EFFECT OF SOCIAL CAPITAL ON RURAL HOUSEHOLD WELFARE IN SOUTHWESTERN NIGERIA

By

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DEDICATION

This thesis is dedicated to Almighty God, the *alpha and Omega,* for sustaining me throughout the programme and to my mother, Mrs. Comfort Oluyemisi ADEWOYIN, for her support in all spheres of my life.

ABSTRACT

Rural household welfare remains low in Nigeria, as the traditional capital (physical, natural, human and financial) has not fully led to its improvement. There is increasing shift of attention to social capital as an element that explains household welfare. The nexus between social capital and rural household welfare in southwestern Nigeria has not been fully examined. The effect of social capital on rural household welfare in southwestern Nigeria was therefore investigated.

Multistage sampling technique was used. Oyo and Ekiti states were selected from the six states in southwestern Nigeria based on their poverty profile (the least poor and the poorest). Six rural Local Government Areas and thirty-two communities were selected from the two states based on probability proportionate to size and sample size of 298 was used for the analysis. Data were collected on household demographic characteristics such as age, education and household size, expenditure profile and social capital dimensions: Membership Density (MD), Decision Making (DM), Meeting Attendance (MA), heterogeneity, Cash Contribution (CC) and Labour Contribution (LC). Data were analysed using descriptive statistics, ordered probit, ordinary least square, two-stage least square and control function regression models at p=0.05.

Ninety three percent of the households were headed by male. Mean age, years of formal education and household size were 48.3 ± 11.7 years, 8.4 ± 6.3 years and 6.1 ± 2.6 respectively. Average MD and DM in association were 4.5 ± 2.1 and 24.7 ± 13.2. Households attended four out of every five meetings scheduled. Diversification of membership measured by heterogeneity index was 21.7 ± 16.4 while annual CC and LC to association were ₦7,412.95 ± ₦9,757.73 and 54.6 ± 18.4 mandays respectively. Membership in religious group accounted for the highest proportion (77.3 percent) while recreational club accounted for the lowest (4.67 percent). The highest Welfare Tercile (WT) had monthly mean *per capita* expenditure of ₦9,135.98 ± ₦4,014.35 which was four times the value for the lowest WT (₦2,239.82 ± ₦958.33). The maximum CC to associations was recorded by the highest WT (₦9,756.90 ± ₦12,358.25) while the lowest WT had the maximum LC of 24.7 ± 20.2 mandays. Majority of the households (78.0 percent) benefited from access to information on market outlets and share of risk/shocks while 55.5 percent had access to land. Low educational level reduced benefit derived from social group by 0.027, while being a

farmer (0.404), LC (0.016) and DM increased benefit received from social group. Household welfare reduced with increase in age (-2.965), being married (-2.965), household size (-0.398), being a farmer (-1.676) and LC (-7.5×10^{-4}). Conversely, age squared, education and DM index increased household welfare by 0.2 percent, 10.8 percent and 2.8 percent respectively. Aggregate social capital index increased household welfare by 9.5 percent, while controlling for non-linear interaction of social capital with unobservable variables further increased the effect of social capital by 13.1 percent.

Decision making and aggregate social capital improved household welfare while labour contribution reduced it. A bi-causality relationship existed between social capital and household welfare.

Keywords: Social capital, Welfare status, Rural households
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CERTIFICATION

I certify that this work was carried out by Adebusola Adenike ADEPOJU under my supervision in the Department of Agricultural Economics, University of Ibadan, Nigeria

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CHAPTER ONE
INTRODUCTION

1.1   **Rural household welfare in Nigeria**

In spite of Nigeria's physical and human resources endowment, there still exist progressively worsening welfare conditions of its nationals (Okunmadawa, 2001). The Human Development Report by UNDP (2011) ranked Nigeria as 156th among 187 countries. This reveals that Nigeria is one of the poorest among the poor countries of the world. With low Human Development Index HDI value of 45.8 percent, Nigeria is ranked 75th among 103 developing countries, (Etim *et al.,* 2009; Etim and Edet, 2009, Etim and Ukoha, 2010).

The level of poverty in a household is widely recognized as a reflection of low welfare of the household, and this is reflected in the central role that the concept of poverty plays in the analysis of social protection policy. The central objective of rural development involves raising incomes and outputs as well as existing assets in order to improve the welfare of rural people in totality (Okorie, 1982). Oluwatayo (2004), reports that poverty exists when an individual or a group of individuals fails to attain a level of well-being, usually material well-being, which is deemed to constitute a reasonable minimum by the standard of that society.

Poverty exists in both urban and rural areas, but in Nigeria, poverty is essentially a rural phenomenon like in many developing countries (Oluwatayo, 2004) This is because most of the impoverished people live in the rural areas where they derive their livelihood mainly from farming activities. Though urban poverty exists and is also becoming of increasing concern, as reflected in the worsening trend in urban welfare indicators (World Bank, 1997), rural poverty is a much wider issue than the urban poverty. It is known that about 68 percent of the extreme poor are dependent on agriculture and live in the rural areas / communities (Cleaver and Schreiber, 1994; UNICEF, 1996; World Bank, 1997).

Like in most developing economies across the globe, rural households in Nigeria face one type of risk situation or another which leads to fluctuations in their income. They are impoverished and vulnerable to negative changes in environmental, socio-cultural, political and economic conditions because of their entanglement in the vicious cycle of poverty. They are also the worst hit by the scourge of food insecurity (FOS 1999a). Irrespective of the fact that these rural households constitute the greater

share of agricultural labour force, they earn low incomes because of poor marketing facilities, poor storage and preservation techniques, bad road network, poor health facilities, low educational level, unfavourable government policies and lack of technological know-how. This consequently leads to further impoverishment and / or at least increased inequality, (FOS, 1999b; ECA, 2001).

The rural households are invariably the most vulnerable due to the peculiar characteristics inherent in their primary means of livelihood and major income source which is agriculture. Static poverty measures neglect several important aspects of households' welfare (Ligon and Schechter, 2002) and economists have long used measures of poverty to summarize the level of well-being of the vulnerable in a population. At the same time, they have recognized that a household's sense of well-being depends on its average income or expenditures. This is particularly true for households with fewer resources.

1.1.2   Social capital and its dimensions

Social capital can be defined as the influence which the characteristics and behaviours of one's reference groups have on one's assessments of alternative courses of behaviour (Durlauf, 1999). This implies that social capital is present when an individual decisions is influenced by what group they belong to. It can also be referred to as the value of connectedness and trust between people. It is one of the keys to sustainable livelihoods by lowering the cost of working together and facilitating cooperation. Individuals invest in collective activities, knowing that others will also do so (Pretty, 2003). It can also be defined as a variety of different entities which have two elements in common. That is, it consists of some aspects of social structure and as well facilitates certain actions either personal or corporate within the structure (Putnam, 1993). Another view of social capital includes social environment, which enables norms to develop and shape social structure. This includes the more formalized institutional relationships and the structures, for example, government, rule of law etc. This institution has effects on the rate and pattern of the economic development and human well-being, (North, 1990).

Social capital is widely seen as a resource that facilitates cooperation within or between groups of people. It can emerge in relationships in many areas of life such as those involving friends and families, school communities, ethnic, religious and community groups, occupational groupings, firms, governments and other institutions.

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The term social capital is used to refer to connections which exist among people and organizations. These social networks have important implications for social identity, emotional support as well as the exchange of goods, services, and information. Views differ about what constitutes social capital, how it operates, to whom and what the concept applies, and how to delineate between its sources, manifestations and effects. However, there seems to be a broader agreement in the literature about what social capital does, than what it is. In particular, it is widely agreed that social capital facilitates mutually beneficial collective action.

Social capital can be viewed from two angles, that is, government influenced social capital and civil social capital. Collier (1998a) differentiates between government influenced social capital as that which involves the enforceability of societal contracts, rule of law, and the extent of civil liberties. Civil social capital involves enforcement of common values, shared traditions, norms, informal networks and associational membership. In societies where government influenced social capital is limited, a large proportion of contracts may depend on civil social capital and trust. Also, Uphoff (1999) distinguishes between structural and cognitive social capitals. Structural social capital involves various forms of social organisation, including roles, rules, precedents and procedures as well as a variety of networks that contribute to co-operation. Cognitive social capital includes norms, values, attitudes and beliefs. Structural and cognitive social capitals are complementary: structures help to translate norms and beliefs into well co-ordinated goal-orientated behaviour. Nonetheless, people's participation in social activities rarely happens spontaneously, rather it involves a social preparation consisting of the process of supporting people to gather information about their circumstances and resources, analyse the situation, prioritise actions they wish to pursue, join a group or an organisation of their own choice, and work out the means to implement these actions (Albee and Boyd, 1997).

According to Narayan and Pritchett (1997), social capital is pervasive and can generate benefits in subtle as well as more visible ways. The mechanisms for how social capital affects outcomes are:

- Improve society's ability to monitor the performance of government in the provision of public goods and services;
- Increase possibilities for co-operative action in solving problems with common local property element;

- Cooperative action in solving problems with a local common property element;

- Facilitate the diffusion of innovations by increasing inter-linkages among individuals;

- Reduce information imperfections and expand the range of enforcement mechanisms, thereby increasing transactions in output, credit, land and labour markets;

- Increase informal insurance (or informal safety nets) between households, thereby allowing households to pursue higher returns, but with more risky activities and production techniques.

A perspective in social capital research emphasizes a "structural" dimension of social capital, consisting of network connections; and a "cognitive" dimension, consisting of attitudes toward trust. Correspondingly, membership in organizations (that is, membership density) and general trust in people (that is, social trust) are two indicators commonly used to relate structural and cognitive social capitals, respectively, to a variety of outcomes.

According to Oyen (2000) and Woolcock (2001), an individual acquires social capital through participation in informal networks, registered organizations, associations of different kinds and social movement. It can also represent the sum of these experiences. Through social networks, individuals develop joint interest in shared norms which in turn leads to trust and better understanding of different cultures; backgrounds and life styles. Social capital can be based on the understanding that both formal and informal structures are formed around human needs. While some social networks are heterogeneous (open to a wide range of participants) others are homogeneous that is, they accept only the people who share common interests. Social networks are often built when, happiest and most rewarding times are spent talking to neighbours, sharing meals with friends, attending religious gatherings and volunteering on community projects (Pretty, 2003).

There is growing evidence that social capital is an element for sustainable development due to the role it plays in managing risks, shocks, and opportunities. It therefore, holds a strong position to confront poverty and vulnerability (Narayan and Pritchett, 1997), resolve disputes (Schafft and Brown, 2000), and share beneficial information (Isham and Kabkonen, 1999). There is therefore, the need to promote the role played by social capital in enhancing productivity and welfare of rural

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households, the level of development of communities and the nation as a whole. The recognition that social capital is an input in a household or a nation's production function has major implications for development policy and project design. It suggests that the acquisition of human capital and the establishment of a physical infrastructure need to be complemented by institutional development, at the local and the national levels in order to reap the full benefits of the aforementioned investments (Grootaert, 2001).

1.1.3   Social capital in relation to household welfare

The linkage between social capital and welfare is particularly relevant in many rural communities throughout sub-Sahara Africa, where households suffer from pervasive and extreme poverty. It can have an important impact on household welfare, either substituting for or enhancing existing forms of capital in communities where traditional forms of capital required to generate income are scarce or depleted. For example, village water groups can encourage cooperation in managing community water resources, thereby avoiding the negative consequences of potential overexploitation (Aker, 2007). Additionally, in agriculture, credit and women's groups can lower economic and social transaction cost, thereby improving access to credit, technology and farm input for group members and non-members. Also, households and villages with stronger social ties might be more likely to share risk, thereby mitigating the negative impact of exogenous climatic shocks. Local associations can serve a wide variety of functions in the life of a community. They can play a vital role in the management of the community such as provision of social services, for example, education and health, provision of infrastructure services like water and electricity. They can also help the household obtain access to credit and help farmers to manage irrigation and improve access to agricultural inputs.

In a poor rural setting, a prime consideration for households is to develop coping strategies to deal with the risk of income fluctuations and this may involve the use of social network in time of need and/or arranging access to credit. Putnam (2000) and Grootaert (1999) believe that social capital has quantifiable effects on different aspects of human endeavour. The duo argue that the effects on different aspects of life include lower crime rates, better health (Wilkinson, 1996), improved longevity, better educational achievement (Coleman, 1988), greater levels of income equality (Kawachi *et al.,* 1997), improved child welfare and low rate of child abuse (Cote and

Healy, 2001). Others include lower corruption and more effective government (Putnam, 1993; Knack, 1999), dispute resolution and enhanced economic achievement through increased trust and lower transaction cost (Fukuyama, 1995). All of these mechanisms can potentially affect household welfare and enhance community groups to overcome poverty.

1.2   Statement of the problem

Poor people have severely limited access to, and control over key assets, including land, physical and human capital. They lack production and labour market endowments, resulting in low income and consumption. Most of the rural poor are also inadequately educated and may not be as healthy as the rest of the population due to the fact that they depend on subsistence agriculture as their main source of livelihood, where returns to labour and capital are generally low. Even those that work in the formal sector receive low salaries, limited protection and frequent spells of unemployment. These factors, coupled with lack of access to the local institutions that shape policies, weaken the decision environment and prevent the rural poor from acquiring the capabilities for decent living.

Whether or not a household is poor is widely recognized as an important, albeit crude, indicator of a household well-being; and this is reflected in the central role played by the concept of poverty in analyzing social protection policy. Poverty is said to exist when individuals/group of individuals fail to attain a level of well-being, usually material that is deemed to constitute a reasonable minimum by the standard of that society. This means that poverty is an ex-post measure of a household's well-being, a state of a long term deprivation of well-being, that is, a situation considered inadequate for a decent life.

Despite the efforts made by government at reducing poverty, the impact largely remained unfelt by the poor (Yusuf, 2008). This is because the focus of the government programmes, until recently, is on provision of infrastructural facilities with little or no consideration for institutional development which enhance social organizations and community development through the creation of employment opportunities at the local level to ensure the delivery of support to the poor (Okunmadewa *et al.,* 2005a).

Also, the differences in welfare whether at individual, household or state level, cannot be explicitly explained using the differences in the use of traditional inputs

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such as labour, land and physical capital. The traditional composition of capital in form of natural, physical and human capital also needs to be discussed along with social capital for sustainable development. This is because social capital has been recognized as a capital which yields a flow of mutually beneficial collective action that contributes to the cohesiveness of people in their societies (Grootaert *et al.,* 2002). Social assets comprising social capital include norms, values and attitudes that predispose people to cooperate with others based on trust, reciprocity and obligations. These are connected and structured in networks and groups and they enhance and strengthen other forms of capital in existence. Social networking helps to improve and shape the social and economic spheres in African countries. This is particularly important in the rural areas where the majority of the population are poor and social connectedness is significant to their daily interactions.

Considering the importance of welfare at the individual and household levels; studies have extensively investigated social capital and household welfare either separately or in relations to each other. The findings of these studies support emphasis on investing in social capital, (Okunmadewa *et al.,* 2005b and Ikporupo, 2007; Yusuf, 2008; and Balogun *et al.,* 2011). The concern of this study becomes more important in that most results revealed have no consideration for the benefit received from participating in social group. The essence of coming together to form a group lies in the expectation of some benefits; the extent to which these benefits are realized could be established through the feedback from the farmers themselves.

Also, many studies on social capital have recognized that social capital formation is endogenous to economic outcome either directly or indirectly, there has been relatively little attention to the implications of this for the interpretation of evidence or its overall social value. This is a problem that needs to be addressed; an aspect that seems to be considered less important in the empirical studies of social capital. This study, therefore, seeks to fill the knowledge gap in welfare analysis by examining the effects of social network on economic outcome that is, the welfare of farming households. Arising from the foregoing, this study thus provides answers to the following research questions:

1.   What are the dimensions of social capital available in the study area?

2.   What is the welfare profile of farming households in the study area?

3.   Which factors determine the level of benefit received from group participation?

4.   Does social capital enhance farming household welfare?

Answers to these questions will provide a basis for evolving strategies at strengthening the neglected local institutions to complement the provision of infrastructure and increase human capital development to empower the poor.

1.3   Objectives of the study

The main objective of the study is to analyze the effect of social capital on household welfare in Southwestern Nigeria. The specific objectives are to:

1.   characterise the various dimensions of social capital based on household demographic or socio-economic characteristics;

2.   present a welfare profile on the basis of household characteristics and social capital dimensions;

3.   determine the factors influencing the level of benefit received from group participation; and

4.   determine the relationship of social capital and household welfare.

1.4   Hypotheses of the study

The following hypotheses were constructed and tested:

1. H_0: Each identified socio-economic characteristics does not influence benefit received from participation in social group.

$Ho: \beta_1 = \beta_2 = \beta_3 = \ldots\ldots\ldots\ldots = \beta n = 0$; $H_o : \beta_i = 0$

H_A: Each identified socio-economic characteristic influences the benefit received from participation in social group.

$H_A : \beta_1 \neq \beta_2 \neq \beta_3 \neq \ldots\ldots\ldots \neq \beta_n \neq 0$; $H_1 : \beta_i \neq 0$

Where $\beta_i = (i = 1$ to n$)$ are the vectors of parameters that determine the level of benefit received from being a member of a social group.

2. H_0: Social capital is not endogenous to household welfare.

H_0: $\delta_1 = \delta_2 = \delta_3 \ldots\ldots\ldots = \delta_n = 0$; $H_o : \delta_i = 0$

H_A: Social capital is endogenous to household welfare.

H_A: $\delta_1 \neq \delta_2 \neq \delta_3 \ldots\ldots\ldots \neq \delta_n \neq 0$; $H_o : \delta_i = 0$

Where $\delta_i = (i = 1 ton)$ are the vectors of parameters that determine endogeneity of social capital.

1.6   Justification of the study

The qualitative assessment of poverty is tagged 'Voices of the poor in Nigeria' as contained in the World Bank Development Report of 2001. The report identifies local level institutions as key to sustaining the welfare of the poor. Studies have revealed that local institutional strengthening through the active participation of the poor in project design and implementation is a necessary factor in poverty reduction in Nigeria. This recognition probably explains the promotion of group formation (social connectedness) as an important requirement for the poor to benefit from some of the public instituted poverty reduction programme (Okunmadewa *et al.,* 2005b).

The ability of individuals to secure benefits by virtue of their membership in social networks or other social structures is becoming an important element in understanding differences in economic outcome. This, therefore, justifies the need to complement acquisition of human capital and establishment of physical infrastructure with social capital. The recognition, that social capital development is an important factor in the production function of an individual or household to reduce poverty suggests that it must complement human and physical capital before the full benefits of any development programme is derived (Okunmadewa *et al.,* 2005a).

The benefits accruable to social capital are; easy access to information on productive activities, training and education, and sharing of risk and shocks during adverse period. Social capital also provides opportunity for financial support in times of need, provision of moral and emotional support, cooperation among group of people, and contribution of resources to enhance community development, among others. This benefit will substantially enhance the economic outcome of individuals, households and communities.

The need, therefore, for the use of quantitative analysis to examine the effect of social capital on household welfare aimed at validating the qualitative assertion in the voices of the poor becomes a necessity. Recent studies in Nigeria have treated social capital and household welfare separately. Examples are Yusuf *et al.,* (1999) and Omonona (2001). Other studies which have empirically established the link between social capital and household welfare in Nigeria are Okunmadewa *et al.,* (2005b, 2007), Yusuf (2008) and Balogun *et al* (2011). In these studies, the conceptualization of social capital is mostly based on household level trust. Also, studies on social capital have only measured social capital in relation to household welfare without

necessarily assessing the useful indicator such as benefits derived from participating in social institutions which this study tries to explore.

In addition to this, researches have suggested credit programmes, fertilizer supply and other input supply as ways by which farmers' welfare can be improved. However, most of these studies are incapable of establishing the contribution of social capital towards rural households' welfare especially in the study area. The study is further justified in its methodological approach to solve endogeneity problem as conceived in similar studies through the use of context-specific household instruments such as length of household residency in the community, household donation in the past year, and membership of religious and ethnic group. The advantage of using these context specific instruments is that they are highly correlated with social capital but weakly correlated / uncorrelated with rural household expenditure, and they provide valuable information for addressing endogeneity and understanding the direction of causality between social capital and expenditures.

Furthermore, the use of two-stage least square regression, the control function approach is used as a robust check on the envisaged problem of endogeneity in household welfare measures due to non-linear interaction of social capital with unobservables and omitted variables which could bias the estimated structural coefficients (Garen 1984, Wooldridge 1997 and Card 2001). The control function variables, therefore, control for the effects of unobservable factors that would otherwise make estimates to be biased.

On welfare issues in Nigeria, recent projects have focused on group formation as a strategy for enhancing household welfare. This approach is based on encouraging the participation of local level institutions in poverty reduction. It is aimed at improving access of the poor to social and economic infrastructure and increase the availability and management of development resources at the community level in Nigeria. Also, government in Nigeria in recent times has assisted individuals based on the group they belong to; that is, input subsidies, grants, loan etc are usually channelled through social capital affiliations like, religious or social group and co-operative societies among others. In terms of policy / programme relevance, this study, therefore, seeks to provide empirical evidence based platform for using group formation as a strategy for enhancing household welfare through poverty alleviation and community development as well as provide justification for or against this strategic approach in reducing poverty in Nigeria.

1.7 Plan of the study

The rest of this report is divided into four chapters. Chapter Two features the theoretical framework for social capital and household welfare. It also contains a review of literature. Chapter Three discusses the methodology applied in the study. This includes the description of the study area, the sampling procedure and the analytical techniques. The result of the data analysed is presented in chapters four under four sections. Section One describe the socio-economic characteristics of the respondents and the social capital dimensions available in the study area. The household welfare status by socio-economic characteristics and social capital dimensions is discussed in section two. This features household distribution of monthly expenditure, categorization of households according to their welfare status, categorization of welfare status based on socio economic characteristics and household welfare status in relation to social dimensions. The dimensions of social capital in relation to respondents' household, socio-economic and demographic characteristics are discussed in section one. Section three presents the three categories of benefit received from the various social groups to which the respondents belong and the determinants of benefit received from social capital. Section four discusses the effect of social capital on household welfare. It contains social capital on household welfare as well as the issue of reverse causality. In Chapter Five, the study is summarized and a conclusion is drawn. The chapter also includes recommendations and suggestions for further studies.

CHAPTER TWO
THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1   Theoretical framework

2.1. 1. The concept and basic dimensions of household welfare

Welfare (a state of well-being), from the 'welfarist' approach, means the level of utility reached by an individual which is a function of goods and services that such an individual consumes. This approach attaches greater importance to individual's perception of what is considered useful to him or her. On the other hand, the 'non-welfarist' approach defines well-being independent of individual's perception of it. It does this by relying on what planners deem desirable for individuals from a social point of view, and selective indicators are used to distinguish certain goods considered socially useful. According to Ravallion (1992), planners generally favour adequate food, improved access to education, health care, housing, clean water, etc.

Household welfare is the state or condition with respect to whether an individual is healthy, safe, happy or prospering. The first and most apparent direction in which the basic dimension of welfare can be expanded entails human development indicators such as health, education, nutrition, fertility, infant mortality, etc. The pertinent issues include access to various public services such as schools, health facilities, piped water, etc. Explicit consideration of time is a second dimension in which the basic welfare concept can be enriched. Relevant issues that immediately come to mind are fluctuations of income both in the short term and over the life cycle, the vulnerability of the household to external shocks, the accumulation of assets and intergenerational transfers (bequests).

2.1.2   Measurement of household welfare

In the early approaches, according to Blundell *et al.,* (1994), welfare is measured as a function of individual utilities of bundles of goods consumed. This traditional approach to the measurement of household welfare has taken the household as the level of decision-making, modeling its behaviour as if it had a single objective function satisfying similar properties to individual utility functions, and then allocating the attained value of the objective equally among its members. However, Grootaert (1980) states that welfare and utility are related but they are not identical

concepts. According to him, welfare can be derived from the consumption of goods, either directly or because of the characteristics of the good. An example is the transportation characteristics embodied in a bicycle. The translation of consumption into welfare units is a function of various socio-economic and demographic characteristics of the recipient and of environmental factors.

There are three main approaches to household welfare measurement, and these are:

1. Estimation of True Indices of Welfare,
2. Full Income Concept, and
3. Total Household Expenditures

- **Estimation of true indices of welfare**

True indices of welfare can be derived from the preference parameters that are estimated in an integrated model of household consumption and employment behaviour. This approach is outlined by Muellbauer (1980). The basic premise is that welfare depends on goods, leisure, household composition and access to public services. These variables, with the exception of leisure, are seen as determinants of welfare at the household level; leisure is introduced in the welfare function at the individual level, that is, the leisure/work choice of each potentially active household member is recognized. The household maximizes welfare subject to a budget constraint which takes into account the prices of outputs and of purchased inputs, the time endowment of each household member, net accumulation of wealth, and the wage rate that each member can obtain in the market. The accumulation variable would be endogenous in an intertemporal context. However, if one is willing to make the assumption that preferences are separable in time, then the intertemporal optimization can be broken down into a series of static optimizations. This has the added advantage that it is not necessary to introduce assumptions regarding the degree of perfection of capital markets.

