Participation of farmers in local institutions has been known to increase their access to loan, promote and encourage savings and investment, hence alleviate their poverty level. This study therefore examined the determinants of group formation and the bi-causal relationship between group formation and poverty reduction among farming households. Data were collected using structured questionnaire. Analysis was done using descriptive statistics, group formation indices, Multidimensional Poverty Index (MPI) and Tobit regression model. The incidence of poverty and the average intensity of MPI were 50.58 percent and 48.7 percent respectively. The Multidimensional Poverty Index (MPI) for the sampled households was 0.246. The Tobit regression result revealed that a unit increase in group interaction and group structure will decrease the level of poverty of the households by 0.0056 and 0.0043 respectively. Similar increase in group goals and group cohesion will lead to 0.0046 and 0.0045 decrease in poverty level respectively. Also, a unit increase in years of education decreases (p<0.01) poverty level by 0.0163. Group formation was truly exogenous to poverty reduction with no reverse causality. The study concludes that group formation positively affects the poverty status of farming households. This implies that a farmer's participation in a group reduces his probability of being poor.

Key words: Poverty, group formation, farming households, Multidimensional Poverty Index

JEL Classification Number: I32

INTRODUCTION

Unlike other regions where remarkable, continuous and sustainable progress is being made in terms of economic growth and development, Africa is still facing an extreme case of poverty which appears to be unending. Africa is not only lagging behind but ensnared in the vicious circle of borrowing and donor dependency syndrome which some critics point out as one of the causes practically sabotaging real development (Balogun et. al, 2011). According to this study, Africa has perpetually failed to focus its development efforts on the optimum utilization of the immense natural resources that many of its countries are endowed with to turn it into wealth to propel their economies and people towards a high level of economic and social development and as a consequence, eliminate pervasive poverty. Great majority (1.4 billion) of people living in developing countries earns $1.25 a day or less and in Africa, an overwhelming number of people lives on barely $0.65 a day and this number is growing relentlessly (IFAD, 2011).

The situation in Nigeria is one of the many paradoxes of development in which case the country is rich in natural resources but the people are poor. Per capita income today is around the same level as in 1970 (Nwaobi 2003). Nwaobi (2003) further revealed that poverty in Nigeria encompasses a very complex society in which regional climatic and ethnic differences are reinforced by different historical and socio-economic legacies. Also, the country has had a complex political history. Frequent changes in governments have led to sharp changes in economic and social policies, which have impacted adversely on the population and have worsened income distribution.
In the face of the nature and magnitude of poverty situation in Nigeria, successive Nigerian regimes have attempted to grapple with the poverty situation in the country. However, efforts at poverty reduction have largely remained unfelt by the poor as a result of much emphasis which most of the interventions placed on the provision of physical infrastructure and the acquisition of human capital to support the poor. There has been little or no consideration for the institutional development of local level institutions or mechanism to ensure delivery of the intended support to the poor (Okunmadewa et al., 2005). Although the acquirement of human capital and increase in real income have been identified as one of the key inputs to break the vicious circle of poverty, the role of group formation in poverty reduction cannot be exaggerated.

Different approaches exist to poverty eradication and not until recently there has been a neglect of the role social capital (one of the benefits of group formation) plays in poverty reduction. Grootaert (1999) asserts that social capital is an important input in the production function of an individual or household and this has some implications. This suggests that institutional or social capital must complement human and physical capital before the full benefits of any development programme can be derived (Okunmadewa et al., 2005). Also, social networks in rural communities have been shown to play an indirect role in increasing agricultural productivity by knowledge sharing (Liverpool and Winter-Nelson, 2010). For example, the knowledge acquired by a group of farmers in the use of urea deep placement technology can be shared with other farmers or groups who weren’t part of the original project design. It is therefore not surprising that group formation is receiving a global attention as it has been revealed that the poor derive more benefits from their membership of local associations when compared with public instituted organizations. Consequently, one may say that the failure of the past interventions by government may not be unconnected to the neglect of group participation as an important factor in poverty reduction. This is because studies that have shown econometrically the effectiveness of different organizations in alleviating poverty are well documented (World Bank, 1996; Olayemi et al, 1999; Okunmadewa, 1998; and World Bank/DFID, 2000). Therefore, membership in groups by poor and low-income group is important in order to achieve the Millennium Development Goals.

