THE ECONOMIC IMPACT OF INVENTORY CREDIT PROGRAMME (ICP) ON CEREAL FARMERS IN THE PRU DISTRICT OF THE BRONG AHAFO REGION

by

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DECLARATION

I hereby declare that this submission is my own work towards the Executive MBA (Banking and Finance) and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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ABSTRACT

Small - scale farmers make up more than 90 percent of the Pru district farming population. Although their production represents nearly three quarters of the district's food produced, small-scale farmers do not enjoy any real market clout. As a result, they remain classic price-takers generally isolated from market information and profitable market opportunities and also find it difficult in accessing working capital loan.

Inventory Credit Programme (ICP) is seen as a panacea to the exploitation by middlemen of farmers in the rural areas, the wastage of farm produce during the peak period in light of non-availability of processing centers and the difficulty of credit accessibility by small-scale farmers. The goal of this study is to examine the effects of ICP on the socio-economic lives of rural cereal farmers in the Pru district by assessing the impact of ICP on Access to Credit, determining percentage Net Incremental Benefit of ICP to farmers over a 5 year period and identify Non – Quantifiable Benefits of ICP to the district.

The entire TechnoServe-assisted groups in the Pru district served as a target population. Thus, members of the 15 groups in 8 communities were considered. This population was selected because that would give a wide coverage of the result of the findings. In addition to this, data were collected from YAPRA Rural Bank; the rural bank operating and collaborating with TechnoServe in the implementation of ICP in the district.

By contacting both ICP participating and non-participating cereal farmers, and the major lending institution for ICP in the Pru district primary information was obtained for the study.

From the study it was realised that besides quantifiable benefits accrued to participating farmers (access to credit, premium price) there are other long-term socio-economic benefits such as improved food security, stable food prices and incomes, market and service linkages creation, group development promotion of local investment to both the participating communities and farmers.

The significance of this findings is that Inventory Credit model has shown its effectiveness in not only enabling small –scale farmers in rural districts to access formal credit but also shown its effectiveness in fighting hunger and reducing extreme poverty in the Pru district, it can be selected as an example of 'good practice' to be implemented at a national level to other storable crops.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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To all my family and friends who supported me with their prayers, good thoughts and in other diverse ways that made this research a success, I say may the ALMIGHTY'S GRACE BE SHOWERED UPON YOU ALL!

Thank You

CHAPTER ONE

INTRODUCTION

1.1. OVERVIEW OF STUDY

The Growth and Poverty Reduction Strategy (GPRS II) policy document by the Ghana government places emphasis on agriculture as one of the pillars to be used in reducing poverty in the country.

Government plans to achieve this objective by enhancing access to credit and agricultural inputs and by increasing availability of extension services. Nonetheless, the agricultural sector still faces major structural problems. For example, it is estimated that only 5 per cent of irrigable land in Ghana is actually irrigated; and extension services are so limited that each technical officer is responsible for assisting nearly 2,000 farmers. Moreover, 40 per cent of all agricultural output is wasted annually due to inadequate storage facilities, marketing chains and poor infrastructure (African Economic Outlook 2005 - 2006).

In recent years, financial institutions such as micro banks and the Agricultural Development Bank (ADB) have expanded their lending portfolio to farmers through Inventory Credit Programme (ICP). Other non-financial institutions such as TechnoServe and other development agencies are constructing warehouses in selected farming communities of the country to promote ICP.

Inventory Credit Programme (ICP) is seen as a panacea to the exploitation by middlemen of farmers in the rural areas, the wastage of farm produce during the peak

period in light of non-availability of processing centers and the difficulty of credit accessibility by small-scale farmers. (TechnoServe Finding Papers, 1999).

Inventory Credit is a different concept than cereal or grain "banks". The grain bank concept was developed as an alternative to the emergency supply of external aid to disaster-prone areas. Grain banks are intended to promote and enhance food security and stabilize local markets by establishing grain reserves under local control. Operational models and practices vary, but all tend to focus on improving local food security.

Inventory Credit on the other hand, is primarily a commercial activity designed to increase the profits of farmers. While the application of inventory credit often results in greater food availability in the area and more stable markets, the primary objective is to increase farmer's income (Londner et al, 1999).

Farmers need access to working capital and investment credit for inputs and expansion, as well as, successful marketing of produce to ensure a return on investment. Inventory credit programme offers farmers marketing and credit solution to spur productivity and increase their incomes. Inventory credit can be applied to any durable or storable product. In Ghana, TechnoServe has applied the use of inventory credit for grain marketing, particularly maize.

The programme is said to be profitable only when the increase in the value of the stored goods exceeds the cost of storage and the borrowed funds. Since inventory credit is essentially a speculative activity, the implementation of such a programme must be managed carefully.

A viable inventory credit programme requires:

- Diligent monitoring of stored goods;
- Price fluctuations and market supply trends;
- A credible warehousing scheme.

1.2. HISTORICAL BACKGROUND OF ICP

TechnoServe first introduced its inventory credit model in Ghana, in the mid-1980s. Sasakawa Global 2000 (SG2000) chose Ghana as one of the countries in which to launch its efforts to create an African "green revolution", seeking to replicate Asia's success in expanding agricultural production. SG2000's early work successfully demonstrated the ability of local farmers to double or triple their yields in major grain crops, notably maize and sorghum, through the use of improved inputs and technologies. But the bumper crops they created depressed local prices and reduced farmer incomes. As a result, few farmers continued the use of improved inputs after the end of the programme.

In 1988, TechnoServe began working with SG 2000, the Agric Development Bank (ADB) and the Government of Ghana's Department of Cooperatives (DOC) to address the marketing problems that had become evident after SG 2000's early success. This led to the introduction and piloting of Inventory Credit Programme in specifically maize-growing belt of Ghana.

1.3. PROBLEM STATEMENT

The population of Pru district is basically rural, population density has increased from 11.82 persons per km^2 in 1984 to 31.82 persons per km^2 in 2000 (Ghana Population Census Report, 2000). The geometric increase in population density over time is an indication of the growing pressure on the district's fragile environment which may gradually result in poor yields and hence economic deprivation. As an agricultural economy, it is critical to encourage people to earn more from their food crops produce and store enough for both local consumption and export thereby organizations such as TechnoServe introduced Inventory Credit Programme in the district.

Eighty percent (80%) of the inhabitants of Pru earn their income from agriculture, 6 percent from service sector 10 percent from commerce and 4 percent from the industry sector (Pru District Planning Control Unit, 2006). Income levels are generally low throughout the district as compared to the national average income per head of GH¢ 390. There is therefore the need to develop the major sectors of the district's economy especially agriculture through effective loan linkages, storage, processing, marketing strategies of produce and support to the private sector (individual farmers in this regard) which is perceived as the engine of growth.

Of the total area cultivated during the 2005 production season, cereals (maize, sorghum, millet and rice) constituted 55 percent, legumes (groundnuts, cowpea and soybean) 30 percent and yam 15 percent. By crop type, more farmland was committed to maize (30%), followed by groundnuts 21 percent and yam 15 percent. The average farm size cultivated was less than one (1) hectare per farmer for most

crops and 41 percent of total revenue generated by farmers in the district is made up of sales of cereal.

The gross margin per unit of land for the selected commodities except yam was less than the national averages. In descending order, the most profitable crop was yam, groundnut, rice and maize. (TechnoServe Baseline study, 2006)

In light of the high number of farmers in cereal crop cultivation with a disproportionate gross profit margin per unit of farmland, TechnoServe, introduced Inventory Credit Programme to the cereal farmers in the district with the objective that they will use their secured produce as collateral for financial assistance to meet their immediate needs and invest in their agri-business, and defer the sales of the produce to the lean season by which period the price might have increased by about 100 percent – 250 percent, by so doing farmers profit margins are expected to increase hence an improvement in their economic status.

The premise for this research is that cereal farmers who participate in ICP in addition to accessing quantifiable benefits as a result of price swings also learn a lot more from the process than non-participating rural cereal farmers.

The goal of this paper is to examine the effects of ICP on the socio-economic lives of rural cereal farmers in the Pru district.

1.4. OBJECTIVES

Among others, the study seeks to achieve the following;

1. To assess the impact of ICP on access to credit
2. To determine percentage Net Incremental Benefit of ICP to farmers over a 5 year period.
3. To identify non – quantifiable benefits of ICP to the district
4. To make recommendations to improve upon the Inventory Credit Programme.

1.5. JUSTIFICATION

The ICP is perceived by development partners to have dramatically reduced inter-seasonal price fluctuations, greatly benefited those small-scale farmers with no choice but to sell immediately after harvest. It therefore appears that ICP can offer farmers marketing and credit options that spur productivity and increase their incomes. Financial institutions benefit from decreased risks and from liquidity as a result of instant collateral to guarantee or reimburse defaulted loans. The farmers benefit from increased profitability due to the ability to delay sales, from improved price transparency, and from enhanced negotiating ability as a result of working in farmers' groups.

Given immediate cash needs, small-scale farmers often sell their produce shortly after harvest, when prices are at their lowest. Without adequate storage facilities and access to loan funds, they are unable to hold their crops for later sale during the "lean season" when prices are much higher.

Since these households cannot sustain themselves on small parcels of land they own or cultivate, they provide labor to others for both farm and non-farm activities inside and outside their villages. Some members of these households migrate to towns and cities on either rotational or a long term basis. In many developing countries both small landowners and tenants are under increasing pressure to get out of the agriculture sector altogether. Underlying this process of "depeasantization" are market forces and policies affecting landholdings, rents, prices, credit, inputs, and public investment in social and physical infrastructure.

It is under this premise therefore that this study has been conducted to evaluate the actual contributions of ICP to cereal farmers in order to improve the livelihoods of farmers of the district.

The study will therefore attempt to evaluate the benefits (both quantifiable and non-quantifiable) participating farmers have realized from the ICP as against the study's proposed objectives.

1.6. RESEARCH HYPOTHESIS

In order to have guidance for the research, the following hypotheses were developed from the research topic;

H_0: The participation in ICP leads to improvement in the economic situation of the cereal farmers in the Pru district.

H_1 : The participation in ICP does not lead to improvement in the economic situation of the cereal farmers in the Pru district.

1.7. SCOPE

The study was conducted in the Pru district of the Brong Ahafo region of Ghana, which was carved out of the Atebubu district in 2004. The district shares boundaries with six other districts namely, East Gonja in the north (Northern Ghana), Sene in the east, Nkoranza and Atebubu Amantin in the south and Kintampo South in the west, all in Brong Ahafo region. The district capital, Yeji is located 493km North of Accra, 223 km North-East of Kumasi and about 310 km (via Nkoranza / Techiman) North-East of Sunyani.

Agriculture is the mainstay of the Pru district economy. It employs about 80 percent of the economically active labor force. Nearly every household in the district is engaged in farming or agricultural related activity. Farming in the district is largely carried out on small-scale basis, the average acreage cultivated ranges between 1-2 hectares for all crops.

Small - scale farmers make up more than 90 percent of the district farming population. Although their production represents nearly three quarters of the district's food produced, small-scale farmers do not enjoy any real market clout. As a result, they remain classic price-takers' generally isolated from market information and profitable market opportunities and also find it difficult in accessing working capital loan.

Despite its importance in the district economy, much of the agricultural potentials in the district remain unutilized. For instance, out of a total of 22,261 hectares of arable land,. only about 3,167 hectares is currently utilized (Pru DADU, 2006). Small-scale farmers would therefore be able to expand if they are able to access timely credit.

The study population was cereal farmers, specifically 123 maize farmers, constituting about 30% of total ICP membership of groups in the eight communities participating in the TechnoServe - facilitated Inventory Credit Programme.

1.8. OVERVIEW OF METHODOLOGY

Separate structured questionnaires were used to collect primary data from executives of participating groups, financial institutions and also from both participating and non-participating individual cereal farmers.

From a group list, members to be interviewed were randomly selected to give an equal chance for all members and a sample size of 123 was targeted to be interviewed from a population of 410 farmers.

1.9. LIMITATION

Time as well as limited financial resources was a limiting factor for the study; however, activities was planned and scheduled in such a way that it did not drastically affect the reliability of the study.

1.10. ORGANIZATION OF CHAPTERS

The paper was organized as follows;

Chapter I constituted the introduction of the study and explored the scope and objectives of the study. Chapter II reviewed the literature on inventory credit, rural poverty, rural agriculture financing and on group versus individual liability lending programs.

Chapter III presented the methodology and Chapter IV constituted the analysis and discussions of the findings from the surveys conducted. Then, Chapter V concentrated on summary of findings, recommendations and conclusions.

CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION

The contribution of inventory credit systems to developing agricultural markets is not well known especially outside the community development and agricultural development sectors. This section attempts to review scholarly journals, periodicals, internet documents and reference journals in relation to subject area.

The theoretical literature has focused almost exclusively on rural poverty, food security and comparing the group versus individual liability, loan repayment and accessibility.

2.2. SMALL FARMERS AND THE MARKET

Farming in the Pru district continues to be main source of employment, livelihood and income for between 50% -80% of the population. Of this percentage, small farmers make the up the majority, up to 70 - 95% of the farming population (TechnoServe Baseline Survey, 2003). They have traditionally survived on subsistence production. Many in the last two decades have experimented with export crops with occasional initial success but many disastrous failures.

Analysts such as Conroy, Murray and Rosset (1996) write about how many developing countries cannot achieve a satisfactory level of development because their small farmers have been sidelined. Respected economists such as Janvry and Jeffrey Sachs (1987) believed that the sort of inequity and poverty the peasantry must face actually blocks true development. They went further to state that the rural poor

are so poor that they have little purchasing power. They thus do not constitute an important market for domestic industry. This in turn means that rural markets are too small to stimulate much economic activity, so production is largely directed toward urban markets and urban elites; as a consequence, the level of demand in the rural economy is too narrow to sustain broad based, effective development. This creates a high degree of dependence on urban markets and a lack of structural incentives that can bring about better living standards for the poor

Coulter and Shepherd (1995) noted that two misconceptions undermine the ability to improve this situation. The first is that small-scale farmers in developing countries operate outside the cash economy and are, therefore, uninterested in, or incapable of, making savings and investments. The fact is that cash outlays are required for school and medical fees, funerals, weddings, domestic needs and increasingly, agricultural inputs. Although these pressing demands for cash make savings and investment difficult, there is ample evidence that with increased cash income, small farmers will begin to save and to invest.

The second misconception as noted by Coulter and Shepherd, particularly among bankers, is that it is not possible to lend profitably to small-scale farmers. Undoubtedly, agriculture is a relatively risky business, and experience with lending to small-holders has been particularly poor (Bank of Ghana, 2006 Annual Report). Nonetheless, a range of profitable financial products do exist that can expand capital flows into this sector. Inventory credit is one of them.

2.3. RURAL POVERTY AND ITS EFFECT ON NATIONAL ECONOMIES

The rural poor depend largely on agriculture, fishing, forestry, and related small – scale industries and services

Rural poverty accounts for nearly 63 percent of poverty world wide, reaching 90 percent in some countries like Bangladesh and between 65 and 90 percent in sub-Saharan Africa. (Exceptions to this pattern are several Latin American countries in which poverty is concentrated in urban areas.) In almost all countries, the conditions – in terms of personal consumption and access to education, health care, potable water and sanitation, housing, transport, and communications – faced by the rural poor are far worse than those faced by the urban poor (Khan, 2001).

In the IMF Economic Issues No. 26, it was acclaimed that persistent high levels of rural poverty, with or without overall economic growth, have contributed to rapid population growth and migration to urban areas. The IMF went further to state that much urban poverty is created by the rural poor's effort to get out of poverty by moving to the cities. Distorted government policies such as penalizing the agriculture sector and neglecting rural (social and physical) infrastructure, have been major contributors to both rural and urban poverty (Khan, 2001).