With this model, the goods/leisure choice and the choice between market and domestic work for each household member can be studied within the household context by estimating functions for (individual) labour supply, demand for commodities, and inputs into the domestic enterprise. This is a system of simultaneous equations which can be estimated from cross-section data, using instrumental variable techniques. Based on the estimated parameters, welfare levels can be calculated and compared since the variables in the welfare function are all

observable. Translation into money-metric equivalents is possible by using a reference price and wage vector. The obvious advantage of this model is its completeness. It estimates welfare directly from the consideration of household behaviour both on the consumption side and on the employment side.

- **Full income concept**

The second approach to household welfare measurement is full income and this is the sum of monetary income, income in kind (including production of the household enterprise and government services), and the value imputed to services derived from endowments and assets such as durables, housing and time owned by the household. The method attaches a monetary value to leisure, based on behavioural decisions by the household and its members to equate the utility of time spent on various activities at the margin. The full income method can be seen as a reduced-form equation of the complete behavioural model described in estimation of true indexes of welfare, that is, the first approach (Kusnic and Da Vanzo, 1980).

The value to be used for imputation of time is directly linked to available opportunities, and the full income method crucially depends on correct estimation of the real opportunity set. Caution is required when assuming that the same full opportunity set exists for everyone and doing all imputations at existing market wage rates. In practice, not all leisure consumption is bound to be voluntary and the failure to recognize this can result in overestimating household welfare. In principle, when quantity restrictions apply, the shadow value of time must be derived from a modelling exercise at the household level, as described in the first approach. However, an investigation of work opportunities at the local level may be a more practical way to obtain an indication of the opportunity wage rates for the community to which a household belongs.

- **Total household expenditures**

This is the third approach to welfare measurement and it relies on the estimation of total household consumption essentially as a one-equation model in which welfare is a function of goods consumed by the household. The key assumption here is that the preference patterns as revealed by the purchases of goods and services by the household implicitly take into consideration other preferences which in the previous approach were introduced explicitly in the welfare function. These include

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the leisure choice, the decision to have children, etc. In the present approach, these decisions are considered exogenous and it is assumed that the implications for household welfare are fully reflected in the pattern of purchases by the household. Welfare measurement is then a question of constructing an index of total expenditures deflated by an appropriate price index and by an index of household size and composition, i.e. an equivalence scale. Ideally, the price index should be a true cost-of-living index. Deaton and Muellbauer (1980) demonstrate that both the Laspeyres Index and the Paasche Index are first-order approximations to a true cost-of-living index. Specifically, the Laspeyres Index is an upper bound for the base referenced true cost-of-living index and the Paasche Index is a lower bound for the current referenced true cost-of-living index.

These approximations unfortunately worsen when important price substitution effects appear, as is often the case in cross-sectional data. This provides an argument for constructing price indexes for different groups which are more or less homogeneous with respect to the prices they face. Distinctions that immediately come to mind are urban versus rural and various geographic locations within a country. If prices also vary with income levels, then different price indexes can be constructed for different income groups. The case for this is strengthened since, often, quantity weights will also vary with income level and/or geographically. We now turn to the issue of differences in household size and composition.

An index number can be constructed, which indicates at reference prices the cost differential for a household due to different household size and composition, to reach the indifference curve of the reference household. Such an index number is known as an equivalence scale. If the reference household consists of a single adult, then the equivalence scale can be thought of as representing a number of equivalent adults.

The total expenditure and full income approaches measure household welfare using monetary and imputed flows without specific assumptions about preferences and are in a sense shortcut versions of the first approach. While they can therefore be seen as conceptually less complete, they do have the advantage of requiring substantially less data. On this basis, this study proposes to adopt household total expenditure as a measure for household welfare in the study area, considering the advantage of less required data and the fact that getting the actual total income of farming household may not be possible. The approach has been extensively used in

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various similar studies by Grootaert (1999), Grootaert *et al.,* (2002), Okunmadewa *et al* (2005b), Okunmadewa *et al.,* (2007) and Yusuf (2008).

2.1.3 Concept of social capital

The concept of social capital in a society includes the institutions, relationships, attitudes and values that govern interactions among people, and this contributes to its economic and social development. Social capital lowers the costs of individuals working together and facilitates cooperation. People have the confidence to invest in collective activities, knowing that others will also do so. The central idea of social capital is that networks and the associated norms of reciprocity have value for the people who are in them, and at least, in some instances, demonstrable externalities, so that there are both public and private aspects of social capital.

Some forms of social capital are highly formal with organised chairperson or a president and membership dues. Examples are national organisations and labour unions. Other forms of social capital, such as a group of people who gather at a newspaper stand every day, are highly informal. Both forms constitute networks in which reciprocity can easily develop, and in which there can be gains. Some forms of social capital are densely interwoven. For example, a group of people who work together every day at the factory and attend the same church every Sunday will exhibit strong social capital. On the other hand is a very thin almost invisible form of social capital, like establishing an acquaintance with a person occasionally at the supermarket or while baiting in a line. Merely nodding to someone in the hall generates visible, measurable forms of reciprocity.

Social capital represents the degree of social cohesion in communities. It refers to the processes between people that establish networks, norms and social trust, and facilitate coordination and cooperation for mutual benefit (HAD, 2004). Putnam's (2000) definition says, "Social capital refers to the value of the social networks which is embodied in various communities (both geographically and communities of interest), and the trust and reciprocity that flow from those networks". The essence of this concept is the facilitated interactions that exist among people on the basis of institutions and the network that they establish among themselves or that they mutually belong to.

The key elements of social capital are:

i). Social resources: these are informal arrangements between neighbours or within a community.

ii). Collective resources: this includes the establishment of self-help groups, credit unions and community safety schemes.

iii). Economic resources which are based on the levels of employment; access to green, open spaces.

iv). Cultural resources - e.g. libraries, art centres, local schools.

All these resources are ordinarily valuable but the values are rarely demanded when there is effective social capital in place. People offer the services free of charge in the spirit of altruism because of the prevailing circumstance that they have all subscribed to. Communities where social capital is abundant are often characterized by high levels of trust between friends and neighbours, shared norms and values and local people engaging in civic and community life.

Social capital at neighbourhood level can be categorised into three types (Stone and Hughes, 2002) as cited by Stone *et al.,* (2003).

• The first type of social network is "informal ties", which include relationships with members of the household, family in-laws, friends, neighbours, and workmates.

• The second type is "generalised relationships", which are community based, and "societal" relationships that people have with individuals they do not know personally, including local people, people in general, and people in civic groups.

• The third type of social network is "institutional relationships", which are the ties individuals have with institutions including the legal system, the police, the media, unions, governments, political parties, universities and the corporate world.

A review of social interventions carried out by Lemmel (2001) finds that community-based approaches have had a significant impact on individual behaviours, access to services and information, service use, education, physical environment and health status. Current literatures on this concept show that it is a multi-component dynamic concept. Despite the fact that there are many definitions of social capital, most of them still recognise the importance of positive social networks. Highlighting the positive aspects of social capital can bring about benefits inherent in the concept (HAD, 2004).

2.1. 4 Dimensions of social capital

It is note-worthy that social capital theory suffers from much criticism for being poorly defined. This problem largely stems from the fact that social capital is multi-dimensional with each dimension contributing to the meaning of social capital, although each alone cannot fully capture the concept in its entirety (Liu and Besser, 2003). The dimension of social capital can be viewed from two aspects, i.e. 'whether it is *bonding (or* exclusive) and/or *bridging (*or inclusive). The former may be more inward-looking and have a tendency to reinforce exclusive identities and homogeneous groups. The latter may be more outward-looking and encompasses people across different social divides (Putnam 2000 as cited by Smith 2001). The main dimensions are commonly seen as:

Trust: The core of social capital is trust, that is, whether people living in an area trust one another or not. Often this trust is forged with specific people through common participation in groups, associations and activities. Nevertheless, when this trust transcends from trust of specific individuals to generalised trust, it is extraordinarily valuable because it enhances social interaction and get things accomplished (Putnam *et al*., 1993; Putnam, 1993, 2001). The first index of social trust combines trust of people in one's neighbourhood, co-worker, shop clerks, co-religionists, local police, and finally "most people". (Coleman, 1988; Cox 1995; Collier, 1998a; Kawachi *et al*., 1999; Leana and Van Buren III 1999; Falk and Kilpatrick 2000; Lemmel 2001; Welsh and Pringle,, 2001)

Diversity of friendships: The diversity in people's social networks otherwise known as heterogeneity is equally important to the levels of social trust (Collier, 1998a). In a survey by Putman (2000), a respondent was asked whether he had a personal friend who was a business owner, a manual worker, a community leader; and was on welfare, owned a vacation home and was of a different faith. The summation of the six categories each respondent mentioned gave an index which broadly measures the degree to which people's social networks (and collectively a community's networks) are diversified. These "bridging ties" are especially valuable in producing community solidarity and in forging a larger consensus on how communities need to change or work together (Falk and Kilpatrick, 2000).

Conventional political participation: One of the key measures of people's engagement in communities is the extent to which they are involved politically. This measure looks at how many people in the communities are registered to vote, actually vote, express interest in politics, are knowledgeable about public affairs or read the newspaper regularly. Putnam (2000) reports that many communities that exhibit low levels of participation in conventional/electoral ways, nonetheless exhibit high levels of participation in protest forms such as taking part in protest marches, demonstrations, boycotts and rallies; participating in groups that took action for local reform; and participating in labour and ethnically-related groups.

Civic leadership and association involvement: This explains decision-making and the density of membership in a social group. Many people typically get involved locally by joining groups that they care about. Such involvements are measured in two ways. These include civic leadership which involves the participation in the decision-making process on issues that affect the welfare of group members or community. This is a composite measure of how frequently individuals engaged in groups, clubs and local discussions of town or school affairs. The second is however associational involvement. It measures associational involvement across broad categories of groups. It exhibits the density of membership in various social organisation. Examples are religious organizations, sports clubs, neighbourhood associations, labour unions and professional societies.

Cash contribution

This is one of the areas that emphasize the level of involvement in social connectivity. Financial commitment to any social group is an indicator of support of the existence of such group or relationship. Aker (2007) posits that donation within a community denotes households' sense of kinship within the community which is not strongly associated with a household's level of wealth. According to her, the poorest household will donate in order to maintain their relationship within the community. In Nigeria, individuals / neighbours donate and or render services towards social function to assist as well as foster friendship or relationship.

Labour contribution

Another facet of building social network and relationship is through an individual's affiliation with organized professional group such as farmers' group or other groups that render services to its members to reduce the cost of required resources. According to Adetunji *et al.,* (2009), farmers in a community cooperate and form a group through which they assist one another (basically members of the society) on farming activities such as land clearing, ridge making and harvesting crops, among others, on a rotational basis. This helps to strengthen the bond within a particular group, which is a valuable asset in community solidarity. It also enhances the team spirit based on the need to work together.

Other authors have identified different groups of dimensions. Narayan and Cassidy (2001), identify a range of dimensions as illustrated in Figure 1. Here, social capital is viewed as a factor which has direct relationship with different features of a social group as well as generalised norms such as rendering assistance to known people. It is also seen to be connected to social network which highlight the togetherness of people and how well they get along in their daily activities. Individuals' decision to participate without being enforced in social activities such as attending ceremonies, providing support when the need arises and the level of trust in various acquaintances are elements of social capital.

Woolcock (1998) also defines four dimensions of social capital as presented in Table 1, in two pairs of opposing concepts: embeddedness and autonomy, and the macro and the micro levels. Uslaner and Dekker (2001) sum this discussion up by identifying that it is clear that the components of social capital need to be treated as multi-dimensional rather than one-dimensional.
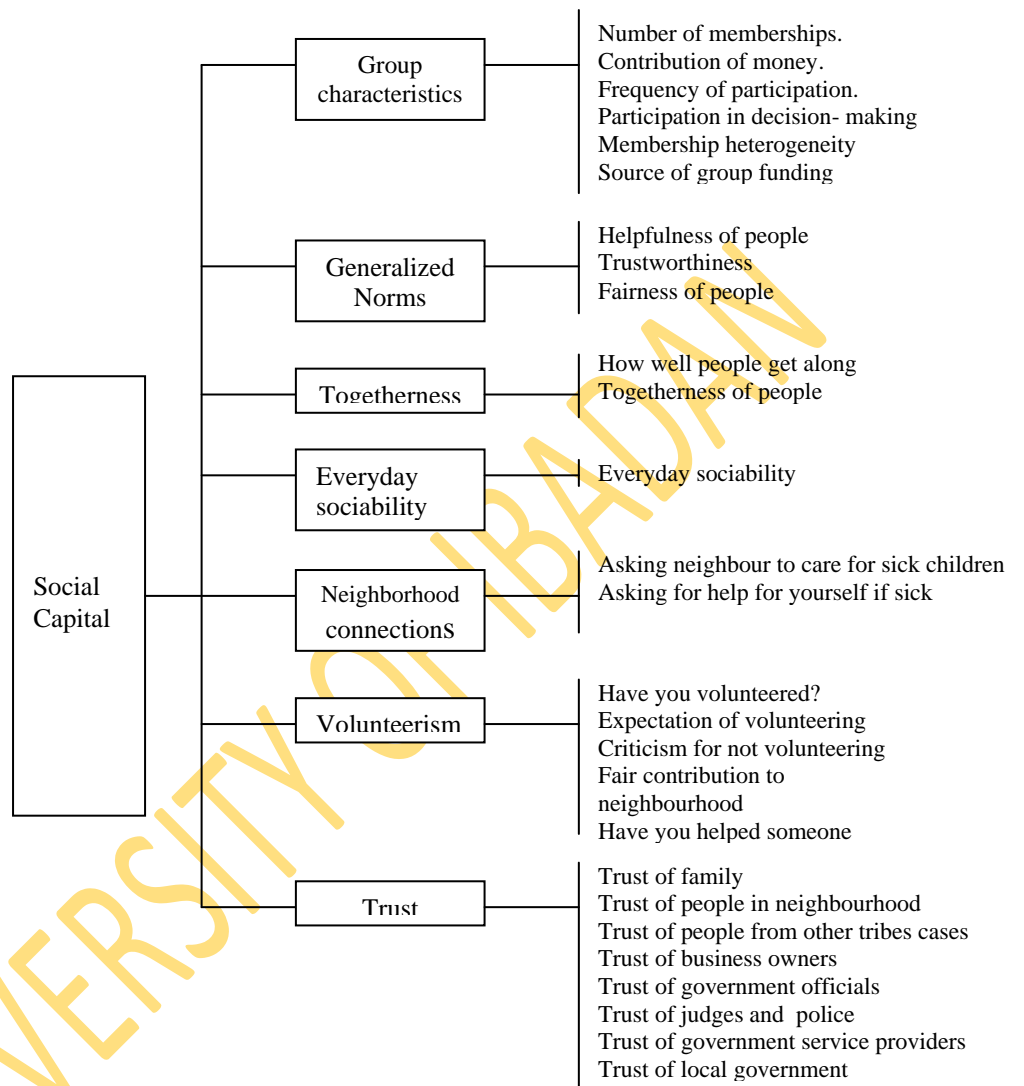
Figure 1: The dimensions of social capital defined by Narayan and Cassidy (2001).
Source: Narayan and Cassidy (2001).

Table 1: Four dimensions of social capital defined by Michael Woolcock (1998).

Perspective	Actors	Policy prescription
Community view		
Local association	Community groups	Small is beautiful
	Voluntary organizations	Recognize social asset of the poor
Network view		
Bonding and bridging	Entrepreneur	Denaturalize
Community ties	Business groups	Create enterprise zones
	Information brokers	Bridging social divides
Institutional view		
Political and legal institutions	Private and public sector	Grant civil and political Liberties. Institute transparency, accountability
Synergy view		
Community network and state	Community group civil	Co production complementarity
Society relations	society firms states	Participation, linkages Enhance capacity and scale of local organization.

Source: Woolcock (1998).

2.1.5   Conceptual framework for the study

The concept of social capital and rural household welfare as conceived by this study is presented in figure 2. The general household characteristics such as location characteristics, household assets, human capital, etc are expected to influence the type of social network that the household engages in, either formal or informal groups. The social capital group directly affects the welfare strategies adopted by the household as well as its income and the expectation of individuals from these social groups. The household welfare problems such as poverty and vulnerability to risk, lack or inadequacy in information, lack of farm inputs, price and income fluctuations and market failures dictate the strategies that the household uses in order to improve its welfare.

These welfare strategies include relying on group members for assistance and adopting suitable coping strategies to improve welfare. Also, households can engage in off-farm activities or diversify from farm enterprise. The household can also employ different coping strategies such as reduction in cultivated farmland, changing of eating habit or pattern and transfer of wards from private to public schools, among others. An individual may engage in social groups/activities based on expectations of assistance in one way or the other. These expectations from social groups may include moral/ financial assistance; access to information as well as training and education. The household general characteristics are expected to directly determine the level of income which will consequently affect various expenditures undertaken at the household level. The instability or fluctuation of income affects household expenditure and hence, rural household welfare.
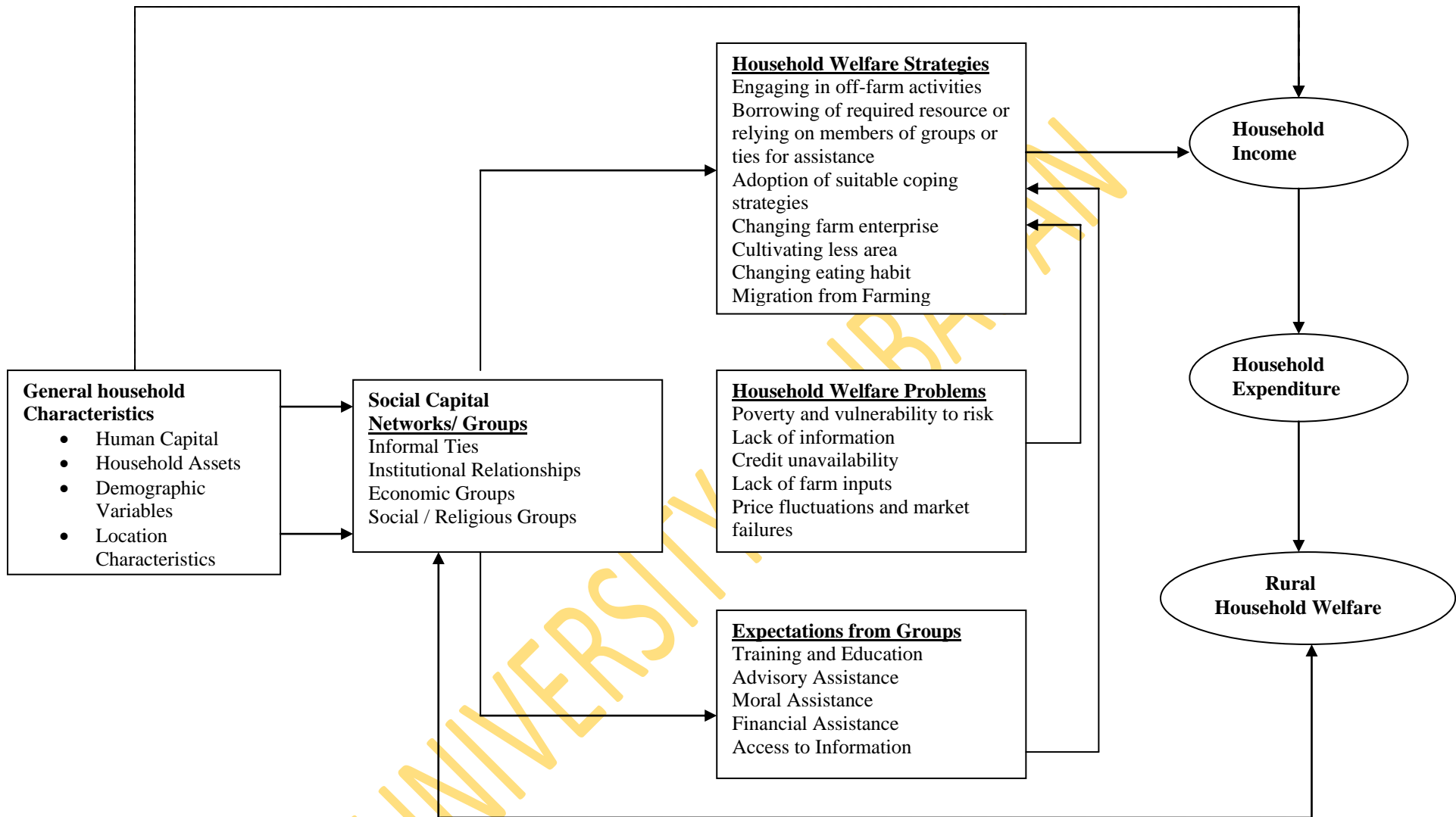
Figure 2: Conceptual framework for social capital and rural household welfare

2.2.1 Review of analytical tools

- **Ordered probit model**

In statistics, ordered probit is a generalization of the popular probit analysis to the case of more than two ordinal dependent variables. It is a widely used approach to estimating an ordered response model, like many models for qualitative dependent variables; this model has its origins in bio-statistics (Aitchison and Silvey, 1957), but was brought into the social sciences by two political scientists (McKelvey and Zavoina, 1975). Ordered probit models describe situations in which a discrete outcome represents greater propensity for a good outcome (Maddala, 1983 and Moffit, 1999). Assumptions of this model include a list of exogenous variables that affect the dependent variable. It can be derived from a measurement model in which a latent variable y^* is mapped to an observed variable y, providing incomplete information about y^* according to the measurement equation:

$$y_i = j \quad \text{if } \alpha_{j-1} \leq y_i^* < \alpha_j \quad \text{for } j = 1 \text{ to : } J \qquad (1)$$

The structural model is:
$$y^* = \mathbf{x'}\beta + \varepsilon_j, \quad \varepsilon_j \sim N(0, 1), \, yi = 1, \ldots, N \qquad (2)$$

where y^* is the exact but unobserved dependent variable, x is the vector of independent variables, β is the vector of regression coefficients to be estimated, and ε_j is the disturbance term which is normalised. The α's are unknown thresholds and must be estimated jointly with the parameter vector β. The model cannot be consistently estimated using ordinary least squares; it is usually estimated using maximum likelihood. Therefore, to estimate this model there is need for a log-likelihood function. The log-likelihood of the samples comes directly from the underlying model and is given by:

$$InL(y/x) = \sum_{i=1}^{n}\sum_{j=1}^{J} dij In \Pr(Yi = j / xi'\beta) \qquad (3)$$

with

$$d_{ij} = (\, 1 \text{ if } y_i = j$$
$$(\, 0 \text{ otherwise}$$

$$\Pr(y_i = j / x_i) = \Phi(\alpha j - \mathbf{x_i'}\beta) - \Phi(\alpha j - \mathbf{x_i'}\beta) \qquad (4)$$

where Φ is the cumulative distribution function of the standard normal distribution.

Further, suppose that while we cannot observe y^*, we instead can only observe the categories of response:

$$y = \begin{bmatrix} \begin{cases} 0 \;\; if \;\; y* \le 0. \\ 1 \;\; if \;\; 0 < y* \le \mu_1 \\ 2 \;\; if \;\; \mu_1 < y* \le \mu_3 \\ \vdots \\ N \;\; if \mu N - 1 < y* \end{cases} \end{bmatrix} \qquad (5)$$

Then the ordered probit technique will use the observations on *y*, which are a form of censored data on *y**, to fit the parameter vector β.

Instrumental variable and two-stage least squares estimation

The method of instrumental variables (IV) is used to estimate causal relationships; it allows consistent estimation when the explanatory variable (covariates) correlates with the error terms. Such correlation may occur when the dependent variable causes at least one of the covariates ("reverse" causation), when there are relevant explanatory variables which are omitted from the model, or when the covariates are subject to measurement error. In this situation, ordinary linear regression generally produces biased and inconsistent estimates (Stock *et al.,* 2002). However, consistent estimates can be obtained with the use of instrument. An instrument is a variable that does not belong in the explanatory equation and is correlated with the endogenous explanatory variables, conditional on the other covariates.

Instrumental variables methods are commonly used to estimate causal effects in contexts in which controlled experiments are not available. Credibility of the estimates hinges on the selection of suitable instruments. According to Nelson and Startz (1990), the two requirements for using an IV in a linear model are:

- The instrument must be correlated with the endogenous explanatory variables, conditional on the other covariates.
- The instrument cannot be correlated with the error term in the explanatory equation, that is, the instrument cannot suffer from the same problem as the original predicting variable.

In estimation, suppose data are generated by a process of the form

$$y_i = \beta x_i + \varepsilon_i \qquad (6)$$

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where i indexes observations, y_i is the dependent variable, x_i is a covariate, ε_i is an unobserved error term representing all causes of y_i other than x_i, and β is an unobserved scalar parameter. The parameter β is the causal effect on y_i of a one unit change in x_i, holding all other causes of y_i constant. The econometric goal is to estimate β. For simplicity's sake assume the draws of ε_i are uncorrelated and that they are drawn from distributions with the same variance, that is, the errors are serially uncorrelated and homoskedastic.