It should be pointed out that studies on empirically establishing the link between group formation and poverty are scanty (Thorp et al. (2003), Baas and Rouse (1997) and Durlauf (2000)). However, a number of studies (Okunmadewa et al., 2005; Narayan and Pritchet (1997); Grootaert 2001; Morris, 1998; and Olayemi et al. 1999) have treated poverty reduction and social capital but not group formation. It should be noted that social capital is not the only reason why groups are formed. There are other benefits obtainable from being a member of a group and these are what this study seeks to explore. The aforementioned situation, coupled with the fact that little rigorous research exists on the subjects of interest, create the need for a study which relates group formation and poverty reduction. Thus, the main objective of this study is to understand and isolate the influence of group formation on poverty in selected rural areas in Ibadan, Oyo State.

Conceputal Framework and Review of Literature

Some Key Dimensions of Groups

Those engaged in the systematic exploration of group processes and dynamics have used different ways of observing group behaviour and gaining insight into the experience of being part of groups. Some have tried for more of an ‘insider’ view using participant observation and conversation. Perhaps the best-known example of this was Whyte’s (1943) study of street corner society. Others have used more covert forms of observation, or looked to structured and overt observation and interviews. A classic example of the sort of scheme that has been used when looking at groups in more structured ways is Bales’ (1950) IPA system (Interaction Process Analysis) with its 12 different ways of coding group behaviour e.g. ‘shows solidarity’, ‘agrees’, ‘asks for opinion’ and so on.

All this research, and the contrasting orientations informing it, has generated different ideas about what to look out for in groups and, in particular, the forces impacting upon group processes and dynamics. Smith (2008) highlighted five group dimensions:

- Group interaction
- Group interdependence
- Group structure
- Group goals
- Group cohesion (and entitativity)

There are various ways of organizing and naming the significant qualities – but Smith (2008) have found this approach to be the most helpful way to start exploration.

Group Formation and Poverty Reduction

Group formation brings about social capital which is the ability of actors to secure benefits by virtue of membership in a social network or other social structures (Portes, 1998). There are other factors influencing group formation and these include: cost of group membership, social distance, level of education, age, sex of an individual among others.

Several studies have been carried out to show the relationship between social capital, a motivation for group formation, and poverty reduction. Social capital has been found to have major impact on the income and welfare of the poor by improving the outcome of activities that affect them. It improves the efficiency of rural development programme by increasing agricultural productivity and facilitating the management of common resources making
rural tracting more profitable. It also improves the access of people or households in both rural and urban areas to water, sanitation, credit and education. It is a key factor from recovering from ethnic conflict and coping with political transition. Finally, it can 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).

Grootaert, (2001, 1999) in his work in Indonesia, Bolivia and Burkina Faso examined poor households' accumulation of social capital and the returns from it in terms of whether it provides them with higher returns than other assets and whether there are differential returns to social capital between the poor and the non-poor as well as what determine (i.e. variables) or is responsible for the differences. It was revealed that households with higher social capital have higher household expenditure per capita, more assets, better access to credit and more likely to have increased their savings. This study further stated that while the strength of the correlation between social capital and welfare outcomes differs by indicator, the overall pattern is quite strong and social capital correlates positively with household welfare.

Okunamadewa et al. (2005) submit that social capital and its dimensions have positive influence on per capita expenditure while at the same time reduce the probability of being poor. In addition, this study also shows that social capital can complement human capital endowment in enhancing welfare and reducing poverty.

Morris (1998) whose study focused on social capital at the macro level and on industrialized countries reveals that those states which were initially well endowed with social capital, were also more successful at reducing poverty. A study by Narayan and Pritchett (1997) has also demonstrated econometrically that the ownership of social capital by households in Tanzania has strong effects on households' welfare.

Though, a number of studies have treated poverty reduction and social capital in Nigeria, studies on empirically establishing the link between group formation and poverty reduction are still limited (Thorp et al., 2003; Baas and Rouse, 1997; and Durlauf, 2000). It should however be pointed out that group formation encourages savings and investment, creates access to credit with cumulative effect of poverty reduction as shown in the figure 1 below. Thus, an empirically determined impact of group formation on poverty reduction will provide an indication of what policy recommendations are necessary to improve the standard of living of Nigerians and this is what this study seeks to achieve.

MATERIALS AND METHOD

Area of Study

Oyo State is an inland state in south-western Nigeria, with its capital at Ibadan. It is bounded in the north by Kwara State, in the east by Osun State, in the south by Ogun State and in the west partly by Ogun State and partly by the Republic of Benin.