Achieving agricultural growth by applying new technologies such as Inventory Credit Programme is one of the most important ways to reduce rural poverty. The impact of such efforts on the rural poor, however, depends on initial conditions, the structure of relevant institutions, and incentives. Research shows that agricultural

stagnation especially in the marketing sector of the value chain has hurt the rural poor in sub- Saharan Africa by creating food shortages and higher prices that have reduced their ability to buy food and find work (TechnoServe, 2000 Finding paper).

In short, poverty becomes a vicious circle that is itself an obstacle to development.

2.4. CLASSIFICATION OF RURAL POVERTY

The rural poor are not a homogeneous group. The IMF institute attempts to classify the rural poor according to their access to agricultural land: **cultivators** have access to land as small landowners and tenants, and **non-cultivators** are landless, unskilled workers.

It went further to state that there is, however, much functional overlap between these groups, reflecting the poverty-mitigating strategies of the poor in response to changes in the economy and society.

The typical Ghanaian peasant farmer falls within the cultivators' classification of the rural poor and this forms the bulk of the rural poor in developing countries, they are directly engaged in producing and managing crops and livestock (IMF Economic Issue No. 26).

Another class of rural poor is the **rural women,** Khan (2001) pointed out that rural women tend to suffer far more than rural men. The IMF in their Economic Issue No. 26 went further to proclaim that the face of rural poverty in Africa is feminine.

2.5. GROUP VERSUS INDIVIDUAL LIABILITY LENDING PROGRAMMES

Group lending is claimed by development experts to improve repayment rates and lower the transaction costs when lending to the poor by providing incentives for peers to screen, monitor and enforce each other's loan. However, some argue that group liability creates excessive pressure and discourages good clients from borrowing, jeopardizing both growth and sustainability.

Ghatak and Guinnane (1999) suggest that group liability can help institutions improve repayment through four channels:

i. Ascertaining how risky the borrower is (adverse selection)
ii. Ensuring that the funds will be used properly
iii. Ensuring that the borrower tells the truth in case of default about her ability to pay
iv. Enforcing repayment if the borrower is reluctant to pay

They further asserted that Group liability contracts in theory can lead to higher repayment because borrowers have better information about each other's types, can better monitor each other's investment, and may be able to impose powerful non-pecuniary social sanctions at low cost.

However, there are other studies that suggest that group liability may instead jeopardize repayment. For example, Besley and Coate (1995) point out that those borrowers who would repay under individual liability may not do so under group liability. This situation may arise if members realize that they cannot repay as a

group. In this situation, since no further loans will be granted, members that could otherwise repay decide to default because the incentive of future credit is no longer present.

The lender's ability to retain good borrowers and attract new ones is equally important to assess the overall profitability. Madajewicz (2003) argues for instance that under group liability, loan sizes are limited by what the group can jointly guarantee, so clients with growing businesses or those who get well ahead of their peers in scale may find that the group contract bogs everyone down. Below a certain scale, group liability dominates individual liability. But above a certain size of business, individual lending will be preferred by customers.

2.6. FOOD SECURITY SITUATION IN DEVELOPING COUNTRIES

Food security and insecurity are terms used to describe whether or not people have access to sufficient quality and quantity of food (Oxford Advanced Learners dictionary). They are affected by factors such as poverty, health, food production, political instability, infrastructure, access to markets, and natural hazards. Improved food security is important for global reduction of hunger and poverty, and for economic development (POSTnote, 2006).

One aim of the Millennium Development Goals (MDG) is to reduce by half the proportion of people suffering from hunger by 2015. Currently, according to the World Food Programme (WFP), 820 million people are affected by hunger in developing countries and numbers are not falling quickly enough to achieve the goal From TechnoServe's Baseline study, the food insecure situation in the Pru District is 5 months.

2.7. SOURCES OF CREDIT AND COMMITMENT OF FINANCIAL INSTITUTIONS TO SMALL-SCALE FARMERS

Food and Agriculture Organization (FAO), 1992 Case Study on private and informal sources of marketing credit, established that many traders can not fund their operations from their own equity, particularly since the extent of these operations is constrained by stockholding limits. Others can raise money on the country's highly developed informal credit markets at high interest rates greater than the prevailing bank rates. Sometimes such loans are made against negotiable warehouse receipts. Traders will often lend short-term funds or "call" money to each other.

In a TechnoServe's Baseline survey undertaken in 2005, few farmers in the studied district accessed credit during production seasons. It was realized that farmers generally used their own resources; the extent of growth of their business was therefore seriously hampered.

For the few who were able to access credit, the survey established that the purpose of loans/credit contracted was basically for agricultural inputs purchases, food processing and business expansion but in reality is used for other social issues making repayment difficult. The table below depicts the percentage distribution of credit/loans by purpose reported in the surveyed district.

Table 2.1: Distribution of Loans by Purpose

Type	Percentage
Agricultural inputs	51.7%
Food processing	6.9%
Business expansion	13.8%
Others	27.6%

Source: TechnoServe Baseline study (2005)

2.8. IMPORTANCE OF COLLATERAL TO BANK FINANCING

Collateral is very important to financial service providers (Agricultural Investment Source book). When they issue loans, there is the risk of borrower default. When they collect deposits and on-lend them to other clients, they put people's savings at risk. Anyone who conducts cash transactions or makes investments risks the loss of those funds. So all financial intermediaries face risks that they must manage efficiently and effectively to be successful. Failure to do so results in financial losses then donors, investors, lenders, borrowers and savers lose confidence and funds begin to dry up (Rural Finance website).

The establishment of collateral in relation to a loan transaction means that the lender is assured of recovering, if necessary by court action, the material value of the loan. This means that the outreach of financial services is often influenced by the collateral that borrowers can offer, particularly in rural areas where agricultural production risks are perceived as high (World Bank, 2004).

Conventional collateral includes the mortgage of land or pledging of moveable assets. It also includes third-party guarantees or endorsements. Poor people have few assets to pledge and land titles are often uncertain. This has led to the use of collateral substitutes such as group guarantees and solidarity funds (Rural Finance website).

2.9. INVENTORY CREDIT PROGRAMME DESCRIPTIONS

Inventory credit is the use of securely stored agricultural produce as collateral for commercial loans, Kwadzo (2000). Participating farmers form groups of typically 20 to 50 members to store their produce into the "lean season". As this time, prices are at their peak, typically 75 to 250 percent above harvest time prices. After storage over a period, the farmers maintain the flexibility to exercise one of the following options.

a. They can decide to sell their produce through the group, using the proceeds to repay the bank (principal and interest) and the group for storage facilities, typically earning a net profit ranging from 40 to 400 percent.

b. They can buy back their own produce from the group to use as food, paying back the bank loan and the group's storage costs, yet saving a substantial amount by avoiding high lean season market prices.

FAO publication (2006) stated that the rationale behind ICP was to;

- Create an opportunity for small-scale farmers to take advantage of seasonal price swings otherwise captured by local traders, thereby accumulating savings for investment in less speculative ventures.
- Enhance food security for farmers who could buy back (or "redeem") their produce from storage rather than selling it cheaply at harvest and buying back at high prevailing market prices; and
- Reduce risk for banks which were skeptical of lending to rural small-scale farmers.

2.10. TYPICAL ANNUAL PRICE CURVE FOR CEREAL

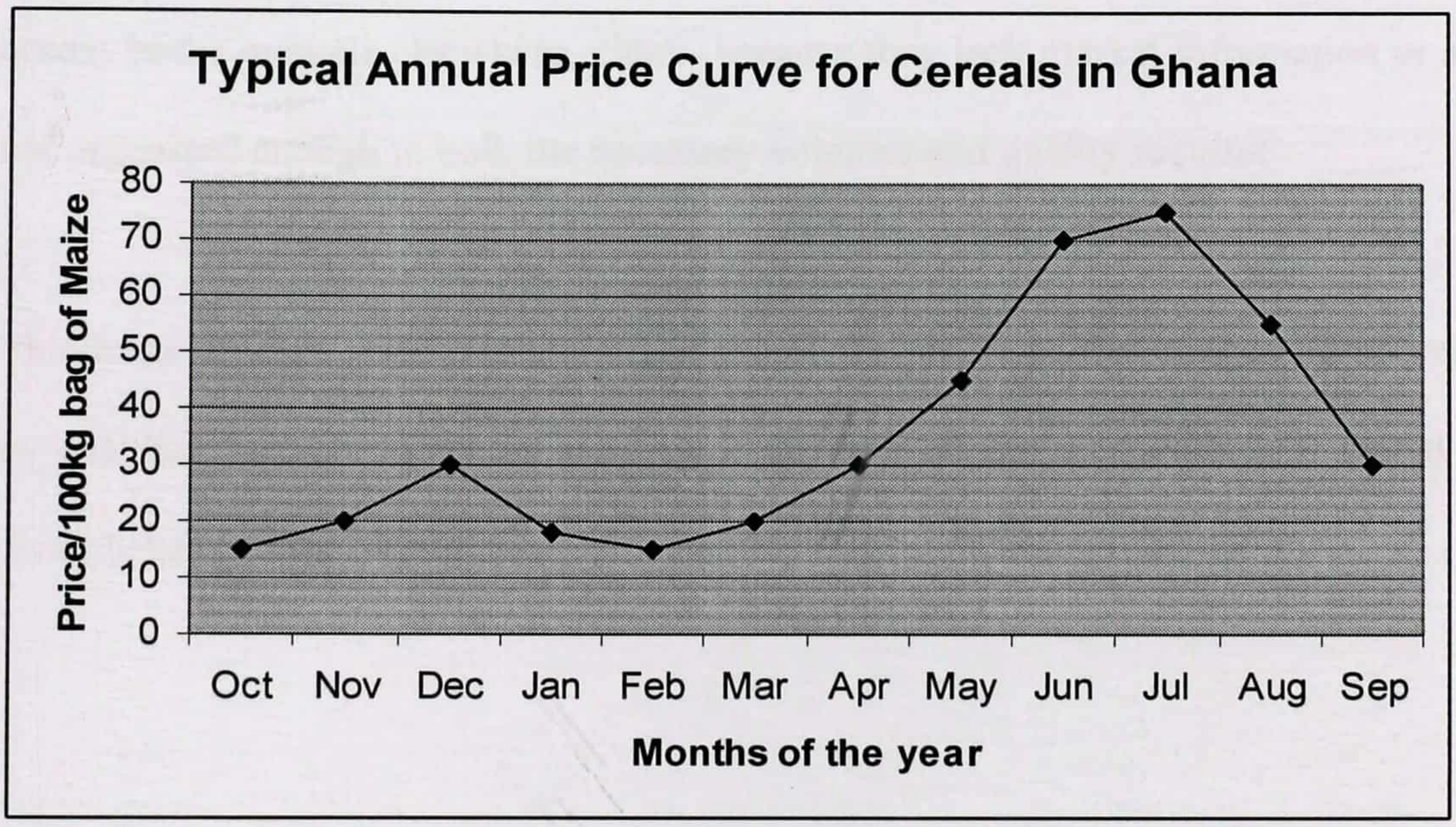

Figure 2.1: Typical price curve for maize in Ghana

Source: Post -Harvest Management Division, Ministry of Food and Agriculture

From the graph above, there is an average appreciation of market price of maize after harvest; this is mainly attributed to the festivities period, it then dips to a lowest

between Jan – March, by which time the minor season maize will be released onto the market, the market forces and seasonality (because Ghana's agriculture is usually rain fed) pushes the price to climb after May, peaking in August before the inception of the major season maize harvest. This therefore results in a free-fall in the price of the old stock, precaution is therefore taken to dispose off inventory stock before this period or else there are great transactional losses.

On the website of a private-sector firm launched in 1997 to provide services targeted at smallholder farmers (www.kacekenya.com) stated that this notable drop in price at harvest time is due to a combination of factors: partly because farmers need cash and must sell; also because farmers do not have sufficient storage to store the crop until the price improves post-harvest; and furthermore, because farmers are not able to access better markets elsewhere, either because they lack market information or are not organized enough to bulk the necessary volumes and quality required.

This issue of wide price fluctuations is one of the problems that ICP could address, by enabling farmers to access some cash for their commodity while it is stored to await better post-harvest prices.

2.11. MECHANICS OF INVENTORY CREDIT

According to FAO and TechnoServe, institutions that are deeply involved in ICP, the programme works in the following ways;

Farmers form groups typically of 15-50 members to store their produce. The technical service provider such as TechnoServe operates the warehouse, and a lending institution provides credit based on the warehouse receipt. Upon arrival of the goods at the warehouse, the products are graded according to moisture content, weight and availability of foreign materials. The farmers then receive a receipt stating the quantity and quality of the goods deposited. Loans are given to groups on behalf of their members, which then disburse them individually.

Initially, the credit amount was limited to 70 -80 per cent of the stored grain's harvest value to limit the lender's risk, in case prices did not rise as expected. With increasing warehouse activity and competitors entering the market, the inter-seasonal price gap was narrowed. This resulted in the loan percentage declining to 40 – 50 percent due to the farmers decreasing debt capacity (TechnoServe, Finding paper 1999).

Once the grain is warehoused, the goods are collective property of the group, which is jointly responsible for treatment, storage and sale. Nevertheless, each farmer's account is tracked separately by the group. Throughout this process, the technical service provider undertakes breakeven analysis and gives market advice.

Under the ICP, farmer group executives have an incentive to ensure that only quality product at the correct weight is brought into inventory for storage, thereby imbedding the culture of standardization and quality assurance in participants. Also, for households without collateral, ICP is amongst the few means by which they can benefit from a lending package either to expand their farms or undertake an economic venture, Fraslin (2002).

In addition and of greater significance for rural development is the related benefit associated with the Inventory Credit Programme. This includes;

- An increased flow of credit to rural areas.
- Improved yields
- Reduced post-harvest losses
- Greater food security through the local storage of domestic grain
- Investments in small-scale agro processing enterprises
- The creation of market and service linkages, and
- Improved farmer group dynamics and enhanced leadership capacity among participating farmers.

Other farmers seeing the benefits accruing to participants in the Inventory Credit Programme are independently adopting the practice of good treatment and inter-seasonal storage of grains.

Inventory credit is unlikely to be successful in countries where the macroeconomic and policy environment is unsupportive of private trade. Traders will not undertake

storage, even for a few months, if they sense a danger that Government will impose price controls, seize stocks (on the ground that traders are "hoarding"), ban exports, permit unscheduled food aid imports and/or suddenly release food security reserve stocks in response to only modest price rises.

To introduce inventory credit successfully into a country, the following conditions will need to be satisfied:

- Acceptance by the Government that traders are entitled to profits they may earn from storing produce
- Absence of any sort of controls on the price, internal movement and private stocks of grain
- Limited Government involvement in trading, whether through parastatals or quasi-governmental cc-operatives
- Consistent and transparent policies towards food aid and international trade
- Moderate and fairly predictable real interest rates

2.12. COMPONENTS OF ICP

Kwadzo (2000) listed the components / strategies of the ICP as implemented by TechnoServe and other development institutions which have evolved over time as;

2.12.1 Collateralized Loan Scheme

2.12.2 Buy/Store and Sell

2.12.3 Simple Storage

2.12.4 Redemption

2.12.5 Shelling and drying; and

2.12.6 Storage and Marketing

The **collateralized loan scheme** involves using stored grain as collateral to obtain a commercial loan that is repaid upon final sale of grain approximately six (6) months later.

The **buy /sell** activity involves the enterprise using either its own resources or a commercial loan to buy produce mainly from non participation farmers, storing it over a period and selling later to make a profit. Mostly, the enterprise uses any "left-over" funds from accessed credit to undertake this activity.