Suppose also that a regression model of nominally the same form is proposed. Given a random sample of T observations from this process, the ordinary least squares estimator is

$$\widehat{\beta}_{\text{OLS}} = \frac{x'y}{x'x} = \frac{x'(x\beta + \varepsilon)}{x'x} = \beta + \frac{x'\varepsilon}{x'x}.$$

(7)

where x, y and ε denote column vectors of length T. When x and ε are uncorrelated, under certain regularity conditions the second term has an expected value conditional on x of zero and converges to zero in the limit, so the estimator is unbiased and consistent. When x and ε are correlated, however, the OLS estimator is generally biased and inconsistent for β. In this case, it is valid to use the estimates to predict values of y given the values of x, but the estimate does not recover the causal effect of x on y.

An instrumental variable z is one that is correlated with the independent variable but not with the error term. Using the method of moments, take expectations conditional on z to find

$$E[y|z] = \beta E[x|z] + E[\varepsilon|z].$$

(8)

The second term on the right-hand side is zero by assumption. Solve for β and write the resulting expression in terms of sample moments,

$$\widehat{\beta}_{\text{IV}} = \frac{z'y}{z'x} = \beta + \frac{z'\varepsilon}{z'x}.$$

(9)

When z and ε are uncorrelated, the final term, under certain regularity conditions, approaches zero in the limit, providing a consistent estimator. Put another way, the causal effect of x on y can be consistently estimated from these data even though x is not randomly assigned through experimental methods.

The approach generalizes to a model with multiple explanatory variables. Suppose X is the $T \times K$ matrix of explanatory variables resulting from T observations on K variables. Let Z be a $T \times K$ matrix of instruments. Then it can be shown that the estimator

$$\widehat{\beta}_{\text{IV}} = (Z'X)^{-1}Z'Y \tag{10}$$

is consistent under a multivariate generalization of the conditions discussed above. If there are more instruments than there are covariates in the equation of interest so that Z is a $T \times M$ matrix with $M > K$, the generalized method of moments can be used and the resulting IV estimator is

$$\widehat{\beta}_{\text{IV}} = (X'P_Z X)^{-1}X'P_Z y, \tag{11}$$

where $P_Z = Z(Z'Z)^{-1}Z'$. The second expression collapses to the first when the number of instruments is equal to the number of covariates in the equation of interest.

The method which can be used to calculate IV estimates is two-stage least-squares (2SLS). In the first stage, each endogenous covariate in the equation of interest is regressed on all of the exogenous variables in the model, including both exogenous covariates in the equation of interest and the excluded instruments. The predicted values from these regressions are obtained.

Stage 1: Regress each column of **X** on **Z**, ($X = Z\delta$ + errors)

$$\widehat{\delta} = (Z'Z)^{-1}Z'X, \tag{12}$$

and save the predicted values:

$$\widehat{X} = P_Z X. \tag{13}$$

In the second stage, the regression of interest is estimated as usual, except that in this stage each endogenous covariate is replaced with the predicted values from its first stage model.

Stage 2: Regress **Y** on the predicted values from the first stage:

$$Y = \widehat{X}\beta + \text{noise}. \tag{14}$$

The resulting estimator of β is numerically identical to the expression displayed above. A small correction must be made to the sum-of-squared residuals in the second-stage fitted model in order that the covariance matrix of β is calculated correctly. In the instrumental variable regression, if we have multiple endogenous

regressors $x_1 \ldots x_k$ and multiple instruments $z_1 \ldots z_m$ the coefficients on the endogenous regressors $\beta_1 \ldots \beta_k$ are said to be:

Exactly identified if *m* = *k*.

Overidentified if *m* > *k*.

Underidentified if *m* < *k*.

The parameters are not identified if there are fewer instruments than there are covariates or, equivalently, if there are fewer excluded instruments than there are endogenous covariates in the equation of interest.

- **Control function approach**

The control function (CF) approach is an econometric method used to correct for biases that arise as a consequence of endogeneity. It is similar to the two-step procedure that is commonly used to correct for traditional selectivity bias (Heckman, 1978). It also deals with selection bias in the correlated random coefficients model (Wooldridge, (1997, 2003); Heckman and Navarro, (2004); but it can be applied in more general semi-parametric settings (Chesher 2003, Imbens and Newey, 2006). It can be used to handle endogeneity in models with linear parameters, and it draws comparisons with standard methods such as 2SLS. Certain non-linear models with endogenous explanatory variables are most easily estimated using the CF method, and the recent focus on average marginal effects may suggest some simple, flexible strategies.

Most models that are linear in parameters are estimated using standard IV methods either two stage least squares (2SLS) or generalized method of moments (GMM). An alternative, the control function (CF) approach, relies on the same kinds of identification conditions. In the standard case where an endogenous explanatory variables appear linear, the CF approach leads to the usual 2SLS estimator. However, there are differences for models that are non-linear in endogenous variables even if they are linear in parameters. And, for models non-linear in parameters, the CF approach offers some distinct advantages.

The basic idea behind the control function methodology is to model the dependence of the outcome unobservables on the observables in a way that allows us to construct a function *K* such that, conditional on the function, the endogeneity

problem disappears. The general set up considers the following two equation structural model; an outcome equation:

$$Y = g\,(X,\,D,\,\varepsilon)\,, \tag{15}$$

and an equation describing the mechanism assigning values of D to individuals:

$$D = h\,(X, Z,\,v)\,, \tag{16}$$

where X and Z are vectors of observed random variables,

D is an observed random variable (vector valued),

and ε and v are general disturbance vectors not independent of each other but satisfying some form of independence of X and Z.

The problem of endogeneity arises because D is correlated with ε via the dependence between ε and v. Because equation 16 represents an assignment mechanism in many economic models, it is generically called the selection or choice equation. The goal of the analysis is to recover some functions of $g\,(X,\,D,\,\varepsilon)$ of interest that cannot be recovered in a straightforward way because of the endogeneity / selection problem. The key behind the control function approach is to notice that (conditional on X, Z) the only source of dependence is given by the relation between ε and v. If v was known, we could condition on it and analyze equation 15 without having to worry about endogeneity. The main idea behind the control function approach is to recover some function of v via its relationship with the model observables so that we can now condition on it and solve the endogeneity problem.

The control function approach proposes a function K (the control function) that allows us to recover $a\,(X,\,D)$ such that K satisfies the following assumptions that

- K is a function of $X,\,Z,\,D,$
- ε satisfies some form of independence of D conditional on $\rho\,(X,\,K)$, with ρ a knowable function, and
- K is identified.

The second assumption is the key assumption of the approach, which states that once we condition on $K,$ the dependence between ε and D (i.e., the endogeneity) is no longer a problem.

Suppose the outcome equation (15) is

$$Y = X\,\beta + D\,\alpha + \varepsilon \tag{17}$$

and assume that our object of interest in equation (17) is α. Assuming that equation (16) is

$$D = X \rho + Z \pi + v \qquad (18)$$

with $v, \varepsilon, \pi, X, Z$ where π denotes statistical independence. Such a model arises, for example, where Y is the dependent variable and D is independent variable with endogeneity problems as in Heckman *et al*. (2003). If the unobservable ε is associated with Y and also with D then ε and v would be correlated.

If we let $K = v$ be the residual of the regression in (18) then we can recover α from the following regression

$$Y = X \beta + D \alpha + K \psi + \eta, \qquad (19)$$

where it follows that $E(\eta / X, K) = 0$. It is easy to show that, in this case, the control function estimator and the two-stage least squares estimator are equivalent.

This is an example of the control function where $K = D- E(D / X, Z)$. In this case, because of the constant effects assumption (i.e. α is not random), standard instrumental variable methods and the control function approach coincide.

2. 3   Literature review

2.3.1   Related studies on poverty and rural household welfare

The rural poor are characterized by a number of economic, demographic and social features, though the most common feature is landlessness or limited access to land. Poor rural households tend to have larger families, with higher dependency ratios, lower educational attainment and higher underemployment (Oluwatayo, 2004). The poor also lack basic amenities such as pipe- borne water, sanitation and electricity. Their access to credit, inputs and technology is severely limited. Other constraints are, the lack of market information, business and negotiating experience and collective organization - depriving them of the power to interact on equal terms with other, generally larger, stronger market forces. Low levels of social and physical infrastructure increase their vulnerability to famine and disease, (Etim and Ukoha, 2010).

The welfare of the rural poor is far worse than that of the urban poor in terms of the personal consumption levels, access to education, health care, availability of potable water and sanitation, housing facilities, transport and communication (Okoruwa and Oni, 2002). In the rural settings, poverty is not only a state of existence but also a process with many dimensions and complexities. It is almost always characterized by high levels of deprivation (dispossession), vulnerability (high risk

and low capacity to cope), and powerlessness. These characteristics form the core of inadequate well-being of households.

Aigbokhan (2000) investigates the relative impact of growth and changes in income inequality on poverty and welfare changes among urban and rural dwellers. It is reported that there was evidence of increased poverty, and this is more pronounced in rural areas. To improve the poverty situation, the study suggests consistency, rather than reversal, in policies made to address the needs of the poor. Okoruwa and Oni (2002) also assess rural welfare implications of agricultural inputs supply, since majority of the rural dwellers engage in farming activities. The findings reveals that the welfare of the Nigerian farmers gradually deteriorates over the years regardless of the various agricultural input policies put in place in the past. It is suggested that the government should place the welfare of the rural populace as topmost priority in its policies.

The level of household income can directly or indirectly affect the level of its well-being. A study conducted by Oluwatayo (2004) examines the impact of income risk on the level of well-being of rural households in Nigeria. The findings revealed that male headed households are more prone to income inconsistency. Households with / without little education are more susceptible to income risk than highly educated households; and large-sized households report more incidents of income flunctuations than the small-sized households. The study also reveals that households relying on agriculture as primary income source are more prone to income risk than households engaged in other occupations such as trading or government salaried job. This is a reflection of the peculiar characteristics of farming as a profession. However, households belonging to an association are better able to cope with manage and share income risk. He submits on a general note that income risk impacts negatively on the well-being of the sampled households and, therefore, recommends that investment in human capital be intensified, land should be recognised as an asset which could be used to manage income risk; therefore, land reform policies should be revisited and improved upon.

Babatunde *et al.,* (2008) analyses the determinants of farm household poverty in southwestern Nigeria. It is reported that the prevalence of poverty is higher among older, small-scale farmers residing in the rural areas and those who do not belong to any farmers' group. Results also revealed that households with smaller membership, headed by male and educated head are better off in terms of poverty than their

counterparts with larger membership, headed by female and uneducated head. Factors discovered to be determinants of poverty include land ownership, farm size and membership of farmers' society. Since most rural households, regardless of whether they have land or not, are dependent on agriculture for their livelihood, policies to improve agricultural production which will have a positive impact on rural household welfare are recommended.

Also, Etim and Ukoha (2010) investigate poverty among rural farming households in south-south Nigeria. They report that poverty incidence, depth and severity increases with increase in age and household size. On the contrary, household heads' years of formal education are negatively related to poverty, that is, poverty decreases with increase in educational attainment.

2. 3. 2 Effects of social capital on rural households

Growing attention is given to the role of "social capital" in influencing the well-being of households and the level of development of communities and nations. The recognition that social capital is an input in a household's or a nation's production function has major implications for development policy and project design. It suggests that the acquisition of human capital and the establishment of a physical infrastructure need to be complemented by institutional development in order to reap the full benefits of these investments. The promotion of social interaction among poor farmers may need to complement the provision of seeds and fertilizer.

Social capital has quantifiable effects on many different aspects of human lives which include lower crime rates, better health, improved longevity, better educational achievement, and greater levels of income equality. Other effects may include improved child welfare and low rate of child abuse, less corruption and more effective government. Others are dispute resolution and enhanced economic achievement through increased trust and lower transaction cost. The main issue is that social capital has effects on different aspects of socio-economic life of the people, which in most instances is positive (Putnam. 2000, and Grootaert, 1999)

Coleman (1994) suggests that social capital can take three forms: firstly obligations and expectations which depend on the trustworthiness of the social environment; secondly, the capacity of information to flow through the social structure in order to provide a basis for action; and thirdly, the presence of norms accompanied by effective sanction. Social capital can and does exist outside the

context of local institutions (whether formal or informal). For example, two neighbours who help each other in times of trouble have social capital but may never embody their bond in an association. Conversely, the mere presence of an association does not prove the existence of social capital. At the level of the community, local associations can be a manifestation of social capital. However, it must be emphasized that social capital and local associations are not synonyms.

Social capital does exist at the macro, meso and micro levels. At the macro level, social capital includes institutions such as government, the rule of law, and civil and political liberties, amongst others. There is overwhelming evidence that such macro level social capital has a measurable impact on national economic performance (Knack, 1999). At the micro and meso levels, social capital refers to the networks and norms that govern interactions among individuals, households and communities. Such networks are often (but not necessarily) given structure through the creation of local associations or local institutions.

2. 3.3 Related studies on household welfare and social capital.

The major impact of social capital has been found to be on the income and welfare of the poor through improvement on the outcome of activities that affect them. This impact enhances the efficiency of rural development programmes by increasing agricultural productivity, facilitating the management of common resources, making rural trading more profitable, and enhancing the access of people or households to water, sanitation, credit and education in rural and urban areas. Social capital is a key factor for recovering from ethnic conflict and coping with political transition. It can also help to reduce poverty through micro and macro channels by affecting the movement of information useful to the poor and by improving growth and income redistribution at the national level (Grootaert and Bastelaer, 2002). Social capital resides in specific natures of social institutions which are networks of social relationships, relationship among social institutions, and culturally legitimate normative values which regulate intra and inter-institutional relationships.

Some studies on social capital outlines a variety of mechanisms through which social capital can potentially lead to improved economic outcomes. The way local associations perform their useful role is centred on three mechanisms: the sharing of information among association members, the reduction of opportunistic behaviour, and the facilitation of collective decision-making (Grootaert, 1997; Collier, 1998b),

These mechanisms can be reduced to four basic arguments. The first is that communities with stronger ties among their members are better equipped to engage in group cooperative action, and this can help to solve the tragedy of the commons or the free rider problem. These ties decrease the potential for individual opportunistic behaviour, and thus lessen the potential for an individual or household to benefit at the expense of others. Secondly, greater association activity may help to reduce imperfect information., thereby lowering economic and social transaction costs for inputs, credit, land and new technology, and leading to higher incomes (Isham, 1999; Narayan and Pritchett 1999; Fafchamps and Minten 1999, Grootaert 1999 and Guiso *et al.,* 2004).

Thirdly, communities with a greater sense of trust and stronger ties are more likely to share household risk and to develop informal means of insurance, which can allow households to pursue higher returns while mitigating the negative impact of exogenous shocks (Townsend 1994). Finally, Putnam (1993) suggests that stronger social networks can lead to more efficient governments, which can have beneficial impact on well-being- In general, all of these mechanisms implicitly assume that pure non-cooperative action leads to inferior outcomes (Narayan and Pritchett, 1999).

The primary hypothesis of these studies reveals that increased social capital can lead to welfare-improving outcomes by facilitating greater cooperation. This also implies that society behaves as a single group in which social relationships foster individual and collective action to prevent predator behaviour and to facilitate improved outcomes.

While most of the studies earlier mentioned are hinged on the measurement of the effect of social capital on direct economic outcomes, there are some others whose primary interest is focused on the effect of social capital on indirect economic outcomes, such as household welfare. A number of studies (e.g., Narayan and Pritchett, 1999; Grootaert *et a.,l* 2002; Knack and Keefer, 1997; and Kawachi *et al.,* 1997, Okunmadewa *et al.,* 2005a; Aker 2007; Okunmadewa *et al.,* 2007, Balogun and Yusuf, 2011) show that, controlling for a large set of community and individual characteristics, social capital is associated with increased household welfare, higher economic growth, and lower levels of mortality.

Studying the linkages between social capital and economic outcomes is particularly relevant in many rural communities throughout sub-Saharan Africa, where households suffer from pervasive and extreme poverty. In Nigeria, poverty

situation, according to NISER (2003), shows that more than 40 percent of Nigerians live in conditions of extreme poverty, spending less than N320.00 *per capita* per month. This expenditure would barely provide a quarter of the nutritional requirements for healthy living. Furthermore, the traditional forms of capital required to generate income are often scarce or depleted. In this environment, social capital can have an important impact on household welfare, either substituting for or enhancing existing forms of capital.

A variety of mechanisms through which social capital can potentially improve household welfare is based on cooperation among individuals at the household and village levels. For example, village water groups can encourage cooperation in managing community water resources, thereby avoiding the negative consequences of potential overexploitation. In addition, agriculture, credit and women groups can lower economic and social transaction costs, thereby improving access to credit, technology and farm inputs for group members and non-members. Also, households and villages with stronger social ties are more likely to share risk, thereby mitigating the negative impact of exogenous climatic shocks. All of these mechanisms can potentially affect household welfare.

Despite the focus of most research on social capital and economic outcomes, the relationship between the two is even more complex, as there could be reverse causality, that is, as social capital affects expenditure, expenditure can as well affect social capital. For example, the depth of poverty may diminish social capital by limiting a households' ability to participate in associational life. Conversely, extreme poverty may increase social capital by precipitating the formation of community groups to overcome poverty,

A study by Narayan and Pritchett (1997) has demonstrated empirically that the ownership of social capital by households in Tanzania has strong effects on households' welfare. The study finds that the magnitude of the estimated effect exceeds that of education and physical assets owned by the household. It also concludes that the effects of social capital operate primarily at the village level. Instrumental variable methods were used to rule out reverse causality between expenditure and social capital. Social capital was measured as a single index, combining (interactively) the number of local groups in a village, kin and income heterogeneity and effective group functioning. The Narayan/Pritchett study is a pioneering effort in the way different social capital dimensions are combined to

estimate quantitatively their impact on household welfare based on a national-level household survey. The study points out that in Tanzania social capital matters more for household welfare than human capital.

Grootaert (1999) also looks into the contributions of social capital to household welfare as well as the relationship between human and social capital in Indonesia, he finds compelling empirical evidence that local social capital, defined as household membership in local associations, makes a significant contribution to household welfare, over and above that stemming from human capital and other household assets. A more recent study conducted by Aker (2007) confirms that household-level social capital is associated with a significant decrease in a household probability of being poor, indicating that social capital could be a valid investment for the rural poor in Tanzania.

Other studies conducted by Okunmadewa *et al* (2005a; 2007) and Yusuf (2008) revealed that an increase in the level of social capital will lead to non-proportionate increase in household expenditure *per capita*. An increase in the human capital will as well lead to a non-proportionate change in the level of household welfare. This confirms Aker's (2007) report on the relationship that exists between human and social capital. Also, the studies indicate that households with higher social capital are less poor. According to Yusuf (2008), disaggregating social capital into its components shows that its effect on welfare is traceable to membership and active participation in decision-making of households in their various associations. He also confirms that social capital is truly exogenous to household's welfare with no reverse causality.

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter presents the research methods used for the study. They include description of the study area, source of data, sampling procedure, sample size as well as the analytical techniques.

3.1   Description of the study area

This study was conducted in southwestern Nigeria, which consists of Lagos, Ogun, Oyo, Osun, Ondo and Ekiti states. It is also known as the South-west geographical zone of Nigeria. The area lies between longitude 20 311 and 60 001 East and Latitude 60 211 and 80 371N (Faleyimu et al., 2010) with a total land area of 77,818 km2 and a population of 27,581,992 (NPC, 2006). The study area is bounded in the east by Edo and Delta states, in the north by Kwara and Kogi states, in the west by the Republic of Benin and in the south by the Gulf of Guinea. According to Falalu (2007) southwestern Nigeria owns and/or control 60% of the nation's industrial capacity, 44% of banking assets, and 67% of insurance assets. It is home to the nation's three deep sea ports of Apapa, Tin Can Island and Roro; the busiest international airport of Ikeja; and three thermal stations of Egbin, Papalanto and Omotosho. Today, its three major industrial estates of Agbara, Ikeja and Otta are all linked to gas under the West African gas pipeline plan. In addition to these, the southwestern population is the most educated as western education came through there and education as a resource was democratized since the early sixties. The geographical location, democratization of western education and availability of resources enhanced in recent years have collectively enabled the southwestern economy to rank as first of the economies in Nigeria. Today, the Southwestern as a region can boast of a defined growing middle class and is perceived to have at least 20,000 of its indigenes with net worth of over N100m each (Falalu, 2007).

The climate of southwestern Nigeria is tropical in nature and it is characterized by wet and dry seasons. The temperature ranges between 21^oC and 34^oC, while the annual rainfall ranges between 1500mm and 3000mm. The wet season is associated with the southwestern monsoon wind from the Atlantic Ocean while the dry season is associated with the northeast trade wind from the Sahara desert. The vegetation is Southwestern Nigeria is made up of fresh water swamp and mangrove forest at the

belt, the lowland in forest stretches inland to Ogun and part of Ondo state, while secondary forest is towards the northern boundary where derived and southern Savannah exist (Faleyimu et al.,2010).

Southwestern Nigeria is dominated by the Yoruba ethnic group. Economic activities undertaken include trading, handcraft, public service employment, and agriculture. The predominant crops in the region are cassava, maize, vegetables such as okra, cucumber, tomatoes, pepper, and tree crops like mango, cashew, cocoa, kolanut, among others
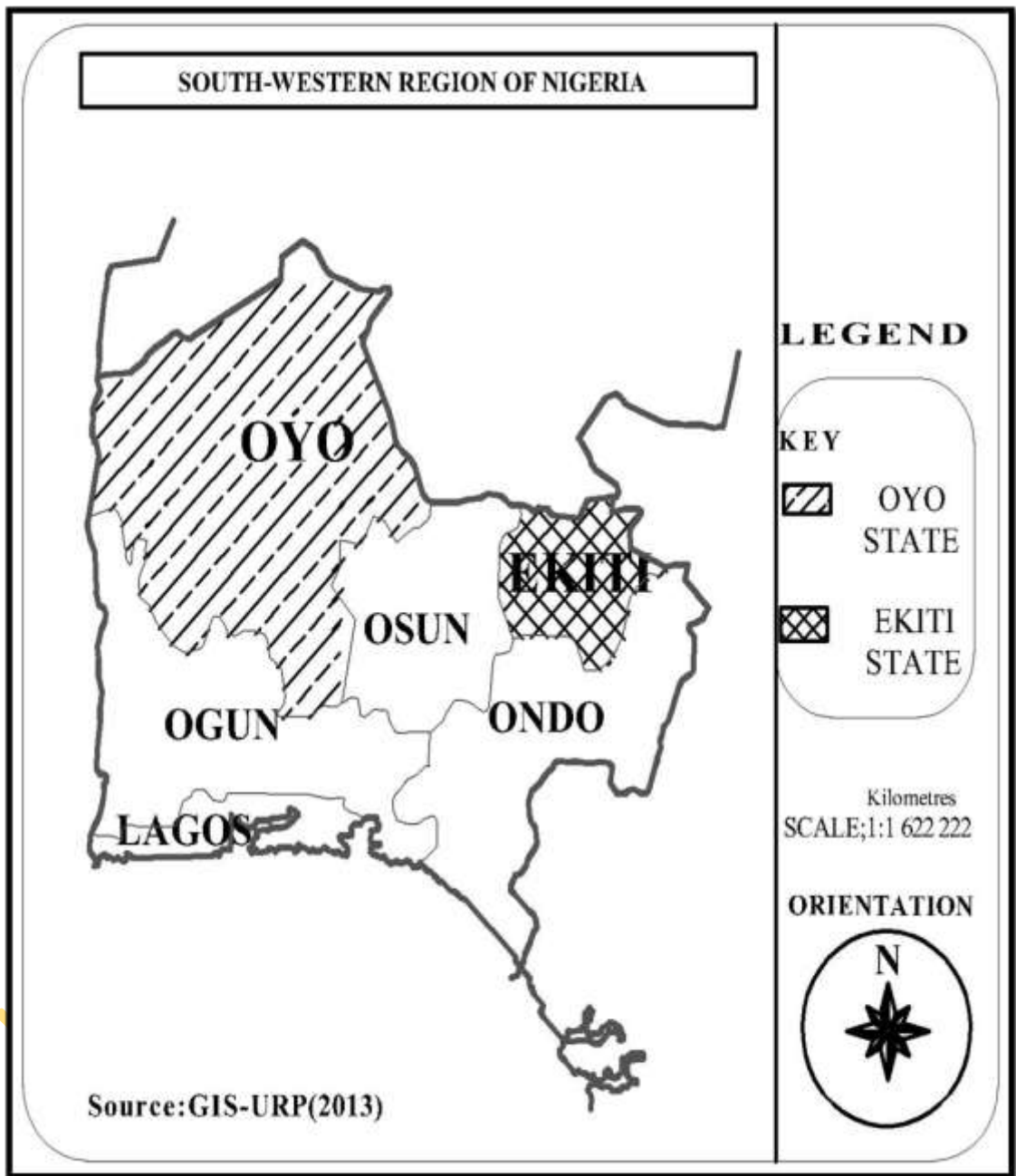
Fig 3: Map of southwestern Nigeria showing the sampled states

3.2   Sources of data

The data for this study were obtained mainly from primary sources. The data were obtained through the use of a structured questionnaire administered on the rural households in the study area. The primary data collected from each household included the following:

(i)   Socio-economic and demographic: such include age, gender, household size, level of education (years spent in school), primary and secondary occupation, type of farm enterprise,

(ii)   Participation in local level institutions: types of association/ institution of household members, three most important association to each household, participation in decision-making, number of meetings of social groups, members annual contributions to various groups.