Oyo State covers approximately an area of 32,249.10 km² out of which 27,107.93 km² is cultivable (OYSADEP, 2001). The climate is equatorial and the two climatic seasons identified in the study area are dry season which is from November to March and the rainy season which starts from April and ends in October (Olaoye et al., 2013). The rainfall pattern in the state follows tropical type with an average annual rainfall of 1000mm-1400mm and fairly high temperature (Oyeyinka and Bello, 2013).

Oyo State has 33 local government areas, all which have been grouped into four zones for administrative conveniences (Olaniyi, 2012). These zones are Ibadan/Barapa, Ogbomoso, Oyo and Saki. The state is homogenous and the indigenes mainly comprise the Oyos, the Oke-Oguns, the Ibadans and the Ibarapas. The study was carried out in selected local governments in Ibadan area of Oyo State. Ibadan is situated at 7.39° North latitude, 3.9° East longitude and 239 meters elevation above the sea level. Ibadan is the largest indigenous city in Africa with an estimated population of about 3,800,000 according to 2006 estimates (P.G. School U.I., 2012). The Local Governments covered in the study were Akinyele, Egbeda and Ido local government. The Local Governments were chosen because most of their inhabitants are known for their farming activities and due to their fairly large concentration of villages that are typical of rural areas

Sources and Method of Data Collection

The data used for this study were mainly primary. Personally administered structured questionnaires were designed, pretested and validated for use in this study. Information reconnoitered from the sampled farm households covered the following: household income, group formation factors, occupational variables, demographic characteristics of household members, perceptions of social distance, benefits and costs of group membership, and other farm related and living condition characteristics.

Sampling Procedure

A multi stage sampling technique was used to obtain the respondents for the purpose of this study. The first stage
involved the selection of three local government areas namely: Akinyele, Ido and Egbeda local government areas. These local governments were purposively selected because of their fairly large concentration of local institutions (Cooperative societies, Fadama and Esusu). The second stage involves a purposive selection of villages in each local government and this decision was based on the relatively high number of farming households in these local governments. In the last stage, farming households were randomly selected from these villages. The data collection took place between April and May, 2012. A total of 180 farming households were therefore randomly sampled. Consequent on unsuitable completion or non-return of 8 questionnaires, a total of 172 households were used for the study.

Analytical techniques

This study employed a number of analytical techniques. These techniques include descriptive and inferential statistics, multidimensional poverty measure and the multivariate regression models. The descriptive statistics used include measures of central tendency, tables, cross tabs and percentages to describe the socio-economic characteristics of farming households and to characterize the dimensions of group formation.

Multidimensional Poverty Index

The multidimensional poverty measure (MPI) is an index of acute multidimensional poverty (OPHDI and UNDP, 2010). It uses a range of deprivations that affect an individual's life. The measure assesses the nature and intensity of poverty at the individual level in education, health outcomes, and standard of living. MPI is calculated as follows:

$$MPI = H \times A$$

Where,

- **MPI**: Multidimensional Poverty Index
- **H**: Percentage of people who are MPI poor (incidence of poverty)
- **A**: Average intensity of MPI poverty across the poor (%)

(OPHDI and UNDP, 2010)

The MPI has three dimensions: health, education, and standard of living. These are measured using ten indicators. Poor households are identified through an aggregate measure constructed using the methodology popularised by Alkire and Foster (2007). Each dimension and each indicator within a dimension is equally weighted.

Indicators used

The following ten indicators were used to calculate the MPI:

Education (each indicator is weighted equally at 1/6)

1. Years of schooling: deprived if no household member has completed five years of schooling

2. Child Enrollment: deprived if any school-aged child is not attending school in years 1 to 8

3. Health (each indicator is weighted equally at 1/6)

4. Nutrition: deprived if any adult or child for whom there is nutritional information is malnourished

5. Sanitation: deprived if they do not have an improved toilet or if their toilet is shared (MDG Definition)

6. Drinking water: deprived if the household does not have access to clean drinking water or clean water is more than 30 minutes walk from home (MDG Definition)

7. Floor: deprived if the household has dirt, sand or dung floor

8. Cooking fuel: deprived if they cook with wood, charcoal or dung

9. Assets: deprived if the household does not own more than one of: radio, TV, telephone, bike, or motorbike

A person is considered poor if they are deprived in at least 30% of the weighted indicators (OPHDI and UNDP, 2010). The intensity of poverty denotes the proportion of indicators in which they are deprived.

