AN ASSESSMENT OF EFFECTS OF PILFERAGE ON ARABLE CROP FARMERS IN IDAH LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

BY

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DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

FACULTY OF AGRICULTURE
AHMADU BELLO UNIVERSITY,
ZARIA, NIGERIA

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DECLARATION

I declare that this thesis entitled "An Assessment of Effects of Pilferage on Arable Crop Farmers in Idah Local Government Area of Kogi State, Nigeria" has been performed by me in the Department of Agricultural Economics and Rural Sociology under the supervision of Dr. D.F. Omokore and Professor Jacob P. Voh. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

_____

ODEKINA, Friday Odekina Date: ……..

CERTIIFICATION

This thesis entitled "An Assessment of Effects of Pilferage on Arable Crop Farmers in Idah Local Government Area of Kogi State, Nigeria" by Odekina, Friday Odekina meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Member, Supervisory Committee Date: ……..

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DEDICATION

This work is dedicated to God almighty who saw me through the turbulent and hectic M.Sc. programme successfully and to my late Mother, Mrs. Alice Aladi Odekina who despite her terminal illness was always there to support and encourage me before her demise on 21st September, 2008. May her soul rest in peace – Amen.

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ABSTRACT

The effects of pilferage on the welfare status of arable crop farmers in Idah Local Government Area of Kogi State have been assessed. A total of 110 household farmers were enumerated using purposive and random sampling technique. The broad objective of the study was to assess the incidence and outcome of pilferage on the livelihood of arable crop farmers with emphasis on three selected crops – maize, yam and cassava. The purposive sampling technique was used to select six villages based on their high involvement in arable crop production. Descriptive statistics and regression model were used to achieve the objectives of this study

Data for the study were collected using structured questionnaire administered to 110 arable crop farmers. The results revealed that 78 farmers representing 70.9 % suffered pilferage on the year 2007 while 32 farmers representing 29.10 % did not. The results further revealed that the level of pilferage on yam, maize and cassava were 22.8 %, 14.7 % and 11.3 % respectively. Average level of all crops pilfered was 16.4 %. It was further discovered that the level of financial loss per farmer stands at 20.66 % and that the effects of pilferage on arable crop farmers in the study area included abandonment of farming activities 10 %, withdrawal from growing yam 32 %, withdrawal from growing maize 22 % and unwillingness to adopt technology that will lead to the expansion of farming business 16 %. Results further revealed that 13.64 %, 11.82 % and 20.00 % of farmers relied solely on fence, charms and vigilance group for pilferage prevention. Others who combined 2 measures included 04.54 %, 07.27 % and 03.64 % of farmers for vigilance group with charms, fence with vigilance group and charms with fence respectively. While 04.54 percent of the entire farmers studied relied mainly on the three measures, 34.55 % utilized no measure for pilferage prevention. The result of regression analysis revealed that farming inexperience (1t 10 % level), large household size (at 5 % level) and large farm size, inadequate/inappropriate security measures and the use of hybrid variety of crop on an attractive farm (at 1 % level) were significant predisposing factors of farmers produce to pilferage. Finally, the result of the hypothesis tested using z-test showed that there was significant difference (Zcal of 2.96 as against Ztab of 1.96) between the output of affected farmers and the output of those not affected by pilferage. Based on the findings of this study, the major recommendations are that the poverty alleviation programme of the Federal Government of Nigeria be extended to the rural areas so that rural youths will be empowered to fend for themselves with a view to discouraging them from taking to pilferage as a result of unemployment and strengthening/recognition of social control measures such as norms, mores and values will help discourage pilferage. This can be achieved by the Local and State Government delegating powers to bidded chiefs of the communities and villages to negatively sanction criminals in their domain. It is also recommended that inexperienced farmers discuss the rudiments and strategies for effective pilferage prevention with experienced farmers before venturing into arable crop production. Farmers with large farm size and those who use hybrid variety of crops are also advised to take the issue of security of their farms very seriously since these groups constituted the greatest majority affected by pilferage.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Arable crops are food crops that are grown or cultivated and harvested within a year. Arable crops include cereals such as maize, sorghum, rice, millet, and guinea corn; roots and tubers like cassava, yam, sweet potato and cocoyam.