(iii)   Household Expenditure: monthly expenditure of household basic needs.

(iv)   Benefit derived from social group and asset ownership: benefit from social group, household farming assets.

3.3   Sampling procedure and sampled size

A multistage sampling technique was employed for the study. A purposive sampling technique was used to select two states from the six states located in the study area, that is, Oyo and Ekiti states. The choice of these states was based on high and low incidence of poverty. Although, Ekiti state has the highest poverty incidence next to Lagos, it was chosen instead of Lagos due to its highly urbanized outlook, while Oyo state has the lowest poverty incidence in the south-westen Nigeria .

All the Agricultural Development Programme (ADP) agricultural zones for both states were used on the basis that the majority of the rural households are into a form of farming activities or the other. There are four and two ADP agricultural zones in Oyo and Ekiti states respectively. These six zones were used for the study. Stratified sampling technique which forms the second stage was used to divide the Local Government Areas (LGAs) under the ADP agricultural zones into into urban and rural as indicated by the Ministry of Local Governmeent and chieftaincy offices of both states.

The third stage involves the use of simple random sampling technique to select a rural LGA from each of the six agricultural zones considered in the study making a total of 6 LGAs. Using a proportionate to size sampling, 26 villages were randomly selected from Oyo State and 8 villages from Ekiti state at the fourth stage Finally, 223 and 107 respondents were sampled in Oyo and Ekiti state respectively. The proportionate factor used to select the respondents from each state is as given below:

Ni $\qquad$ = $\qquad$ ni / N *330 $\qquad$ (20)

Where Ni = the number of instrument to be used in the state i, (i = 1 and 2)

ni = the population of the state i

N = total number of population for the two states

330 = this is the total number of instruments used in the selected states

It should, however, be noted that, only two hundred and ninety-eight copies of the questionnaire were used in the analyses. Inadequate information and inconsistency necessitated the rejection of others. The sampled zones, number of villages and the corresponding number of households sampled are presented in Table 2 below.

Table 2: List of villages sampled in Southwestern Nigeria

State	ADP Zones	LGA	Names of Villages	Samples /LGA
Oyo	Ibadan / Ibarapa	Ibarapa East	Lanlate, Temidire, Eruwa, Egboolasa, Lawoore and Maya	51 (6)
	Ogbomoso	Surulere	Sekengbede, Iresaadu, Iresaapa, Ayanyan, Mayin and Okin	61 (5)
	Oyo	Itesiwaju	Gbonka, Aba-Aladie, Eleku, Onisile, Araromi, Pakoyi, Ayetoro and Oniyanrin	55 (6)
	Saki	Olorunsogo	Tesi-garuba, Tesi-apata, Dogo, Gaa-siidi, Gida-lalere and Igbeti	35 (4)
Ekiti	Ikere- Ekiti	Emure-ekiti	Oge-Ekiti, Eporo-Ekiti and Emure Ekiti	41 (6)
	Aramoko-Ekiti	Irepodun/Ifelodun	Iworoko-Ekiti, Igbemo-Ekiti, Are-Ekiti,Afao-Ekiti and Araromi-Ekiti	55 (5)

Figures in parentheses are discarded responses which have inadequate information
Source: Field survey,, 2009
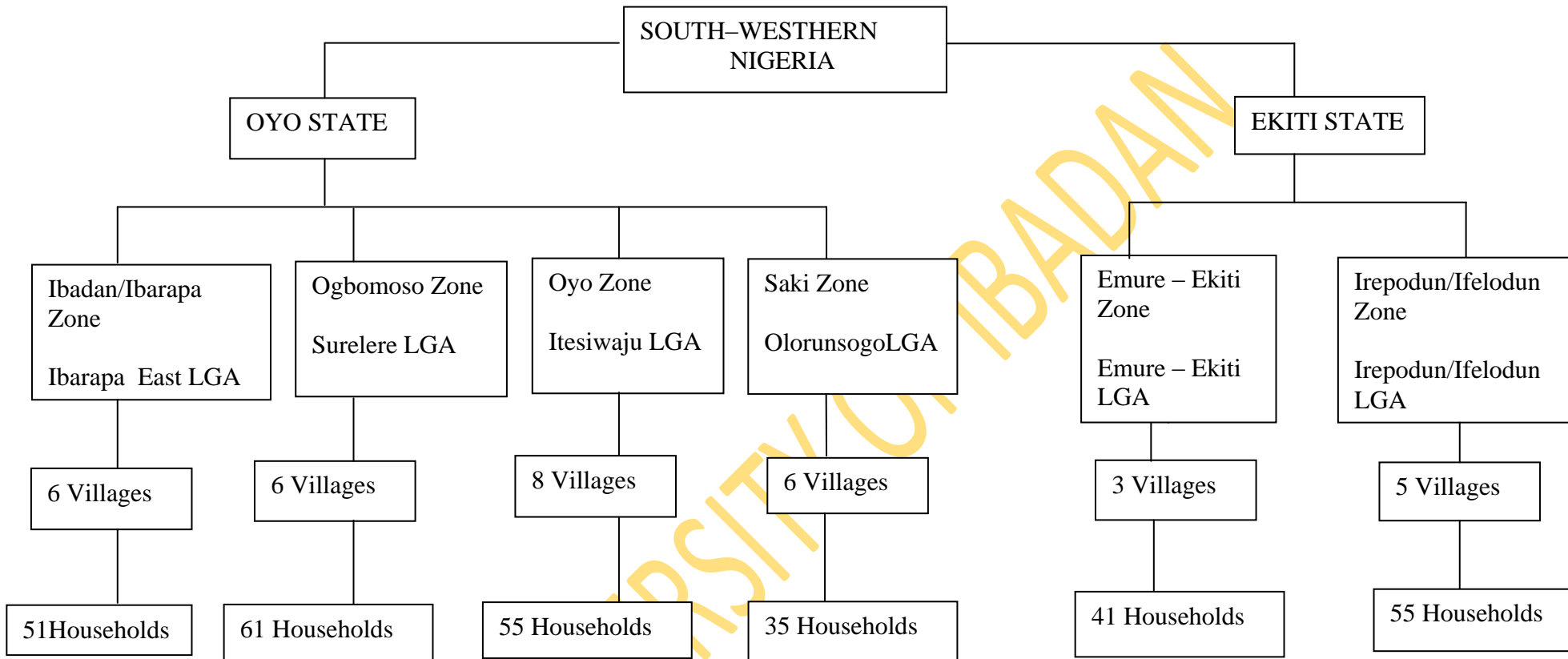
Fig. 4: Sampling procedure of Southwestern Nigeria
Source: Field survey,

3.4   Analytical technique

Considering the objectives of the study, the study made use of a number of analytical techniques to effectively analyse the data collected. The analytical tools used are descriptive and inferential statistics, such as Ordered probit, ordinary least square (OLS), two-stage least square (2SLS) and Control function regression models.

3.4.1   Descriptive statistics

This was used to analyse objectives 1 and 2, the descriptive statistics used include tables, percentages and all forms of indices to characterise the dimensions of social capital, types of local level associations and ascertain enterprise characteristics of the farming households.

3.4.2   Composite score

This was used to measure the level of benefit that farmers received from their various social groups (objective 3). Repondents were made to respond to questions relating to expected benefits derived from being members of a social group as discussed in the literature. These benefits include information on credit source, market, subsidized fertilizer, and the other inputs and access to financial assistance, labour supply and land provision, amongst others. Binary scale, that is scoring 1 point for Yes and 0 for No responses in Table 3 below regarding the benefits received, was used to rate the respondents. With 10 statements; a respondent can score a maximum of 10 points and a minimum of 0 points. The categorisation into high, intermediate and low benefit was then achieved using a composite score as presented in Table 4 and as used by Sirkin (1995), Yekinni (2007) and Salimonu (2007):

High category = Between Mean + S.D and 10 points

Medium (intermediate) = between lower and upper categories

Low Category = Between 0 and Mean – S.D.

Table 3: The level of benefit that is received was derived from the following statements

	STATEMENTS	Yes	No
	I easily access information from members of my social group on:		
1	MarketOutlets		
2	Credit Source		
3	Source of Subsidised fertilizer		
4	Improved seeds and chemicals		
5	New opportunities/technology/enterprise		
6	I enjoy services/labour supply from the members during harvesting, planting,weeding, etc		
7	I benefit from financial assistance in terms of need		
8	I am able to share my risk,shocks, ill-health and adverse condition with the members of my group		
9	I benefit from lowered economic and social transaction cost from the group		
10	Easy access to land		

3.4.3 Ordered probit model

Objective 3 was achieved using ordered probit model. This is a regression model which generalises probit regression by allowing more than two discrete outcomes that are ordered. Ordered probit model is used to model relationships between a polytomous response variable which has an ordered structure and a set of regressor variables. Using the composite score from the set of questions above, the level of benefit received from social interactions was categorized into high benefit, intermediate benefit and low benefit respectively. The standard ordered probit model is widely used to analyze discrete data of this variety and is built around a latent regression of the following form:

$$y^* = x' \beta + \varepsilon$$

where x and β are standard variable and parameter matrices respectivelys and ε is a vector matrix of normally distributed error terms. Obviously predicted grades (y^*) are unobserved. We do, however, observe the following:

$$y = 0 \text{ if } y^* \leq 0 \tag{21}$$

$$y = 1 \text{ if } 0 < y^* \leq \mu_1 \tag{22}$$

$$y = 2 \text{ if } \mu_1 < y^* \leq \mu_2 \tag{23}$$

where μ_1 and μ_2 are the cut points i.e. the threshold variables in the probit model. The threshold variables are unknown and they indicate the discrete category that the latent variable falls into. They are determined in the maximum likelihood estimation procedure for the ordered probit.

Normalise σ to 1

$$\Pr(y_i = 0) = \Pr(y^* < 0) \tag{24}$$
$$\Pr(X_i \beta +, \varepsilon < 0)$$
$$\Pr(\varepsilon < 0 - X_i \beta)$$
$$\Phi(0 - X_i \beta)$$

$$\Pr(y_i = 1) = \Pr(0 \leq y^* < \mu_1) \tag{25}$$
$$\Pr(0 \leq X_i \beta + \varepsilon < \mu_1)$$
$$\Pr(\varepsilon < \mu_i - X_i \beta) - \Pr(\varepsilon < 0 - X_i \beta)$$
$$\Phi(\mu_1 - X_i \beta) - \Phi(0 - X_i \beta)$$

$$\Pr(y_i = 2) = \Pr(y_i^* \geq \mu_1) \tag{26}$$
$$\Pr(X_i \beta + \varepsilon \geq \mu_1)$$
$$\Pr(\varepsilon \geq \mu_1 - X_i \beta)$$

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$$1 - \Pr(\varepsilon \le \mu_1 - X_i\beta)$$
$$1 - \Phi(\mu_1 - X_i\beta)$$

Note that $0 < \mu_1$ in that order for the benefits received from being a member of a social group. The likelihood for benefit received by an individual is

$$L = \left[\Phi(0 - X_i\beta)\right]^{z_{i1}} \left[\Phi(\mu_1 - X_i\beta) - \Phi(0 - X_i\beta)\right]^{z_{i2}} \left[1 - \Phi(X_i\beta - \mu_1)\right]^{z_{i3}} \qquad (27)$$

$$z_{ij} = \begin{cases} 1 \, if \, y_i = j \\ 0 \, otherwise \, for \, j = 0, 1 \, and \, 2 \end{cases} \qquad (28)$$

where for the ith individual, y_i is the observed outcome and X_i is a vector of explanatory variables. The unknown parameters β_j are typically estimated by maximum likelihood.

y = level of benefit received, (0 = low benefit, 1 = intermediate benefit, 2 = high benefit,).

X_1 = Age (years)

X_2 = Sex (male=0, female=1)

X_3 = Level of education (years)

X_4 = Household size (number)

X_5 = Farming status (full-time=0, part-time=1)

X_6 = Crop enterprise (crop=1 , otherwise=0)

X_7 = Livestock production (livestock= 1, otherwise = 0)

X_8 = Fisheries production (fisheries= 1, otherwise = 0)

X_9 = Mixed farming (mixed farm =1, otherwise = 0)

X_{10} = Status in the group (executive=0, member=1)

X_{11} = Meeting attendance index

X_{12} = Heterogeneity index

X_{13} = Labour contribution index

X_{14} = Decision-making index

X_{15} = Cash contribution (N).

X_{16} = Membership density

X_{17} = Aggregate social capital index

Marginal effect on the odds is one of the interpretations of the result from this model; it refers to partial effect on the odd of falling into a category as opposed to

user-chosen reference category. We also have marginal effect on the probability of an event as one of the interpretations; this also still refers to a particular response category. There is also an interpretation as the predicted probabilities in a given set of values in the explanatory variables. This value gives the proportional predicted probabilities by which the explanatory variables contribute to the response variable.

This statistical tool was employed to compare the probability of a household falling into high, intermediate and low benefit categories as a result of being a member of a social group. The model becomes useful, given the distribution of the dependent variable as concerned in the analysis. This model has been extensively used in studies like Jerry *et al.,* (1991), Abdel-aty (2001) and Kawakatsuy and Largeyz (2008)

3.4.3.1 Description, measurement of variables and expected signs

The study proposed thirteen variables. The expected signs of their coefficients were predicted a priori based on economic theory and/or logical reasons.

The dependent variable (Y)

This is the level of benefit received for being a member of a social group. The benefit received is categorized into three (for the ith household can belong to any), that is, low, intermediate and high benefit. It is hypothesized that the benefit received by each household is influenced by the independent variables.

The independent variables (Xi)

These are the socio-economic characteristics and social capital dimensions of the households sampled.

Socio-economic characteristics-

Age of the respondent (X_1)

The age of the ith household was measured in years. It is assumed that the age of an individual can affect his reasoning towards social interaction and the level of trust for others, weighing the benefits of connectivity. The older the members of the household are the more the tendency to associate with others within their vicinity and community at large, considering the social gain, in terms of gathering information, sharing risk with others, rendering help through neighbourliness, etc. It is expected that increase in age will enhance benefit received and household welfare therefore, the

relationship should be positive. This is in line with Grootaert (1999), Okunmadewa *et al (*2005b), Yusuf (2008).

Gender of the respondent (X₂)

Male respondents are scored 1 while the female farmers are scored zero. Male respondents may be expected to belong to more social groups than their female counterpart because of the assumption that they have more responsibilities to shoulder in terms of payment for most of the essentials of the household and also that they have less domestic activities to perform. The expected sign is positive since most household heads, the target population, are male. Therefore, they will be more than the female counterpart. The literature studied revealed equal number of positive outcomes (Grootaert, 1999; Yusuf, 2008) and negative sign Maluccio, 2000; Okunmadewa *et al.,* 2005a).

Education of the respondent (X₃)

Educational level of respondents is an important issue in household welfare. This is due to the exposure it gives in acquiring and utilizing social capital. Aker (2007) posits that attaining an appreciable level of household welfare, education and social capital act as complements and are important, that is, as household members acquire more education, the usefulness of associations and networks for improving household welfare may be increased, and returns to social capital may be higher for better-educated households. This supports the findings of Helliwell and Putman (1999), who report that individuals with more education get relatively high levels of utility out of social interaction. Education is measured as the number of years spent in school. The coefficient is expected to be positive (Grootaert, 1999; Aker, 2007; Okunmadewa *et al.,* 2005a; Maluccio 2000).

Household size of respondents (X₄)

A household is made up of the family, that is, the father, the mother(s), the children and other relatives such as brothers, grandfather, grandmother, house-help and so on. In other words, household size is larger than the family size. The household head in this case has many dependants. Some studies highlighted that the coefficient of household size has a positive relationship with household welfare since it provides a large supply of family labour which could enhance income-generation. However,

past literature reveals that this variable is negatively related to household welfare and probably social capital benefit too because, as household size increases the consumption pressure will also increase and consequently reduce welfare. (Grootaert 1999; Maluccio, 2000; Aker, 2007; Okunmadewa *et al.,* 2005b). The variable is measured by the number of persons in the household.

Farming status of respondents (X_5)

The farming status of the respondents was measured using a dummy, where 1 was scored for respondents that were engaged in farming as primary occupation and 0 for otherwise. It is generally believed that the majority of the rural dwellers engage in farming activities and are poor relative to their urban counterparts. They are, therefore, believed to gain more from belonging to social group especially in the area of labour contribution during planting and harvesting seasons. The coefficient is expected to be positive.

Crop farming (X_6)

Respondents that engage in crop production were scored 1 and otherwise were scored 0. Crop farmers are expected to benefit through labour contribution, information sharing, and acquisition of innovations and so on. The coefficient is expected to be positive.

Livestock production (X_7)

Livestock farmers were scored 1 and otherwise were scored 0. The farmers are expected to benefit through labour contribution, information sharing, acquisition of knowledge among others. The coefficient is expected to be positive.

Fish farming (X_8)

The respondents that engage in fish production were scored 1 and otherwise were scored 0. Fish farmers are expected to benefit through labour contribution, information sharing, acquisition of innovations and so on. The coefficient is expected to be positive.

Mixed farming (X_9)

Respondents that engage in two or more agricultural activities were scored 1 and otherwise were scored 0. These set of farmers are expected to benefit through labour contribution, information sharing, acquisition of innovations and so on. The coefficient is also expected to be positive.

Status in social group (X$_{10}$)

Being a member of a social group or other similar association enhances interaction, cross-fertilization of ideas, flow of information and opportunities. The membership in social group is likely to give respondents access to credit, fertilizer and other required inputs. They are also likely to receive pieces of advice or dwell upon the experience of their associates. This is, therefore, expected to be beneficial to the respondents. The status of respondents in their various social groups is believed to affect how well they function in the group, that is, their level of participation. Being an executive member was scored 1 and otherwise was scored 0. The coefficient of the variable is therefore expected to be positive

Social capital dimensions

Meeting attendance index (X$_{11}$)

The index was obtained by summing up attendance of household members at meetings and relating it to the number of scheduled meetings per annum by the associations they belong to. The value was then multiplied by 100. Meeting attendance is expected to be positively related to the benefit received from social group (Maluccio, 2000, Aker, 2007).

Heterogeneity index (X$_{12}$)

This is an aggregation of diversity of members of the three most important institutions to the households, for example, same kin group, occupation, economic status, religion, gender, age group and same occupation. A maximum score of 10 was allotted to each association to represent the highest level of heterogeneity. The scores by the three associations for each household was then divided by the maximum score of 30 to obtain an index which was then multiplied by hundred. The higher the score, the more diversified are group members. The coefficient is ambiguous because it is positively related to the benefit received and household welfare in studies like Grootaert (1999) and Yusuf (2008), while in other studies the index is negative, for example, Okunmadewa *et al., (*2005b).

Labour contribution (X$_{13}$)

This is represented by the number of days that household members claimed to have worked for their various groups. It represents the total number of days worked

by household members or the number of days worked per year as membership contribution. The coefficient is ambiguous as it was reported to be positive in studies such as Yusuf (2008) and Okunmadewa *et al., (*2005b), and negative as reported by Grootaert (1999).

Decision-making index (X_{14})

This is the summation of how the respondents rank their participation in the decision-making of the three most important groups to them. An average of the rank for the three groups was calculated and multiplied *by* 100 for each household. The expected sign is positive (Grootaert, (1999), Yusuf (2008), Okunmadewa *et al., (*2005b)).

Cash contribution index (X_{15})

This is the amount paid as membership due per annum in an association. This was obtained by the summation of the total cash contributed to the various associations which the household belongs. Cash contribution can also reveal respondents' commitment to the group. The coefficient is, therefore, expected to be positive, Grootaert (1999).

Membership density(X_{16})

This is the average number of active membership in association per household as calculated. The coefficient is expected to be positively related to the benefit received through social capital acquisition as well as household welfare (Aker 2007).

Aggregate social capital index (X_{17})

This is the multiplicative social capital index. The index was calculated using the products of density of membership, heterogeneity index and decision-making index of households in their various social groups. The expected sign is positive.

3.4.4 Social capital and household welfare

This study applied the analytical framework earlier used by Narayan and Pritchett (1997), Grootaert, (1999), Grootaert and Bastelaer (2002b), Okunmadewa *et al.,* (2005b), (2007), Aker, (2005), and Yusuf, (2008). The conventional model of household economic behaviour under constrained utility maximization was used to relate the level of household expenditure (as money - metric indicator of welfare) directly to household endowments (assets) and variables describing social and economic environments in which decisions are made. The household welfare is hypothesized to be influenced by the independent variables included in the model below:

$$In \; E_i = \alpha + \beta SC_i + \gamma HC_i + \delta OC_i + \sum_{i=1} x_i \; + Z_i + \mu_i \qquad (29)$$

Where E_i is *per capita* expenditure of household i

SC_i is a measure of the household endowments of social capital, the variables include: density of membership, heterogeneity index, meeting attendance index, cash contribution index, labour contribution index and decision-making index, aggregate social capital index

HC_i is the household human capital:(education in years)

OC_i represent other household assets: (farm size in hectare, value of farming equipment, value of livestock and value of crop owned)

X_i is a vector of household characteristics: (age in years, sex (dummy), household size (actual number), marital status (dummy), farming enterprise (dummy)

Z_i, is the distance of the village to the nearest urban area (km), and

μ_i represent unobserved disturbances and potential measurement errors.

The key feature of the model is the assumption that social capital is truly "capital" i.e. a stock, which generates a measurable return (flow of income) to the household. Social capital has many "capital features: it requires resources (especially time) to be produced and it is subject to accumulation and destruction. Social capital is believed to be built during interactions which occur purposely for social, religious, or cultural reasons. The key assumption is that the networks built through these interactions will have measurable benefits to the participating individuals, and lead, directly or indirectly, to a higher level of well-being. There is an impact assumption that social capital is embodied in the members of the household. This conforms to the

position of Portes (1998), which advocates that social capital itself is an individual asset, although it is sourced from the relationship which exists among a group of individuals. Contrary to this is the position of Putman (1993), who sees social capital as a collective asset. For the purpose of this study, the position by Portes (1998) is adopted; hence, social capital is viewed as an individual household asset.

3.4.4.1 Description and measurements of *per capita* expenditure and other variables

The *per capita* expenditure for the households was obtained by the sum of all household monthly expenditure on food and non-food items and then divided by the household size. It is used to measure household welfare. Household welfare is hypothesized to be influenced by independent variable such as age, sex, education, household size, marital status, social capital dimensions (as earlier described) and household assets such as farm size, value of farm equipment, livestock value and crop value.

Marital status of the respondents

The sign of the marital status of the farmers is expected to be positive such that married respondents are expected to have improved welfare. This is expected since the married respondents are likely to have larger household. Therefore they benefit from engaging in more social groups than the unmarried or single respondents. Married respondents were scored 1 and others 0.

Respondents farm size

The farm size is measured in hectares. Farm size could be a constraint in investment in food crop production. As farm size increases, the land constraint is relaxed such that the respondent is able to allocate the land to various enterprises, thereby increasing income which consequently improves the household welfare. The variable is expected to have an influence on household welfare, hence, a positive sign.

Farm equipment owned

The value of farm equipment owned by the household was measured in naira. The quantity of equipment owned by a household as asset can give a description of the household in terms of level of welfare. It, therefore, can contribute to the earning

capacity of the household, thereby improving welfare level. The coefficient is expected to be positive, (Aker, 2007).

Livestock value

This is a disposable asset for the household because it can easily be sold when the household is in dire need of funds. Livestock in the study includes pigs, goats, rams, cows and poultry birds. This as an asset can positively influence household welfare. It is measured in naira. The expected sign is positive, (Aker, 2007).

Crop value

This is also another disposable household asset. For the purpose of this study, crop value includes harvested crops such as grains, tubers, palm oil, honey and cocoa beans. Since these could contribute positively to the income earning capacity of the farm household; they are expected to improve household welfare. Hence, a positive sign of the coefficient is expected (Aker, 2007). It is also measured in naira. The coefficient is expected to be positive

Distance to urban centre

The closer a rural community is to an urban centre, the better the welfare of such rural community. Therefore, the distance to the closest urban area was also used as a variable. Distance was measured in kilometers. The apriori expectation is positive relationship to household welfare.

Proposed content specific variables used as instrument in the study.

In order to ascertain the endogeneity effect of social capital on household welfare, instrumental variables that are highly correlated with endogenous social capital and are uncorrelated with household expenditures are to be used. The proposed instrumental variables for social capital are four and they include:

Length of residency

Given the time it takes to build social networks and relationships, length of residency was proposed to be used as an instrument for social capital, because the longer a household resides in an area, the greater its potential for building social capital. It was measured using the number of years spent in an area of residence.

Household membership in religious group

A household's affiliation with an organised religion may offer it an opportunity to build additional social networks and relationships, thereby increasing its membership in associations. However, since it is not associated with access to resources or specific income groups, it was proposed as an instrument for social capital. It was measured using a dummy, household members that belong to a religious group were scored 1 and zero for otherwise.

Respondents' Charity donation

Donation within a community, rendering services/assistance (labour) or providing financial support (gift) during social functions in Nigeria is not a new idea. People may donate, assist or support others in order to maintain their relationships within their community or with their friends. It was, therefore, proposed as an instrument for social capital. It was measured in naira.