Tobit Regression Model

The Tobit regression, a hybrid of the discrete and continuous dependent variable, was used to determine the influence of the group variables on the farming household poverty. The model that was developed by Tobin (1958) as adopted by Omonona (2001) is expressed below

$$q_i = P_i = \begin{cases} \beta^T X_i + e_i & \text{if } P_i > P_i^* \\ 0 & \text{if } P_i \leq P_i^* \end{cases}$$

Where

- **q_i** = Dependent variable.
- **P_i** is the poverty depth/intensity which is derived from the multidimensional poverty index (MPI).
- **P_i^*** is zero.
- **X_i** = a vector of explanatory variables
- **β** is a vector of parameters and e is error term

The independent variables to be used in determining the factors influencing poverty are specified below.

Household characteristics variables

- **X_1** = Age of household head (years)
- **X_2** = Farming experience (years) of the household head
- **X_3** = Access to infrastructure (Accessible = 1, otherwise = 0)
- **X_4** = Gender of household head (male =1, otherwise=0)
Group Formation and Poverty Reduction among Farming Households in Selected Areas in Ibadan, Oyo State

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X₅= Household size
X₆ = Educational level of the household head measured in years.
X₇ = Farm size (ha)
X₈ = Level of income
X₉= Dependency ratio (This is defined as the ratio of non-workers to workers in each household)

Group formation variables

F₁ = Perception of cost of group membership (Yes =1, No =0)
F₂ = Perception of social distance (Yes = 1, No= 0). This variable represents the degree of reciprocity that subjects believe exist within a social interaction.
F₃=Perceived benefits of group participation (Yes=1, No=0)

Group Dimension Variables

D₁ = Group interaction (%)
D₂ = Group interdependence (%)
D₃ = Group structure (%)
D₄ = Group cohesion (%)
D₅ = Group goals (%)

Each of the group dimensions has a number of indicators through which it can be calculated and a comprehensive procedure showing how these indicators were arrived at is shown in Appendix B.

Table 1: A priori expectations for the independent variables in poverty status models.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Expected signs</th>
<th>Literatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age X₁</td>
<td>+/-</td>
<td>(Omonona, 2001, Omonona et al., 2008)</td>
</tr>
<tr>
<td>Farming experience X₂</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Access to infrastructure X₃</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Gender of household head X₄</td>
<td>+/-</td>
<td>(World bank, 1996; Omonona, 2001, Omonona et al., 2008)</td>
</tr>
<tr>
<td>Household size X₅</td>
<td>+</td>
<td>(World bank, 1996; Omonona, 2001, Omonona et al., 2008)</td>
</tr>
<tr>
<td>Educational level of the household head X₆</td>
<td>+/-</td>
<td>(World bank, 1996; Omonona, 2001, Omonona et al., 2008)</td>
</tr>
<tr>
<td>Dependency ratio X₇</td>
<td>+/-</td>
<td>(World bank, 1996; Omonona, 2001, Omonona et al., 2008)</td>
</tr>
<tr>
<td>Farm size X₈</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Primary occupation X₉</td>
<td>+</td>
<td>(Omonona, 2001, Omonona et al., 2008 )</td>
</tr>
<tr>
<td>Level of income X₁₀</td>
<td>-</td>
<td>(Omonona, 2010)</td>
</tr>
<tr>
<td>Group participation F₁</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Social distance F₂</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Cost of group membership F₃</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Benefit of group participation F₄</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Group interaction D₁</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Group interdependence D₂</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Group structure D₃</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Group cohesion D₄</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Group goals D₅</td>
<td>+/-</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed from Field Survey, April-May, 2012

The final regression model used in the poverty analysis excluded dependency ratio variable because it was discovered that its exclusion led to one more significant variable. This could be to its significant correlation with annual income (P<0.1). This decision was based on the reasoning that the more significant variables there are, the better the analysis. It was also noticed that dependency ratio as a variable was not significant in the regression result in which it was included. However, the regression result, obtained from the Tobit analysis having dependency ratio as a variable, is presented in Appendix A.