Maize is the third most important cereal of the world after wheat and rice (FAO, 1999). The crop which originated in South and Central America contains on the average 60% starch, 13% water, 10% protein, 4% oil, 2% sugar and 3% fibre and it is grown throughout the tropics as well as temperate regions (Fisher and Palmer 1984). Maize is the most important cereal in the rain forest area and southern guinea savannah regions of West Africa. Nearly all the maize produced in West-Africa is utilized locally. The world greatest producer of this crop which belong to the grass family of plants (*gramineae*) are United States of America, Brazil, Soviet Union and Mexico (FAO, 1999). With the recent rapid expansion of poultry and livestock industry, the upsurge in industrial use of maize coupled with the increased consumption by human beings as well, its production has gained prominence in the Savannah zones of Nigeria. The zones have earlier been reported to have the greatest potential for maize production because of solar radiation (Kassam et al, 1975).

Roots and tubers are mainly yam, cassava, cocoyam, sweet potato and Irish potato. They are the major sources of carbohydrate in the diet of Nigerians.

They also constitute significant proportion of the National diet (15.7% of all calories and 10.2 % of all protein in the daily diet of an average Nigerian). Per capita consumption of tropical root crops in Nigeria has been on the average of 259.7kg/yr; supplying an average of 649cal/day for every Nigerian. (Banwo, 1995)

Yam belongs to the genus Dioscorea. The most important species grown in Nigeria are white guinea yam (*Dioscorea rotunda*), Yellow yam (*Dioscorea cayenensis*) and water yam (*Dioscorea alata*). Nigeria produces more than 75% of white yam exported to other parts of Africa (Kassam *et al*., 1995).

Cassava belongs to the family *Euphorbiceae*. The crop which originated from North East-Brazil has great economic potentials for food security(IITA,1999;Ajayi and Onuche, 2005). Two varieties exist, namely sweet cassava (*Manihot palmata*) and bitter cassava (*Manihot utilisima*).Cassava is a major cheap source of energy for man, feed for livestock and raw materials for industries (IITA 1998; Alabi and Alabi, 2002).

Even though farmers are actively involved in the cultivation of these three crops, their labour has not been translated to economic gain as expected. This is because theft of maize, cassava and yam crops has become a common experience in most rural communities in Kogi State. It has become a rare occurrence nowadays to find arable farms without security guards or any strategy that can prevent pilferage. According to Adedoyin (1995), pilfering which is defined by Joda(1995) as a clever way of deliberately and fraudulently making away with a

proportion of another person's property on a continuous basis with a view to making the owner unsuspecting of the loss has rapidly gained prominence as the greatest threat to food security in Nigeria. Adefuye (1995a) drew attention of scholars in Africa to the need for organized scientific inquiry on pilferage in agriculture. Sequel to this, the National Research Network on Pilferage in Agriculture (NARNPA) was established on 1st May, 1995 with a view to finding out causes of and solution to pilferage in Agriculture (Anonguku, 2005).

1.2 Statement of the Problem

Arable crop production in Nigeria especially maize, yam and cassava has grown within the past few decades from an aggregate of backyard production into a thriving commercial production. The production of these crops have helped in no small measure as a source of staple food for most communities, as a good source of income when sold to brewing industries, bakery and confectionary industries and even fed to livestock. It is therefore hoped that hunger and poverty by most Nigerians would be a thing of the past as a result of emphasis on cassava and yam production coupled with the Presidential Initiatives on Maize Doubling and the number of farmers that embrace arable crop production on annual basis. However, elimination of hunger and poverty still remains a mirage due to the activities of criminals who pilfer on these crops in an increasing manner. Adewodu (1991) noted that pilfering is a serious and formidable impediment to farming activities. According to Banwo (1995), a single incident of pilfering might lead to withdrawal from farming activities.

Although works have been done on pilferage by other researchers previously in some areas such as incidence of Livestock pilferage in Benue State (Anonguku,2005) and The future of Goat and Sheep Rearing in Ijebu North Local Government Area of Ogun State (Adefuye and Adedoyin, 1995), there is insufficiency of information on the effects of pilferage on farmers in Idah Local Government Area of Kogi State. On the basis of this realisation, the need to reduce the ugly trend to the barest minimum and raise public awareness pose a key challenge. Against this background the emerging questions which form the basis for this study are:

i. what are the socio-economic characteristics of arable crop farmers in Idah Local Government Area of Kogi State?
ii. what is the level of pilfering on yam, maize and cassava in the study area?
iii. what are the socio-economic factors that predispose farmers' produce to pilferage in the study area?
iv. what are the effects of pilfering on the welfare and economic status of arable crop farmers in Idah, Kogi State?
v. What are the measures adopted by farmers in the study area to reduce or curb pilferage?