Household membership in ethnic group

This group is formed particularly where a group of people recognized to be from the same ethnic group are residing outside their domain. This was proposed as an instrument, because it is generally believed that households with more homogenous ethnic compositions would develop and maintain social relationships more easily and not necessarily influence welfare. It was measured using a dummy. Household members that belong to an ethnic group were scored 1 and zero for otherwise.

- **Two-stage least square (2SLS)**

In order to correct for the endogeneity of social capital, instrumental variable (IV) was used. Since social capital can be assessed at a cost (time and resources), therefore the causality between expenditure and social capital runs in both direction and this will cause the OLS estimates to be biased. In order to address the joint endogeneity problem, it will be necessary to isolate the exogenous impact of social capital on household expenditure. Instrumental Variable (IV) was used for the potential exogenous variable in the model, that is, social capital. The IV used was highly correlated with social capital and uncorrelated with household expenditures.

Variables such as length of household residency in the community, household donation in the past year and membership in a religious and ethnic group(s) were considered as potential instruments for social capital variable. The 2SLS reduces the correlation of the explanatory endogeneous variable with the error term. (Olayemi, 1998). As a result, the regression parameters are better enhanced. The structural equation (equation 30) and reduced form equation (equation 31) of the 2SLS is as expressed below:

$$E_i = \beta_0 + \beta_1 G_i + \beta_2 SC + u \qquad (30)$$

$$SC = \alpha_0 + \alpha_1 G_i + \alpha_2 Q + v \qquad (31)$$

Where E_i is the household per capita expenditure

$\beta_0, \beta_1, \beta_2, \alpha_0, \alpha_1$ and α_2 are vectors of the estimable parameters

u and v are the disturbance error term.

G_i represents other estimable exogeneous

C is the household social capital endowment

Q is the instrumental variable which is correlated with social capital and uncorrelated with the error term

- **Control function approach**

  The control function approach is an econometric method used to correct for endogeneity problem (Wooldridge, 1997, 2003); Heckman and Navarro, 2004). It could also be applied in more general semi-parametric settings (Chesher, 2003); Imbens and Newey, 2006). The basic idea behind the control function methodology is to model the dependence of the outcome unobservables on the observables in a way that allows a construction of a function *K* such that conditional on the function, the endogeneity problem disappears.

  Using Wooldridge (2002) and Ajakaiye and Mwabu (2007), the estimation strategy may be summarized as follows.

$$E = g_1 \delta_e + \beta SC + \varepsilon_1 \qquad (32)$$

$$SC = f \delta_{sc} + \varepsilon_2 \qquad (33)$$

$$P = 1(f \delta_p + \varepsilon_3 > 0) \qquad (34)$$

Where,

E, SC, and P are expenditure (to capture household welfare), social capital and an indicator function to select the observation into the samples respectively.

g = vector of exogenous covariates; f = exogenous variables which consist of covariates of expenditure g_1 and a vector of instrumental variables which affect social capital (SC) but have no direct influence on expenditure, E; δ, and β are vectors of parameters to be estimated and ε, a disturbance term.

Equation 32 is the structural equation of household welfare whose parameters are to be estimated. The second equation is the reduced form of linear probability model of social capital, that is, the linear projection of the potentially endogenous variable, social capital on all the exogenous variables f. Equation 34 is the probit for the sample selection. It is the probability of an inclusion of factors that can affect household welfare. It helps to correct sample selection bias in the parameters to be estimated. In order to accommodate the non-linear interactions of the unobservable variables with the expenditure regressors, equation 32 is rewritten as

$$E = \alpha_0 + g_1 \delta + \beta SC + \alpha_1 V + \gamma (V \times SC) + \theta (SC \times R) + \mu \qquad (35)$$

Where

V is the fitted residuals of social capital which is derived from a linear probability model, that is, observed value minus the fitted value,

$V \times SC$ is the interaction of the fitted social capital variables with the actual value of the social capital variables.

R is the exogenous variables such as donation; religion and length of stay, among others, which is correlated with social capital. μ is a composite error term. In equation 35, the terms V, and $V \times SC$ are the control function variables which control for the effect of the unobservable factors that will contaminate the estimates of the structural parameters.

The effect of social capital (SC) on household expenditure (E) from equation 35 is given by the partial derivative expression below.

$$\partial E / \partial SC = \beta + \theta R + \gamma V \qquad (36)$$

β in equation 36 is the direct effect of SC on the expenditure E which should be zero because social capital has no direct effect on household expenditure. However, the role of social capital is to help reduce or share household risk through social connectedness and trust which in return improves household welfare. θR which is not

actually estimated, is the indirect or complementarity effect which explains the impact of the correlation of social capital SC with other sources of capital on welfare. Although this complementarity effect is not obvious, it is readily understood by noting that when both SC and R are increasing, welfare is improving at the rate θ. The parameter θ is the effect of the increase in both SC and R on welfare, where the increase is not necessarily proportional, i.e θ is the effect of a unit increase in the interaction term, (SC x R) on welfare. In as much as SC increases, a unit increase in R increases welfare by θ. Both SC and R are normalized to zero at the origin. The third term in equation 36, γ V captures the non-linear effect of SC on welfare.

The reduced form Social capital residual V, serves as the control for unobservable variables that are correlated with SC. If an observed variable is linear in V, it is only the intercept, α_0 that is affected by the unobservable, thus the IV estimates of equation 35 are consistent even without the inclusion of the interaction term. The interaction term, (V x SC), controls for the effects of non-linear interaction of an observable variable with social capital. Specifically, if the effect of SC on welfare is influenced by an observable variable, α, which is correlated with SC, this unobserved influence (α x SC) is relegated to the structural error term and its source neglected during estimation. The estimated coefficient on SC contains this neglected effect of unobservable variables; other structural coefficients may be similarly affected. The inclusion of the interaction term, (α x SC) in equation 35 purges the estimated coefficients of the effects of the unobservables (Card, 2001). The interaction of V with SC captures the idea that the size of α varies non-linearly with SC. Thus, the unobserved and neglected effect (α x SC) changes in a non-linear way as SC changes, the polynomials of the fitted residual term, V, and its interactions with exogenous covariates, f, can be included in equation 35. The IV estimates of equation 35 are unbiased and consistent only when one or the other of the following conditions holds (a) expected value of the interaction between social capital and its fitted residual (V x SC) is zero; (b) the expectation of interaction between SC and its fitted residual is linear (Wooldridge, 1997)

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CHAPTER FOUR
RESULTS AND DISCUSSIONS

The chapter discusses the results of the study. The discussion is along the stated objectives of the study. There are four sections in all.

4.1 Socio-economic characteristics of respondents and dimensions of social capital

This section presents the results which explain objective one. It summarises the socio-economic characteristics of the respondents namely: age, sex, education, household size, farming status, marital status and major occupation. The summary statistics of the various dimensions of social capital used is also presented here. These include; meeting attendance, membership density, heterogeneity, cash contribution, labour contribution, decision-making as well as aggregated social capital.

4.1.1 Socio-economic characteristics of the respondents

The socio-economic characteristics of the respondents are presented in Table 4, about 76 percent of the respondents are between 30 and 59 years age range. The average age in the study area is 48.3 years. This shows that most of the respondents are in their economic active age irrespective of the report of the UNDP (2011) that life expectancy of Nigerians is 51.9 years. The result also reveals that 26.51 percent of the respondents have spent between 7 and 12 years in secondary education while only 7.38 percent spent 18 years and above learning (postgraduate education). However, about 24 percent of the respondents had no formal education. The average years spent in school is 8.4 years and this is not statistically different from the minimum prescription of nine years of basic education under the Universal Basic Education Programme in Nigeria. This is an indication that an average respondent had six years of primary school and three years of post-primary education. This result is in line with the findings of a study conducted by Salimonu (2007).

The average household size in the study area is 6, which falls into the group of households that have the highest representation (59.73percent) in household size, that is, households having between 5 and 8 members. About two percent of the respondents have above 13 household members. The highest household number in the study area is 18.

The majority of the respondents in the study area are males, having a representation of 82.89 percent of the total population for the study. The result further

reveals that 17.45 percent of the respondents do not engage in any form of agricultural production, while 3.36 percent engage in other agricultural activities such as marketing, processing, forestry, etc. About 58.05 percent of the respondents are involved in crop production while only 2.01 percent engage in the production of fish. This is an indication that majority of the respondents in the study area engage in agricultural activities either as primary or secondary income generating activity. Also, the result reveals that 57.72 percent of the respondents primarily engage in farming activities as a source of livelihood. The least primary occupation of the respondents is about 1 percent, for those who claimed to engage in other activities such as nursing, security services, cleaning services, etc. The married respondents account for 92.95 percent of the total population studied.

Table 4: Distribution of socio-economic characteristics of the respondents

Variables		Frequency	Mean	Std.Deviation	Minimum	Maximum
Age (yrs)	< 30	16 (5.37)	48.33	11.17	20	75
	30- 39	48 (16.10)				
	40- 49	97 (32.55)				
	50- 59	84 (28.19)				
	60- 69	45 (15.10)				
	>69	8 (2.68)				
Education (yrs)	0	73 (24.50)	8.42	6.32	0	26
	1- 6	72 (24.16)				
	7- 12	79 (26.51)				
	13- 17	52 (17.45)				
	>18	22 (7.38)				
			6.16	2.68	1	18
Household	1- 4	80 (26.85)				
Size	5 - 8	178 (59.73)				
	9-12	33 (11.09)				
	>13	7 (2.35)				
Sex	Female	51 (17.11)				
	Male	247 (82.89)				
Marital status	Single	21 (7.05)				
	Married	277 (92.95)				
Farm enterprise		52 (17.45)				
None		173 (58.05)				
Crop production		24 (8.05)				
Livestock production		6 (2.01)				
Fisheries		33 (11.07)				
Mixed farming		10 (3.36)				
Others						
Primary occupation		172 (57.72)				
Farming		61 (20.47)				
Civil service		19 (6.38)				
Private enterprise		8 (2.68)				
Transport service		16 (5.37)				
Artisan		19 (6.38)				
Trading		3 (1.00)				
Others						

Source: Field survey, 2009

4.1.2 Dimensions of social capital

The distribution of the social capital dimensions available in the study area is presented in Table 5. The study focused on six dimensions of social capital and these are decision-making, membership in social groups, heterogeneity, meeting attendance, and cash and labour contributions. About 45 percent of the repondents belong to 3 to 4 social groups while only 4.7 percent are members in more than eight social groups. On the average, a household belongs to at least four social groups. A majority of the respondents (48.3 percent) claim to participate in 80 percent of the decision made in their various groups, while just 3 percent has less than 20 percent participation in decision-making. An average rural household has 80 percent of participation in decision-making.

The level of heterogeneity to which an average household belongs is very low, i.e. 21.7 percent. However, less than 10 percent household belong to social group where their level of diversification is more than 40 percent. Average meeting attendance is 54.66 percent. Only 4.4 and 5 percent of the respondents have less than 20 percent and above 80 percent meeting attendance index respectively among the respondents. About 54 percent of the rural households contributed less than N5,000 annually in their various groups while an approximately 8 percent of them contributed more than N20,000. An average of ₦7,412 is contributed annually by each household to various groups.

Labour contribution is generally in the study area with an annual average value of 21.74 man-days. Fifty-four percent of the respondents contributed 10 man-days or less annually while less than 10 percent of them claim to contribute above 20 man-days annually. The average social capital index in the study area is 46 percent. These six social capital dimensions are further presented based on household socio-economic characteristics.

Table 5: Distribution of social capital dimensions

Social capital	Frequency	Mean	Std.Deviation	Minimum	Maximum
Membership in social groups					
≤ 2	31(10.4)	4.49	2.13	1	13
3-4	133(44.6)				
5-6	76(25.5)				
7-8	44(14.8)				
>8	14(4.7)				
Decision-making index					
<20	9(3.0)				
20-40	2(0.7)	80.70	19.79	0	93
41-60	13(4.4)				
69-80	130(43.6)				
>80	146(48.3)				
Heterogeneity index					
<20	131(44.0)				
20-40	146(49.0)				
41-60	16(5.0)	24.73	13.27	0	88
61-80	4(1.3)				
>80	1(0.3)				
Meeting attendance index					
<20	13(4.4)				
20-40	37(12.4)				
41-60	134(45.0)	54.66	18.49	0	94
61-80	99(33.2)				
>80	15(5.0)				
Cash contribution					
<5000	162(54.4)				
5001-10000	66(21.1)				
10001-15000	37(12.4)				
15001-20000	13(4.4)	7412.95	9757.73	0	64700
>20000	20(6.7)				
Labour contribution					
≤ 10	161(54.0)				
11-20	108(36.2)				
21-30	21(7.0)				
31-40	3(1.0)	21.74	16.43	0	92
>40	5(1.7)				
Aggregate social capital index					
<20	68(22.8)				
20-40	88(29.5)				
40-60	81(27.2)				
69-80	28(9.4)	45.89	33.83	1	83
>80	33(11.1)				

Source: Field survey, 2009

4.1.3.1. Age of respondents and social capital dimensions

As presented in Table 6, participation of households in social institutions reveals that the age range between 40 and 49 years accounted for the highest percentage (25.33 percent) in membership of local institutions, followed by respondents that are between 50 and 59 years (22.80 percent). Those that are less than 30 years have the lowest membership density (15.46 percent). On the level of membership diversity, people within the age range of 60 and 69 years have the highest diversity in the association they belong and this accounted for 27.9 percent while those above 69 years have the lowest diversity. This could be due to weakness or reduction in active rural activities, a consequence of ageing. Attendance of meeting result reveals that all the age groups except the respondents that are less than 30 years have more than average attendance at scheduled meetings by their various associations. However, the highest representation of 58.19 percent at meeting attendance was recorded for age group within 40 and 49 years. This implies that households attend at least every other meeting scheduled that is, one out of every two meetings.

The highest representation of cash contribution to various associations is within age group of 40 and 49 years, followed by 50 and 59 years with mean value of ₦9,374.95 and ₦7,656.32, respectively. The least money contributed, ₦5,399.00, is by respondents above 69 years. The reason for this least contribution by this group could be traced to reduction in income as age increases or a reduction in their income generating activities due to health reasons. On decision-making in various associations, 90 percent of the respondents that are above 69 years participate in decision-making in their associations, while the least in decision-making are those who fall within the age group of 30 and 39 years as represented by 73.8 percent. The result reveals that all the age groups are well above average in decision-making in their various associations. The overall social capital dimension shows that 44.8 percent of respondents within age group of 60 and 69 years have the highest aggregate social capital and the least represented by 38.10 percent are those that are less than 30 years. The F-statistics of the analysis of variance shows that there is significant difference among the age groups in relation to the social capital dimensions except for the aggregate social capital.

Table 6: Distribution of respondents age and social capital dimensions

Age groups (years)	Membership Density Index (percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
< 30	15.46 (7.54)	23.12 (9.15)	47.75 (26.45)	5418.12 (5529.36)	10.81 (8.25)	75.70 (26.36)	38.10 (11.07)
30- 39	21.72 (11.12)	23.33 (10.50)	54.20 (16.89)	5848.54 (8247.52)	18.42 (17.54)	73.84 (19.24)	39.63 (9.68)
40- 49	25.33 (11.23)	25.40 (14.75)	58.19 (19.35)	9374.95 (12113.31)	23.70 (16.03)	79.95 (19.94)	43.56 (9.29)
50- 59	22.80 (9.44)	24.24 (13.51)	53.84 (15.26)	7656.32 (9560.54)	21.64 (15.31)	82.27 (18.74)	43.11 (9.02)
60-69	20.06 (11.07)	27.92 (13.09)	52.18 (18.74)	5554.98 (6722.66)	23.91 (19.24)	86.42 (18.33)	44.80 (8.96)
>69	17.75 (6.50)	17.33 12.65	51.94 (23.87)	5399.00 (6636.39)	27.20 (12.43)	90.00 (14.30)	41.69 (5.13)
F-statistics	9.28	8.50	7.15	6.76	5.03	6.25	1.12

Figures in parentheses are standard deviation.
Source: Field survey, 2009

4.1.3.2.   Educational level of respondents and social capital dimensions

The educational level of the respondents is presented in Table 7. Respondents with 7 to 12 years of education have the highest percentage of membership density in local institution (24.65percent) and this is closely followed by respondents with primary and tertiary education that is, 24.48 percent and 24.27 percent, respectively. The least in the group, however,is those without formal education. This indicates that educational level can expose households more to local level institutions. On the issue of diversity in membership, respondents with 7 to 12 years of education are most diversified with 28.1 percent while the least diversified are those with primary education. Meeting attendance across the educational groups shows that all the respondents have above average attendance except those that have 18 years of education or above. This could be as a result of their involvement in other activities. However, they (respondents with postgraduate education) have the highest value of contribution with an average of ₦11, 588.75 as their monthly contribution to their various associations.

Respondents with no formal education accounted for the least cash contribution with ₦4, 357 as the average contribution. This can be attributed to the fact that this set of people belongs to the least paid which will likely reflect in their contribution capability to local level institution.   While 23.45 man-days of the respondents represent the highest value of labour contribution for those without formal education, respondents with 13 to 17 years of education have the least value represented by 18.5 percent. This could be expected since the exchange of physical labour would be more recorded among those without formal education**.** All the educational groups claim to partake in decision-making in their various associations. However, respondents without formal education accounted for the highest average value (84.9 percent) while the least average value is 76.9 percent representing respondents with 13 to 17 years of education. Except for respondents with 18 years of education and above, it is observed that decision-making reduces as the number of years of education increases. On the aggregate, the educational class that has the highest social capital value is made up of the respondents with over 18 years of education (43.55percent) and this is closely followed by those with post primary education with an average value of 43.37 percent. The least however, are the respondents with post secondary school qualification represented by 40.88 percent.

Table 7: Distribution of respondents level of education and social capital dimensions

Educational Groups (years)	Membership Density Index(percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
0	18.49 (7.41)	24.93 (14.89)	53.96 (22.59)	4357.86 (4735.30)	23.45 (19.45)	84.93 (20.06)	42.79 (9.07)
1- 6	24.48 (11.28)	20.14 (8.44)	56.79 (15.41)	5572.50 (7076.32)	20.75 (14.42)	83.33 (13.70)	42.65 (6.62)
7- 12	24.65 (10.84)	28.10 (14.91)	54.50 (15.90)	9496.85 (13059.72)	23.35 (15.12)	77.36 (21.00)	43.37 (10.35)
13- 17	21.15 (10.48)	24.55 (13.05)	55.99 (20.37)	9156.92 (10150.96)	18.52 (14.13)	76.92 (22.96)	40.88 (9.67)
≥18	24.27 (13.66)	27.22 (11.45)	48.05 (16.37)	11588.75 (11220.24)	21.17 (20.44)	79.17 (20.80)	43.55 (12.75)

Figures in parentheses are standard deviation.
Source: Field survey, 2009

4.1.3.3. Respondents' household size and social capital dimensions

The composition of the household in terms of size is presented in Table 8. The household size groups that participated most in local institutions are those having between 5 and 8 members with a representation of 23.7 percent as the average value, while those with least participation in local institution are those with 13 and above members. Households with 9 to 12 members have the highest diversification (29.1 percent) while those with 13 members and above are least diversified (19.2 percent). On meeting attendance, households with 13 members and more have an average of about 62.6percent meeting attendance while the least representation is an average value of 52.4percent for households with 4 members and below. With the exception of household with 9 to 12 members, meeting attendance increases as household size increases.

Respondents having between 5 and 8 household members contributed most to their various associations with an average value of ₦8,103.94. There is a wide gap between the average values of the highest and the least cash contributors. The least cash contribution of ₦1,974.89 was from respondents with 13 members and above. This could be attributed to their high dependency ratio within the household. On the other hand, this group has the highest labour contribution of 36 man-days per annum while respondents with members between 1 and 4 have the least average value of about 17 man-days. Results for decision-making for various association reveals that all categories of household size participate in decisions made in their various associations. An average value of 83.5 percent gives the representation of households with 9 to 12 members while households with 13 members and more have about 76.5 percent average value. On the aggregate level, social capital increases as the number of household increases except for those with members that are equal to 13 or above which has a reduced value of 37.8 percent.

Table 8: Distribution of household size and social capital dimensions

Household size distribution	Membership Index (percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
1- 4	20.84 (10.67)	21.92 (9.90)	52.14 (19.30)	7777.86 (11377.54)	17.15 (13.23)	79.30 (22.62)	40.69 (10.70)
5-8	23.71 (10.74)	25.47 (14.11)	55.40 (18.16)	8103.94 (9769.15)	22.87 (17.12)	81.02 (19.06)	43.40 (9.02)
9-12	21.06 (10.00)	29.09 (14.25)	54.60 (17.51)	4284.24 (4555.18)	22.88 (15.43)	83.50 (14.73)	44.55 (7.29)
≥13	17.78 (9.39)	19.26 (13.82)	62.67 (20.58)	1974.89 (403.96)	36.00 (21.01)	76.54 (22.50)	37.86 (29.81)

Figures in parentheses are standard deviation.
Source: Field survey, 2009

4.1.3.4. Sex of respondents and social capital dimensions

Table 9 presents the dimensions of social capital in relation to their gender. The male household heads belong to more associations than their female counterparts and this is reflected in the result of membership index which shows that male household heads have an average of 23.3 percent memberships. However, the associations that the female household heads belong to are more diversified than those of the male counterparts. The male household heads attend association meetings on the average level, while the female meeting attendance is below average. Also, the male household heads contribute more to the various groups which they belong to with an average cash value of ₦7,813, while the female heads contribute about ₦5,455. Although labour contribution is almost equal but the female heads have a higher value of 21.8 man-days when compared with 21.74 man-days for the male heads. As expected in decision-making, the male household heads have a higher index of 81.2 percent as well as with the social capital aggregate level of 43 percent. The F-statistics shows that there is no significant difference among the social capital dimensions for both the males and their female counterparts.

Table 9: Distribution of respondents sex and social capital dimensions

Sex of household head	Membership Index (percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
Female	18.14 (10.33)	25.26 (12.14)	47.86 (18.64)	5455.88 (7454.75)	21.84 (18.91)	78.00 (22.50)	40.56 (10.90)
Male	23.36 (10.54)	24.56 ()13.50	50.06 (18.18)	7813 (10131.15)	21.72 (15.91)	81.25 (19.19)	43.06 (8.96)
F-staistics	0.60	0.58	0.89	0.69	0.53	0.37	1.04

Figures in parentheses are standard deviation.
   Source: Field survey, 2009

4.1.3.5. Major occupation of respondents and social capital dimensions

The primary occupation of the respondents is presented in Table 10. Respondents whose primary assignment is farming have the highest value of involvement in local institution participation (23.4percent) while the least occupational group that are involved in local institution are those with other occupations different from those specified in Table 10. Examples are medical professionals, ICT and banking personnels among others (13.5 percent). In addition to this, they are also the group with lowest level of diversity (22percent) while respondents in the civil service have the highest level of diversity as represented by 29.9 percent. All the respondents with the exception of respondents in private enterprises have meeting attendance that is above average. However, 62.1 and 48.5 percent are the highest and lowest average values for meeting attendance for artisans and private enterprise (sole proprietors) respectively. Respondents that are in the civil service contributed most to their association with an average cash value of ₦10,778 while those with the least contribution are those who engage in other occupation with a mean value of ₦4,990.

Labour contribution is highest among respondents that are farmers and lowest among those who engage in other occupations with average value of 24.6 and 12.8 man-days respectively. This is due to recurrent labour requirements in farming which include planting and weeding, unlike other occupations. The reason behind this is not far-fetched. As farming is seasonal and tedious; it therefore needs more hands during farming season. All the occupational groups have a high percentage in decision-making. However, those in other occupations have the highest (91 percent) and the artisans have the lowest values (69.4 percent). On the aggregate, respondents that are into transport service have the highest social capital (44.7percent) and this is followed by the farmers (43.3percent). The least social capital value is recorded against the artisans having a value of 38.3 percent.

Table 10: Distribution of respondents major occupation and social capital dimensions

Primary occupation	Membership Index (percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
Farming	23.43 (10.49)	24.36 (13.44)	55.27 (16.95)	6179.80 (9055.43)	24.63 (17.22)	82.30 (18.61)	43.36 (8.45)
Civil service	21.27 (9.98)	29.97 (14.34)	53.47 (22.09)	10778.03 (11990.53)	17.79 (14.31)	80.33 (17.73)	42.19 (8.72)
Private enterprise	20.53 (10.92)	27.72 (13.14)	48.56 (15.90)	9155.26 (9687.19)	20.37 (16.86)	80.12 (22.40)	42.79 (12.34)
Transport service	22.81 (13.05)	26.67 (14.47)	57.70 (14.82)	7840.00 (8908.91)	14.25 (9.36)	84.72 (13.19)	44.73 (8.98)
Artisan	21.72 (10.98)	23.75 (10.74)	62.14 (21.96)	7293.13 (8278.82)	16.38 (15.02)	69.44 (25.17)	38.30 (11.27)
Trading	22.50 (13.57)	25.09 (11.51)	51.73 (14.27)	6588.95 (8942.72)	19.63 (15.56)	73.10 (28.52)	40.23 (13.99)
Others	13.50 (3.79)	22.00 (10.43)	53.96 (34.54)	4990.00 (3675.32)	12.80 (10.11)	91.11 (9.30)	42.20 (4.41)

Figures in parentheses are standard deviation.
Source: Field survey, 2009

4.1.3.6.   Marital status of respondents and social capital dimensions

Table 11 presents the marital status of the respondents in the study area. The married respondents have a higher average value of membership density in local institution (23.0 percent), and heterogeneity (24.9 percent) (that is, they are more diversified in the associations they belong to). They also have higher values for meeting attendance (56.2 percent), labour contribution (22.1 man-days) and contribute more to their local associations in terms of cash (₦7,593.75) than their single counterparts. However, in decision-making, the singles' value is slightly higher than that of the married. In all, the married respondents have higher aggregate social capital than the singles in the study area.