Instrumental Variable Method

In order to validate the assumption that group formation is truly an input in poverty reduction, the study tested for the existence of two-way causality with the aid of the instrumental variable method. In this case, a variable which determine group participation but not related to poverty was used. Following Elias and Alwang (2008) study conducted in Honduras on economic theory of group formation, an individual’s decision to join a group is influenced by a number of factors, among which is perceived social distance. Social distance is the degree of reciprocity that subjects believe exists within a social space. Therefore, the instrument used for analysis is the inherited social distance. This indicator resembles the use of years of schooling as a proxy for human capital. Though, this may not be a perfect instrument, it at least provides the direction of causality between group participation and poverty. A reverse causality is said to exist if there is no improvement or reduction in the R² as well as in the value of the instrumental variable estimate. The aggregate group formation model is indicated in table 5.
RESULTS AND DISCUSSION

Derivation of the Multidimensional Poverty Index of the Sampled Households

The very first step in the analysis of poverty is the determination of the poverty line, which is the threshold that separates the non-poor from the poor. The Multidimensional Poverty Index (MPI) has developed by Oxford Poverty and Human Development Initiative (OPHDI) and UNDP 2010, was used to determine this threshold and the condition is that a household is considered poor if they are deprived in at least 30% of the weighted indicators. The distribution of the households by MPI is given in tables 2 and 3.

Table 2: Summary of Farmers’ Deprivation on the Weighted Indicators

<table>
<thead>
<tr>
<th>Decile</th>
<th>Mean Weighted score</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>Not MPI poor</td>
</tr>
<tr>
<td>2</td>
<td>0.077</td>
<td>Not MPI poor</td>
</tr>
<tr>
<td>3</td>
<td>0.173</td>
<td>Not MPI poor</td>
</tr>
<tr>
<td>4</td>
<td>0.244</td>
<td>Not MPI poor</td>
</tr>
<tr>
<td>5</td>
<td>0.280</td>
<td>Not MPI poor</td>
</tr>
<tr>
<td>6</td>
<td>0.324</td>
<td>MPI poor</td>
</tr>
<tr>
<td>7</td>
<td>0.389</td>
<td>MPI poor</td>
</tr>
<tr>
<td>8</td>
<td>0.440</td>
<td>MPI poor</td>
</tr>
<tr>
<td>9</td>
<td>0.542</td>
<td>MPI poor</td>
</tr>
<tr>
<td>10</td>
<td>0.698</td>
<td>MPI poor</td>
</tr>
<tr>
<td>Mean of Means</td>
<td>0.317</td>
<td></td>
</tr>
</tbody>
</table>


Table 2 gives the summary of how the MPI indicators were measured for the sampled households. Each decile, as shown above, consists of a minimum of 17 households and the scores displayed in the above table are averages taken over 17 households. It can be seen that households in the first decile to the fifth decile have a mean weighted scores of 0 percent, 7.7 percent, 17.3 percent, 24.4 percent and 28 percent respectively. Since households in these deciles are not deprived in at least 30 percent of the weighted indicators, they are therefore not MPI poor. Farming households in the sixth decile to tenth decile have mean weighted scores of 38.9 percent, 44.0 percent, 54.2 percent and 69.8 percent respectively. Given that the mean weighted scores of households in these deciles exceed 30 percent, it can therefore be said that they are MPI poor.

Table 3: Distribution of Farming Households by Multidimensional Poverty Index (MPI)

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPI poor (&lt;0.3)</td>
<td>87</td>
<td>50.58</td>
</tr>
<tr>
<td>Not MPI poor (≥0.3)</td>
<td>85</td>
<td>49.42</td>
</tr>
<tr>
<td>All</td>
<td>172</td>
<td>100</td>
</tr>
</tbody>
</table>


Table 3 shows that 49 percent of the sampled households are not MPI poor as they are not deprived in at least 30 percent of the weighted indicators, while 51 percent are considered to be MPI poor due to deprivations in at least 30 percent of the weighted indicators.

The MPI of the entire sampled households, as given by OPHDI and UNDP (2010), is calculated from table 4.14 as follows:

$$MPI = H \times A$$

Where,

H: Percentage of people who are MPI poor (incidence of poverty)
A: Average intensity of MPI poverty across the poor (%)

Factor H for the sampled households = \(\frac{87}{172} = 0.5058\)

Factor A for the sampled households = \(\frac{\text{41.351}}{87} = 0.4753\)

MPI for the sampled households = 0.5058 x 0.4753 = 0.2404

From the above calculation, 50.58 percent of the sampled households are MPI poor and those who are poor suffer from deprivation in 47.53 percent of indicators, on average. The MPI for the sampled households is 0.246 while that of Nigeria as revealed by OPHDI and UNDP (2010) is 0.368.

Effect of Group Formation on Poverty

Tobit (otherwise called Tobin’s Probit) Model as specified in the methodology was used to analyse the effect of group formation on poverty among farming households in selected areas in Ibadan, Oyo State.

