group memberships or spend their plentiful time securing a source of minimum income rather than participate in-group activities.

The study also shows a positive relationship between non-farm incomes and the probability of joining social institutions. This could be capturing the impact of associations for owners of non-farm enterprises. Owners of non-farm enterprises tend to join associations to acquire information on credit, technology, markets and inputs in their production process. Bar (2000), for instance shows that social net-works among Ghanaian entrepreneurs serve to channel information about new technology and Fafchamps and Minten, (1999) show the importance of business networks in conveying information about employment and market opportunities.

The results show a positive correlation between social capital formation and education. Households with a head with more years of schooling are more likely to join social institutions. The significance of education in enhancing individual incentives to group membership has been confirmed in the literature by empirical work based on regression analyses such as Godquin and Quisumbing (2005), Christoforou, (2004), Gleaser *et al*. (2000), and Alesina and La Ferrara (2000). There are alternative explanations of this outcome. Better-educated households may have a higher demand for group membership because they can more easily

benefit from the positive externalities. Secondly, education is viewed as a way of creating opportunities for collective action, either through offering access to social networks and personal acquaintances, or through cultivating values and morals leading to a sense of citizenship and solidarity (Christoforou, 2004; and Alesina and La Ferrara, 2000). Another factor in the literature that explains the social capital-education relationship is the idea that social skills are learned from schools.

Gender and marital status are also determinants of social capital. In general, the gender variable (Sex) captured in this study as a dummy variable that takes the value of one if male and zero if female is positively and significantly related to social capital. Being male increases the probability of joining a group. A critical examination reveals that males tend to have a high probability of joining social institutions and reduced probability of joining production institutions (Appendix 7). This result could partly be explained by the fact that women carry the biggest burden of family and household chores such as child rearing. Also being married significantly increases the probability of group membership. This suggests that family obligations do not hamper incentives for group membership, but instead encourages for the family to be able to meet their needs.

The results also show that there is a positive relationship between age of household head and participation in associational activities. Alsina and La Ferrara (2000) justify a similar finding that younger households are particularly busy because of marriage, having children and setting up new households. The older however may participate more, since they have more time than their younger counterparts.

Poor road access measured in this study as the distance to nearest seasonal road increases the probability of participating in group activities. This could be seen as a survival strategy to reduce transactions costs of acquiring and sharing information, and solving their social needs, in order to mitigate public sector

failures of road provision. More interestingly, distance to seasonal roads reduces the probability of joining production institutions and more of social associations. This is expected because of the inherent constraints created by poor road infrastructure on production related institutions.

5.7 Conclusions and policy recommendations

In this paper, we have undertaken the task of investigating how social capital may impact on household poverty. Specifically we were interested in establishing the impact of participating in an agrarian association on household level poverty. Our basic premise was that social capital increases household incomes and therefore reduces poverty. However it was also observed that the level of household expenditure might also determine certain components of social capital, thus suggesting an endogeneity problem. The presence of endogenous regressors therefore led to the use of econometric techniques such as the 2SPLS and 2SCML that control for endogeneity. Using two nationally representative data sets, our main conclusions and policy implications are summarised as follows:

i) Social capital defined in terms of membership to local and other organizations positively impacts on household income and therefore reduces poverty. Households that invest in social capital tend to be much better off than their non- participating counter parts. The impact of social capital on household welfare compares well with that of other forms of capital such as human capital. The policy implication of this finding is that the government should invest in social capital, by supporting the emergence and functioning of local associations. This can be achieved by incorporating social capital in the poverty reduction strategies. Incorporation of social capital in the national poverty alleviation strategy would be an important component since the returns to investment in social capital are larger for the poorest of the society.

ii) We also observe that homogeneous associations measured by being a member of a local community oriented organization tend to be welfare decreasing. This may be associated with inbreeding and conservatism associated with and common in these institutions. The policy implication of this finding is that, there is need to develop a policy that bridges the associations with other local, national and non-governmental organisations. Capacity building programs on production technologies, and market information access using the moblisation infrastructure of the local institutions would be of significant importance. This can be achieved through the government extension infrastructure or through the relevant non-governmental institutions to break the information boundaries.

iii) Education is a crucial factor that determines household incomes but also has strong positive influence on the probability of joining social groups. Public intervention in the provision of quality education for rural households therefore would be crucial in the fight against poverty. Continued government support for free primary education, adult literacy programs and other productivity enhancing training opportunities could be of paramount importance in enhancing social participation and poverty reduction.

iv) Results show that household expenditure is positively and significantly associated with the formation of social capital or group participation. This suggests that continued government effort to increase household incomes especially taking into consideration the existing social institutions will go a long way to encourages associational growth and performance and therefore reduce poverty.

CHAPTER VI

SUMMARY, CONCLUSIONS AND IMPLICATIONS FOR POLICY AND RESEARCH

Policy makers in Uganda face a formidable task of enhancing agricultural productivity, and ensuring sustainability of the natural resource base on which the majority of the population depend for their livelihood. It has been observed that land degradation in Uganda manifested through soil nutrient loss and soil erosion poses a threat to national and household food security and the overall welfare of the rural population. Uganda is said to have one of the highest rates of soil nutrient loss and soil erosion in sub-Saharan Africa.