Table 11: Distribution of respondents' marital status and social capital dimensions

Marital status	Membership Index(percent)	Heterogeneity Index (percent)	Meeting attendance index (percent)	Cash contribution (₦)	Labour contribution (manday)	Decision-making index(percent)	Aggregate social capital(percent)
Single	14.29 (8.07)	22.22 (9.39)	34.19 (16.38)	5010.95 (4957.79)	16.67 (11.89)	80.95 (21.70)	39.15 (10.30)
Married	23.09 (10.60)	24.92 (13.51)	56.20 (17.73)	7593.75 (10008.4)	22.12 (16.67)	80.68 (19.68)	42.90 (9.24)

Figures in parentheses are standard deviation.
Source: Field survey, 2009

4.2   Household welfare profiles and social capital dimensions

This section discusses the distribution of respondents according to their welfare status in relation to their socio-economic features and dimensions of social capital.

4.2.1.   Household distribution of monthly expenditure

The average distribution of the monthly expenditure for the households in the study area is presented in Table 12. The highest proportion of the monthly expenditure by household is on food and this accounted for 32 percent of the total expenditure. This is followed by expenses on school activities of the respondents' children which has also accounted for 20 percent. The proportion of expenses spent on housing is minimal relative to other basic needs of life. As presented on the Table 13, 2.4 percent of total monthly expenditure is spent on rent allowance. This may be due to the fact that majority of the respondents claim non-payment for housing because they live within their family house while others who reside in their personal houses did not indicate how much it could cost them if it was not their house. The least cost for an average household in the study area is water. Many of the respondents claimed that they source their water from nearby streams or wells that were close to their homes. In all, an average total of ₦27,871 was spent monthly by each household, which is less than ₦1,000/household/day irrespective of the household size.

Table 12: Distribution of household monthly expenditure

Monthly expenditure	Average value (₦)	Percentage
Food	8975.50	32.20
Clothing	2828.33	10.14
Rent allowance	670.50	2.41
Transport	1957.53	7.02
Toiletries	1056.60	3.80
Health	1192.00	4.28
Education	5774.00	20.72
Electricity	487.10	1.75
Fuel /Gas	863.97	3.10
Kerosene	1095.07	3.93
Water	105.83	0.37
GSM maintenance	1308.65	4.70
Remittances	1424.33	5.11
Other expenses	131.67	0.47
Total	**27871.09**	**100.00**
Mean *Per capita* Expenditure	**5,320**	

Source: Field survey, 2009

4.2.2.   Categorisation of households according to their welfare status

The households were categorised into terciles based on a measure of *per capita* expenditure (PCE) of households on food and non–food items. Table 13 shows the distribution of the respondents by terciles. The households in the first tercile have a mean PCE of ₦2,239.82 monthly representing only 14.03 percent of the total mean PCE for the study area. This mean PCE gradually increases from the first tercile to the third tercile with a mean PCE of ₦9,135.98 which accounted for 57.24 percent of the total mean. The mean PCE for the households in the study area is ₦5,320 monthly

Table 13: *Per capita* expenditure (PCE) distribution in tercile

Tercile	Mean PCE (₦)	Expenditure distribution (percent)
1	2,239.82	14.03
2	4,584.44	28.73
3	9,135.98	57.24
Total	15,960.68	100.00
Mean	5,320	

Source: Field survey, 2009

4.2.3 Welfare profile distribution by household characteristics

The categorization of households into welfare profile was done to relate differences in welfare status to socio-economic characteristics. Table 14 presents the socio-economic characteristics in relation to the welfare status of the respondents. The result reveals that 37.37 percent of the first tercile are within the age range of 40-49 years, 4.04 percent of the second tercile are less than 30 years and only one percent of the third tercile is above 69 years of age. It is observed that the least representation for the three categories of welfare is the respondents that are either less than 30 years or above 69 years. As expected, respondents with above 18 years of education have no representation in the first tercile and the least value among the second tercile categories (3.03 percent), while those without formal education and primary education account for 36.36 and 33.33 percents respectively for the first tercile. This supports the idea that educational level of the household head has effect on household welfare status. About 4 and 3.03 percents of households with 13 members and over fall under the first and second tercile categories. It is noteworthy that respondents with more than 8 household members have no representation among the third tercile category and this can be attributed to large household size which consequently affects welfare status. While 5.05 percent of the single respondents fall under the first category, 4.04 percent are in the second category and 12.12 percent are in the third category.

Also, 84.85 percent of the first category are males, 17.17 percent of the second category are females and 81.82 percent of the male headed household fall under the third category. None of the livestock farmers in the study area fall under the first category, while only 1.01 percent of the second welfare category is into fish farming; about 28.28 percent of the third welfare category do not engage in any agricultural activity.

Based on the result, respondents that engage in occupations such as farming and civil service in the study area are perceived to have enhanced welfare status.

Table 14: **Distribution of respondents based on welfare status in relation to socioeconomic variables**

Variable	First	Second	Third	Total
Age group (yrs)				
<30	2 (2.02)	4 (4.04)	10	16 (5.37)
30-39	8 (8.08)	21(21.21)	19	48 (16.10)
40-49	37(37.37)	25(25.25)	35	97 (32.55)
50-59	31(31.31)	29(29.29)	24	84 (28.19)
60-69	18(18.18)	16(16.16)	11	45 (15.10)
>69	3 (3.03)	4 (4.04)	1	8 (2.68)
Education (yrs)				
0	36(36.36)	27(27.27)	10	73 (24.50)
1-6	33(33.33)	25(25.25)	14	72 (24.16)
7-12	26(26.26)	28(28.28)	25	79 (26.51)
13-17	4 (4.04)	16(16.16)	32	52 (17.45)
>=18	0 (0.00)	3 (3.03)	19	22 (2.68)
Household size				
1-4	11(11.11)	23(23.23)	46	80 (26.85)
5-8	61(61.62)	63(63.64)	54	178 (59.73)
9-12	23(23.23)	10(10.10)	0	33 (11.07)
>=13	4 (4.04)	3 (3.03)	0	7 (2.35)
Marital status				
Single	5 (5.05)	4 (4.04)	12	21 (7.05)
Married	94(94.95)	95(95.96)	88	279 (92.95)
Farming Status				
Non Farming	18(18.18)	40(40.40)	68	126 (42.28)
Farming	81(81.82)	59(59.60)	32	172 (57.72)
Sex				
Female	15(15.15)	17(17.17)	19	51(17.11)
Male	84(84.85)	82(82.83)	81	247 (82.89)
Farm enterprise				
None	10(10.10)	14(14.14)	28	52 (17.45)
Crop production	74(74.75)	56(56.57)	43	173 (58.05)
Livestock production	0 (0.00)	11(11.11)	13	24 (8.05)
Fisheries	2 (2.02)	1 (1.01)	3	6 (2.01)
Mixed farming	11(11.11)	13(13.13)	9	33 (11.07)
Others	2 (2.02)	4 (4.04)	4	10 (3.36)
Pry occupation				
Civil service	6 (6.06)	18(18.18)	37	61(20.47)
Private enterprise	0 (0.00)	7 (7.07)	12	19 (6.38)
Farming	81(81.82)	59(59.60)	32	172 (57.72)
Transport service	2 (2.02)	4 (4.04)	2	8 (2.67)
Artisan	5 (5.05)	4 (4.04)	7	16 (5.37)
Trading	5 (5.05)	6 (6.06)	19	19 (6.38)
Others	0 (0.00)	1 (1.01)	2	3 (1.00)
Total	**99**	**99**	**100**	**298 (100)**

Figures in parentheses represents percentages
Source: Field survey, 2009

4.2.4. Social capital dimensions in relations to welfare profile

Table 15 presents the social capital dimensions in relations to the tercile distribution of households. The result reveals that respondents in the second tercile have the highest average membership index of 23.05 percent; the lowest however, are respondents in the first tercile with a mean value of 21.70 percent. The average meeting attendance for each of the tercile is above average with the highest mean value of 56.36 percent and least value of 52.15 percent for respondents in the first tercile and third tercile, respectively. It is worthy to note that this mean value decreases with increase in tercile. This confirms that as the mean PCE of households increases (improvement in welfare), meeting attendance decreases as expected.

Respondents in the second tercile account for the highest mean percentage in decision-making (82.44percent) while those in the first tercile have the lowest mean value of 77.44 percent. The level of diversity in the study area is generally low; however, the highest level of membership diversity is found in the second tercile with an average percentage of 26.67percent and the lowest from the first tercile (23.30percent). Also, as expected, the average cash contribution increases with increase in the tercile; the least however has a value of ₦4,845.44. This is an indication that as the mean PCE increases per tercile, the value of cash contribution in various social group increases relatively. Labour contribution also increased across the tercile with the highest mean value of 24.66 man-days. The least value for labour contribution was recorded in the third tercile (19.97 man-days). This result is in line with a-priori expectation that as mean PCE increases, less labour contribution will be demanded because as households attain a stable welfare status they can afford to pay for hired labour services which do not require reciprocal labour services. Lastly, the highest aggregate social capital index is found in the second category while the least of 20.42 percent is found among the first tercile category.

Table 15: Social capital dimensions in relations to terciles distribution of respondents

Social capital dimensions	1st Tercile	2nd Tercile	3rd Tercile
Membership index			
Average	21.70	23.05	22.68
Minimum	0	5	2.5
Maximum	60.0	50	67.5
Standard deviation	10.0	10.78	11.26
Meeting Attendance index	56.36	55.48	52.15
Average	0	0	0
Minimum	87.5	89.20	94.10
Maximum	19.54	17.35	17.55
Standard deviation			
Decision-making index			
Average	77.44	82.44	82.22
Minimum	0	44.45	0
Maximum	100	100	100
Standard deviation	25.44	14.05	17.94
Heterogeneity index			
Average	23.30	26.67	24.23
Minimum	0	6.67	0
Maximum	100	66.67	53.33
Standard deviation	16.81	10.99	11.05
Cash contribution (₦)			
Average	4,845.44	7,636.51	9,756.90
Minimum	0	0	0
Maximum	48,500	37,700	64,700
Standard deviation	7094.65	8,499.66	12,358.25
Labour contribution (manday)			
Average	24.66	20.79	19.77
Minimum	0	0	0
Maximum	92	66	64
Standard deviation	20.17	12.62	15.35
Aggregate Social Capital			
Average	20.42	24.92	23.50
Minimum	0	1.85	0
Maximum	70	91.67	79.17
Standard deviation	16.33	16.71	17.55

Source: Field survey, 2009

4.3. Categories of benefits received from social groups

The section presents the categories of respondents based on the benefits derived from participating in social groups and the factors influencing the benefits derived.

4.3.1. Household membership in social groups

Table 16 presents the various associations / social groups that are sampled by this study. The distribution of the respondents, based on the membership in these social groups reveals that membership in the religious group accounted for the highest frequency with 77.85 percent. This is closely followed by farmers group with 77.85 percent percent while cooperative societies recorded 68.79 percent. The reason for this is not far-fetched because majority of the respondents are religious and engage in farming activities and cooperative activities for financial support. The community based association has an average membership of 55.70 percent. On the other hand, associations / social groups below average membership include gender association, health group, age group, traders' association, parents-teachers association, neighbourhood / village group, social service group, occupational / professional group, environmental protection/natural resources group, cultural groups, sports group, recreational club etc. The least, however, is the non-specified group for which only 0.67 percent claimed membership.

Table 16 : Distribution of respondents according membership in social groups

Association/Institution	Frequency	Percentage
Community Based Association	166	55.70
Gender Association	61	20.47
Health group	30	10.07
Age group	96	32.21
Traders association	63	21.14
Farmers group	210	70.47
Parents-teachers association	139	46.64
Religious group	232	77.85
Neighbourhood/village group	111	37.25
Social service group	77	25.84
Occupational / Professional group	111	37.25
Environmental Protection/Natural Resources Group	15	5.03
Cooperatives societies	205	68.793
Cultural groups	21	7.05
Sports group	21	7.05
Youth group	33	1107
Political group	132	44.30
Non-Governmental Organisations / Civic group (Rotarian)	12	4.03
Recreational club	14	4.70
Others *(specify)*	2	0.67

Source: Field survey, 2009

4.3.2. Benefits received from social group by respondents

The distribution of respondents according to the benefits received from participation in social groups is presented in Table 17. About 79 percent claimed to access information on market outlets; and this is closely followed by respondents that benefited from sharing risk, shocks, attendance to ill-health and adverse condition with members of their group (78.52 percent). Next to this are respondents that access information on various credit sources and benefited from financial assistance in times of need (76.17 percent). This result shows that financial support is one of the reasons why households participate in social activities.

Some of the respondents also claimed to access information from their social group on sources of subsidized fertilizer (62.42 percent), improved seeds and chemicals (68.79 percent), as well as opportunities, technology and enterprise (64.67 percent). This implies that farming households have easy access to information that can aid/ improve their income source in the long run. The least of the benefits received by respondents is information on how they can easily access land and this accounted for 55.70 percent. The result reveals that benefits received from social groups by the majority of the respondents are above average.

Table 17: Distribution of respondents based on benefits received from social group

	STATEMENTS	*Yes	*No	*No Response
1	Markets outlets	236 (79.19)	34 (11.41)	28 (9.40)
2	Credit source	227 (76.17)	55 (18.46)	16 (5.37)
3	Source of subsidised fertilizer	186 (62.42)	86 (28.86)	26 (8.72)
4	Improved seeds and chemicals	205 (68.79)	69 (23.15)	24 (8.05)
5	New opportunities/technology/enterprise	194 (65.10)	76 (25.50)	27 (9.06)
6	I enjoy services/labour supply from the members during harvesting, planting, weeding, etc	167 (56.04)	107 (35.91)	24 (8.05)
7	I benefit from financial assistance in terms of need	225 (75.50)	54 (18.12)	19 (6.38)
8	I am able to share my risk, shocks, ill-health and adverse condition with the members of my group	234 (78.52)	47 (15.77)	16 (5.37)
9	I benefit from lowered economic and social transaction costs from the group	173 (58.05)	104 (34.90)	21 (7.05)
10	Easy access to land	166 (55.70)	109 (36.58)	23 (7.72)

*Multiple responses
Source: Field survey, 2009

4.3.3. Categories of benefit received from social groups

The distribution of respondents into levels of benefit received based on the various social groups they belong to in their locality is shown in Table 18. This is achieved using a composite score obtained from ten different benefits derived from membership in social group. A respondent can score a maximum of 10 points if he or she derives all the benefits mentioned and a minimum of 0 point if he or she does not derive any benefit from social group. The mean score for benefit received is 6.71 and the standard deviation is 2.85. The responses were then put into three categories as used by Sirkin (1995), Yekinni (2007) and Salimonu (2007):

High benefit or Upper Category = Mean + SD to 10 = 9.56 = 10

Intermediate benefit or Medium Category = Between lower and upper category limit = 3.86 to 9.55

Low benefit or Lower Category = 0 to (Mean – SD) = 0 to 3.85

Table 14 reveals the categories of benefits that the respondents derived for belonging to their social groups. The intermediate benefit category is 57.05 percent, followed by high benefit (29.53 percent) and then low benefit (13.42 percent). This implies that the majority of the respondents in the study area are in the intermediate benefit category. The mean value of 6.71 (approximately 7.0) implies that an average household derives up to about seven benefits from the various social groups that they belong to in the study area.

Table 18: Distribution of the categories of social capital benefit

Categories of social capital benefit	Frequency	Percentage
Low benefit	40	13.42
Intermediate benefit	170	57.05
High benefit	88	29.53
Total	**298**	**100.00**

Source: Field survey, 2009

4.3.4 Factors influencing benefit received from social group

Table 19 presents the result of the ordered probit model used to investigate the determinant of the benefit received from social group. The three categories of benefit received – low, intermediate and high - formed the dependent variables while 18 explanatory variables were considered in the model. However, only 17 were allowed in the model from which only eight were statistically significant at various levels. The significant variables are education, farming status, crop enterprise, livestock production, mixed farming, executive membership, decision-making index and labour. The likelihood ratio chi-square of 116.72 with a p-value of 0.0000 reveals that the model as a whole is statistically significant. Pseudo R squared is 0.2044.

Education significantly affects benefit received from social group at 1 percent level of significance. However, an increase in the years of education will increase the probability to receive low benefit by 0.0039, intermediate level by 0.0047 and will decrease the likelihood of receiving high benefit by 0.0086 as presented in table 20. This can be due to the fact that exposure to formal education may minimize the active participation in social group. Farming status is also statistically significant at 5 percent level of significance. A part time farmer has the probability of receiving low and intermediate benefit while a full time farmer has a likelihood of receiving high benefit. This implies that being a full time farmer influences the earnings and benefits from social group. Similar pattern was recorded for specific farming enterprise such as crop, livestock and mixed farming which were also statistically significant at 1 and 5 percent.

Status in a social group is positively related to benefit derived from the social group and significant at 10 percent. Being an executive member in a group increase the probability of receiving high benefit by 0.1038 while ordinary members have the probability of receiving intermediate or low level benefit. The more members of a social group are involved in decision-making, the more they derive benefit from being members of the social group. Decision-making index emphasizes the issue in executive membership as it is also positively related to social capital benefit and statistically significant at 1 percent. An increase in participation in decision-making process will reduce the probability of receiving low benefit by 0.0018 while it will increase the likelihood of receiving intermediate and high benefit by 0.0022 and 0.0041 respectively. This implies that it is not enough to be a member of a social group; active participation is a sufficient condition to derive the benefits of belonging

to one. Also, an increase in man-day will reduce the likelihood of receiving low benefit and intermediate benefit by 0.0024 and 0.0029, respectively while it will increase the probability of receiving high benefit by 0.0053. This implies that more labour contribution will increase benefits derived. It is also not surprising that labour contribution directly affects social capital benefit and it is statistically significant at 10 percent. Majority of farmers in the rural area operate on small scale farming and depend mostly on manual labour. Therefore, they need contributory efforts on their farming, most especially during land preparation, planting, harvesting etc. Thus, there is the need to form social groups so that they can collectively assist one another on their farmlands.

Conversely, age was statistically significant at 10 percent when multiplicative social capital is considered but not significant as additive. However, a year increase in age will reduce the probability of receiving low and intermediate benefit by 0.0029 and 0.0031 respectively while it will increase the possibility of receiving high benefit by 0.0060. This reveals that as household head is ageing, there is tendency to benefit more from the social group, hence, their involvement in social activities.

The foregoing, therefore, permits the rejection of the earlier stated null hypothesis that socio-economic characteristics do not influence the benefit received. Since some of the hypothesized variables were statistically significant, the alternative hypothesis is hereby accepted.

Table 19:   Result of the ordered probit for categories of benefit received

Social Capital Benefit	Coefficient	Std. Error	Z	P>|z
Age	0.0138	0.0084	1.63	0.102
Sex	-0.1143	0.2046	-0.56	0.576
Education	-0.0272*	0.0143	-1.90	0.058
Household size	-0.0334	0.0347	-0.96	0.335
Farming Status	0.4048**	0.1793	2.26	0.021
Crop	0.5610***	0.2146	2.61	0.009
Livestock	0.6557**	0.3128	2.10	0.036
Fisheries	-0.1603	0.5228	-0.31	0.759
Mixed Farming	1.2124***	0.2987	4.06	0.000
Others	0.6405	0.4036	1.59	0.112
Status in social group	0.3499*	0.1834	1.91	0.056
Meeting attendance	-0.0043	0.0041	-1.05	0.292
Heterogeneity index	-0.0004	0.0057	-0.08	0.937
Labour contribution	0.0169***	0.0050	3.39	0.001
Decision-making index	0.0129**	0.0042	3.10	0.002
Cash contribution	-8.3400	8.1300	-0.85	0.393
Cut 1	0.8325	0.5568		-0.2588
Cut2	2.9505	0.5784		1.8167

LR chi2(16) = 116.49	Prob > chi2 = 0.0000		Observation = 298	
Log likelihood = -227.26	Pseudo R2 = 0.2040			
Age	0.0186**	0.0080	2.32	0.020
Sex	- 0.1266	0.1935	- 0.65	0.513
Education	- 0.0277**	0.0138	- 2.00	0.045
Household size	- 0.0321	0.0327	- 0.98	0.326
Farming Status	0.4342**	0.1724	2.52	0.012
Crop	0.6262**	0.2044	3.06	0.002
Livestock	0.7487**	0.3044	2.46	0.014
Fisheries	- 0.0514	0.5095	- 0.10	0.920
Mixed Farming	1.2237***	0.2896	4.22	0.000
Others	0.6132	0.3952	1.55	0.121
Status in social group	0.5688***	0.1643	3.46	0.001
Aggregate social capital	0.0003	0.0043	- 0.07	0.946
Cut 1	0.2545	o.4258		-0.5800
Cut 2	2.2516	0.4418		1.3857

LR chi2(12) = 89.47	Prob > chi2 = 0.0000			
Log likelihood = -240.77	Pseudo R2 = 0.1567			

*** 1 percent significant level,   ** 5 percent significant level,   * 10 percent significant level
Source: Field survey, 2009

Table 20: Marginal effect of categories of benefit received

Variables	Marginal effect for Y= low benefit	Marginal effect for Y= intermediate benefit	Marginal effect for Y= high benefit
Age	- 0.0019	- 0.0024	0.0043
Sex	0.0154	0.0216	- 0.0370
Education	0.0039	0.0047	- 0.0086
Household size	0.0047	0.0058	- 0.0105
Farming Status	- 0.0605	- 0.0641	0.1249
Crop	- 0.0858	- 0.0850	0.1709
Livestock	- 0.0625	- 0.1746	0.2372
Fisheries	0.0254	0.0225	- 0.0479
Mixed Farming	- 0.0905	- 0.3569	0.4474
Others	- 0.0591	- 0.1745	0.2336
Status in social group	- 0.0562	- 0.0476	0.1038
Meeting attendance	0.0006	0.0007	- 0.0013
Heterogeneity index	0.00006	0.00007	- 0.00014
Labour contribution	- 0.0024	- 0.0029	0.0053
Decision-making index	- 0.0018	0.0022	0.0041
Cash contribution	0.0000019	0.0000045	- 0.0000026
Age	- 0.0029	- 0.0031	0.0060
Sex	0.0190	0.0230	- 0.0421
Education	0.0044	0.0045	- 0.0089
Household size	0.0051	0.0052	- 0.0104
Farming Status	- 0.0727	- 0.0645	0.1372
Crop	- 0.1077	- 0.0872	0.1949
Livestock	- 0.0773	0.1997	0.2771
Fisheries	0.0084	0.0079	- 0.0163
Mixed Farming	- 0.1041	- 0.3496	0.4537
Others	- 0.0658	- 0.1602	0.2260
Status in social group	- 0.1089	- 0.0575	0.1664
Aggregate social capital	0.000045	0.000047	- 0.000093

4.4 Effect of social capital on household welfare

This sections explains the effect of social capital on household welfare under different approaches, using the ordinary least square, two-stage least square and the control function. It also presents the result of the second hypothesis tested which reveals the relationship that exists between social capital and household welfare.

4.4.1 Social capital and household welfare

The result of the ordinary least square method is presented in Table 21. Two models were used for the OLS estimation for comparison. Model 1 presents the OLS estimation of the effect of household socio-economic variables on household welfare while Model 2 includes the potential endogenous variables of farm equipment, livestock and crop owned. The OLS result for Model 1 indicates that age and age squared which capture the life cycle of the household head, sex, education, marital status, household size and farming status make significant contributions to changes in household welfare. The adjusted R^2 slightly increased in Model 2 as household assets (farm equipment, livestock and crop) are added in Model 1. This suggests that household demographic characteristics play a significant role in explaining variations in household welfare. For example, an increase in household size is associated with a decrease in household *per capita* expenditures, whereas an increase in the level of education is associated with an increase in household *per capita* expenditures.

An inclusion of social capital variables in Model one increases the model's explanatory power in Model 2. The primary exogenous variables, such as age, education, household size, farming and marital status are statistically significant. Participation in decision-making in a social group is statistically significant and positively related to household *per capita* expenditures. This suggests that household welfare will improve as households get involved in the affairs of their social group. Labour contribution is significant but negatively related to household welfare. This is an indication that labour contribution is in excess such that it consequently affects household welfare negatively. Though a positive relationship with household welfare is reported by Aker (2007), the negative effect as discovered in the study is in line with the study conducted by Yusuf (2008).