From Table 4, the value for sigma (σ) is 0.302 and it has a t-value of 15.427. Therefore, it is statistically significant (p<0.01). It also shows that chi-square (χ²) is 99.65 with pseudo r² 0.6532; hence, the chi-square (χ²) is statistically significant (p<0.01). This indicates that the model has a good fit to the data. The intercept is 2.806 and this represents the autonomous poverty among farming households in the study area. The result of the Tobit regression is shown below.

The result as presented in the table above indicates that five of the postulated variables determine the level of poverty. These variables cut across demographic and group dimension variables. Four of the five significant variables are related to group dimensions. The Tobit analysis reveals that the more educated a household head is, the lower the poverty level. The magnitude of the reduction in poverty level as result of a unit increase in educational level is 1.6 percent. This result is not surprising because educated household heads are better able to adopt new improved technologies to raise productivity and income than the uneducated ones. Also, because of their level of education, they are better able to get other paid jobs besides farming.
The four group dimension variables with significant effect on poverty are: group goals, group cohesion, group interaction and group structure. Group interaction index has a negative coefficient of -0.006. This implies that a unit increase in group interaction index will lead to a 0.6 percent decrease in poverty. An increase in group interaction factor implies that the interests of the leaders in the group are centered on structure and task actions and that they are based on the feelings and needs of the group members. Consequently, the leaders are driven towards making effort that will be beneficial to their members. Hence, an improvement in members’ welfare.

The coefficient of group cohesion was -0.005. This means that the autonomous poverty level is reduced by 0.5 percent for those households belonging to a group. Similarly, the coefficient of group goals is -0.005 and this implies that a unit increase in group goals factor will reduce the autonomous poverty from 2.807 to 2.802. Also, the coefficient of group structure is -0.004, implying that a unit increase in group structure will lead to 0.43 reduction in poverty level. It can be seen that group interaction, group cohesion, group structure and group goals come up as important variables for poverty reduction. Hence, they are the key group dimension factors necessary for poverty reduction. Although group interdependence as a variable is not significant, it has the right sign meaning that a unit increase in it will lead to a reduction in poverty. This result is in consonance with quite a number of studies: World Bank, 1996; Baas and Rouse, 1997; Olayemi et al, 1999; Okumadewa, 1998; Durlauf, 2000; and World Bank/DFID, 2000; and Thorp et al., 2003.

In sum, group participation has significant effect on poverty reduction as being a member of a group has its associated benefits. These include the availability of credit facilities, access to extension services, non-agricultural investment activities among others and these ultimately improve the welfare of the households and hence a reduction in their poverty level.

**Group Participation and Poverty Status: Testing for Bicausal Relationship**

In order to validate the assumption that group formation is truly an input in poverty reduction, the study tested for the existence of two-way causality with the aid of the instrumental variable method. In this case, a variable which determine group participation but not related to poverty was used. Following Elias and Alwang (2008) study conducted in Honduras on economic theory of group formation, an individual's decision to join a group is influenced by a number of factors, among which is perceived social distance. Social distance is the degree of reciprocity that subjects believe exists within a social space. Therefore, the instrument used for analysis is the inherited social distance. This indicator resembles the use of years of schooling as a proxy for human capital. Though, this may not be a perfect instrument, it at least provides the direction of causality between group participation and
poverty. If group formation is truly a capital input, the coefficient of the instrumental variable (social distance) and R² should be higher than their values in the actual group formation model.

**Table 5: Group Participation and Instrumental Variable Estimation**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tobit regression</th>
<th>Instrumental Variable Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of household</td>
<td>0.211196 (1.2)</td>
<td>0.288125 (0.43)</td>
</tr>
<tr>
<td>Age of household head</td>
<td>-0.00647 (-1.28)</td>
<td>-0.01903 (-1.12)</td>
</tr>
<tr>
<td>Years of Education of HH Head</td>
<td>-0.06767 (-5.54)**</td>
<td>-0.29675 (-2.99)**</td>
</tr>
<tr>
<td>Marital Status</td>
<td>0.132297 (0.34)</td>
<td>-0.12848 (-0.09)</td>
</tr>
<tr>
<td>Farming Experience</td>
<td>0.003326 (0.64)</td>
<td>0.000744 (0.04)</td>
</tr>
<tr>
<td>Household Size</td>
<td>0.007528 (0.48)</td>
<td>0.018362 (0.34)</td>
</tr>
<tr>
<td>Annual Income</td>
<td>-6.33E-08 (-0.95)</td>
<td>-2.19E-7 (-1.05)</td>
</tr>
<tr>
<td>Farm Size</td>
<td>0.002639 (1.00)</td>
<td>0.005033 (0.55)</td>
</tr>
<tr>
<td>Access to infrastructure</td>
<td>-0.14229 (-1.14)</td>
<td>-0.66134 (-1.39)</td>
</tr>
<tr>
<td>Social distance</td>
<td>-0.00493 (-0.04)</td>
<td>-0.2002 (-0.41)</td>
</tr>
<tr>
<td>Group participation</td>
<td>-0.6025 (-4.67)**</td>
<td>0.89799 (0.34)</td>
</tr>
<tr>
<td>Constant</td>
<td>3.145148 (6.72)**</td>
<td>3.72055 (2.36)**</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.299</td>
<td>0.296</td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>106.69</td>
<td>66.28</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-125.056</td>
<td>-294.879</td>
</tr>
<tr>
<td>Prob&gt; chi²</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Figures in parenthesis are t-values significant at **1%, *5% and *10%.