Simple storage refers to when participating farmers bring their grains for storage without taking any commercial loan. Thus, when the grain is finally sold, participants only pay the associated storage and treatment cost. This activity is common among matured enterprises in the ICP.

Redemption of grains is common in food insecure communities where it serves a food security need. Participating farmers "buy back" their own produce from the group to use as food, paying the bank loan and the group's storage costs, yet saving a substantial amount by avoiding high lean season food prices.

Shelling and drying is one of the ancillary activities that have been recently introduced as part of the ICP package for participating farmers' and farmer groups. Either an individual participant and/ or a participating group is assisted to acquire the needed shelling and drying equipment, and provide these services to members for a fee.

Beyond shelling and drying, an individual farmer, and/or a participating group may form a marketing company that buys the grain from both members and non-members at premium price. The grain is then stored and marketed later when prices are highest or through periodical off-loads to a contractual buyer.

2.13. CURRENT FARM CREDIT SITUATION

Desai and Mellor (1993) noted that farm credit has always been an important factor in improving agricultural productivity and strengthening the rural economy in every African country. However, the operational mechanism of farm credit services is now complicated by emerging new challenges that are changing the context in which African's rural economic landscape operates.

They went further to suggest that the need to address farm credit issues has now become even more vital amid the increasing forces of globalization and economic liberalization on the financial and agricultural markets in the region, which has narrowed the policy options of the governments in many countries. Likewise, credit institutions have to observe more rigid rules following the international standards, and are now restricted to lessen their traditional role of protecting the interests of the farmers. Trade liberalization has also led to a considerable decrease of agricultural product prices, consequently making farmers' cash-flows unstable. In this process, small-scale farmers in Africa are likely to experience harsher farm credit environment.

In some developing countries, agricultural credit policy heavily relies on commercial banking, the rigid mechanism of which is not compatible with the resources of the small-scale farmers, Desai and Mellor (1993). This has resulted to lower access by

the farmers to financial resources. Important lessons from past rural credit programs point to the need to redesign or improve delivery mechanism to minimize institutional barriers and, hence, open access of small-scale farmers to credit. In rural communities of developing countries where physical collateral is a major problem, land certification program should be one of the national policy options, Walker *et al* (2005). Sustainable microfinance institutions (MFIs) should also be established, and should lead to modified-conventional banking system based on the capacity and resources of the small-scale farmers.(Daily Graphic, Dec 3 2005 Edition)

The World Bank in its 2004 Annual publication noted that Agriculture remains an important sector in most developing countries, whether its share in the Gross Domestic Product (GDP) is large or small. Hence, agricultural finance and/or credit are essential to the farmers and to the improvement of the rural economy in the region. The demand for agricultural credit is increasing parallel to meeting the requirements of increasing agricultural productivity and improving the livelihood of developing countries farmers.

However, as a result of economic globalization and trade liberalization, small-scale farmers in the developing countries face keen competition with foreign farm products, making it difficult to improve the relative level of farm income. This, in turn, has unfavorable impact on the creditability and payment ability of the farmers. Effective measures must be taken to solve the increasing debt burden of farmers, particularly to raise the competitiveness and sustainability of agricultural banking institutes.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

This chapter outlines the various tools; methods and procedures which were used to gather data for the study. It specifically looked at the population, sample size and sampling technique, research instruments, data collection procedure, pre-testing of questionnaire and the tools used to analyze the questionnaires and the data analysis.

A good research involves a proper data collection and data analysis methods that best represents the scope and elements under study. This study examines Inventory Credit Programme and its impact on cereal farmers specifically in the Pru district.

3.1. POPULATION

The entire TechnoServe-assisted groups in the Pru district served as my target population. Thus, members of the 15 groups in 8 communities were considered. This population was selected because that would give a wide coverage of the result of the findings. In addition to this, most rural banks claim to be supporting agricultural marketing and poverty alleviation, to make a more representative conclusion, facts were therefore collected from YAPRA Rural Bank; the rural bank operating and collaborating TechnoServe in the ICP implementation in the district.

By contacting both ICP participating and non-participating cereal farmers, and the major lending institution for ICP in the Pru district primary information was obtained for the study.

3.2. SAMPLE SIZE AND SAMPLING TECHNIQUE

A sample size of 123 respondent farmers were selected from a sample population of 410 cereal farmers from 15 TechnoServe- assisted groups in 8 communities, representing 30 percent of the population. Thus, a selection was made to represent all the various TechnoServe-assisted groups in the district that participate in ICP.

Respondents comprise of both ICP participants and non-participants (members of the group), these respondents were purposively selected. This method involved grouping the elements of the study, which is ICP participants and non-participants (groups of identifiable characteristics, and then used the purposive criteria to select the respondents or elements). Due to the nature of the spread of the study, this method is considered as suitable in arriving at a comparison with regards to the benefits of ICP in accordance with the established objectives of the study.

To ensure validity of data, several people analyzed the results and reliability through careful data collection and having key informants review the draft case reports. In view of the subjective nature of the study, in line with, Goodwin *et al's* (1997, pp 170) methodology, the validity would be assessed first, by sending a summary of the findings to ICP experts for their comments and suggestions.

3.3. TOOLS AND DATA COLLECTION

Questionnaires, desktop research and interviews were the tools used for the research. The questionnaires and interviews were used to collect quantitative as well as a qualitative data.

3.3.1. Questionnaire

Self-administered questionnaires were mostly used in collecting data from respondents although existing literature also provided additional information. This was printed in English with blanks for respondents to provide their responses (translated into local dialect when necessary). It was numerically listed to differentiate one question from the other. Optional boxes were provided for respondents to tick where necessary.

Questionnaires were used in cases where personal interview was impossible to carry out. For instance literate sample units who were busy may be given questionnaires to answer for collection on a later date. This greatly reduced inconveniences caused by unfavorable interview times and busy schedules.

There were three sets of questionnaires designed for each of the category of people who were directly connected with the ICP namely; ICP participating farmers and non participating farmers, selected official of YAPRA rural bank and TechnoServe-assisted group executives. Some of the questions were open-ended while others were pre-coded with majority of the questions being close-ended.

The open ended questions were given to respondents to solicit for views which they believe are vital for getting information on how ICP have been and can be of more benefit to farmers in the district.

With such questions, spaces were provided for respondents to write their views. This was important because it gives the respondent the freedom to express his views without any restriction of feelings on the issue under investigation. It also provides the basis for recommendations to be suggested on the findings.

On the other hand, the close-ended questions were given to respondents to answer. With these questions, answers were provided for respondents to select their views. Some of the questions were multiple choice where as others were 'Yes/No'.

The length of the questionnaires was influenced by the scope and the depth of information desired.

3.3.2. Pre-Testing of questionnaires

Pre-testing of questionnaires was conducted to ascertain the suitability of the questions asked. In conducting the pre-testing two vital factors the researcher considered were;

- Proximity
- Cost

The rationale was to address any biases that could rise out of the results. It also helped to reframe and restructure the questions in the questionnaire to suit the research objectives.

3.3.3. Interviews

Various categories of stakeholders including banks operating in the district and farmers were interviewed as part of the data gathering process. This was done for relational analysis of views and for other confirmatory responses given by respondents. Information from this category of people will shed authentic light on ICP and how it has impacted on the rural poor in the district.

The use of interview in this study is deemed appropriate in order to get as close as possible to interviewees. This is intended to afford interviewees the opportunity to express themselves and to afford interviewers the chance to ask other relevant questions that may come to bare during the interview process.

Structured and semi-structured questions were used in the data collection.

The structured questions were used to solicit information from the group executives and bank official. This was done to have an in-depth understanding of the ICP situation in the district. These questions were written and researcher categorically asked the interviewee.

The semi-structured questions were used for further clarification from respondents on responses that are not clear. These questions were formed during the process of the interview. Questions are quickly taken to be asked after the interviewee has finished with the questions he is answering.

3.4. PRIMARY DATA

The primary data were collected in 8 TechnoServe-assisted communities of the Pru district, TechnoServe-assisted group executives and rural bank official. Reconnaissance surveys were carried out to identify the relevant stakeholders to identify the groups participating in ICP. After the identification, a sample of beneficiaries was selected to be used for evaluation. The selection of cereal farmers from Techno Serve's assisted groups were based on the following;

- The purpose of assessing Inventory credit (business development and improvement of livelihood)
- Number of cereal farmers in the district participating in inventory credit
- Number of years Inventory credit has been in operation in the district
- Whether Inventory credit programme have impact on the participants
- If the participants and stakeholders are willing to cooperate with the research.

After the selection of the respondents several methods were used to collect primary data. These methods include questionnaires for participants and key stakeholder interviews.

3.5. SECONDARY DATA COLLECTION

Secondary data was obtained from the following sources:

i. Publications

ii. Documents from TechnoServe and other community development agencies

iii. Academic journals

iv. Internet websites

In addition, data in the form of books, institutional handouts and so on were analyzed to identify the various issues in the questions understudy.

3.6. DATA ANALYSIS

Quantitative and qualitative methods of analysing statistical data were employed in the analysis of the data. The results were subsequently computed into percentages. Percentage values, which were not round figure, were approximated to the nearest whole number. Diagrammatic representations of the statistical summaries of the results were presented in the form of pie charts, bar graphs and tables.

Computer data analysis software such as Microsoft EXCEL and Microsoft SPSS and other relevant software were the main tools employed to analyse the data in order to help interpret results. The Microsoft EXCEL and SPSS were used to analyse the close-ended questions. This package was used to compute the percentages because it is easier to use. It can also be used to make the tables needed for discussions of the results.

The other questions that were open-ended were analysed by listing all the vital responses given by the respondents. They were then considered based on their relevance to the research. This gave the general ideas about the problem in question. Computer data analysis software was employed to analyse the data in order to help interpret results.

The research went through six main processes, the process included;

a. Pre-Editing: this looked at examination of the responses received for completeness, relevance, appropriateness and its importance to the study.
b. Coding of Rough Data: this involved the grouping of the data into the various categories and subjects that would best help analyze them.
c. First write up: this is the stage where the information was written to form one continuous piece.
d. Data Entry: this is where modern techniques were employed to typeset the data.
e. Data Modification: at this stage the researcher sent the drafts for editing and for expert advice. After, corrections were made to give it an appreciable form.
f. Finishing: at this stage the entire project was put together and final corrections made. It was at this stage that printing and binding took place to give the research a complete form.

CHAPTER FOUR

ANALYSIS AND DISCUSSION

4.0 INTRODUCTION

This chapter interprets the data gathered from the study with questionnaires; these revelations are captured in this chapter and in some instances recommendations made to improve upon the situation for reading among development agencies and students in the district and as well as those who simply wish to develop new lending instruments.

Sample questionnaires are on Appendix A. Careful analysis of the data collected on the subject in the district revealed certain significant issues. Some of these findings are presented below.

4.1 TARGETED GROUP PROFILE

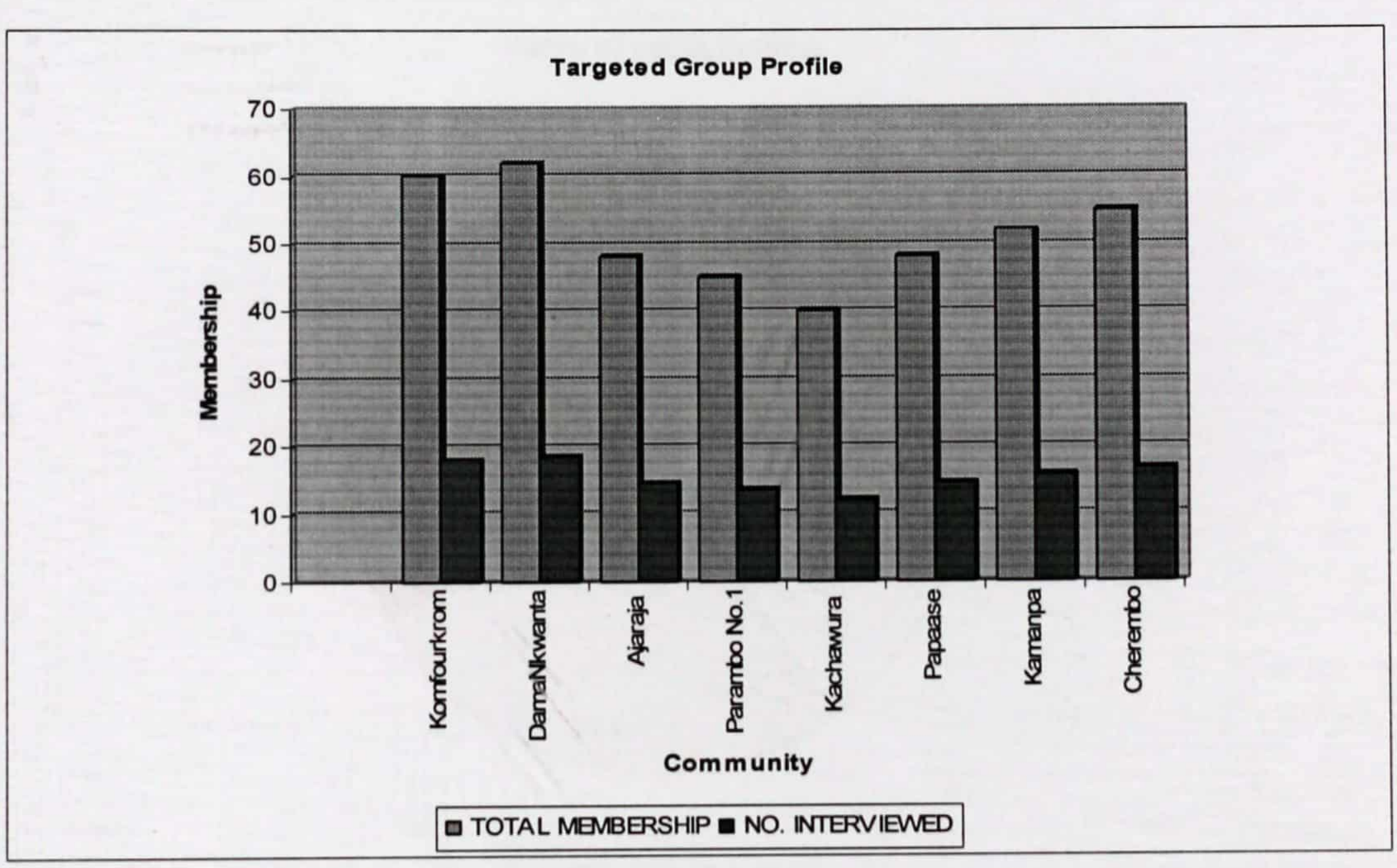

Figure 4.1: Targeted group profile

Source: Author's own construct

The study focused on eight (8) ICP participating communities in the Pru district, the figure 4.1 above gives the details of the number of farmers that were interviewed, on average it was about 30 percent of each group total membership and they are all maize farmers. From the figure, it is obvious that the sample distribution was fairly distributed to give a wider range of participants.