Table 21: Result of the OLS estimate of social capital and household welfare

Variable	Model 1 Coeff	t	Model 2 Coeff	t	Model 1 with additive social capital Coeff	t	Model 2 with additive social capital Coeff	t
Constant	16.0572***	(8.29)	16.3204***	(8.58)	14.9366***	(7.34)	15.3699***	(7.69)
Age	-0.2575***	(-3.45)	-0.2338***	(-3.18)	-0.2566***	(-3.41)	-0.2373***	(-3.20)
Age squared	0.0027***	(3.61)	0.0024***	(3.32)	0.0025***	(3.39)	0.0024**	(3.14)
Sex	0.8831*	(1.78)	0.9944*	(2.03)	0.7496	(1.49)	0.8542	(1.74)
Education	0.1134***	(3.56)	0.0911***	(2.84)	0.1306***	(4.00)	0.1083***	(3.30)
Marital status	-3.1667***	(4.34)	-3.4514***	(-4.80)	-2.6662***	(-3.54)	-2.9655***	(-4.00)
Household size	-0.4790***	(5.67)	-0.4743***	(-5.72)	-0.4022***	(-4.66)	-0.3986***	(-4.72)
Farming status	-2.0218***	(-5.01)	-1.8130***	(-4.52)	-1.8122***	(-4.37)	-1.6768***	(-4.09)
Disturb	0.0042	(0.60)	0.0060	(0.88)	0.0020	(0.28)	0.0041	(0.58)
Farm Size	0.0421	(1.41)	0.02165	(0.68)	0.0318	(1.05)	-0.0092	(-0.28)
Farm equipment			0.0391	(1.42)			0.0475	(1.63)
Livestock			-0.1149	(-0.17)			-0.1890	(0.28)
Crop			-1.3388***	(-3.58)			-1.3436***	(-3.55)
Cash contribution					0.012	(0.60)	0.0053	(0.27)
Labour Contribution					-0.0111	(-1.01)	-0.00075**	(0.69)
Decision-making					0.0280**	(3.12)	0.0283***	(3.21)
Heterogeneity index					-0.0129	(-0.99)	-0.0198	(-1.53)
Membership Density					-0.0211	(-1.16)	-0.0143	(-0.80)
Meeting attendance					-0.0149	(-1.49)	-0.0165	(-1.65)
Number of Observation	298		298		298		298	
R^2	0.4267		0.4552		0.4534		0.4817	
Adj R^2	0.4089		0.4324		0.4245		0.4485	

*** significant at 1 % level, ** significant at 5% level and * significant at 10% level

(T- values in parentheses)

Source: Field survey, 2009

4.4.2 Endogeneity effects of social capital on household welfare

Since membership in social groups is at a cost, taking into consideration, time and other resources. It therefore becomes important to isolate the exogenous impact of social capital on household expenditure. The study tested for the existence of causality effect with the aid of instrumental variable, using (2SLS) and control function approach. Earlier studies have always used a common instrumental variable to verify the endogeneity effect of social capital. The instrument commonly used is "trust" as used by Narayan and Prichett (1997), Grootaert (2001), Grootaert *et al.* (2002), Okunmadewa *et al.* (200b5) and Yusuf (2008). The limitation of the use of trust as an instrument for social capital was acknowledged by Putman (2000) and Yusuf (2008). This study, however, used other instruments for social capital, based on the submission of Aker (2007). These instruments include households' length of residency in their present locations, a binary variable indicating charity contribution in the past year, membership in a religious body as well as membership in an ethnic group.

The heterogeneity of *per capita* household expenditure due to non-linear interaction of social capital with unobservable and omitted variables could bias the estimations of the structural coefficients. A control function approach is hereby employed in this study in order to address this issue (Wooldridge, 1997; Card, 2001 and Mwabu and Ajakaye, 2007). The application of control function estimated through Heckman's two-step procedure becomes more suitable for the study in order to take care of endogeneity issues. The correction factor is the inverse of the "Mills Ratio".

The result of the correlation analysis of the multiplicative social capital and specific instruments for social capital reveals that household membership in ethnic group has the highest correlation coefficient (0.2267) with the social capital and it is, therefore, used as the instrumental variable for social capital in the 2SLS analysis and control function analysis as presented in Table 22.

Table 22: Correlation values of instrumental variables with social capital

	Length of residency	Charity donation	Membership in Religious group	Membership in Ethnic group
Multiplicative social capital	0.0081 (P>0.1)	0.0950 (P>0.1)	0.0623 (P>0.1)	0.2267 (P<0.001)
Remark	Not significant	Not significant	Not significant	Significant at 10%

Source: Field survey, 2009

The estimation of endogeneity effect of social capital using control function is presented in Table 23. The age of the household head and its square are significant at 1 percent and are negative and positive respectively. This is an indication that as household head is older there will be decrease in household welfare, but this tendency decreases at an increasing rate as the age advances. Education significantly affects household welfare and is positively related to it too; therefore an increase in years of education will enhance household welfare. However, household size also affects welfare but is negatively associated with it. This shows that as household size increases there will be decrease in household welfare. Households that engage in non-farm activities as a major occupation have improved household welfare over their counterpart.

The result of the instrumental variable (2SLS) as presented in appendix 5 shows an improvement in the adjusted R^2 from a value of 0.4049 (with actual social capital index) to 0.4215 in the second stage where social capital was instrumented for. Also, the result reveals that there is an increase in the coefficient of social capital index in the 2SLS relative to the OLS estimates from 0.0190 to 0.0280. This implies the absence of significant reverse causality, since there is increase in the coefficient of social capital index and the adjusted R^2 in the instrumental variable method compared with the estimates of the OLS method. The exogeneity of social capital is therefore inferred. This result is in line with Naranya and Prichett (1997), Grootaert (1999), Okunmadewa *et al.,* (2005b), Aker (2007) and Yusuf (2008).

The problems due to endogeneity and neglected non-linearities are revealed by a comparison of the of 2SLS estimates with the estimates derived from the control function approach. The improvement in the adjusted R^2 and coefficient of social capital index over OLS estimates infers that social capital is exogeneous. The results on the Table 23 and Appendix 5 indicate that the endogenous effect of social capital on household welfare largely depend on method of analysis. The coefficient of social capital in the control function method is more than that of the OLS estimate, and this better explains the effect of social capital on household welfare. A comparison of the two-stage least square (2SLS) estimates with that of control function approach reveals the problems due to endogeneity and neglected non-linearities. The 2SLS coefficient of the effect of social capital on household welfare is 0.0280, which is an improvement on the OLS coefficient of 0.0190. Conversely, when social capital is endogenised under the control fuction approach, the coefficient is further increased

from 0.019 to 0.0287. Accounting for non-linear interaction of social capital with the unobservables further increases the coefficient to 1.0606. This trend in improvement of the coefficient shows that social capital substantially has an effect on household welfare in the study area.

Furthermore, in the control function approach, the coefficient of the fitted social capital residual is statistically significant at one percent (Table 24). Also, the coefficient of the inverse of the Mills ratio is insignificant. This, according to Ajakaiye and Mwabu (2007) suggests that sample selection bias is not a problem in the data set. The estimated coefficients of the household welfare (endogenous), while addressing the linear interaction of social capital (potential endogenous) with its fitted residual under control function approach are identical to the estimates of instrumental variables (Wooldridge, 1997, 2003; Heckman and Navarro, 2004).

The coefficient on the fitted residual with controls for linear interactions is 0.1048 and significant at one percent. However, with the controls for non-linear interactions between social capital and unobservables, this coefficient increases to 0.1305 and it is significant at one percent. This indicates that social capital is endogenous to household welfare. This result is contrary to the submission of Grootaert (1999), Okunmadewa (2005), Aker (2007) and Yusuf (2008), who used 2SLS model to test the endogeneity effect of social capital on household welfare. This means that the level of household welfare can influence a household to belong to a social group in order to acquire social capital. On the other hand, membership in a social group can also influence the level of household welfare.

Based on this result, the control function approach is, therefore, an appropriate estimation strategy because it takes into account both the endogeneity of social capital and the heterogeneity of response of household welfare to social capital. This heterogeneity issue, however, arises from the non-linear interaction of social capital with unobserved determinants of household welfare such as the household head endowment, behavioural attitude of households towards their own welfare and the environment. Inclusion of the control function variable, ($V\times$SC), in the household welfare equation thus purges the estimates of any effects of heterogeneity and reveals endogeneity effect of the endogenous exogenous variable in the model.

Since the control function takes into account the interaction between social capital and the unobservables revealing that social capital is truly endogeneous, it therefore permits a rejection of the earlier stated null hypothesis that social capital is

not endogenous to household expenditures; hence, the alternative hypothesis is hereby accepted.

Table 23: Estimation of endogeneity effects of social capital using control function

Variables	OLS		Control Function (using Heckman)			
			Linear Interaction of Social Capital with unobservables		Non-Linear Interaction of Social Capital with unobservables	
		t-value		t-value		t-value
	Coefficient		Coefficient		Coefficient	
Age	-0.2333***	-3.05	-0.2606***	-3.39	-0.2606***	-3.40
age_sqr	0.0024***	3.26	0.0026***	3.44	0.0026***	3.45
Sex	0.9819*	1.95	-0.6157	1.22	0.6164	-1.22
Education	0.1159***	3.52	0.1727***	5.61	0.1729***	5.61
Marstatu	-3.1244***	-4.26	2.8832***	4.02	2.8913***	4.03
Hhdsize	-0.4985***	-5.78	-0.4828***	-5.66	-0.4814***	-5.62
Famgstatus	-2.0106***	-4.92	-0.6647**	-1.93	-0.8133**	-2.66
Dsturbn	0.0053	0.72	0.0121	1.67	0.0122	1.70
Famsize	0.0177	0.55	0.0311	-0.99	-0.0323	-1.02
Famequip	-0.0035	-0.25	0.0101	-0.72	-0.0103	-0.74
Livestock	0.0013	1.19	0.0014	1.25	0.0014	1.29
Crop	0.0022	1.25	0.0016	0.95	0.0016	0.94
Aggregate social capital	0.0190*	1.77	0.0287**	2.70	1.0606	2.76
_cons	15.5976***	7.91	11.0834***	4.88	10..9880***	4.8
Reduced form Social Capital residual			0.1048***	7.83	0.1305***	10.77
Social Capital x social capital residual					0.0560***	7.16
Inverse of Mills Ratio			0.1124	0.02	0.1295	0.21
R^2	0.4351					
Adjusted R^2	0.4049					
F statistics	16.94	(0.00)				
Wald statistics			215.44	(0.00)	215.72	(0.00)
Sample sizes	298		298		298	
Censored obs			5			
Uncensored obs			293			

Source: Result from 2SLS and control function estimates

CHAPTER SEVEN
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1.   Summary of major findings

The study has examined the effect of social capital on rural household welfare. Primary data on socio-economic features, participation in social group, benefit received from social group as well as household expenditure were obtained from Oyo and Ekiti states. A sample size of 298 households from these states was used for the final analysis. Data were analysed using descriptive statistics, composite score, ordered probit, two-stage least square and control function. The major findings of the study are highlighted below:

- An average household belongs to at least 4 social groups and has 80 percent index of participation in decision-making. The heterogeneity of groups to which an average household belongs to is low, about 24.7 percent, average meeting attendance is high at about 54.6 percent while labour contribution is low i.e. 21.7 man-days. An average sum of ₦7, 412 is contributed annually by each household to various groups.

- The average age in the study area is 48.3 years. Respondents within the age range of 40 and 49 years accounted for the highest percentage in membership and meeting attendance in social groups, and they gave the highest cash contribution (₦9,374.95). Respondents above 69 years gave the least cash contribution; however, they recorded the highest labour contribution. The age group with the highest diversity is that of respondents within the age range of 60 and 69 as constituting by 27.9 percent.

- The average years spent in school is 8.4 years. Respondents with post primary education have the highest percentage of membership density and diversity in social groups, that is, 24.65 and 28.1percent respectively. With the exception of respondents with postgraduate education that have 48.05 percent in meeting attendance, all other educational groups have above average in meeting attendance. This category of educational group also has the highest cash contribution of N11, 588.75. While respondents without formal education

have the least cash contribution, they record the highest labour contribution (23.45percent). Except for postgraduate respondents, it is observed that percentage in decision-making reduces as the number of years of education increases.

- The average household size in the study area is 6. The groups of household size that participated most in local institutions are those having between 5 and 8 household members (23.7percent). Households with 9 to 12 members have the highest diversification (29.1), while households with 12 members and more account for 62.6 percent in meeting attendance. With the exception of households with 9 to 12 members, meeting attendance increases as the number of household increases. Respondents with 5 to 8 household members contributed most to their social groups (₦8,103.94). However, there is a wide difference between the average values of the highest and the least cash contributors. The least cash contribution of ₦1,974.89 was from respondents with 12 members and above. They also recorded the household with the highest labour contribution. It is remarkable that labour contribution decreases as the number of household size decreases.

- Most of the respondents in the study area are males accounting for about 83 percent of the total population for the study. The male household heads belong to more associations than their female counterparts. However, the groups that female household heads belong to are more diversified. As expected, the male household heads contribute more to the groups which they belong to with a cash value of ₦7,813 and also have a higher index in decision-making.

- The majority of the respondents in the study area engage in agricultural activities either as primary or as secondary income-generating activity. The respondents who engage in livestock production record the highest average value (25.5percent) in participation in social groups while those who engage in other agricultural activities record the highest level of diversification. Fish-producing respondents have the highest index for meeting attendance with a value of 62.6 percent while livestock producers contribute most to the various

associations they belong to with an average cash value of ₦13,266. All the respondents are involved in decision-making in the various groups they belong to.

- The highest proportion of the monthly expenditure is spent on food items (32 percent), the proportion of expenses spent on housing is minimal relative to other basic needs of life (2.4 percent), while the least cost for an average household in the study area is water. In all, an average total of ₦27,871 was spent monthly by each household, which is about ₦900 / household / day irrespective of the household size.

- Based on categorisation of households according to their welfare status in tercile, households in the first tercile have a monthly expenditure representing about 14 percent while second and third tercile categories have 28.73 and 57.24 percent respectively. While 68 percent of the first tercile are within the age range of 40 to59 years, the respondents with above 18 years of education have no representation in the first tercile and record the least value among the first and second tercile. None of the respondents with more than 8 household members has representation among the third category. Eighty four percent of the first tercile are males but none of the livestock farmers in the study area falls under the first tercile category.

- The mean value of 6.71 reveals that an average household derived up to about seven benefits from its various social groups. The majority of the respondents are in the intermediate benefit category (57.05 percent).

- The factors influencing the benefit received from social groups are: Education, significant ($P < 0.1$) and negatively related to benefit received from social interaction. Farming status is also statistically significant ($P < 0.05$) and positively related to the benefit derived in order of category. In addition to this are these farming enterprises; crop enterprise ($P<0.01$), livestock ($P< 0.05$), and mixed farming ($P< 0.01$). Being an executive member in a social group is positively related to the benefit derived from the social group and significant

(P< 0.1). Decision-making index emphasizes the issue in executive membership as it is also positively related to social capital benefit and is statistically significant (P<0.01). Lastly, labour contribution also directly affects social capital benefit and is statistically significant (P< 0.1).

- The OLS estimate reveals that socio-economic characteristics such as age, age squared, sex, education, marital status, household size and farming status make significant contributions to percentage changes in household welfare. An addition of social capital dimensions to OLS model further reveals that decision-making index and meeting attendance are statistically significant, and both are positively and negatively related to household welfare respectively. Also, there is an improvement in the adjusted R^2 when social capital dimensions are included in the model.

- In the control function approach, the coefficient of the fitted social capital residual is statistically significant at 5 percent and the coefficient of the inverse of the Mills ratio is insignificant. This, according to Ajakaiye and Mwabu (2007) suggests that sample selection bias is not a problem in the data set. However, controlling for non-linear interactions between social capital and unobservables, the coefficient of fitted residual increases from 0.1048 to 0.1305 and both are significant at one percent. This, with reference to Ajakaiye and Mwabu (2007), is an indication that social capital is truly endogenous to household welfare.

- The use of the control function model was adopted because it takes into account both the endogeneity of social capital and the heterogeneity of response of household welfare to social capital.

5.2. Conclusion of the study

The study examined the effect of social capital on rural farming household welfare in Oyo and Ekiti states, representing southwestern Nigeria. The study provides empirical evidence that social capital and its dimensions have effect on household welfare. The disaggregation of social capital into six dimensions reveals

that participation in decision-making and meeting attendance in social groups can influence household *per capita* expenditure and consequently improve its welfare. It is evident from the study that education can complement social capital in improving household welfare.

The new context specific instrument, that is, a binary variable of membership in ethnic group was also used as an instrumental variable instead of the social trust to test for the reverse causality between social capital and household expenditure. The problem of endogeneity of social capital on household welfare was addressed using control function approach, and the estimates confirm the endogeneity problem of social capital with household welfare having controlled for non-linear interactions between social capital and the unobservables.

5.3.1   Policy implications and recommendations

1. A group of people who interact directly, frequently, and in multifaceted ways, better captures the aspects of good governance which explain the popularity of social capital. This is because the focus is on what the group does rather than what individuals have. Hence, they own the success of their efforts and, therefore, will benefit fully from their involvement which enhances their quality of life, i.e. welfare. There is need therefore, to encourage connectedness and trust among rural households in the southwestern part of Nigeria. This is because findings from the study reveal that its existence improves welfare. Also, the finding is in consonance with other studies that social capital is self-reinforcing.

2. The positive effect of education on involvement in social organisation has been found to heighten household welfare. However, this poses policy challenges for interventions that uses grassroots' organisation for local development, given the fact that the majority of the rural people have lower levels of formal education. Therefore, it is very essential to augment human capacity development of the rural households in southwestern part of Nigeria through increased school funding in order to overcome the financial constraints of parents involvement in educating up-coming generations.

3   Deprivation in development term is viewed as being associated with higher household size. High dependency ratio in terms of large household size has significantly shown over time to lower welfare levels than those with fewer members. This consequently leads to inadequate manpower in the economy, low level of production and hence, reduced *per capita* income and increased government expenditure. Since the study reveals that household size is relatively large and this has negative consequences on household welfare, it is recommended that family planning policy among the rural households should be promoted to enhance birth control.

5.4   Suggestions for further study

Findings from the study reveal that household assets such as land owned, farm equipment, livestock etc also have potential endogenous effect on household welfare. Further research on detecting the endogeneity effect of these household assets on household expenditure should be made.

Research can also be made to identify the type of association that may likely influence the largest benefits to the household.

5.5   Contribution to knowledge

This study has contributed to knowledge on the effect of social capital on household welfare with particular reference to southwest Nigeria in the following areas:

1.   It has empirically established the effect of social capital on household welfare specifically in Oyo and Ekiti states of Nigeria.

2.   It also reveals that household welfare can influence social capital and vice versa.

3.   It has established the benefits derived by household members from participating in social groups.

4.   It introduces the use of a context specific instrumental variable, that is, ethnic group other than the conventional use of social trust by previousstudies.

5.   It uses control function approach as a robust check on the application of instrumental variable to solve endogeneity problems of social capital.

REFERENCES

Abdel-aty, M, 2001. Using ordered probit modelling to study the effect of ATIS on transit ridership. Transportation research Part C: *Emerging Technologies*, Vol. 9.4: 265-277.

Adetunji, M. O., Oladejo, J. A., Okunola, S. O. and Adepoju, A. A. 2009. Cooperative economics: principles and practices. ISBN 978-080-177-4. God's Grace publishing house, Osogbo, Osun state. 54-61

Aigbokkan, B. E. 2000. Poverty growth and inequality in Nigeria: A case study. AERC Research Paper 102, Nairobi.

Aitchison, J., and Silvey, S. 1957. The generalization of probit analysis to the case of multiple responses. *Biometrika*. 44:131-40.

Ajakaiye, O. and Nwabu, G. 2007. The demand for productive health services: an application of control function approach. Paper prepared for presentation in the 12th Annual Conference of the African Econometric Society, 4-6 July 2007

Akanji, O.Q 2000. incidence of poverty and economic growth in Nigeria. *Statistique Development* eL Droits de L'Homme Moutreux. 34-40

Aker, J. *C*. 2007. Social networks and household welfare in Tanzania: Working together to get out of poverty. Department of Agricultural Economics, University of Califonia-Berkeley. www.cgdev.org/doc/expert%20pages/Aker

Albee, I. and Boyd, O. 1997. Doing it differently, networks of community development agents. Scottish Community Education Council, Edinburgh, Scotland. www.abdn.ac.uk/irr/arkletondocuments/scotland5.pdf.

Babatunde, R.O., Olorunsanya E.O. and Adejola, A.D. 2008. Assessment of rural household poverty: evidence from Southwestern Nigeria. *American-Eurasian J. Agric. & Environ. Sci*. Vol. 3.6: 900-905, ISSN 1818-6769

Balogun O.L., Yusuf, S.A., Omonona B.T. and Okoruwa, V.O. 2011. Social capital and microcredit effects on poverty among the rural households in South west States, Nigeria. *Arpn journal of agricultural and biological science*. Vol. 6.3: 48-59

Balogun, O.L and Yusuf, S.A 2011. Effect of social capital on welfare of rural households in Southwestern states, Nigeria. *Journal of American science;* 7(3):506-514. (ISSN: 1545-1003). http://www.americanscience.org.

Blundell, R., Preston, I. and Walker, I. 1994. *The measurement of household welfare*. Published by Cambridge University. ISBN-13 9780521451956

Card, David 2001. Estimating the return to schooling: progress on some persistent problems *Econometrica,* Vol.69.5: 1127-1160

CEDAR 2003. Poverty knowledge and policy processes in Ekiti State, Nigeria. Research report 102, Centre for Enterprise Development and Action Research, Ibadan.

Chesher, Andrew 2003. Identification in non-separable models', *Econometrica, September* I. Vol. 71.5 1405 -1441.

Cleaver, K.M. and Schreiber, G.A. 1994. Reversing the spiral: the population, agriculture and environment nexus in Sub-Saharan Africa. In Development Series 3, World Bank.

Coleman, James 1988. Social capital in the creation of human capital." *American Journal of Sociology* Vol. 94 (Supplement): S95-SJ20.

Coleman, J. C. 1994. *Foundations of social theory*, Cambridge, MassHarvard University Press. 67-76

Collier, P. 1998a. The political economy of ethnicity. Paper Presented at Annual Bank Conference on Development Economics April 12-21, Washington D.C: World Bank.

Collier, P. 1998b. Social capital and poverty. Social capital initiative. 4. The World Bank, Washington DC, USA

Cote S. and Healy, T. 2001. The well-being of nations. The role of human and social capital. organisation for economic co-operation and development, Paris: OECD

Cox, E. 1995, *A truly civil society*, ABC books, Sydney. 87-112

Deaton A. and Muellbauer, J. 1980. *Economics and Consumer Behavior,* New York: Cambridge University Press. 25-56

Durlauf, S. F. 1999. The case against social capital. Focus Vol. 20.3: 68

ECA (Economic Commission for Africa) 2001. Transforming economies: Africa's Overview. Addis Ababa: ECA. 8-11

Etim, N.A and Edet, G.E. 2009. Determinants of rural poverty among broiler farmers in Akwa Ibom State. *In*: Agiang, E.A., L.N. Agwunobi and O.O. Olawoyin (eds.), Proc. 32nd Annual conference of the Nigerian society for animal production held in University of Calabar, March 18 – 21, 2009

Etim, N.A., Edet, G.E. and Esu, B.B. 2009. Determinants of poverty among peri-urban Telferia occidentalis farmers in Uyo, Nigeria. *J.Agric. Soc. Sci.* Vol.5: 49–51

Etim, N.A. and Ukoha, O.O. 2010. Analysis of poverty profile of rural households: evidence from South-South Nigeria. *J. Agric. Soc. Sci.* Vol.6: 48–52

Fafchamps, M, and Minten, B. 1999. Social capital and the firm: evidence from agricultural trade, Social capital initiative working paper No. 11. The IRIS Center.

Falalu Bello 2007. Nigeria: One Country Four Economies Discussion Points. http://www.gamji.com/article6000/NEWS7879.htm

Faleyimu, O. I., Akinyemi, I, O., and Agbeja, B. O. 2010. Incentives for forestry development in the South-west Nigeria. *African journal of general agriculture* Vol. 6. 2: 68. http://www.asopah.org

Falk, I., Kilpatrick, S., 2000. What is social capital? A study of interaction in a rural community. *Journal of the European Society for Rural Sociology, Sociologia Ruralis*, Vol. 40.1. 87-110

Federal Office of Statistics (FOS) 1999a. *Poverty Profile for Nigeria, 1980-1996* Lagos: Federal Office of Statistics.

Federal Office of Statistics (FOS) 1999b. *Poverty and agricultural in Nigeria*. Federal Office of Statistics, Abuja, Nigeria

Fukuyama, F 1995. *Trust : social virtues and the creation of prosperities*. New York: Free Press. 89-123

Garen, J. 1984. The returns to schooling: A selectivity bias approach with a continuous choice variable, *Econometrica.* Vol. 52.5: 1199-1218.

Glaeser, E., D. Laibson, I and Bruce Sacerdote 2000. The economic approach to social capital." NBER Working Paper 7728.

Grootaert, C. 1981. The conceptual basis of measures of household welfare and their implied survey data requirement. Paper presented at the seventeenth general conference of the international association for research in income and wealth, gouvieux, France, August 16-22 1981.

Grootaert, C. 1997. The Determinants of poverty in Cote d'lvoire in the 1980s", *Journal of African economies* Vol.6.2: 169-196

Grootaert, C. 1999. Social capital, household welfare and poverty in indonesia" local level. Institutions study, working paper 6, Social Development Department, Washington, D.C. The World Bank.