**Source:** Computed from Field Survey, April-May, 2012.

It is evident that the use of the instrumental variable led to slightly lower R² (0.296) compared to that obtained with the use of the actual group participation index (0.299). In addition, the instrumental variable estimate (0.2002) had a higher explanatory power than the group participation estimate (0.0049). This implies that the direct effect of group participation on poverty in the model described in the methodology outweighs the reverse effect in the explanation of the correlation between the two variables. A reverse causality could have been accepted if there was no improvement or reduction in the R² and the value of the instrumental variable estimate. Since there is an improvement in both cases, it can be concluded that there is an absence of significant reverse causality and this thus confirm the exogeneity of group participation.

A unit increase in the instrumented group participation variable leads to 0.90 increase in the poverty level of the sampled households while a one unit increase in the actual group participation factor using the Tobit regression will lead to 0.60 decrease in the poverty level of the household heads.

**CONCLUSION**

The research work established that group formation has significant influence on poverty reduction and the findings of this study support recent emphasis on investing in group formation. The test of reverse causality between group formation variable and poverty level using the instrumental variable estimation technique indicates that the direct effect of group participation on poverty exceeds the reverse effect in the explanation of the correlation between the two variables. In addition, it has been shown that the promotion of group formation is an important requirement for the poor to benefit from some of the public instituted poverty reduction programme. This is based on the above claim that group formation has a positive impact on poverty reduction.

**RECOMMENDATIONS**

In order to alleviate the poverty level of farming households in Ibadan, Oyo State, Nigeria the following recommendations are made:

1. Since group formation has been found to reduce poverty level, farming households should make concerted effort to improve their welfare status by belonging to associations. Complementing the above assertion is that group participation allows members to have access to goods and services more easily than they would have on an individual basis. For example support given by institutions like Bank of Agric and progamme like Fadam, LEEMP etc, which have the ability of revolutionizing farmers’ wellbeing, are group based).

2. The poorest households are those with no formal education and those with 1 to 6 years of education. This may not be unconnected to the fact that farming households with higher levels of education are better able to earn additional incomes from other paid jobs besides farming. Therefore government should make effort to provide a learning environment for farmers regardless of their age, religion or political affiliation.

3. Farmers should ensure that the group dimension variables in associations where they belong are enhanced as they reduce their poverty level.

4. Lastly, quite a number of farming household heads are deterred from group participation due to the failure of past promises made by group leaders or government. Government should not restrict their effort to releasing funds to groups alone; they should also ensure proper monitoring and evaluation of the disbursed funds.
REFERENCES


Smith, Mark K (2008) ‘What is a group?’ The Encyclopaedia of Informal Education. [www.infed.org/groupwork/what_is_a_group.htm].