1.3 Objectives of the Study

The broad objective of the study is to assess the incidence and outcome of pilferage on the livelihood of arable crop farmers with emphasis on three selected crops - maize, yam and cassava. The specific objectives are to:

i. describe the socio-economic characteristics of arable crop farmers in the study area;

ii. determine the level of pilferage on yam, maize and cassava in the study area;

iii. ascertain the socio-economic factors that predispose farmers' produce/crops to pilferage in the study area;

iv. determine the effects of pilferage on the economic and welfare status of arable crop farmers; and

v. identify measures adopted by farmers to reduce or curb pilferage on their produce in the study area.

1.4 Justification for the Study

This study on pilferage on the three selected arable crops will provide an insight into the activities of pilferers with a view to proffering useful solution towards curbing the social-ill. In line with the desire of the Federal, State and Local governments in Nigeria to completely eradicate pilfering on agricultural produce, this study will prove useful in the design of cost-effective measures against pilferage in the study area. This study is intended to provide valuable information to raise public awareness to combat pilferage, thereby contributing to the development of the communities studied. The study will also contribute to the robustness of information that will guide incoming researchers who might be interested in carrying out further works on pilferage in other locations.

1.5 Hypothesis

There is no significant difference between the output of affected farmers and those not affected by pilferage.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter deals with the review of related literature. For the purpose of clarity and ease of understanding, this chapter was arranged as follows:

i. Concepts and dimensions of pilferage in Agriculture

ii. Rate of pilferage in Agriculture

iii. Predisposing Factors / Causes of pilferage in Agriculture

iv. Sources of pilferage in Agriculture

v. Roles of Youths in pilferage of Agricultural produce

vi. Extension implications of pilferage of Agricultural produce

vii. Effects of pilferage on farmers

2.1 Concepts and Dimensions of Pilfering In Agriculture

Pilfering has been mentioned in agricultural literatures as one of the problems encountered on farms (Jibowo, 1992). While Adedoyin (1995) conceptualized pilferage as loss of resources, materials and produce on farms occassioned by deliberate and fraudulent removal by another person without any right to do so, Joda (1995) views it as a clever way of stealing whereby a proportion of someone else's property is made away with usually on a continuous basis by the pilferer with a view to making the owner unsuspecting of the loss. According to Olubanjo (1995), pilfering is petty theft or stealing in small quantities like the rampant theft of biro, pens in the early childhood, the occasional theft of small meat pieces or small fish cuts from household pots, or

even sweets in the township supermarkets. The irony of the situation nowadays, however, stems from the fact that the unwholesome act which hitherto was associated with youth has grown in magnitude and context from ordinary petty thefts to grandiose thefts and it is now quite common among the elderly ones within the society. The phenomenon has now fully transformed from the occasional (or infrequent) incidence to a permanent and quite rampant feature in both rural and urban communities as well as within private and public ventures. There is even a dimension to it in some communities, the operational policy borne out of fear of open confrontation and accusation within their community and their likely incarceration if caught within their immediate communities, such antisocial persons do cover long distances to carry out their acts before returning to base with their loots which sometimes may even include livestock before dawn.

Glaser (1972) defined pilfering as a predatory crime in which a person deliberately takes some one else's property. In the same manner, Laseinde (1994) defined pilfering as a clever way of stealing whereby a proportion of some ones property is made away with usually on continuous basis by the pilferer with a view to making the owner unsuspecting of the loss. Also Adefuye (1995) sees pilfering as an occurrence when a person deliberately takes the property of another person.