Surprisingly, despite the extent of the land degradation problem, and government effort to contain soil erosion and reverse soil nutrient mining by promoting use of SFM and conservation technologies, the rate of adoption of these technologies is low. These trends of events suggest that unless immediate intervention is put in place, land degradation and therefore household welfare are bound to continue worsening. Among other factors, poverty has been blamed for the low rates of adoption. It has been argued that the poor living barely on subsistence level do not have economic capacity to use purchased inputs such as inorganic fertilizer. More so, the limited access to productive assets by the poor (livestock, land, and non-farm income) constrains their ability to engage in improved land use practices such as terracing and fallowing among others.

Other factors considered to be conditioning the poverty-land degradation relationships in the literature include institutional factors (property rights), capital (physical, social, natural, financial and human), and other socio-economic factors of the areas of study. Among these conditioning factors, is the question of social capital that has attracted minimum attention from both academics and policy makers in Uganda. Social capital can influence land degradation-poverty interaction through the following ways:-

i) it facilitates transmission of knowledge about technology and markets, reducing market failures in information and therefore reducing transactions costs (costs of obtaining information about technology, market, creditworthiness of contract parties among others).
ii) Reducing problems of free riding and thereby facilitating cooperative action,
iii) Enhancing coordination and monitoring effective public services delivery,
iv) Ameliorating other conventional resource constraints such as market access or credit limitations and thus reduce vulnerability of households to poverty.

Studies that have incorporated social capital in determinants of adoption of SFM and conservation technologies in Uganda on one hand and determinants of poverty on the other are non-existent. More so, studies that analyse the determinants of social capital formation are also non-existent. To appropriately address the twin problems of land degradation and poverty, and avoid the down-ward spiral suggested in the literature, there was need therefore to understand the underlying causes of low adoption rates and the determinants of poverty in the country.

The goal of this study was therefore two fold. First, the study investigated the determinants of SFM and conservation practices in Uganda, with particular interest on the role played by poverty, social capital and land tenure in explaining adoption of these technologies. Secondly, the study provided an understanding of the causal relationships between social capital (measured by group membership) and poverty. Specifically, the study investigated the importance of social capital in explaining household poverty as well as the importance of poverty in explaining participation in social agrarian groups. It was hoped that understanding these key relationships would help policy makers design appropriate policies addressing the needs of the poor communities in the country.

The study utilised a data set from a survey conducted by IFPRI and the World Bank, in collaboration with the Uganda Bureau of Statistics (UBOS). The survey covered eight districts of Arua, Iganga, Kabale, Lira, Kapchorwa, Masaka, Mbarara and Soroti. The districts were chosen to take into consideration the different agro-ecological zones, level of poverty, farming systems, land tenure and endowment of natural resources in the country.

Econometric approaches were used to establish the determinants of adoption of SFM and conservation technologies and to establish the empirical relationship between social capital and household poverty in Uganda. To establish the determinants of adoption of SFM and conservation technologies, a multinomial logit (MNL) model was used. Choice of MNL was motivated by the need to address the interdependent and joint nature of the adoption decision making. A two-stage probit least squares 2SPLS was used to correct for possible endogeneity effects, associated with the poverty-SFM and conservation relationships. In the second part of the study, a linear regression model was used to understand the determinants of poverty in Uganda while a probit model was used to capture the determinants of group participation, our measure of social capital. In order to correct for the endogeneity problem associated with poverty and social capital (involving discrete endogenous dependent variables), a two stage non-recursive procedure was used. The 2SPLS and two stage conditional maximum likelihood (2SCML) approaches were used to correct for possible endogeneity effects associated with social capital-poverty relationship.

Key findings emerged from this study. The study shows that poverty measured by household consumption expenditure increases the probability of non-adoption in general and particularly reduces the probability of adopting organic and inorganic fertilizers and terracing. This result was attributed to the fact that the poor have limited access to cash, markets, land and livestock assets which constrain their productive potential. This finding suggests that government

programs to reduce poverty would go a long way in promoting the use of SFM and conservation practices.

The study also found that participation in social institutions generally tends to increase the probability of adopting most land management practices and generally reducing non-adoption. This finding suggests that investment in social capital is therefore of paramount importance to encourage adoption of SFM and conservation technologies. Two policy implications of this outcome are clear. First, the results suggest that development projects should not be designed so that they deal with all communities uniformly, but be adapted to different levels of existing social institutions and norms. For instance extension programs need to put emphasis on pre-project analysis and preparation so as to assess and identify farmer circumstances including formal and informal institutional constraints. Secondly, extension workers should understand the institutional set up in their areas of work and be able to promote and exploit the existing institutional infrastructure for the dissemination of information about new technologies and encourage cooperative action.