In order to obtain an overview of the incremental growth in participation membership, to ensure its adoption rate which is indicative of how farmers perceived the benefits accrued from the programme, a question of number years in participation was put to the total sample size of 123 farmers. From Figure 4.2 below, seven (7) percent were in the programme as at the time of inception (Year 2003), 13 percent enrolled in year 2, twenty (20) percent in year 4 and 33% in Year 5, this

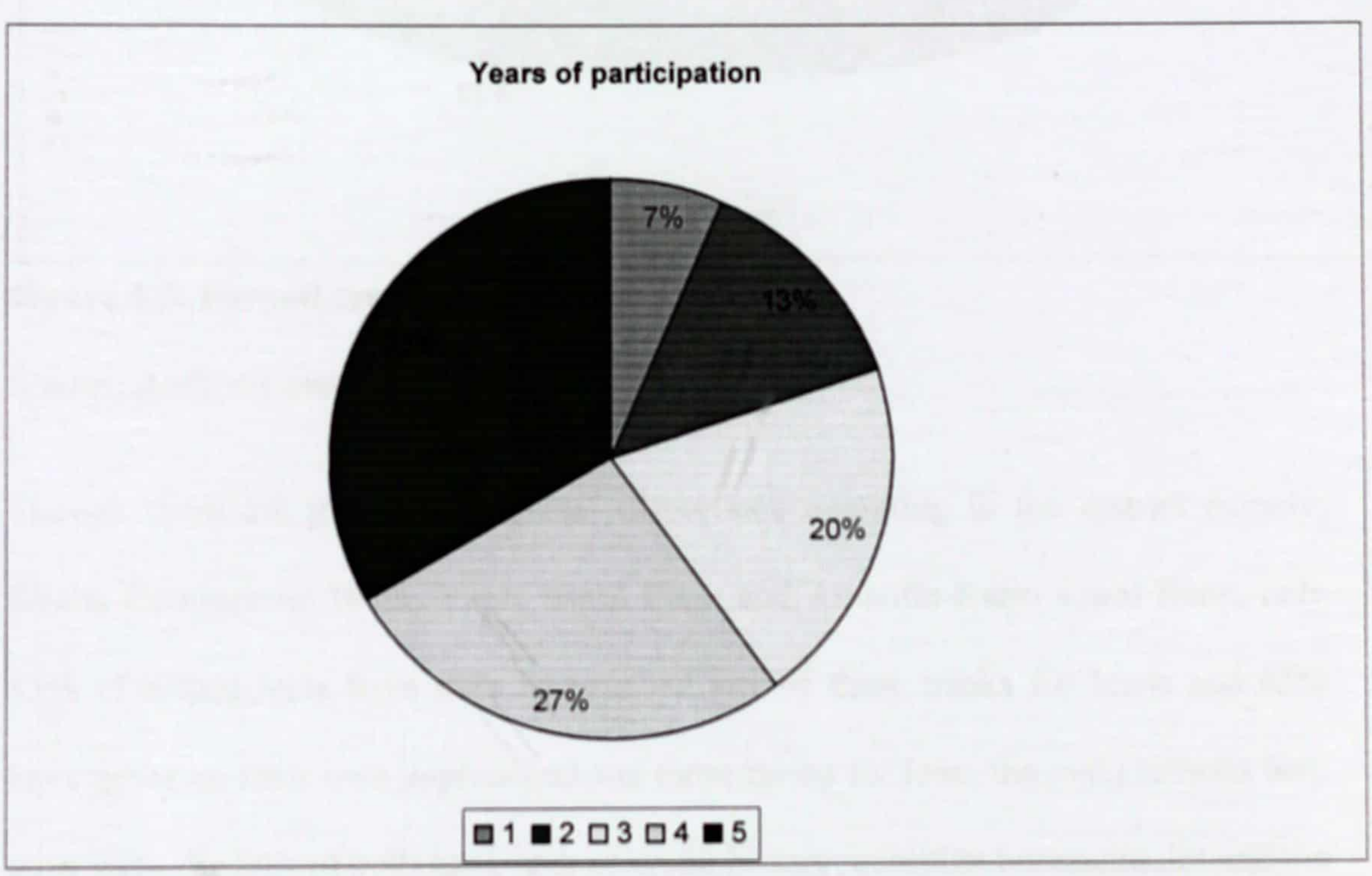

Figure 4.2: Years of participation

Source: Author's own construct

could be attributed to the benefits that initial participants accrued from the programme which serves as a motivating factor for new entrants in the following years; considering the late adoption rate of poor rural farmers because of the fear that new technologies will not work, this trend could easily appreciated.

4.2 CREDIT ACCESSIBILITY

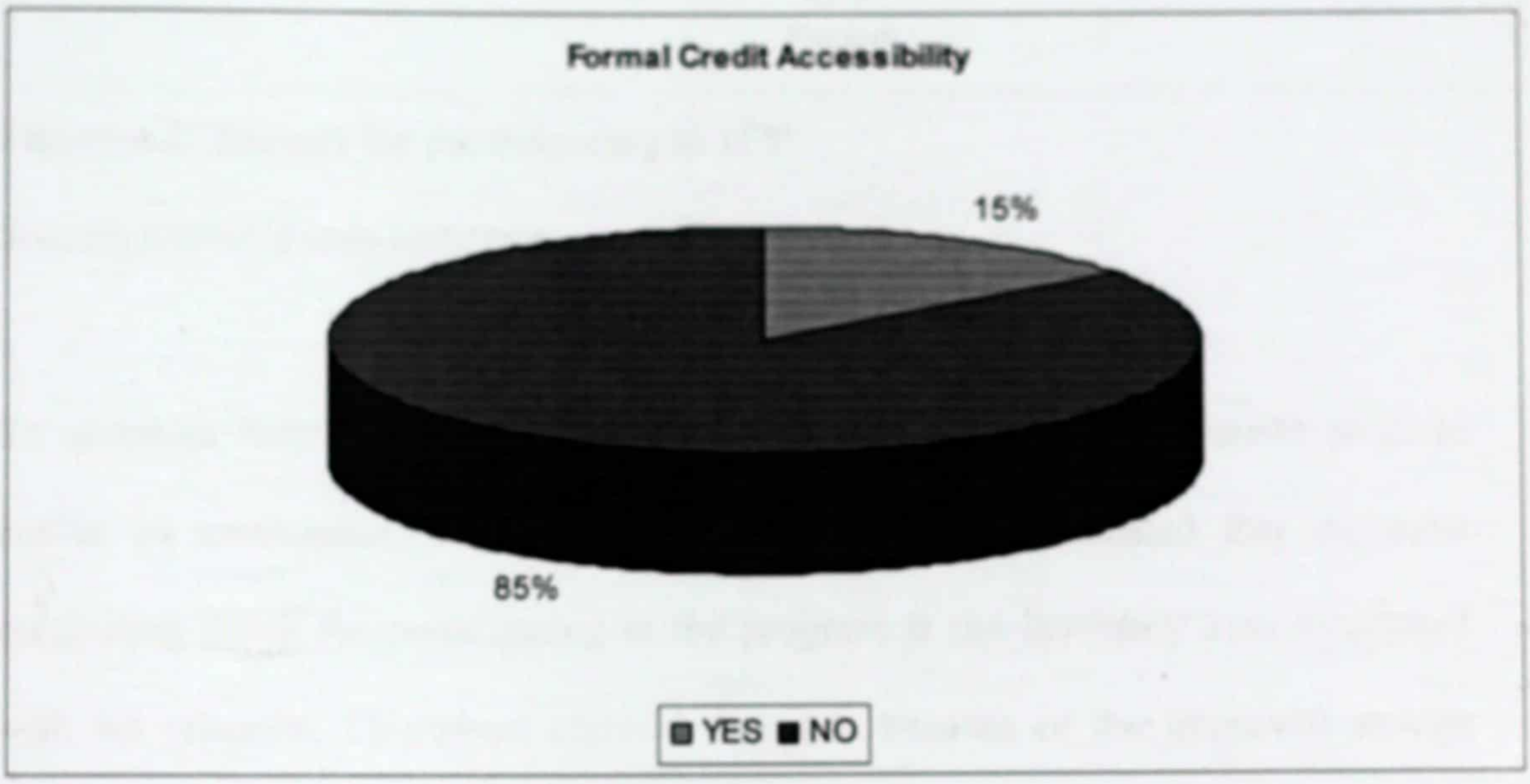

Figure 4.3: Formal credit accessibility

Source: Author's own construct

Though there are three (3) financial institutions operating in the district namely; Ghana Commercial Bank, Yapra Rural Bank and Amantin-Kasei Rural Bank, only 15% of respondents have ever approached any of these banks for loans and 85% have never on their own approached any these banks for loan, the main reasons they gave were the lack of collateral, lack of credit history, complex bureaucracies and the perception that the banks will not grant small scale farmers credit because of the perceived risk associated with their business.

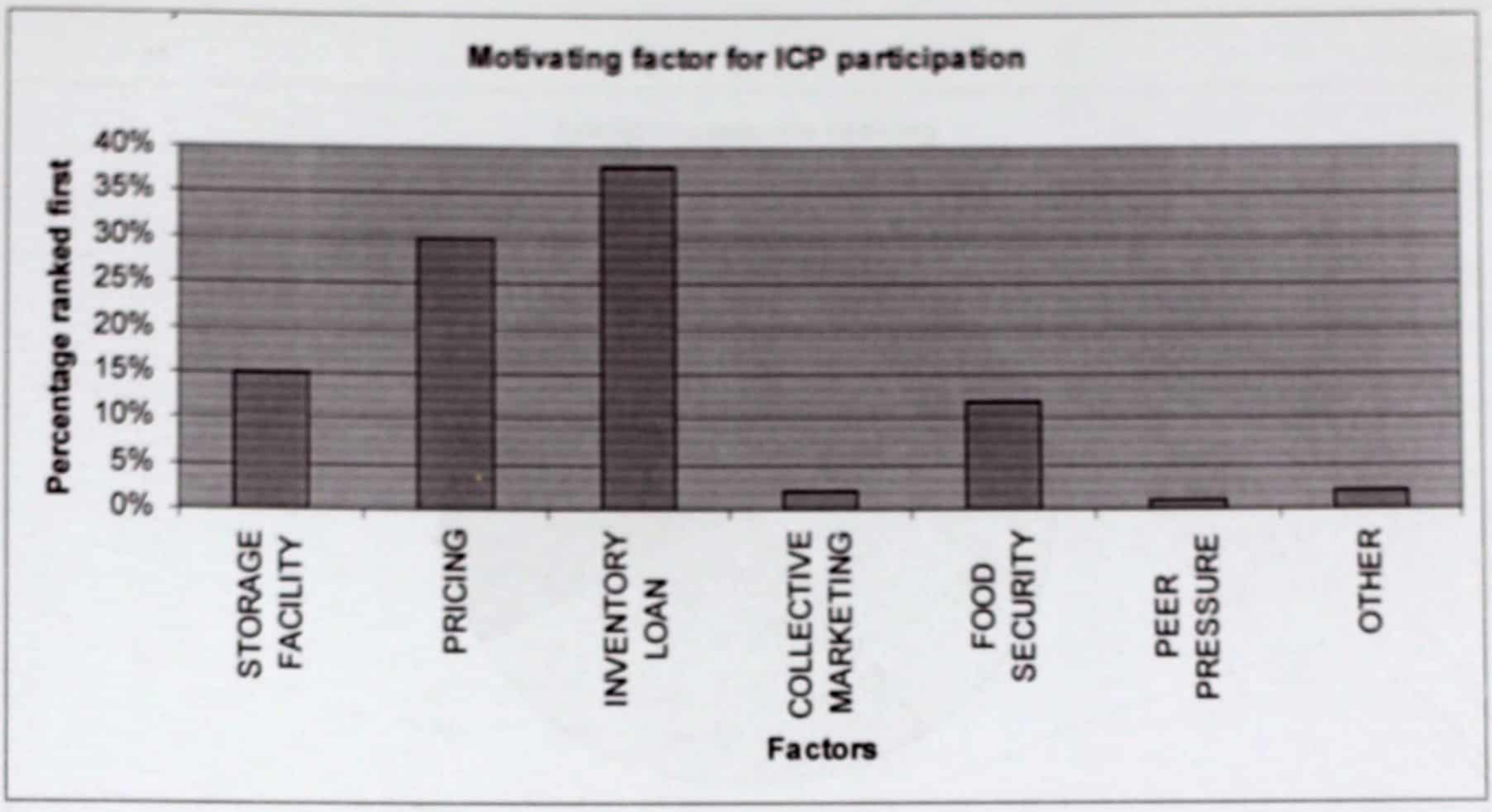

Figure 4.4: Factors for participating in ICP

Source: Author's own construct

To ascertain factors motivating farmers to participate in inventory credit so as to enable its assessment, over 38 percent of respondents indicated that the most motivating factor for participating in the program is the inventory loan associated with the program, 15 percent claimed that it is because of the improved storage technology and facility, 30 percent participated because of the effective sales price premium they received. About 12 percent indicated that food security is the main motivating factor for their participation. Worth mentioning is that, in two of the participating communities were food security is an issue this percentage was found to be far above the study's average. From Figure 4.4 above, it can be deduced that accessibility to loan is the primary reason farmers in the Pru district participate in TechnoServe's sponsored ICP.

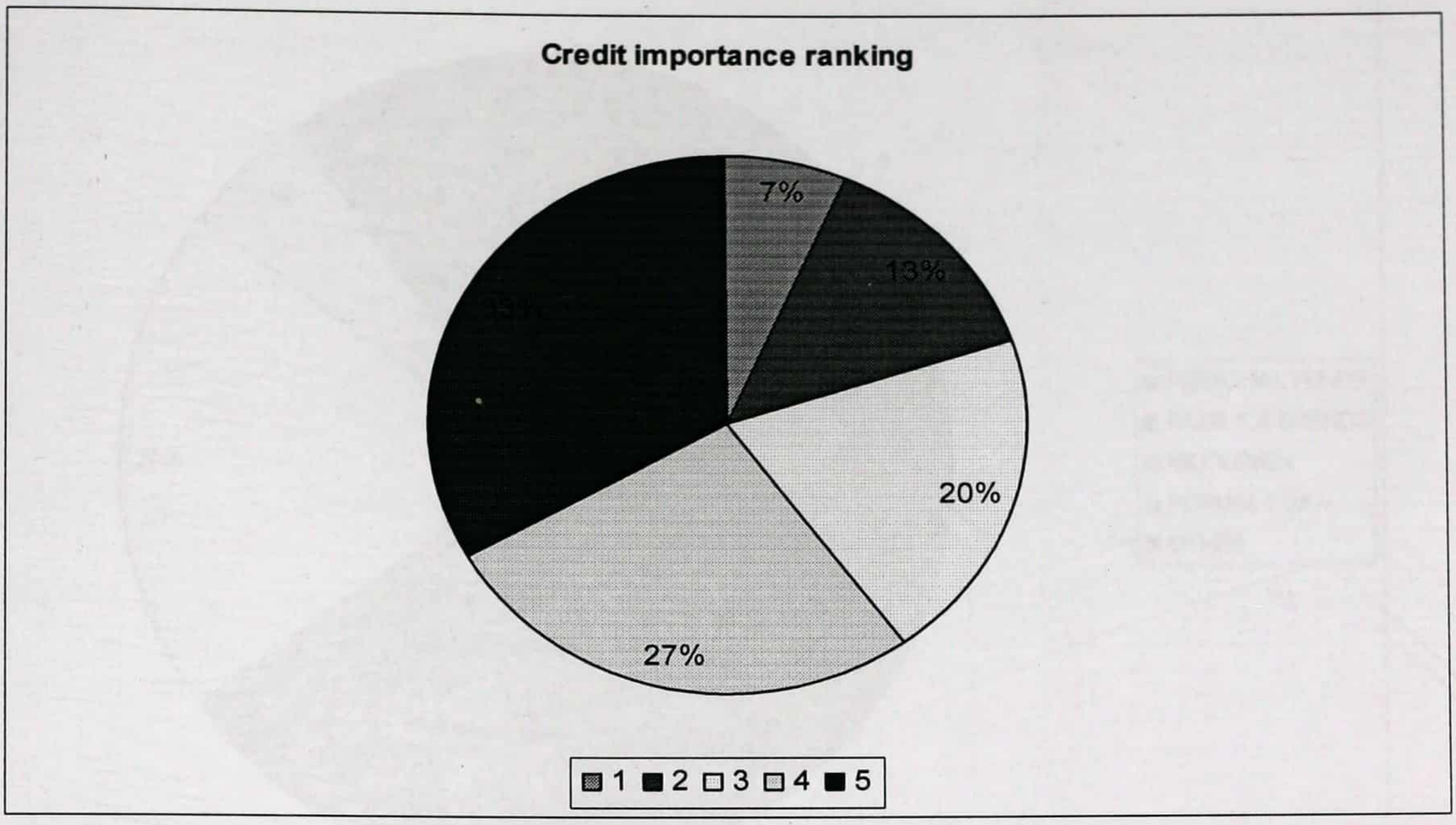

Figure 4.5: Credit Importance rating

Source: Author's own construct

In an effort to narrow down on the importance of credit to the business operation of farmers, respondents were asked to rank credit's importance in their business on a scale of 1 to 5; with the least important being 1 and 5 the most important. Seven (7) percent of respondents mostly women claimed that credit is the least important (mostly women, cautious in terms of accessing credit) and 27 percent ranked credit importance 4 and 33 percent claimed credit is the most important in their business operation.