2.2 Rate of Pilferage In Agriculture

According to Adefuye (1995a) pilfering on farms as a source of farm losses has long been known but its pestilence has recently increased to a level that should make producers and consumers alike uncomfortable. Pilferage is a social problem. In the good old days, pilferage was recognized on farms but considered as a minor social problem and farmers did not bother much about it though painful (Adewodu, 1991; Jibowo, 1992). In the prevailing economic malady even at the global level, pilferage in agriculture is so rampant that it touches and threatens all facets of agriculture. In other words, hard times promote pilferage on farms. In farming it is generally believed that pilfering is inevitable and should account for less than 2% loss. However, as noted by Laseinde (1994) more than 10% loss is now attributed to pilferage in recent times. In fact the rate of pilferage in agriculture is gradually increasing at an increasing rate.

2.3 Predisposing Factors/Causes of Pilferage In Agriculture

According to Olusanya *et al*. (1995) the means of rural survival have been threatened by losses despite improved technologies in genetics, nutrition, health and management practices in Nigeria. The causes of these losses had in the recent past been mainly ascribed to disease outbreak, poor management practices and poor soil type while pilferage had been greatly neglected.

Arable crop farming is the most important source of food, income and employment for the rural dweller (Adefuye, 1995b). Therefore, pilfering of

arable crops is of immense importance to arable crop farmers since their profit is gradually eroded and their produce/harvest greatly reduced where it is rampant, thus its control is of vital importance in order to improve the arable crop farmers lot. Many farmers are becoming too old to actively engage in farming and the younger people are not taking to agriculture, therefore, food crop production has become drastically reduced causing food prices to escalate beyond the each of the rural non-producers. This has resulted in the rural people pilfering food crop items from farmer's farms to make ends meet, particularly at this hard times when it is extremely difficult for a working class man to feed a family of five conveniently. The rural populace had resulted to pilferage of agricultural food crops (Adedoyin, 1995).

Olusanya *et al*. (1995) in their study found out that causes of livestock pilferage included greed (66.66%), poverty (59.16%), laziness (29.17%), unemployment (18.06%), bad company (16.6%), inborn traits/kleptomania (11.11%), lust (6.94%); and wickedness (1.39%).

Banwo (1995) pointed out the possible causes of pilfering to include protests that may arise from aggrieved relations or workers, hunger or economic depression, attempts to seek compensation or redress for some perceived loss like underpayment, wage deduction or deprived rest or a tendency for willful damage.

2.4 Sources of Pilfering In Agriculture

According to Banwo (1995), there are a few possible sources from which pilfering could arise; viz:

a) Internal sources: These include relations of farmers, marketers, friends and hired labour or assistants or even security agents. These pilferers rely on the confidence reposed on them, which they betray to cause losses. Farm owners and their security agents would not normally pay serious attention to these sources for security checks and the pilferers capitalize on this.

b) External sources: These include pilferers that come from outside the set up. They have to device means of beating the security set up if any. They cause more loss to the farmers than the items pilfered since they cause additional damage to security to perpetrate their deeds.

These professional pilferers go about in small groups and in automobiles from one location to another. During such trips, they do not steal crops alone but equally steal animals of all ages from owner's farms. Osulaja (1995) maintained that the role of man as pest (i.e. pilfering agricultural produce) has been recognized by ancient Hebrews. In the same vein, Olubanjo (1995) identified farming colleagues, village residents and "visitors" to the community as major sources of pilfering. Nasir (1995) also identified two sources of pilferage on farms, that, caused by persons alien to the farm and that caused by insiders, employees or workers on the farm.

2.5 Roles of Youths In Pilferage of Agricultural Produce

The sociological background of pilferers and victims of pilferage cuts across a wide continuum of diverse rural dwellers ranging from the old, the young, the men and the women folks, the literates and the illiterates and even the rich and the poor within the rural communities. This cankerworm has an equal effect just like pests and diseases against the achievement of qualitative food production. Rural youths however, due to their nature, are found to be more prominent in disposition to pilfering in rural communities (Torimiro, 1995).

Youth constitute a very significant proportion of the population of rural communities all over the country (Umaru, 1992). While the United Nations defines youths as young men and women between the ages of 15 – 24 years (Torimiro, 1995) defines youths as the period in an individual's life which comes between the end of childhood and entering into the world of work.

Umaru (1992), Torimiro (1995) and Anonguku (2005) in their various studies agreed that pilfering has been accepted in the circle of youths as a kind of social behaviour that has been socially institutionalized. This is because youths are known to be characterized by their state of mind, their preference for boldness, love for adventure, process to change, etc. All these culminate in the nature of youths in rural communities, which are more or less significant in predisposing them to pilfering in their communities. This youthful exuberance is an important factor predisposing them to a propensity to pilfer (Torimiro, 1995).