APPENDICES

Appendix: A

Effect of Group Formation on Poverty (Tobit Regression)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of household head</td>
<td>0.051204</td>
<td>0.086909</td>
<td>0.59</td>
</tr>
<tr>
<td>Age of household head</td>
<td>-0.00089</td>
<td>0.003161</td>
<td>-0.28</td>
</tr>
<tr>
<td>Years of formal education</td>
<td>-0.0225</td>
<td>0.006263***</td>
<td>-3.59</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.030859</td>
<td>0.195594</td>
<td>0.16</td>
</tr>
<tr>
<td>Farming experience</td>
<td>0.002029</td>
<td>0.002815</td>
<td>0.72</td>
</tr>
<tr>
<td>Household size</td>
<td>-0.00831</td>
<td>0.010875</td>
<td>-0.76</td>
</tr>
<tr>
<td>Annual income</td>
<td>9.58E-10</td>
<td>1.69E-08</td>
<td>0.06</td>
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<tr>
<td>Farm size</td>
<td>0.000656</td>
<td>0.001077</td>
<td>0.61</td>
</tr>
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<td>Access to infrastructure</td>
<td>-0.0545</td>
<td>0.073748</td>
<td>-0.74</td>
</tr>
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<td>Social distance</td>
<td>0.064669</td>
<td>0.078968</td>
<td>0.82</td>
</tr>
<tr>
<td>Benefit of group participation</td>
<td>0.152383</td>
<td>0.128395</td>
<td>1.19</td>
</tr>
<tr>
<td>Cost of group membership</td>
<td>0.074014</td>
<td>0.062831</td>
<td>1.18</td>
</tr>
<tr>
<td>Dependency Ratio</td>
<td>-0.01976</td>
<td>0.017608</td>
<td>-1.12</td>
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<tr>
<td>Group Interdependence</td>
<td>-0.00159</td>
<td>0.001918</td>
<td>-0.83</td>
</tr>
<tr>
<td>Group Structure</td>
<td>-0.0045</td>
<td>0.002437*</td>
<td>-1.84</td>
</tr>
<tr>
<td>Group Cohesion</td>
<td>-0.00586</td>
<td>0.00213**</td>
<td>-2.75</td>
</tr>
<tr>
<td>Group Interaction</td>
<td>-0.00657</td>
<td>0.002941**</td>
<td>-2.23</td>
</tr>
<tr>
<td>Group goals</td>
<td>-4.5E-05</td>
<td>0.000796</td>
<td>-0.06</td>
</tr>
<tr>
<td>Constant</td>
<td>3.851641</td>
<td>0.326955</td>
<td>11.78</td>
</tr>
<tr>
<td>Sigma</td>
<td>0.3083777</td>
<td>0.0199891</td>
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<tr>
<td>Pseudo R²</td>
<td>0.6217</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LR chi-squared</td>
<td>94.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-28.858507</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***, **, * = Significant at 1, 5, and 10% probability level, respectively. Dependent variable-Multidimensional Poverty Index

Appendix: B

Indicators used for Deriving the Group Dimensions

In order to derive values for the group dimension indicators mentioned below, questions were distilled from each indicator and these were answered by the respondents. These values were then converted to percentages by multiplying them by 100. For each of the indicator, the corresponding score was awarded to each of the respondent for a positive response given (such as 'yes' or 'high') while a value of zero was given if the response is otherwise (i.e. No or low). If the respondent at any time chooses "medium" in response to a question, half of the value of the weight carried by the corresponding indicator was given.

**Group Interaction** (each indicator is weighted equally at 1/3)
1. Task interaction: deprived if group members do not carry out tasks as a team
2. Relationship interaction: deprived if an individual in a group does not feel concerned when a member of the group is bereaved or in a celebrative mood.
3. Leader's focus: deprived if the leaders do not focus on structure and task actions or on the feelings and needs of the group members.

**Group Interdependence** (each indicator is weighted equally at 1/3)
1. Members' outcomes: deprived if an individual's feelings are not sometimes influenced by that of others in the group or when actions carried out are not based on other members in the group
2. Common goal: deprived if common goals are not shared in a group

**Group Structure** (each indicator is weighted equally at 1/3)
1. Size of the group: deprived if the number of people in a group is more than 12
2. Norms: deprived if a group does not have rules of conduct which indicate attitudes and behaviour expected by group members
3. Roles of the Group Leaders: deprived if executives in a group do not perform separate roles

**Group Cohesion** (each indicator is weighted equally at 1/5)
1. Cooperation: deprived if the extent to which group members are prepared to cooperate to achieve their goals is slight
2. Bond: deprived if an individual does not have feelings for other members in his or her group
3. Similarity: deprived if there is no form of similarity in the way members in a group do things or conceive ideas
4. Common fate: deprived if the extent to which members in a group seem to experience the same or interrelated outcome is low
5. Proximity: deprived if members in group live far apart

**Group goals** (each indicator is weighted equally at 1/3)
1. Group objectives: deprived if there are no objectives to be to be jointly achieved by the group and its members
2. Programmes: deprived if the group does not have an ongoing or planned beneficial program(s) for its members
3. Achievements: deprived if the extent to which a group is achieving its stated objectives is low

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