From the figure 4.5 above, majority of respondents believe that with credit they could implement all their farm business operations and expansion which will result in their socio-economic improvement.

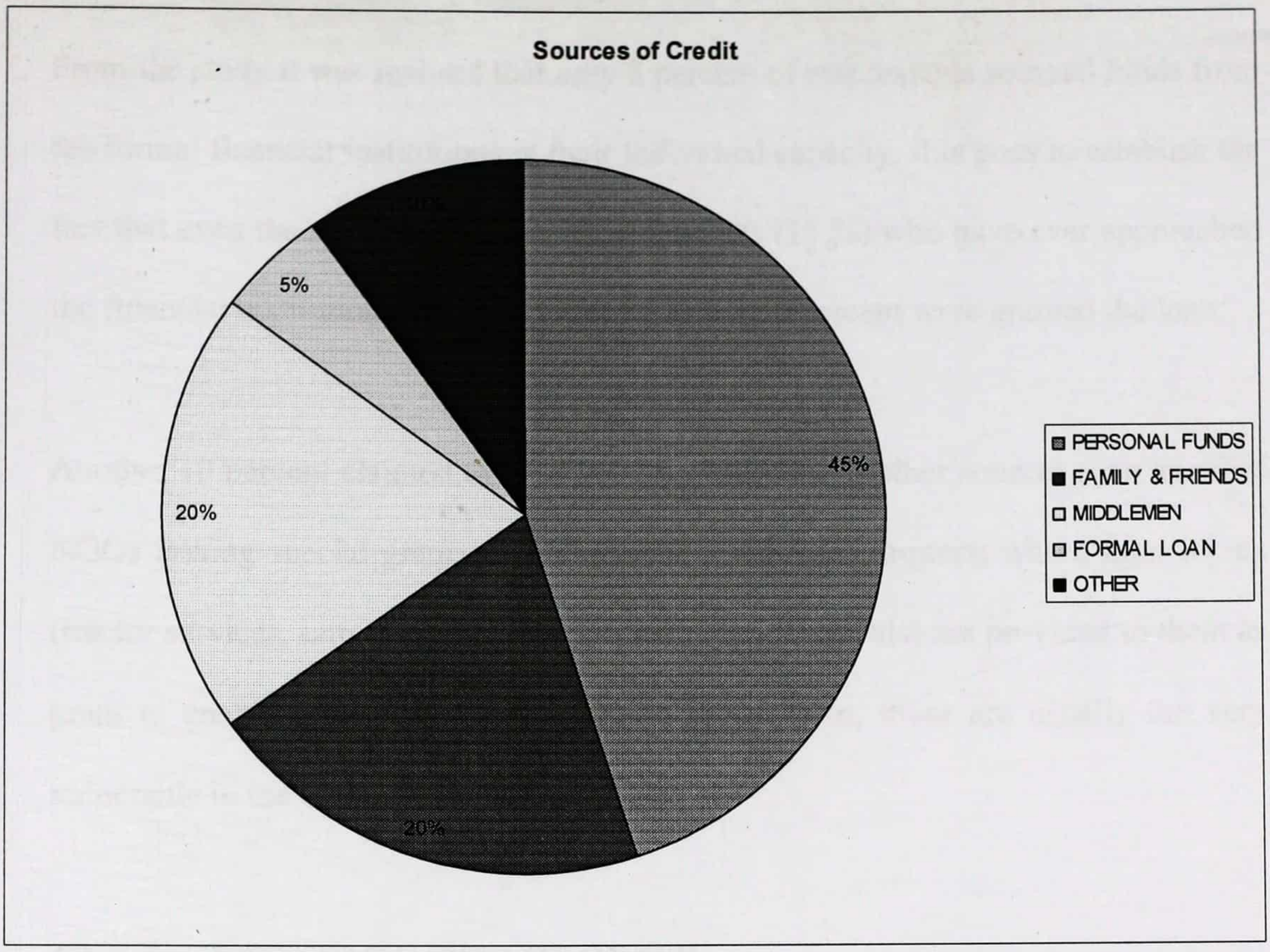

Figure 4.6: Sources of funds

Source: Author's own construct

In light of the limited access to credit, the sources of credit available to farmers for their business operations became imperative. And it was seen from the study that bulk of the funds for their operations came from their personal funds, in fact, from Figure 4.6 above, 45 percent of respondents utilizes their own funds usually "savings" from previous year's activities, 20 percent sourced for credit from family and friends at no cost but usually small in quantum and very unreliable. Another 20 percent utilizes the long relationship they have with their customers (middlemen) to source for pre-financing of their operations. In such a situation, the middlemen purchase the farmer's produce at a pre-determined price to defray the loan usually exploiting the farmer in the process.

From the study it was realised that only 5 percent of respondents sourced funds from the formal financial institutions in their individual capacity, this goes to establish the fact that even the small percentage of respondents (15 %) who have ever approached the financial institutions for loan (Figure 4.3) only 5 percent were granted the loan.

Another 10 percent claimed they sourced for funds from other sources such as relief NGOs issuing special grants for vulnerable small-scale farmers; where farm inputs (tractor services, improved hybrid seeds and agro-chemicals) are provided to them as grant to enable them cultivate an acre of maize farm, these are usually the very vulnerable in the community.

4.3 ECONOMIC IMPACT OF ICP

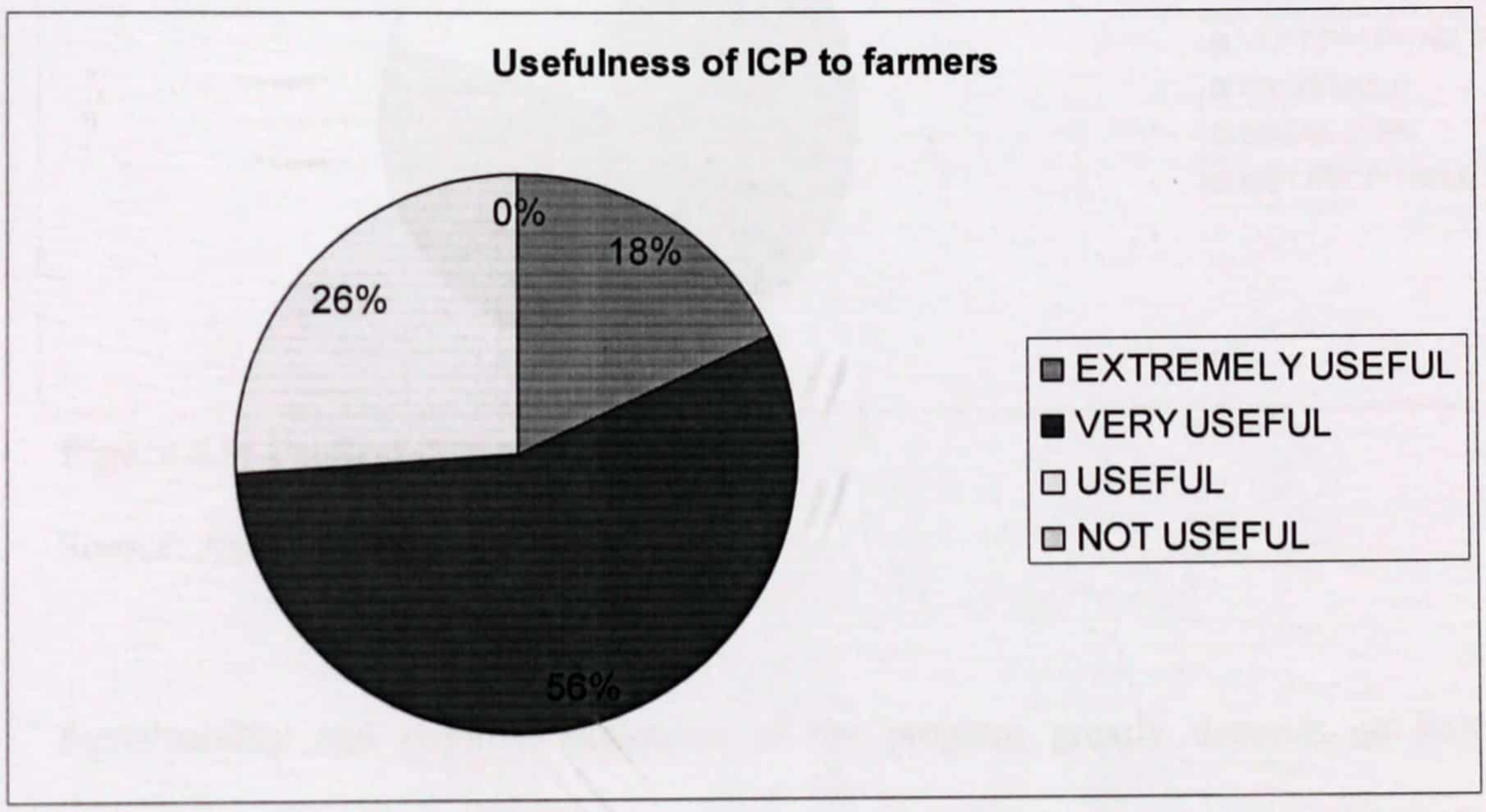

Figure 4.7: Usefulness of ICP

Source: Author's own construct

One of the means by which the effectiveness of an intervention such as the inventory credit program can be verified is to obtain the response from the beneficiaries of the intervention themselves.

As depicted in Figure 4.7 above, 18 percent glorified it to be extremely useful and it was seen that 56 percent of respondents found the ICP intervention to be very useful, 26 percent classified it just useful, worth mentioning is that none of the respondents (0%) found it not to be useful. This goes to confirm that beneficiaries appreciate the impact of ICP on their socio-economic lives.

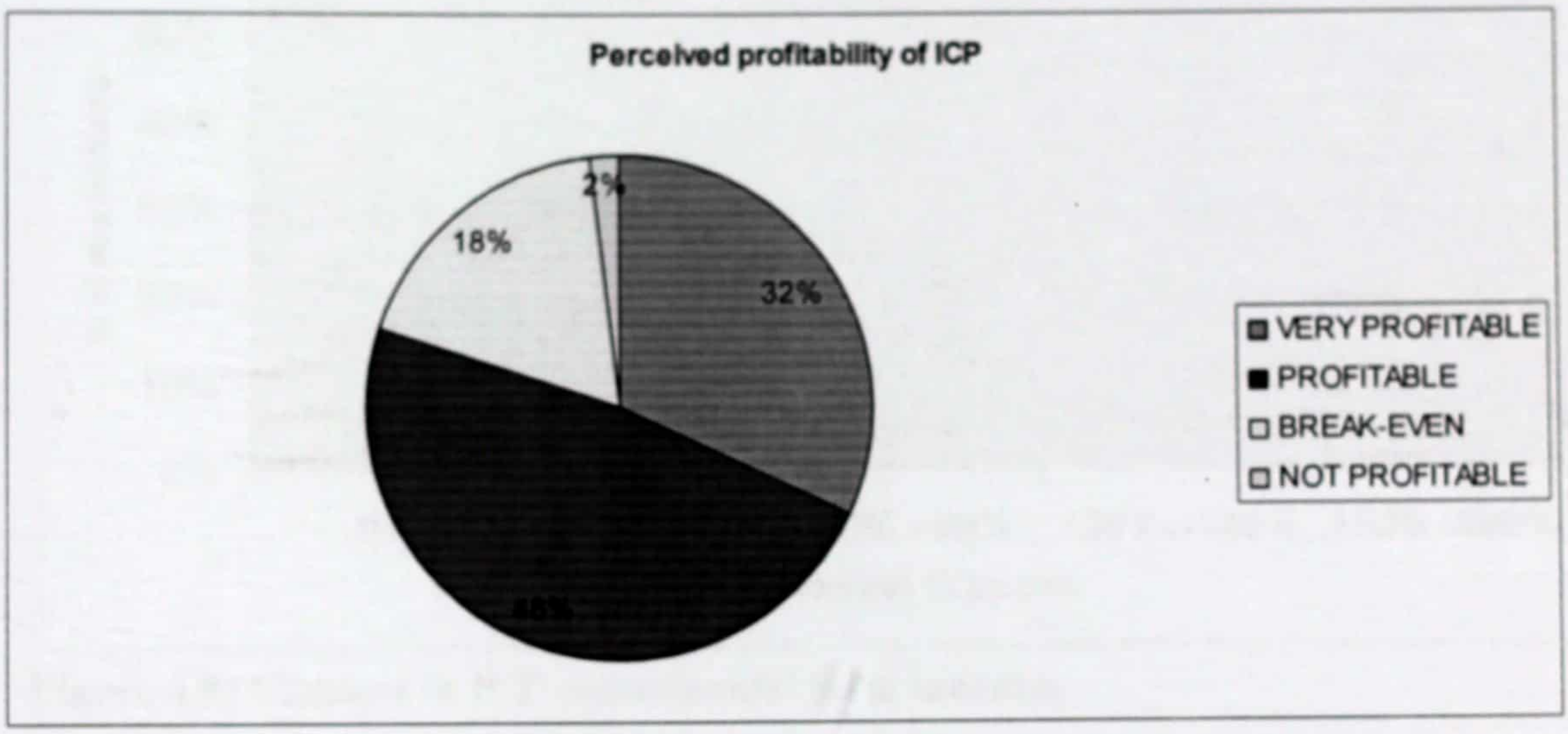

Figure 4.8: Profitability of ICP

Source: Author's own construct

Sustainability and possible expansion of the program greatly depends on how profitable the participants perceived the program. From figure 4.8 above, the study revealed that 32 percent of respondents see the program to be very profitable, 48 percent view it as profitable while 18 percent deemed it a break-even venture and 2 percent said it is not profitable.

Considering the fact that stored produce is marketed in bulk and there is no produce differentiation after receipt into the warehouse; all produce therefore receive the same sales price at the end of the program, the differences in perception with regards to profitability could only arose if they compute their revenue against their production cost. In situations where yields are low as a result of poor agronomic practices and conditions, the unit cost of production is likely to be high thereby reducing profitability.