Rural youths are energetic, they can move up and down. They can climb trees and even gather fruits/tree crops through pilferage. Most often, they organize themselves into a vigilance Group in readiness to deliberately ponder on orchards or any fruit/tree crops farm. Any sight of the farm owner will send them scampering helter-skelter for refuge. They see themselves as trespassers but they derive pleasure in the pilferage adventures.

2.6 Extension Implications of Pilferage

According to Adedoyin (1995), farmers are expected to find agricultural innovations attractive to them so as to be able to increase their productivity, earn increased income, enjoy high standard of living and improve their performance of basic civic responsibilities. However, this will not just happen without skilful extension service properly and appropriately put at their disposal. It is also true that people refuse to accept, adopt and put innovations into use or discontinue the use of earlier adopted ones due to some reasons (Adedoyin, 1995).

Torimiro and Adedoyin (1995) reviewed communication as an instrument for change alongside with pilferage occurrence on farms. They found that attitude modification is a process of revealing the unwanted socio-cultural practices through behavioural disposition, such requires a change which cannot not be achieved solely by enforcement but through an understandable well package communication pattern. Pilfering is behavioural in nature, which may attract a measurable and significant influence of change if adequate communication strategies are employed (Anonguku, 2005).

The food consumed in Nigeria is produced by small scale arable crop farmers who form over 80 percent of the rural population (Jibowo, 1992). These people depend on farm produce for food and income, and the extent to which they are supported and sustained by the farm output is a reflection of agricultural development. Ezuch (1984), Moyal (1988) and Walker (1987), recognized agents such as diseases and pests, as sources of losses on farms. However, as noted by Anonguku (2005), pilfering is much more dangerous than diseases and pests because it disturbs farmers emotionally and psychologically. Adewodu (1991) also noted that pilfering is a serious and formidable impediment to farming activities. Ekong (2003) observed that communication is indispensable in attitude formation and modification. The process of socialization will equally go hand in hand with the communication process for adequate and gradual dislodgement of bad attitudes.

Anonguku (2005) noted that extension will play a significant role in controlling pilferage, if pilferage is embedded into the mainstream of extension system in Nigeria. Adefuye and Adedoyin (1994), Adefuye (1995a) and Adefuye (1995b) also in their enquiry into factors militating against sustainable and sustained agricultural production recognized that one of such major sources of losses to agricultural output is pilfering.

2.7 Effects of Pilferage On Farmers

Olusanya *et al*. (1995) identified the effects of pilferage on the victims to include financial losses (95.83%) and emotional disturbances (36.11%). In his

study at Ijebu North, Ogun State, Adedoyin (1995) observed that farmers were well aware of the occurrence of pilfering on farms, majority of them had fallen victims to pilferers several times and had suffered great financial losses.

Olubanjo (1995) observed that pilfering lowers the standard of living of the private livestock farmers and not only reduces enterprise outputs and incomes but also lowers substantially the total profits realizable from livestock husbandry.

Pilfering is fast becoming a serious research problem. It has been found to account for as high as an average of 5% of the total cost to marketers and 4% of total quantities handled (Anonguku, 2005). The operational efficiency of marketers has been found to decrease with increasing pilferage rate with a correlation co-efficient as high as -0.66. Profit per unit of commodity is also found to decrease with increasing pilferage rate and a correlation co-efficient of -0.62 recorded (Banwo, 1995). Esiemokai (1986) put losses to individual farms in Nigeria from pilfering at 7 to 11 percent annually.

2.8 Conceptual Framework

A theory may be defined as set of inter-related constructs (concepts), definitions and propositions that present a systematic way of phenomena by specifying relations among variables, with the purpose of explaining and predicting some phenomena [Onigu,1994]. This study was premised on the theoretical concept of deviance which was guided by three perspectives of deviance.