Grootaert, C. 2001. Does social capital help the poor? A synthesis of findings from the local level institutions studies in Bolivia, Burkina Faso and Indonesia, Local level institutions paper 10, Social Development Department, Washington, D.C.

Grootaert, C. and Van Bastelaer, Thierry 2002a. *The role of social capital in development: an empirical assessment.* Cambridge, U.K.: Cambridge University Press. 67-74.

Grootaert, C. and Van Bastelaer, Thierry 2002b. *Understanding and measuring social capital a mu!ti-disciplinary tool for practitioners.* Washington, DC.: The World Bank.

Guiso, L. Paola Saptenza and Luigi Zingales 2004. The role of social capital in financial development, *The American Economic Review,* Vol. 94.3:18-21

HAD, 2004. Briefings of HDA supported task groups. HDA Briefing 21, June 2004. http://www.socialaction.org.uk/hdaresearch/research.asp

Heckman, James J. 1978. Dummy endogenous variables in a simultaneous equation system. *Econometric Society*, Vol. 46.4: 931-59

Heckman J. J., Lance Lochner, and Petra E. Todd 2003. Fifty Years of Mincer Earnings Regressions, Technical Report 9732, National Bureau of Economic Research 2003.

Heckman, James J. and Navarro, Salvador 2004. Using matching, instrumental variables, and control functions to estimate economic choice models. *Review of Economics and Statistics*, Vol 86.1: 30-57.

Helliwell, J. and Putnam, R. 1999. Education and social capital. NBER Working Paper No.7121

Ikporupo, C. O. 2007. Ethnicity and social networks in a fish marketing system, Warri. Nigeria
http://www.dur.ac.uk/nigerian.marketing/Chapter2.ETHNICITYANDSOCIALNETWORKSINAFISHMARKETINGSYSTEM,WARRI.pdf

Imbens, Guido W. and Newey, Whitney K. 2006. Identification and estimation of triangular simultaneous equations models without additivity. Unpublished manuscript, Department of Economics. Machachusette Inst. of Tech. (MIT), USA

Isham, J. 1999. The effect of social capital on technology adoption: evidence from rural Tanzania, Mimeo, University of Maryland at College Park.

Isham, J. and KahKonen, S. 1999. What determines the effectiveness of community-based water projects? Evidence from Central java, Indonesia on demand responsiveness, service rules, and social capital. Social capital initiative working paper 4. The IRIS Center.

Jerry A., Hausman, W. L., Andrew, U and MacKinlay, Craig 1991. An ordered probit analysis of transaction stock prices, NBER working paper 3888, National Bureau of Economic Research, Inc.

Kawachi, L, B. Kennedy, K. Lochner and Prothrow-Stith, D. 1997. Social capital, income inequality and mortality., *American journal of public health* Vol. 7.9: 1491-1498

Kawachi, I., Kennedy, P. and Glass, R. (1999). 'Social capital and self-rated health: a contextual analysis', *American journal of public health*, Vol. 89.8: 1187-1193.

Kawakatsuy, H and Largeyz, A. G. 2008. EM Algorithms for ordered probit models with endogenous regressors. *Econometrics Journal*, Vol.1.23.

Knack, S., and Keefer, P. 1997. Institutions and economic performance: cross-country tests using alternative institutional measures. *Economics and Politics* Vol. 13: 202-27. *1996.*

Knack, S. 1999. Social capital, growth and poverty a survey and extensions. Social capital initiative working paper 6, Social Development Department Washington, D.C World Bank.

Kusnic, M. and Da Vanzo, J. 1980. Income inequality and the definition of income: the case of Malaysia. (R-2416-AID), Santa Monica, CA: The Rand Corporation June (1980).

Leana, C. and Van Buren, H. 1999. Organizational social capital and employment relations, *Academy of Management Review.* Vol. 24.3: 538-555

Lemmel, Larry. 2001. The dynamics of social capital: creating trust-based relationships and trustworthy environments. *National Civic Review* Vol. 90.1: 97-103.

Ligon, E., and L. Schechter 2002. Measuring vulnerability: The director's cut'. WIDER Discussion paper 2002. 86. Helsinki: UNU-WIDER

Liu, A. Q., and Besser, T. 2003. Social capital and participation in community improvement activities by elderly residents in small towns and rural communities. *Rural Sociology,* Vol. 68.3: 343-365.

Maddala, G.S. 1983. *Limited dependent and qualitative variables in econometrics*, Cambridge University Press.

Maluccio J, L. Haddad and May, J. 2000. Social capital and household welfare in South Africa, 1993-1998. *Journal of development studies* Vol.36. 5: 56-81

McKelvey, R. and Zavoina, W. 1975. A statistical model for the analysis of ordinal level variables. *Journal of mathematical sociology.* Vol. 4.10:3-20

Moffit, R. A. 1999. New developments in econometric methods for labour market analysis, in Ashenfelter O. and Layard R., eds., Handbook of Labor Economics, Vol. 3.

Muellbauer, J., 1980. Market and non-market employment activity and welfare measurement," LSMS draft working paper, Washington D.C.: World Bank.

Narayan. D. and Pritonett, L. 1997. Cents and Sociability Household Income and Social Capital in Rural Tanzania. Policy Research Working Paper No. 17 Washington DC: World Bank.

Narayan, D. and Pritchett, L. l999. Cents and sociability-household income and social capital in rural Tanzania, *Economic Development and Culture Change* 47. 4: 871-897.

Narayan, D. and Cassidy, M. 2001. A dimensional approach to measuring social capital: development and validation of a social capital inventory. *Current Sociology* Vol.49.2: 59-102.

NBS 2005. Poverty profile for Nigeria. National Bureau of Statistics, Lagos www.nigeriansta.gov.ng/Connections/poverty/POVPreliminary.pdf

Nelson, C.R., and Startz, R. 1990. Some further results on the small sample properties of the instrumental variable estimator. *Econometrica,* Vol.58.4: 967–976.

N1SER 2003. Understanding poverty in Nigeria: NISER, Ibadan Oyo State.

116

North, D.C., 1990. *Institutions, Institutional Change and Economic Performance* Cambridge, Cambridge University Press.

NPC, 2006. National Population Commission: state population www.population.gov.ng/component/content/article/89

Okorie, A. 1982. An impact and performance evaluation of Gusau ADPS, Nigeria. An Unpublised PhD Thesis in the Department of Agric. Economics, University of Ibadan.

Okoruwa V.O. and Oni, O.A. 2002. Agricultural inputs and farmers' welfare in Nigeria. Okunmadewa, F (eds). In: *Poverty reduction and the nigeria agricultural sector*. Elshaddai Global Ventures Ltd, Ibadan, Nigeria.

Okunmadewa, F., 2001. *Poverty Reduction in Nigeria: A Four–Point Demand.* An Annual Guest Lecture. The House, 20th Anniversary Lecture delivered at the University of Ibadan.

Okunmadewa, F, Olaniyan O, Yusuf, S.A., Bankole, A.S, Oyeranti O.A, Omonona, B.T, Awoyemi, T.T and Olayiwola, K. 2005. Human capital. institutions and poverty in rural Nigeria, A research report submitted to the African Economic Research Consortium AERC, Nairobi for the second phase collaborative poverty research project.

Okunmadewa F V., Yusuf S. A. and Omonona B.T. 2005. Social capital and poverty in Nigeria, Draft final report submitted to African Economic Research Consortium (AERC) Kenya

Okunmadewa F V., Yusuf S. A. and Omonona B.T. 2007. Social capital on rural poverty in Nigeria. *Pakistan journal of social sciences* Vol. 4.3: 331-339

Olayemi, J. K. 1998. *Elements of applied econometrics*. Elshaddai Global Ventures. Mokola. ISBN 978355162

Oluwatayo I. B 2004. Income risk and welfare status in rural households in Nigeria: Ekiti state as a test case ,UNU/ World institute of Development Economics Research-Research Paper 2004/61.

Omonona B T. 2001. Poverty and its correlates among rural farming households in Kogi state, Nigeria. An unpublished Ph.D thesis in Department of Agric. Econs. University of Ibadan. Ibadan, Nigeria.

Oyen, Else 2000. Social capital formation: A poverty reducing strategy. In social capital and poverty reduction, which role for the civil society organisations

and the state? Paper presented at the world UNESCO/MOST and CROP/ MOST at the UN Summit.

Portes, A. 1998. Social capital: its origins and applications in modem sociology. Annual review of sociology 24: 1-24.

Pretty, J. N. 2003. What is social capital? *World Development*, Vol. 29.2: 209-227 University of Essex Web Site.

Putnam, Robert, Robert Leonardi, and Raffaella Nanetti. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, New Jersey: Princeton University Press.

Putnam R. D. 1993. The prosperous community; social capital and public life- the american prospect, No. 13

Putman, R. D. 2000. Social capital community benchmark survey. the saguaro seminar - civic engagement in America John F Kennedy school of government, Harvard university. URL http://www.bettertogether.org

Ravallion, M., 1992. Poverty comparisons: A guide to concepts and methods. LSMS working paper 88. World Bank, Washington DC.

Salimonu, K. K. 2007. Attitude to risk in resource allocation among food crop farmers in Osun State, Nigeria. An unpublished Ph.D thesis Submitted to the Department of Agricultural Economics. University of Ibadan, Ibadan

Schafft, Kai A., and David L. Brown. 2000. Social capital and grassroots development: the case of roma self-governance in Hungary. *Social Problems* Vol: 47.2: 201-19.

Sirkin, R. M. 1995. *Statistics for the social sciences*. Sage publications international educational and professional publisher, London, New Delhi.

Smith, M. K, 2001. Social capital, *the encyclopedia of informal education* www.infed.org/biblio/social_capital.htm

Stock, J., Wright, J. and Yogo, M. 2002. A survey of weak instruments and weak identification in Generalized Method of Moments. *Journal of the American statistical association,* Vol. *20*.4, 518–29.

Stone, W., Gray, M. and Hughes, J. 2003. Social Capital at work: How family, friends and civic ties relate to labour market outcomes. Research paper 31, Australian Institute of Family Studies.

Stone, W. G., and Hughes, J. 2003. Social capital at work: how family, friends and civic ties relate to labour market outcomes. Australian Institute of Family Studies. Research Paper 31.

Townsend, R.1994. Risk and Insurance in Village India. *Econometrica* Vol.62.3: 539-591

UNDP (United Nations Development Programme), 2011. *Human Development Report*. Oxford University Press, New York

UNICEF (United Nations International Children's Fund), 1996. *FOS–Multiple Indicator Cluster Survey*. Lagos, Nigeria

Uphoff, A.O. 1999. Understanding social capital: learning from the analysis and experiences of participation, in Dasgupta and Seregeldin, Social capital*: A* Multifaceted Perspective, World Bank, Washington D.C.

Uslaner, E. M and Dekker, P. 2001. *Social Capital and Participation in Everyday Life* Publisher: Routledge. London.

Welsh, T and Pringle, M. 2001. Social capital: Trusts need to recreate trust. Clinical Research Ed. 323: 177-8

Wilkinson , R., 1996. Income inequality and population health. social science and medicine 47: 411-2

Woolcock, M. 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework', *Theory and Society*, Vol. 27.2: 151-208.

Woolcock 2001. The place of social capital in understanding social and economic outcomes. In social capital; getting sovcial relations right in the theory and practice of economic development. Princeton University Press, London.

Wooldridge, Jerey M. 1997. Two-stage least squares estimation of the average treatment effect in a random coefficient model. Economics Letters, October 1997, Vol. 56.2: 129-133.

Wooldridge, Jerey M. 2002. *Economic analysis of cross section and panel data,* Cambridge, MA: MIT Press.

Wooldridge, Jerey M. 2003. Further results on instrumental variables estimation of average treatment efffects in the correlated random coeffcient model, Economics Letters, May 2003, 79 (2), 13 185_191.

World Bank, 1997. *Poverty and Welfare in Nigeria: FOS/NPC.* The World Bank

World Bank 2001. Project appraisal documentation proposed credit to Federal Government of Nigeria for a Community Based Poverty Reduction Project. World Development Report 2001.

World Bank/DFID 2001. Voice of the Poor. The World Bank and Department for International Development, Abuja, Nigeria.

Yekinni, O. T. 2007. Political economy of agricultural policy implementation in Nigeria: Oyo state as a case study. A research project submitted to F. S. Idachaba foundation for research and scholarship, Ibadan, 2007.

Yusuf, S.A., Oni O.A, Okoruwa, V.O. and Odedina, O.K. 1999. An assessment of the poverty situation of Ijebu − Imushin community of Ogun State. A chapter in *Poverty Alleviation and Food Security in Nigeria.* Y.L. Fabiyi, and E.O Idowu, (editors). Nigerian Association of Agricultural Economic (NAAE) pp. 45-51.

Yusuf, S. A. 2008. Social capital and household welfare in Kwara State, Nigeria. *Journal of human ecol*., Vol. 23.3 : 219-229

Appendix 1

Analysis of objectives of the study

Objectives	Data required	Meaning of objective	Analytical tool/ models
Identify various dimensions of social capital	Density of membership, heterogeneity index, meeting attendance index, decision-making index, membership dues.	It gives information about the various forms of social capital available in the study area.	Descriptive Statistics
Present a welfare profile on the basis of household characteristics and social capital dimensions	Food items, Clothing and Foot wears, Rent allowance, Transportation, Toiletries (soap, detergent, tooth paste etc), Health facilities, Education (School fees, books, uniform and writing materials), Electricity bill, Fuel for Car and / Generator, Kerosene, Fuel wood / Gas /Coal, Water utilities, GSM / Telephone bills, Remittances (gift and money sent to, relatives and friends)	It will give information about the categories of welfare status of the respondents relative to their expenditure	Descriptive statistics
Determine factors influencing the level of benefit received from group participation	information on Credit facilities, marketing, fertilizer supply, subsidized input, labour supply, Level of benefit received (dependent variable), socio-economic and demographic characteristics	It will provide information on the level of benefit that farming households' received from being a member of social capital institution and the extent to which the expectations are met.	Descriptive statistics, Composite score and Ordered Probit analysis
Determine the effect of social capital on household welfare.	Household expenditure, age, household size, harvest failure, education, membership in association, attendance at village meetings, land owned, No. of farming equipment, No. of cattle owned, Instrumental Variables: length of residency, contribution to charity, membership of religious groups, ethnic groups.	This will ascertain if being a member of a social group has affect \ improve household welfare.	2SLS and Control Function analysis.

Appendix 2

Test of significance between respondents' level of education and Nigeria UBE Policy

```
One-sample t test                                      ttest educatio == 9
----------------------------------------------------------------------------------------
Variable |   Obs    Mean      Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+------------------------------------------------------------------------------
educatio |   298   8.416667   .3646736    6.316331    7.699015   9.134319
----------------------------------------------------------------------------------------
mean = mean(educatio)                                      t =  -1.5996
Ho: mean = 9                                         degrees of freedom = 297
Ha: mean < 9                  Ha: mean != 9                  Ha: mean > 9
Pr(T < t) = 0.0554            Pr(|T| > |t|) = 0.1107        Pr(T > t) = 0.9446
```

Appendix 3

Test of significant difference among age groups

. anova agegrps cas_con lab_con hetero_ind dem_ind memden_ind mtgatt_ind socapaggr1, partial

Number of obs =   298   R-squared   = 0.9976
Root MSE   = .408248   Adj R-squared = 0.8798

Source	Partial SS	df	MS	F	Prob > F
Mode l	413.746667	291	1.41210466	8.47	0.0058
cas_con	190.278921	167	1.12591078	6.76	0.0108
lab_con	40.252893	48	0.83860195	5.03	0.0244
hetero_ind	29.763411	21	1.41730529	8.50	0.0068
dem_ind	6.249779	6	1.04162999	6.25	0.0211
memden_ind	27.836411	18	1.54646729	9.28	0.0056
mtgatt_ind	36.916382	31	1.19085105	7.15	0.0103
Residual	1	6	0.16666667		
Total	414.746667	297	1.3871126		

. anova agegrps socapaggr1, partial

Number of obs =   298   R-squared   = 0.5763
Root MSE   = 1.14096   Adj R-squared = 0.0615

Source	Partial SS	df	MS	F	Prob > F
Mode l	239.006587	162	1.45735724	1.12	0.2486
socapaggr1	239.006587	162	1.45735724	1.12	0.2486
residual	175.740079	135	1.30177837		
Total	414.746667	297	1.3871126		

Appendix 4

Test of significant difference between male and female

. anova sex cas_con lab_con dem_ind hetero_ind memden_ind mtgatt_ind, partial

Number of obs =   298   R-squared   = 0.9764
Root MSE   = .408248   Adj R-squared = -0.1773

Source	Partial SS	df	MS	F	Prob > F
Mode l	41.3300	291	0.141058020	0.85	0.6840
cas_con	19.5618	167	0.115759368	0.69	0.7979
lab_con	4.2665	48	0.088885394	0.53	0.8954
dem_ind	0.4280	7	0.061144755	0.37	0.8922
hetero_ind	1.9395	20	0.096978713	0.58	0.8316
memden_ind	1.8103	18	0.100575613	0.60	0.8109
mtgatt_ind	4.5858	31	0.147931704	0.89	0.6299
Residual	1	6	0.166666667		
Total	42.3003	297	0.141571906		

. anova sex socapaggr1, partial

Number of obs =   298   R-squared   = 0.5587
Root MSE   = .371987   Adj R-squared = 0.0226

Source	Partial SS	df	MS	F	Prob > F
Mode l	23.6494	162	0.1442	0.85	0.4032
socapaggr1	23.6494	162	0.1442	0.85	0.4032
residual	18.6805	135	0.1383		
Total	42.3300	297	0.1415		

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Appendix 5

Two Stage Least Square (2SLS) Estimates

Variables	2SLS (Use of Instrumental Variable)	
	Coefficient	t-value
Age	-0.2381***	-3.18
age_sqr	0.0024***	3.29
Sex	0.8890*	1.78
Education	0.1026***	3.19
Marstatu	-3.2805***	-4.53
Hhdsize	-0.4733***	-5.52
Famgstatus	-2.0226***	-5.02
Dsturbn	0.0040	0.56
Famsize	0.0312	0.26
Famequip	0.0037	0.26
Livestock	0.0011	1.01
Crop	0.0009	0.51
Aggregate ssocial capital	0.0280**	2.52
_cons	15.4430***	7.94
R^2	0.4467	
Adjusted R^2	0.4215	
F statistics	17.76	(0.00)

Questionnaire for study

UNIVERSITY OF IBADAN

DEPARTMENT OF AGRICULTURAL ECONOMICS

EFFECT OF SOCIAL CAPITAL ON RURAL HOUSEHOLD WELFARE

IN SOUTHWESTERN, NIGERIA

I am currently carrying out a research work on the above topic. Kindly assist in responding to the questions below. All information given will be treated with utmost confidence. Thank you

LGA_____ Community

A.   SOCIO-ECONOMIC CHARACTERISTICS

1. Sex of household head _____

2. Age of household head (years) _____

3. Education (in years) _____

4. Marital status _____

5. Household size (in numbers) _____

6. Occupation of household head *(Pls, tick as appropriate)*

    a). Civil Service ( )   b). Private enterprise / Contractor ( )

    c). Farming   ( )   d). Transport Services   ( )

    e). Artisan   ( )   f). Trading   ( )

    g). Others *(specify)* _____

7. Secondary Occupation *(Pls, tick as appropriate)*

    a). Trading   ( )   b). Private enterprise / Contractor ( )

    c). Farming   ( )   d). Transport Services   ( )

    e). Artisan   ( )   f). Others *(specify)* _____

8. Type of farm enterprise _____

B.   PARTICIPATION IN LOCAL LEVEL INSTITUTIONS

9. Type of Association/Institution of household members. *(Please tick as many as applicable for each members of household that is involved in local level institutions)*

Association/Institution	Household Head	Spouses	Other members of Household (Please indicate the actual number)
▪ Community Based Association			
▪ Gender Association			
▪ Health group			
▪ Age group			
▪ Traders association			
▪ Farmers group			
▪ Parents teachers association			
▪ Religious group			
▪ Neighbourhood/village group			
▪ Social service group			
▪ Occupational / Professional group			
▪ Environmental Protection/Natural Resources Group			
▪ Cooperatives societies			
▪ Cultural groups			
▪ Sports group			
▪ Youth group			
▪ Political group			
▪ Non Governmental Organisations / ▪ Civic group (rotarian)			
▪ Recreational club			
▪ Others *(specify)*			

10.   Please list the three most important associations to your household

(i) _____ (ii) _____ (iii)_____

11. On the basis of the above, please use the table below to provide information on the three most important associations/institutions to your household

	Association 1	Association 2	Association 3
Do all members of the association live within the same area (Yes/No)			
Do all members belong to the same clan/family/lineage (Yes/No)			
Are all members of the same occupation? (Yes/No)			
Do members belong to the same income group? (Yes/No)			
Are members of the same religion? (Yes/No)			
Are the association members of the same sex (Yes/No)			
Do members belong to the same age group (Yes/No)			
Are members of the same educational qualification?(Yes/No)			
Do members trust one another (Yes/No)			
Do members have the same beliefs and cultural practices (Yes/No)			

12. Please complete the table below to show the number of meetings of each association per annum and the number of times each association member from the household attended meeting in the past one year.

Association/Institution	Actual number of meetings per annum	Number of times attended per annum by			Hold a position in the Group	
		House hold Head	Spouse	Others	Yes	No
Community Based Association						

Gender Association						
Health group						
Age group						
Traders association						
Farmers group						
Parents teachers association						
Religious group						
Neighbourhood/village group						
Social service group						
Occupational / Professional group						
Environmental Protection/Natural Resources Group						
Cooperatives societies						
Cultural groups						
Sports group						
Youth group						
Political group						
Non-Governmental Organisations / Civic group (Rotarian)						
Recreational club						
Others *(specify)*						

13. Indicate how you will rate your household members' participation in decision-making in the three most important institutions to your household. *(Please mark the appropriate cell).*

Rank			
	Very active	Active	Not active
Association 1			
Association 2			
Association 3			

14. Please indicate the annual contributions of the association members in your household to their respective associations.

Association/Institution	Cash (₦)	Labour (No. Of days)	Other non-cash contribution
Community Based Association			
Gender Association			
Health group			
Age group			
Traders association			
Farmers group			
Parents teachers association			
Religious group			
Neighbourhood / village group			
Social service group			
Occupational/Professional group			
Environmental Protection/Natural Resources Group			
Cooperatives societies			
Cultural groups			
Sports group			
Youth group			
Political group			
N GOs/Civic group (rotarian)			
Recreational club			
Others *(specify)*			

C.   HOUSEHOLD INCOME AND EXPENDITURE

15- Income of working members of Households

	Occupation	Number	Monthly income for those engaged in the occupation (₦)
Household Head			
Wives			
Children			
Others			

16.   Monthly expenditure of Household on basic needs.

Item	Expenditure (₦)	Value of own Production consumed by household
Food items		
Clothing and Foot wears.		
Rent allowance		
Transportation		
Toiletries (soap, detergent, tooth paste etc)		
Health facilities		
Education (School fees, books, uniform and writing materials)		
Electricity bill		
Fuel for Car and / Generator		
Kerosene, Fuel wood / Gas /Coal		
Water utilities		
GSM / Telephone bills		
Remittances (gift and money sent to relatives and friends)		
Others *(specify)*		
Others *(specify)*		

D. BENEFIT DERIVED FROM SOCIAL GROUP AND ASSET OWNERSHIP

17.   Please indicate the benefit that is received from being a member of a social group

	STATEMENTS	Yes	No
	I easily access information from members of my social group on:		
1	Markets Outlets		
2	Credit Source		
3	Source of Subsidised fertilizer		
4	Improved seeds and chemicals		
5	New opportunities/technology/enterprise		

6	I enjoy services/labour supply from the members during harvesting, planting,weeding etc
7	I benefit from financial assistance in terms of need
8	I am able to share my risk, shocks, ill-health and adverse condition with the members of my group
9	I benefit from lowered economic and social transaction cost from the group
10	Easy access to land

18. How long have stayed in the present community where you reside? _____ years

19. Apart from associational membership dues, did you make charity donation in your community / neighbourhood in the past year?   Yes ( )   No ( )

20. If yes, how much in total (₦) _____

21. Do you belong to any religious group?   Yes ( )   No ( )

22. Do you participate in any villagization / vigilante group in your community?

    Yes ( )   No ( )

23. Are members of your residential area from the same clan/ethnic group?

    Yes ( )   No ( )

24. Did you experience harvest failure in the last planting season? Yes ( )   No ( )

25. What is the size of your farmland _____ hectares

26. Number of cattle owned   _____,

    Value (₦) _____

27. Number of poultry owned_____,

    Value (₦) _____

28. Number of sheep owned   _____,

    Value (₦) _____

29. Number of goat owned   _____,

    Value (₦) _____

30. Number of pig owned   _____,

    Value (₦) _____

31. Number of farm equipment owned _____

Value (₦) _____

32. What is the value of stored farm products?

      a.) Crop   Value (₦) _____

      b). Honey   Value (₦) _____

      c). Palm Oil   Value (₦) _____

      d). Cocoa   Value (₦) _____

      e). Others   Value (₦) _____

Thank you.