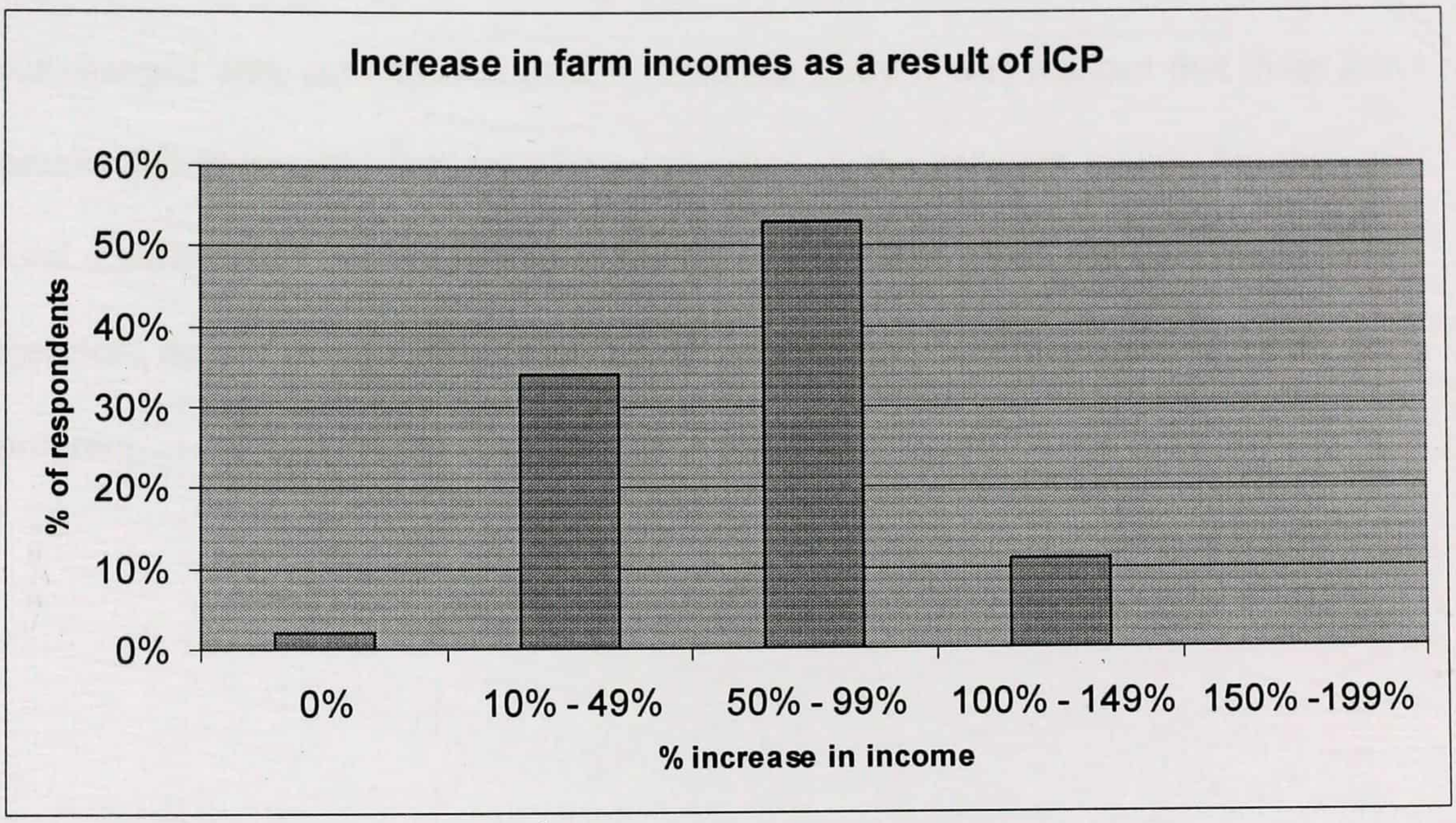

Figure 4.9: Changes in ICP participants' farm incomes

Source: Author's own construct

It would be expected that based on the perceived profitability of ICP, participants will invest in their primary business –farming. It therefore became imperative to assess the change in farm incomes due to their participation in ICP; either through farm expansion and/or improved post-harvest handling methods.

As indicated in Figure 4.9 above, none of the respondents said that their farm income has increased by 150% - 199%, however, twelve (12%) percent claimed their farm income has increased by 100 % -149%. The greater majority; 54 percent of respondents indicated that their farm income has increased between 50% and 99%, and over 30 percent of respondent claimed that their farm incomes increased only by 10% - 49%.

As expected about 2 percent of respondents confirmed that their farm income has not changed with participation in ICP, from the study it was realised that these are usually the vulnerable farmers who participated in the program mainly because of food security and therefore redeemed their produce before group sales are made, they therefore do not benefit fully from the net incremental benefits associated with the program.

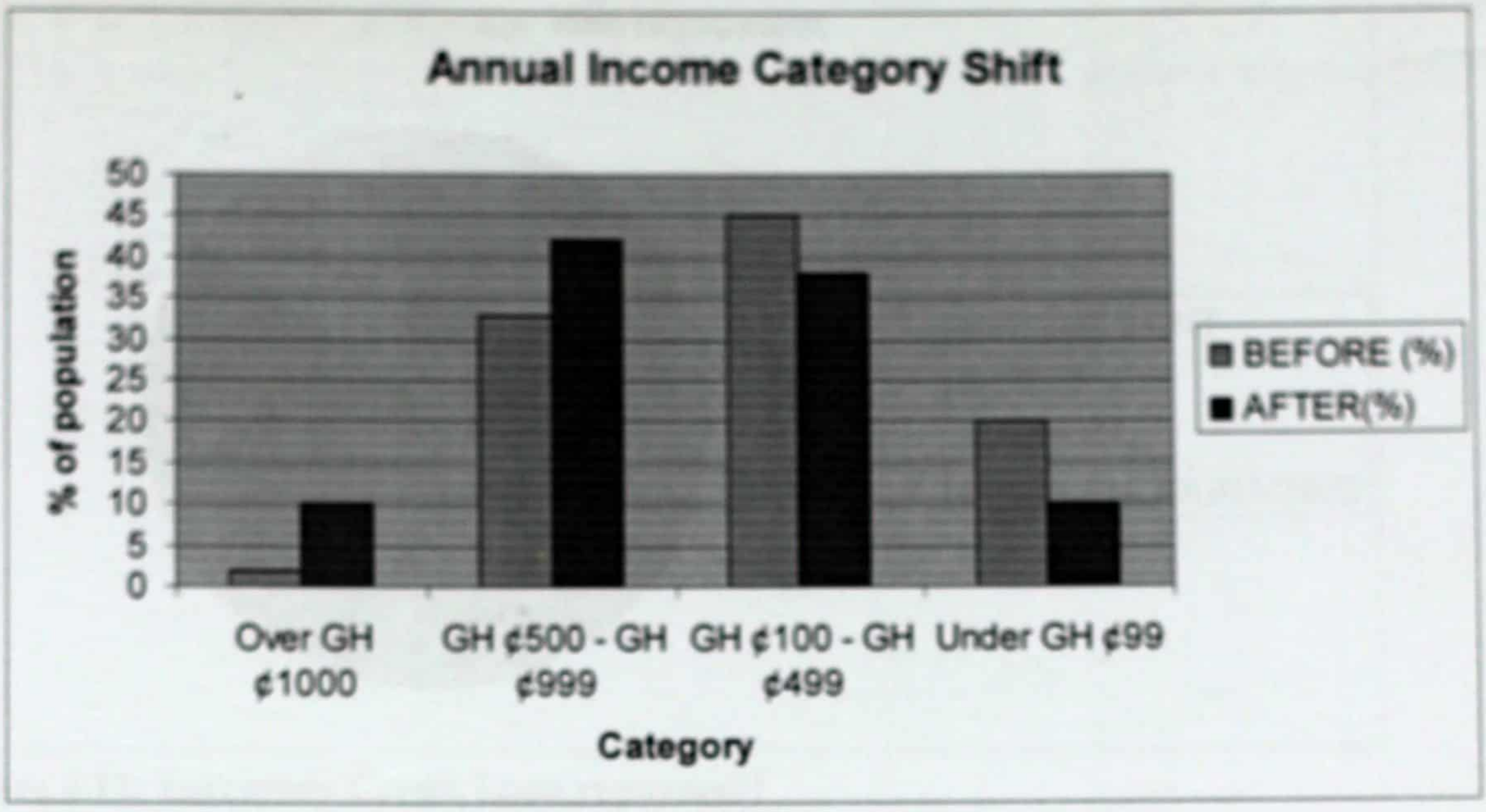

Figure 4.10: Annual Income Category shift attributable to ICP

Source: Author's own construct

The figure above shows the responses from group executives (mostly community opinion leaders) on income category shift in community attributable to ICP. From figure 4.10, the average percentage of the population of the eight (8) communities participating in ICP in the district with an annual income of over GH ¢1000 has increased from below 3 percent to 10 percent, that for those earning annual income between GH ¢100 - ¢499 however decreased from 45 percent to about 38 percent; this anomaly could be due to either individuals who were once in the GH ¢100-GH¢499 category moving up possibly into the GH ¢500 – GH ¢999 category or that the rate at which participants from the under GH ¢99 category move to replace those who have moved from GH ¢100-GH¢499 category is low.

These are usually the vulnerable that participated in the program mainly because of food security and did not therefore benefit from the full net incremental benefit of the program.

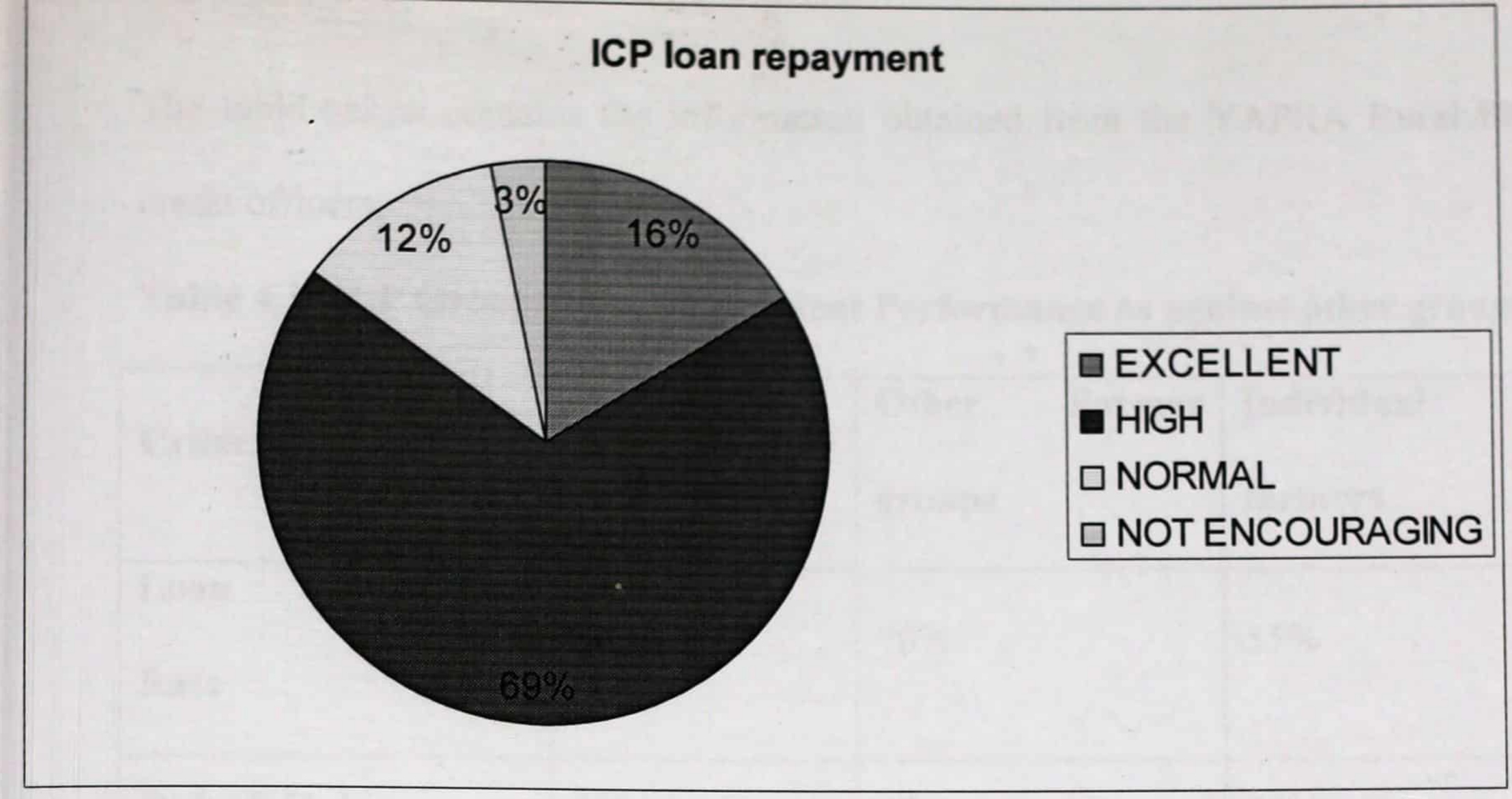

Figure 4.11: Inventory Credit Loan repayment

Source: Author's own construct

The executives of the various groups were asked to rate the loan repayment of their groups with regards to the inventory credit program loan accessed from the YAPRA Rural Bank. From figure 4.11 above, 16 percent responded that on average their loan repayment has been excellent, 69 percent claimed ICP loan repayment to be high, 12 percent termed their loan repayment as normal, while only 3 percent said their loan repayment was not encouraging.

For a first verification on the loan repayment performance further questions were directed to the Credit officers of the bank, it was established that while the average rate of loan recovery from individual farmers is 55 percent that from a farmer group is 70 percent and that for a TechnoServe facilitated group is 98.5 percent (see Table 4.1).

This proves that with the ICP, conditions are set for easy group repayment and with the right infrastructure such as a secured warehouse financial institutions can use farmers produce as collateral to advance loan.

The table below contains the information obtained from the YAPRA Rural Bank credit officers;

Table 4.1: ICP Groups Loan Repayment Performance as against other groups

Criteria	ICP Groups	Other Farmer groups	Individual farmers
Loan Repayment Rate	98.5%	70%	55%
Default Rate	0%	15%	30%
Credit Period (Months)	8	12	12

Source: Author's own construct

Another objective that ICP attempts to address is food security; the study therefore enquired from beneficiaries the degree to which food security has been addressed with their participation in ICP. From figure 4.12 below, 33 percent of respondents perceived ICP to have addressed food security situation excellently in their communities (months of shortage of food non existent), 56 percent ranked the extent to which food security issues have been addressed by ICP as high (months of food shortage reduced to 1 month). Eleven (11) percent also ranked the degree of impact of ICP on food security as normal (months of food shortage reduced to 2 months).

In light of findings from a district baseline survey conducted by TechnoServe in 2005 that the number of months of food insecurity in the district is five (5), it can be deduced that ICP has positively impacted on food security in participating communities.