2.8.1 The theory of anomie and crime

2.8.2 Social control theory; and

2.8.3 Conflict theory

2.8.1 The theory of anomie and crime

According to Merton (1968), in primitive societies, there exists mechanical solidarity where mores and folkways control people's behavior. But as society gets larger and more complex, there is a shift from mechanical to organic solidarity which results in increasing division of labour and heterogeneity. The result is that the traditional forms of social control become ineffective. As a consequence a state of anomie or "normlessness" replaces the former state of solidarity. Under this condition, individuals strive to reach their goals by the most effective means that come to hand, regardless of the moral prohibitions of society. The result is high rate of deviant behavior one of which is pilferage. Utilising this theory of anomie, Merton, [1968], suggests that all social structures have two characteristics, namely goals and means. The goals are those things that are 'worth striving for. The means are the approved methods for achieving the goals but in a state of anomie, when the goals have been rejected or the means for obtaining those goals are rejected, deviant behavior results. Merton designed the following typology to describe the methods of adaptation that are available to those who react to the goals and means of society, that is, in a competitive capitalistic society.

a) **Conformity:** Conformity describes the acceptance of the goals and also the means of society

b) **Innovation:** Innovation represents the acceptance of the goals but rejection of the means for obtaining the goal. Innovation in this sense involves the use of proscribed means for goal achievement.

c) **Ritualism:** In ritualism, as a mode of adaptation to anomie, one rejects the culturally approved goals and concerns himself only with means.

d) **Retreatism:** The retreatist rejects both the goals and the means and in so doing, rejects the whole social system. The alcoholic who drinks so as to forget the realities of life situations is a good example.

e) **Rebellion:** The mode of adaptation to anomie represents not only a rejection of existing goals and means, but also substitution of new goals and new means. Marxists and Communists who advocate the liquidation of capitalism and substitution of communism are under this category.

Table 1: Five modes of individual adaptation.

	Modes of adaptation	Culture goals	Institutionalized means
I	Conformity	+	+
ii	Innovation	+	-
iii	Ritualism	-	+
iv	Retreatism	-	-
v	Rebellion	∓	∓

Source: Merton (1968)

2.8.2 Social Control Theory

The social control theory states that criminal behavior results when social controls are either weakened or breakdown. When controls are strong, deviance like pilferage does not occur. Most people conform to the dominant values because of both inner and outer controls. The inner controls are the internalized norms and values one learns. The outer controls are social rewards for conformity and the penalties for deviation which one receives. However, these days values and norms are no longer appreciated by most people in the present generation hence deviation is almost very common in our societies and social control in rural areas are highly weakened, hence pilferage has become very rampant.

2.8.3 Conflict Theory

Class conflict theorists such as Karl Marx reject the consensus model of a stable, integrated society whose members are in basic agreement upon values.

"Consensus upon values" is viewed as a myth artfully cultivated by the powerful for their own benefit. These theorists attribute deviation not to the different cultural norm of different social class but to their different interest. Thus deviations such as pilferage on the farm or at home by workers or family members will continue as long as class inequalities exist between such workers or family members and their employers or head of the family and the later continues to exploit them as perceived by them.

2.9 Conceptual Model

A model is simply an attempt at classifying the major elements of an entity or phenomenon with regards to their functions and inter-relationships in order to understand more easily how the elements function within the entity (Emmanuel, 2007).

The model for this study posits that socio-economic characteristics of arable crop farmers such as age, farming experience, sex, educational level, farm size, household size, storage place and inadequate security measures can possibly predispose their produce/crops to pilferage. It also posits that pilferage would lead to financial loss by farmers, discouragement from adoption of recommended technologies, withdrawal from growing certain crops highly prone to pilferage and even complete abandonment of farming activities by arable crop farmers.