Also land tenure security was found to be positively correlated with adoption of fallowing and organic fertilizer use and generally reducing the probability of non-adoption of land management technologies. These results also suggest that programs that enhance tenure security such as land registration would encourage adoption of most land management practices. In addition, distance to markets was found to reduce use of marketed inputs, such as inorganic fertilizer while increasing use of traditional technologies such as fallowing. From a policy perspective, these findings suggest that public intervention in road provision would reduce non-adoption of marketed inputs.

The results further show that agricultural extension doesn’t significantly affect adoption of most of the technologies except use of inorganic fertilizer. This result has been attributed to the fact that the extension system in Uganda has been

packaged to promote use of inorganic fertilizer in an effort to intensify agricultural production at the expense of traditional practices. More so, the weak relationship between extension and adoption decisions is also attributed to inadequate and some times complete absence of extension services. Only 28 percent of the sampled households have had a single visit by an extension agent for a period of one year. The policy implication of this outcome is that there is need to revitalize the extension services and open it to support use of other traditional SFM and conservation technologies that are more readily available even to the poor farmers.

The study also shows that households that are endowed with family labour use more labour intensive management practices, while older farmers were found to be associated with traditional management practices such as fallowing because they tend to be more risk averse and therefore resistant to change to newer technologies. Differences in agro-climatic regions were also found to be key in explaining adoption of SFM and conservation practices. For instance, the likelihood of using fallowing and inorganic fertilizer in the bi-modal agro-climatic zones was substantially lower than in Unimodal agro-climatic zones. This finding was attributed to sparse population and organised fertilizer supply for maize/barley and tobacco farmers in Kapchorwa and Arua districts, respectively. On the other hand, the likelihood of using organic fertilizer and terracing is higher in the densely populated bi-modal agro-climatic zones, because of availability of family labour and ability to pay for hired labour, since these are labour intensive technologies.

In the second part of the study, determinants of both poverty and group participations are analysed. The results suggest that an increase in the level of social capital stock and its use increases the level of household expenditure. Households that invest in social capital tend to be less poor than those that do not invest. As argued earlier, these results show that government investment in social capital is of paramount importance to eradicate poverty and show that

earlier analyses that have neglected the role of social capital were missing an important part of the poverty puzzle. It is therefore important to incorporate social capital in the national poverty alleviation strategy since the returns to investment in social capital are large even for the poorest communities. Investment in social capital could be done through direct investments e.g. through provision of financial support, supply of equipment (e.g. tractors), infrastructure development (e.g. Silos), training and capacity building for local organizations or indirectly by providing an enabling environment for their functioning (legal framework).

Another interesting outcome was that homogeneous associations defined as membership in a local community oriented organization were found to be welfare decreasing. This outcome was associated with inbreeding and conservatism associated with and common in these kinds of institutions. The policy implication of this finding is that, there is need to develop a policy that promotes linkages and networking with other local, national and non-governmental organisations. Capacity building programs on production technologies, and market information access using the infrastructure of the local institutions would be of significant importance. This can be achieved through the government extension infrastructure or through the relevant non-governmental institutions to break the information boundaries.

Access to road infrastructure and provision of education to the rural masses as expected were found to reduce poverty in Uganda. Besides education providing greater opportunities for gainful employment it also helps in accessing and utilizing useful and productivity enhancing information hence improving household welfare. Access to road infrastructure improves access to input and output markets, as well as services such as education, communication, and health facilities. Public intervention in the provision of quality education and improve road infrastructure for rural households would therefore significantly contribute to poverty reduction. Other factors that were found to reduce poverty included ownership of physical assets such as land and livestock.

As regards group participation, the study shows that household expenditure, education and non-farm income increase the probability of participating in social capital institutions. The appropriate policy implications therefore remain as discussed in the previous sections.

In conclusion, the problem of identifying all the endogenous variables in cross section data sets of this nature remains a big challenge. The causal relationships between the different variables included in the model still remain debatable. This could have had an impact on the inferences made. Future investigations could therefore use other more advanced methods such as bi-probit or tri-variate probit in addressing some of the possible endogeneity problems. Secondly, final conclusions on the direction of causality between poverty and land degradation remains a challenge because of lack of appropriate data. Further research to effectively study causality of the two twin problems would require panel data containing plot level and household level information over time, given the inter-temporal nature of the two problems. Institutions that can help build a panel data set of this nature will go a long way in aiding the analysis and understanding of the existence of the twin problems.

Thirdly, this study did not cover how off-site effects of soil erosion can be managed. Some information could have been captured by the social capital variable, through the impact of social capital on encouraging cooperative action. The study however mainly provides solutions for onsite effects only. Landowners/users are expected to invest and manage their land to increase their productivity. Whereas it is in the interest of the farmers to invest in the control of on-site effects, management of off-site effects may require interventions from local social institutions, government and cross country initiatives among others. The policy implications of managing the off-site and on-site effects are therefore different. Further investigations to understand how off-site effects can be managed will be of great policy importance.