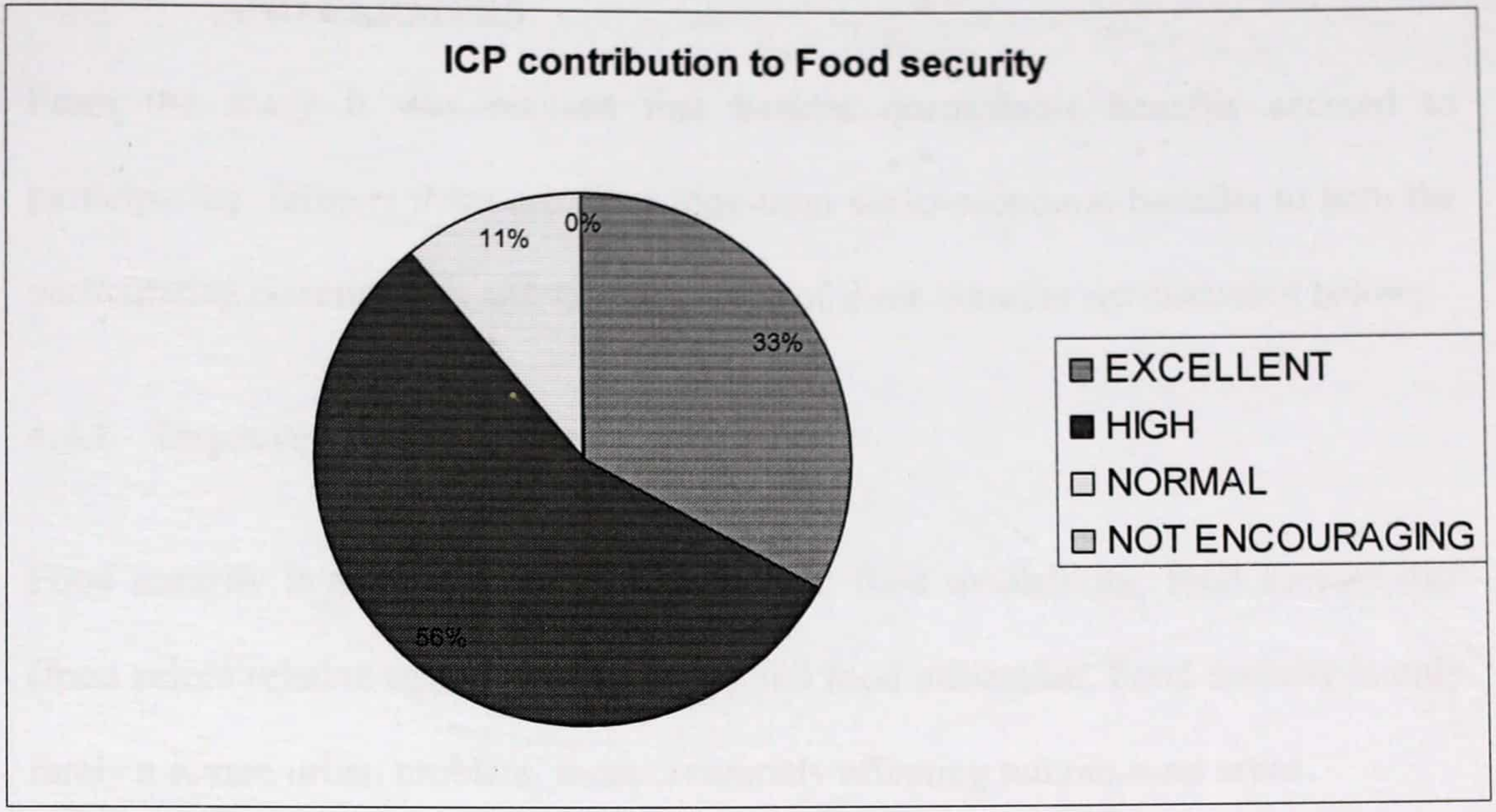

Figure 4.12: ICP contribution to Food security

Source: Author's own construct

4.4 NON QUANTIFIABLE BENEFITS OF ICP TO COMMUNITIES AND FARMERS

From the study it was realised that besides quantifiable benefits accrued to participating farmers there are other long-term socio-economic benefits to both the participating communities and farmers, some of these benefits are discussed below;

4.4.1 Improved Food Security

Food security is a function of several factors: food availability, food accessibility (food prices relative to people's incomes) and food utilization. Food security is only rarely a severe urban problem, more commonly affecting remote rural areas.

In Kachawura and Cherembo, it was realized that participating farmers tend to redeem rather than sell the bulk of their stored grains to use as food for their families. These communities have an average per capita income level well below the regional average which is also below the national average of GH ¢390, a poverty rate that is three times the national average, and is the most food insecure part of the region. The value of the inventory credit program to these farmers is captured primarily by savings in expenditures on food rather than in additional income. Participating farmers also have the psychological benefit of knowing that there are food stocks in their community. When they redeem the stored grain for consumption they only pay storage and handling costs plus accumulated principal and interest on their loans. These savings can be significant since family expenditure on food in this district may often be as much as two-thirds of total household expenditure.

4.4.2 Stable Food Prices and Incomes

Inventory credit's potential benefits are based on the magnitude of seasonal price swings which, in Ghana, remain large for maize and several other grains. It was seen that over time, expansion of inventory credit activities and continued improvements in rural infrastructure (warehouses, driers etc) led to stored produce being released onto the market more evenly and systematically, with the result that the seasonal price swings will gradually become less extreme. In turn, the incomes that the farmers earned from grains sales should also become more stable.

4.4.3 Creation of Market and Service Linkages

Another finding was that, respondents' affiliation with a group provides improved access to government services, such as the Ministry of Food and Agriculture's Post Harvest Management Department, and to larger and more reliable grain traders; such large buyers normally have difficulty finding and purchasing bulk quantities of high-quality grains directly from small-scale producers. These markets would not have been open to individual farmers.

Lack of relevant and timely market information greatly disadvantages smallholder farmers in the market place, and reduces their access to better markets and better prices. As a result, farmers are often exploited by middlemen in local markets who offer relatively low prices, sometimes below production costs. In addition, farmers either remain ignorant of better market opportunities, or face high transaction costs in trying to access new markets. The combination of low prices, lack of access to better markets or high transaction costs result in low farm incomes, keeping the farmer in a vicious cycle of poverty as stated by Janvry and Jeffrey Sachs (1987).

4.4.4 Promotion of Local Investment

The inventory credit has achieved dual objectives of improving farmers' family incomes and generating capital for less speculative, value-adding rural investments. Improved family incomes are essential not only to raising immediate living standards, but also to introducing the rural poor to the new economic possibilities of savings and investment.

It was established that a range of investments are flowing from inventory credit activities, both at the group and family levels. Groups are investing in value-adding agro-processing activities, such as maize shelling and milling, cassava processing, groundnut decorticating equipment and soap making, as well as in improved storage facilities. Group investments also include activities such as farming, agro-forestry and bee-keeping.

Families have used their profits to expand their maize farms, to purchase modern inputs, and to improve animal husbandry. They are also investing in improved housing and farm buildings, in their family's health care and in their children's education.

4.4.5 Access to Credit and Individual Savings

Sketchy evidence indicates that participants are developing closer ties with local financial institutions, primarily through increased use of individual savings accounts. However, despite the farmers' excellent loan repayment record to date, there does not appear to be much change in individuals' access to credit from formal institutions.

4.4.6 Group Development

Because many groups are formed but quickly collapse, group executives were asked what could lead to the possible collapse of groups and it was realized that circumstances that could lead to the collapse of a group are when credit or assistance is not forthcoming and when there is no financial transparency within the group.

Strengthening farmer groups is central to development strategy, and lies at the heart of the inventory credit program. By forming groups, farmers are able to qualify for inventory credit loans from banks which are not available to individual farmers. Group members can also accumulate the capital required to make investments in a range of food processing and other equipment. With access to such equipment and initial managerial assistance, these groups are able to create and operate their own agro-processing businesses.

In this context, the loan repayment performance record and continuing enthusiasm at the local level for the inventory credit work is all the more notable.

4.4.7 Enhanced Leadership Capacity

The skills needed to run a successful inventory credit program are essentially the same basic skills needed to plan and operate almost any small business. It was realised from the study that the long-term success of these businesses is dependent upon the effectiveness of the training provided and the calibre and motivation of the group leaders. While it is certainly possible that, a farmers' group might have good leadership and yet fail, it is virtually impossible that a group lacking good leadership will succeed.

Through the inventory credit programme essential factors of successful group leadership such as effective communication, careful planning, proper record keeping, and information sharing have been introduced to the group executives at trainings. With these elements in place, broad and equitable rural economic development can be realised through the growth of profitable businesses.

4.4.8 Reduction in Post-Harvest Losses

Overall post-harvest losses in Ghana continue to be high. The loss estimates for grains vary from 10 – 35 percent, depending on a number of local factors and the time span of measurement. All too commonly, in the Pru district, farmers are either unable to harvest and transport maize from their fields due to limited access to local transport (which is especially severe at harvest time), or the inability to hire sufficient labour to undertake these tasks. The situation is compounded when farmers anticipate low returns for their grain and are, therefore, unwilling to spend their limited cash on harvesting and post-harvesting activities.

The potential for increased incomes, combined with the availability of improved methods to safely hold grains for six months or more, have provided strong incentives for participating farmers to reduce post-harvest losses.

With the expectation of earning higher prices through inventory credit, many farmers are willing to make the extra effort and expense to harvest their maize and to try new storage methods, such as shelling the dried maize, treating it with appropriate insecticides and keeping it in bags for easy storage and transport. Moreover, as farmers earn more money from one year to the next, they typically have additional cash reserves to pay for extra labour to harvest and store their produce.

Once grains have been bagged and stored by participants in a secured warehouse, post-harvest losses incurred for up to six months have been reduced to a minimum. Losses in the field and in preliminary crib drying / storage facilities are difficult to measure but are estimated to be sharply reduced, based on increased volumes of maize placed in storage and the observed adoption of improved practices.

4.4.9 NON-QUANTIFIABLE BENEFITS RATING FOR ICP (NQBR)

In most community development interventions, participants do not benefit quantitatively but also qualitatively. In some cases the major gain is in the influence the intervention has on local government policy and socio-economic structure of the communities affected.

The Non –Quantifiable Benefits Rating allows for the assessment of the qualitative benefits of inventory credit program.

From Table 4.2 below, the overall ratio of 0.54 or 53.91 percent indicates that the ICP in the Pru District of the Brong Ahafo Region has an overall positive impact on the economic, social and policy situation within the district.

This data was obtained from rankings made by group executives who are usually opinion leaders of the communities.

Table 4.2: Non Quantifiable ICP Benefits Rating

NON QUANTIFIABLE BENEFITS RATING											
CATEGORIES & FACTORS		SCORING									
											WEIGHTED
A.	**ECONOMIC BENEFITS**	**WEIGHT**	**CMMTY 1**	**CMMTY 2**	**CMMTY 3**	**CMMTY 4**	**CMMTY 5**	**CMMTY 6**	**CMMTY 7**	**CMMTY 8**	**AVERAGE**	**AVERAGE**
	ENTREPRENEURIAL SKILLS	20	1.00	0.63	1.00	0.12	0.80	0.41	0.33	0.38	0.58	11.68
	CLIENT CREDIBILITY	20	0.32	0.70	0.10	0.60	0.45	0.77	0.25	0.67	0.48	9.65
	INSTITUTIONAL COLLABORATION	6	0.70	0.25	0.31	0.42	1.00	0.33	0.87	0.66	0.57	3.41
	POTENTIAL FOR REPLICATION	9	0.23	0.70	0.67	0.52	0.30	0.30	0.31	0.66	0.46	4.15
	SUB TOTAL	**55.00**	**2.25**	**2.28**	**2.08**	**1.66**	**2.55**	**1.81**	**1.76**	**2.37**	**2.10**	**28.88**
										ECONOMIC NQB BENEFIT		**0.53**
B.	**POLICY BENEFITS**											
	CBEs AS VEHICLES FOR RURAL DEVELOPMENT	10	0.50	0.89	0.73	0.88	0.33	0.23	0.22	0.66	0.56	5.55
	AWARENESS ON GRAIN STORAGE	10	0.11	0.61	1.00	0.22	0.43	0.56	0.69	0.70	0.54	5.40
	SUB TOTAL	**20.00**	**0.61**	**1.50**	**1.73**	**1.10**	**0.76**	**0.79**	**0.91**	**1.36**	**1.10**	**10.95**
										POLICY NBQ BENEFIT		**0.55**
C.	**SOCIAL BENEFITS**											
	IMPROVED WELFARE STATUS	5	0.77	0.72	0.70	0.87	0.80	0.65	0.32	0.77	0.70	3.50
	IMPROVED SOCIAL COHESION	10	0.40	0.66	0.82	0.99	0.54	0.88	0.55	0.49	0.67	6.66
	IMPROVED LEADERSHIP	10	0.32	0.25	0.38	0.53	0.34	0.43	0.29	0.59	0.39	3.91
	SUB TOTAL	**25.00**	**1.49**	**1.63**	**1.90**	**2.39**	**1.68**	**1.96**	**1.16**	**1.85**	**1.76**	**14.08**
										SOCIAL NBQ BENEFIT		**0.56**
	TOTAL	**100.00**	**4.35**	**5.41**	**5.71**	**5.15**	**4.99**	**4.56**	**3.83**	**5.58**	**4.95**	**53.91**

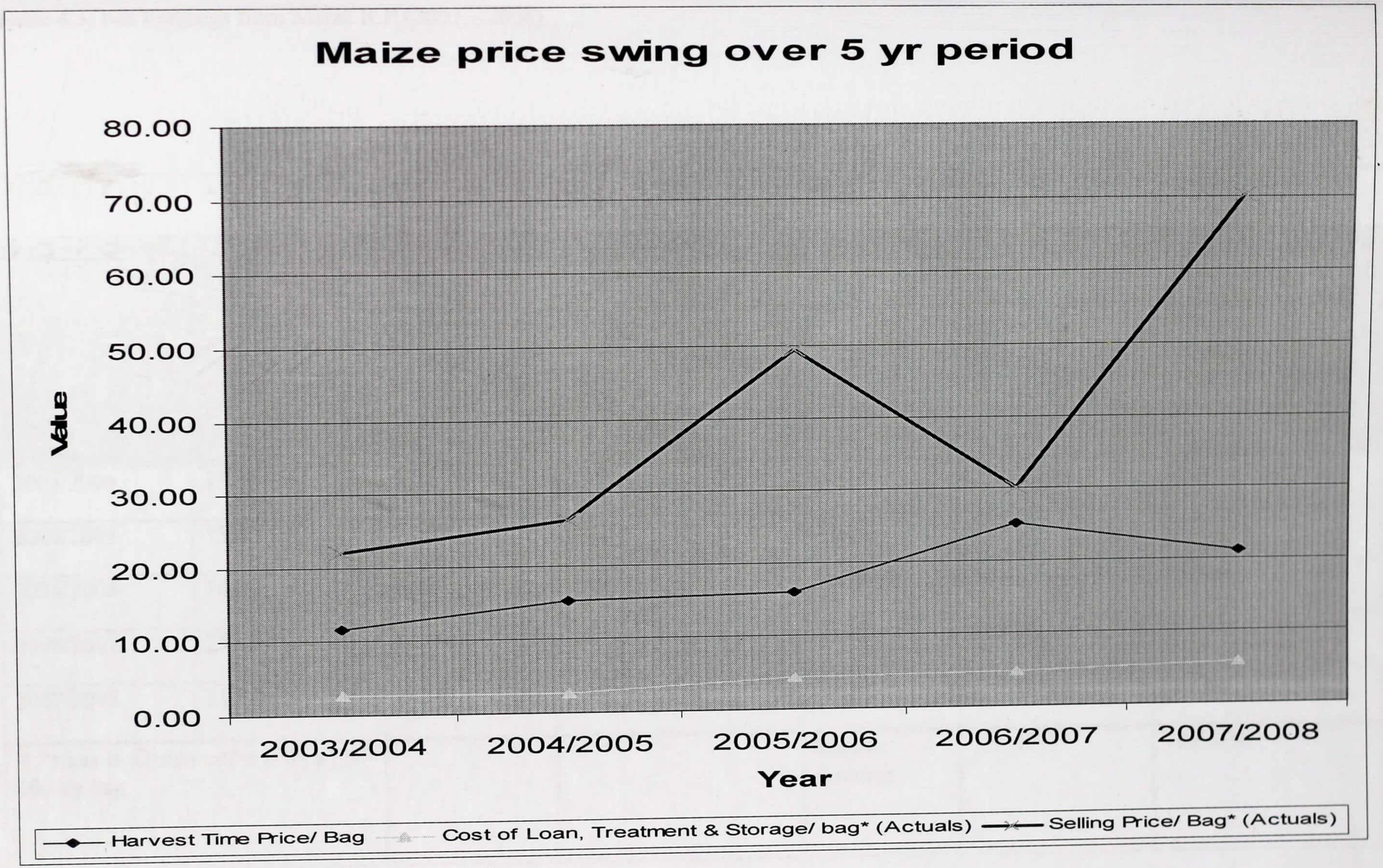

Fig 4.13: Maize price swing over five year period

Table 4.3: Net Earnings from Maize ICP (2003 – 2008)

ITEM CODES	A	B	C	D		
YEAR	**Harvest Time Price/ Bag¶**	**Loan / Bag¶ (50%*A)**	**Cost of Loan, Treatment & Storage/ bag¶ (Actual)**	**Selling Price/ Bag¶ (Actual)**	**% Increase from Harvest to Sales Price (D-A)/A*100**	**% Net Incremental Benefit to Farmer (D-(A+C))/A*100**
2003/2004	11.50	5.75	2.59	22.00	91.30%	69%
2004/2005	15.20	7.60	2.66	26.14	71.97%	54%
2005/2006	16.00	8.00	4.40	49.50	209.38%	182%
2006/2007	25.00	12.50	4.75	29.98	19.92%	1%
2007/2008	21.00	10.50	5.78	70.20	234.29%	207%
¶ Prices in Ghana cedis (GH ¢) per 100 kg bag				Simple Average	125.37%	102.57%

Another observation from the study is the undulating trend of the annual market price of maize as indicated in Fig 4.13 above. From an expert's opinion, this could be explained that in preceding years of bumper harvest, as a result of the forces of supply and demand, the inter seasonal price swing is moderate, farmers therefore diversify and cultivate other crops leading to scarcity the following year and high inter seasonal price swing attracting farmers' interest to cultivate more leading to a cycle of year of glut (low prices) and year of scarcity (high prices).

From Table 4.3, in year 2003/2004, the participants actually received an effective sales premium of 69 percent and in 2004/2005 farming season, 54 percent price premium.

Empirical evidence from the study shows that the degree of inter seasonal price variability is often high, farmers participating in the inventory credit program during the past five years (2003 – 2008) have increased their net earnings from maize, their second major cash crop, an average of 102.57 percent each year, based on average price increases of 125.37 percent.

4.5 DISCUSSION

According to the goals several results, effects and impacts have been observed-:

For the producer and the farmer association, the economic results of the inventory credit (average over the 5 year period) have been tremendous in light of additional income generating activities made possible from the loans obtained. The experience in Pru district has shown a 125.37 percent average increase of the value of the stored produce and a net profit of 102.6 percent.

At the financial level, the inventory credit has enabled the local, rural financial institutions to reduce their credit risk by obtaining a tangible guarantee that is easy to be monitored and recouped, adding to this is the positive effects of a solidarity guarantee by grouping small loans into one for which the farmer associations take responsibility. In the longer perspective, inventory credit may increase the supply of financial services to rural households by attracting new financial operators to establish themselves in the rural areas.

As of 2008, loans granted under the inventory credit model have been repaid, without major difficulties; at 100% both as far as capital and interest are concerned. This largely improves the health of the lending portfolios of the rural financial institutions and increases the farmers' credibility / eligibility towards the banking sector as far as refinance is concerned.

At the consumer market level, inventory credit (better trade financing) should result in a higher degree of inter-temporal market integration. Over the long term, this will happen as follows. As closer links are forged between the financial and agric

produce marketing sectors, funds will increasingly flow backwards and forwards between them. As already happens in developed countries and some more advanced economies in the developing world, trade will attract commodity finance seeking speculative profit. Indeed finance will continue to be attracted up to a point of what economists call "normal profits", i.e. the minimum level of profit to attract those who are speculating on price rises, inter seasonal price swings will therefore be even out, enabling consumers to benefit from stable market prices irrespective of the season.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

- By forming groups, farmers are able to qualify for inventory credit loans from banks which are not available to individual farmers. Group members can also accumulate the capital required to make investments in a range of food processing and other equipment
- Vulnerable farmers, who participated in the program mainly because of food security and therefore redeemed their produce before group sales are made, do not benefit fully from the net incremental benefits associated with the program.
- With the ICP, conditions are set for easy group repayment and with the right infrastructure such as a secured warehouse financial institutions can use farmers produce as collateral to advance loan.
- The inventory credit has achieved dual objectives of improving farmers' family incomes and generating capital for less speculative, value-adding rural investments such as agro-forestry and bee-keeping.
- Improved family incomes are essential not only to raising immediate living standards, but also to introducing the rural poor to the new economic possibilities of savings and investment.
- Respondents' affiliation with a group provides improved access to government services and to larger and more reliable grain traders; such large buyers normally have difficulty finding and purchasing bulk quantities of high-quality grains directly from small-scale producers. These markets would not have been open to individual farmers.

- Participating farmers also have the psychological benefit of knowing that there are food stocks in their community. When they redeem the stored grain for consumption they only pay storage and handling costs plus accumulated principal and interest on their loans.

- In situations where yields are low as a result of poor agronomic practices and conditions, the unit cost of production is likely to be high thereby reducing profitability associated with ICP.

- Access to credit by small-scale farmers in rural districts such as Pru is still low.

5.2 CONCLUSIONS

The study aimed at ascertaining the impact of inventory credit on cereal farmers in Pru district of the Brong Ahafo region. The study covered eight inventory credit participating communities.

Given the background of previous policies, and the time required to bring about sustainable improvements in agricultural financing, overall progress is highly encouraging. At the same time the success of traders who have obtained inventory credit seems to be having a snowball effect, with the appearance of more farmers operating on a relatively large scale.

The lack of finance for agricultural production and inter-seasonal storage of durable agricultural commodities particularly grain crops is a problem which is widespread in Ghana and other developing countries which are liberalizing their agricultural marketing systems.

Since its implementation in the Pru district in 2003, the Inventory Credit Programme has significantly contributed to eradicate rural poverty. Because it enables farmer to use agricultural produce as collateral for working capital and has resulted in a significant increase of farm size and yields, thereby contributing to reduce hunger and poverty in the district. In the Pru district, the Inventory credit is thus playing a key role in the fulfilment of the UN Millennium Development Goal No. 1; "Eradicate extreme poverty and hunger".

The development of inventory credit depends to a large extent on the capacity of the participating farmers to manage in an efficient manner additional financial resources.

Because the Inventory Credit model has shown its effectiveness in fighting hunger and reducing extreme poverty in the Pru district, it can be selected as an example of 'good practice' to be implemented at a national level and be applied to other storable crops besides cereals such as cowpea and dried chillies.

5.3 RECOMMENDATIONS

The study indicated that most of farmers contacted appreciated the impact of ICP on their socio-economic lives since it has to an extent addressed their credit and marketing needs. Other major problem encountered in the implementation of the programme is the pooled marketing aspect of ICP which can be abused when sub standard produce (in terms of weight and quality) is brought into storage. Agric commodities traded in the market place do not have specified grades and standards against which to provide price quotation everything is therefore delivered or sold as fair average quality.

To improve, sustain and increase the impact of ICP on cereal farmers the following recommendations have been proposed;

- Farmers often experience problems in storing large quantities of grain. Notwithstanding the prospect of higher lean –season prices, they are often forced to sell grain either to satisfy immediate cash needs or to avoid storage problems. Such problems are particularly acute where farmers grow hybrid varieties of maize due to their susceptibility to pests. In Ghana, farmers grow traditional varieties of maize for home consumption while hybrid varieties are cultivated for the market. Traditional storage techniques are usually adequate for storing the traditional varieties but not for the hybrids, which must be stored properly in order to avoid spoilage. Technoserve and Village Infrastructure Project (VIP) have built warehouses in selected communities; figure 5.1 below is one of the warehouses built by TechnoServe for farmer groups in Dama Nkwanta in the Pru district. More of such infrastructure would be needed to make the inventory credit programme successful.

Figure 5.1: A community-managed warehouse built by Technoserve with support from USAID

- In Africa, most governments do not have Early Warning Units producing crop forecasts, while a few have Market Information Service (MIS) which disseminate price and other information. In the Pru district, such units does not exist and it will be prudent to have it established so as to disseminate range of information items such as crop forecasts, prices in neighbouring districts and major marketing centres, prospective imports and food aid arrivals to the banks and farmers.

- There are a lot of risk associated with ICP; some of which are Inconsistent Government Policies, Speculative Loss and Physical Security of the produce. It will be difficult to attempt to address the first risk from the district level, however, the last two risks involving physical security can be reduced by making sure the

produce is insured against fire (Pru is a bushfire prone district) and extreme weather conditions.

This will likely come at a cost to the farmer thereby decreasing the profitability of the programme but the credibility of the program will be assured and enhanced.

To manage speculative loss risk, there is the need to spread sales of stored grain over a period of time rather than waiting for the highest possible price at the end of the lean season (June-July)

- Even where groups have been promoted in a professional manner, questions may be raised about their long-term sustainability. In the Pru district, the repayment has been good but this is largely attributable to high level of outside supervision.

Technoserve or development NGOs do not pass on cost of the programme to beneficiaries; such as monitoring cost, honorarium to Agricultural Extension Agents, transport and communication costs and others, this therefore beefs up the profitability of the programme, it will be financially prudent if such costs are factored in the computation of profit to enable participants appreciate the true profit of the programme.

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APPENDICES

QUESTIONNAIRE FOR THE EVALUATION OF ECONOMIC IMPACT OF INVENTORY CREDIT PROGRAMME AT.....IN THE PRU DISTRICT.

1. INTRODUCTION

Technoserve has been assisting farmer groups in this community to improve their living standard. Among other technologies promoted by Technoserve to realize this objective are high yielding hybrid seed cultivation, improved agronomic practices, market and credit linkages and inventory credit programme scheme.

For most rural farmers, marketing at economic profit is a lifeline, since farming is usually their only occupation. It is for this reason that a programme such as ICP, would, I feel greatly enhance the economic status of individual farmers and the community.

This questionnaire is to enable me know your views on what benefits or otherwise you have derived from the ICP scheme and what would receive your support.
Please be as honest and realistic as possible in your answers. Your response will be treated in confidence. It is entirely anonymous unless you wish to add your name.

FARMERS LEVEL SURVEY

1. Are you a member of the .....Multipurpose group

   YES ☐ NO ☐

2. If YES for how long?: .....years

3. Do you have a need for a loan or capital infusion?

   YES ☐ NO ☐

4. If YES, on a scale 1-5 below, please indicate how important a loan is to you?
   (1= least important, 5 =very important)

   ☐1 ☐2 ☐3 ☐4 ☐5

5. What do you intend to use the loan for?

   .....
   .....
   .....

6. As an individual, do you have a bank account?

   YES ☐ NO ☐

7. Have you ever accessed a working capital loan from the bank?

YES ☐ NO ☐

8. Was it granted?

YES ☐ NO ☐

9. If NO, why?

.....

.....

10. What is/are your source (s) of working capital, please indicate percentage?

i. Personal funds.....
ii. Family and friends.....
iii. Pre-financing from middlemen.....
iv. Formal loan.....
v. Other (specify) .....

11. Have you ever participated in the group's Inventory Credit Programme (ICP)?

YES ☐ NO ☐

12. If YES, what crops do you bring into inventory, if NO, why?

.....

.....

.....

.....

13. Besides your harvest do you purchase agric produce from the open market for inventory?

YES ☐ NO ☐

14. What is the main motivating factor for your participation?, please indicate in order of importance (1 =most important)

☐ Storage facility
☐ Pricing
☐ Inventory loan
☐ Collective marketing
☐ Food security
☐ Peer pressure
☐ Other.....

15. How profitable do you see ICP, on average?

- ☐ Very profitable
- ☐ Profitable
- ☐ Break-even
- ☐ Not profitable

16. What benefits have you accrued from ICP?

.....

.....

.....

ECONOMIC IMPACTS

17. By what percentage has your farm income increased as a result of your ICP participation?

- ☐ 0%
- ☐ 10% - 49%
- ☐ 50% - 99%
- ☐ 100% - 149%
- ☐ 150% - 199%

18. In general, how has the ICP been of use to you?

a. Extremely useful
b. Very useful
c. Useful
d. Not useful

19. With regards to your household, how has the ICP been of benefit to you?

a. Extremely useful
b. Very useful
c. Useful
d. Not useful

20. Is there any physical infrastructure acquired or specific instance as a result of ICP worth mentioning?

.....

.....

What would you recommend to improve the scheme?

.....

.....

THANK YOU

GROUP'S EXECUTIVE LEVEL SURVEY

1. INTRODUCTION

Technoserve has been assisting farmer groups in this community to improve their living standard. Among other technologies promoted by Technoserve to realize this objective are high yielding hybrid seed cultivation, improved agronomic practices, market and credit linkages and inventory credit programme scheme.

For most rural farmers, marketing at economic profit is a lifeline, since farming is usually their only occupation. It is for this reason that a programme such as ICP, would, I feel greatly enhance the economic status of individual farmers and the community.

This questionnaire is to enable me know your views, as an executive of a TechnoServe-assisted group, on what benefits or otherwise you have derived from the ICP scheme and what would receive your support.
Please be as honest and realistic as possible in your answers. Your response will be treated in confidence. It is entirely anonymous unless you wish to add your name.

1. Name of Technoserve- assisted group:.....
2. Executive position held:.....
3. Does the group participate in ICP?

☐ YES ☐ NO

4. If YES, for how many years?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. How many participants are in the group?.....
6. Of these number how many are women?.....
7. Does the group keep records with regards to ICP transactions?

☐ YES ☐ NO

8. If YES, what is the average dividend per bag of cereals brought into inventory?
9. What are the challenges faced by the group with regards to ICP?

.....
.....
.....
.....

10. Can you list some of the benefits of ICP to the group and community?

.....
.....
.....
.....
.....

11. On average, how would you classify the importance of ICP to the community?

a. Extremely useful
b. Very useful
c. Useful
d. Not useful

12. What has the loan repayment been like?

a. Excellent
b. High
c. Normal
d. Not Encouraging

13. During the past ICP period how has the food security situation been in the community

a. Excellent
b. High
c. Normal
d. Not Encouraging

14. On average how many hands do you employ during ICP?

.....

15. What is the total wages or salary paid during this period?

.....

16. Before the introduction of ICP, which category best describes total annual household incomes?

a. Over GH ¢1,000
b. GH ¢500 to GH ¢999
c. GH ¢100 to GH ¢ 499
d. Under GH ¢99

17. After the introduction of ICP, which category best describes total annual household incomes?

a. Over GH ¢1,000
b. GH ¢500 to GH ¢999
c. GH ¢100 to GH ¢ 499
d. Under GH ¢99

18. On a continuous scale of 0 to 1, rank the benefits of ICP to the respective categories and factors. (i.e. 0, 0.1, 0.2 .....1.0)

	Categories & Factors	Score
1.0	ECONOMIC BENEFITS	
	Entrepreneurial skills	
	Client credibility	
	Institutional collaboration	
	Potential for replication	
2.0	POLICY BENEFITS	
	CBEs as vehicles for rural development	
	Awareness on Grain storage	
3.0	SOCIAL BENEFITS	
	Improved welfare status	
	Improved social cohesion	
	Improved leadership	

19. What would you recommend to improve the scheme?

.....

.....

.....

.....

THANK YOU

BANK OFFICIAL'S SURVEY QUESTIONNAIRE

1. Name of Bank.....

2. Position:.....

3. What is percentage distribution of loan by sector

Sector	% distribution
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

4. On average what is the average rate of recovery of loans accessed by farmers?

.....

5. What problems do you face with farmers who want to access loan package?

.....

.....

.....

...

6. How much funds was advanced to Technoserve-assisted groups last year?

GH ¢.....

7. Has there been any attempt to pay back?

☐ YES ☐ NO

8. If YES, what is the recovery rate as against those accessed by individual farmers?

.....

9. At what rate has Inventory loan been advanced for past three (3) years

Year 2005 .....% p.a.
Year 2006.....% p.a.
Year 2007.....% p.a.

10. What would you recommend to improve the scheme?

.....

.....

.....

.....

Thank you.