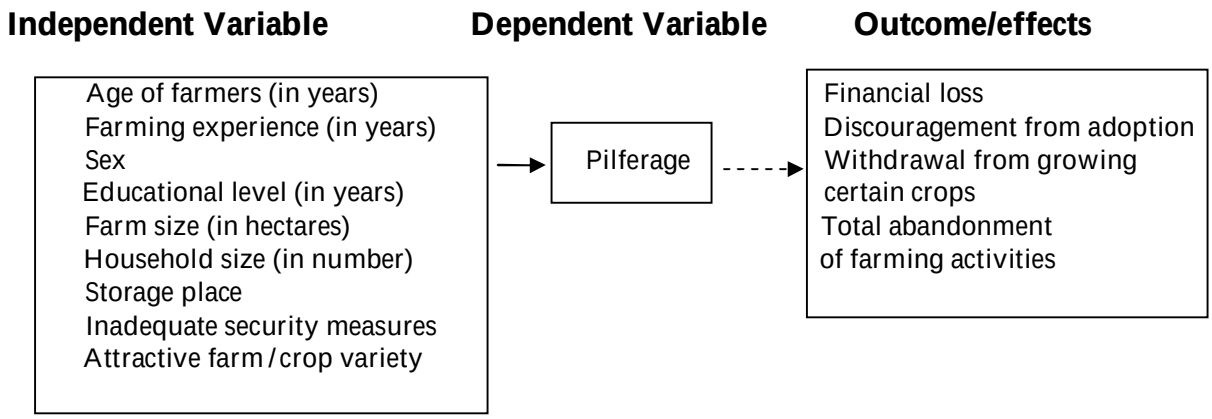


Fig. 1: A model of pilferage effects

Figure 1 is a model of pilferage effects. The independent variables in the model are socio-economic characteristics of farmers that can possibly predispose his or her farm/produce to pilferage (the dependent variable). Such socio-economic factors or characteristics include the age of farmer, his experience in farming, his educational level, the size of his farm, his or her sex, place of storage of his harvested produce and available security measures and the use of attractive farm/crop variety. These are in other words called explanatory variables. The dependent variable is predisposition to pilferage. The outcome or effects of pilferage when obtained may include financial loss, discouragement from adoption of innovations that would lead to bumper harvest; withdrawal from the growing of certain crops perceived or determined to be prone to pilferage and in extreme cases the total abandonment of farming business on the part of the farmers.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

The study was conducted in Idah Local Government Area (LGA) of Kogi State. The choice of the area was essentially on the basis of the large concentration of arable crop farmers. Kogi State is in the Southern Guinea Savanna ecological zone and lies between latitude 7^{o}N and 8^{o} 31'N and longitude 5^{o}E and 6^{o} 15'E. The state has population figure of 3,314,043 (NPC, 2006). Out of these males account for 1,672,903 while females account for 1,641,114. According to the same source, the total population of Males in Idah LGA is 40,141, while females stands at 39,614 giving a gross total of 79,755 (NPC, 2006).

The LGA has a typical savannah climate with distinct wet and dry season. The wet season falls between the month of April and October while the dry season falls between November and March. The annual rainfall ranges from 1100 mm to 1300 mm. It has sandy light-hued grey/reddish in colour impervious soil. It has Guinea savanna vegetation with tall grasses and some trees. These grasses and trees are green in the rainy season during the rainy season but the dry season shows charred trees and remains of burnt grasses (Udok and Mamman, 1993).

Farming accounts for 80% of the population of the area. The major crops grown are yam, cassava, maize, rice and tree crops such as oil palm, citrus, and cashew. Apart from crop farming, livestock such as goats, sheep and poultry are

kept. Cropping pattern is mainly mixed cropping with few farmers practicing sole cropping.

3.2 Sampling procedure and sample size

Simple random sample was used to select 10% of the total population (1091) which was given by Kogi State Agricultural Development project (KSADP, 2006). The sample size was 10% of the population which add up to 110 farmers as shown in Table 2.

Table 2: Sample frame and sample size

S/No	Village	Population	Sample Size
1	Allah Okweje	78	8
2	Aloko-inah	276	28
3	Efulu	122	12
4	Ichekene	122	12
5	Ekwokata	197	20
6	Ichala-Edeke	296	30
	Total	1091	110

Source: Field Survey Data, 2007

3.3 Sources of data

Primary data was used to collect information through structured questionnaire based on 2006—2007 cropping activities. Information generated included farmers age, sex, income, level of education, farm size, storage system and location, available security measures on the farm to checkmate pilferage, nature of farm/variety of crop planted, sources of labour on the farm, perceived

causes of pilferage, perceived sources of pilferage and effects of pilferage on them etc. The interview method of data collection was adopted.

Secondary data were also obtained from existing literatures relevant to the study.

3.4 Analytical Techniques

Generally, the data emanating from the study were analyzed with statistical package for social science (SPSS).

3.4.1 Descriptive statistics

According to Murray (1961), the phase of statistics which seeks only to describe and analyze a given group without drawing any conclusions or inferences about a larger group is called descriptive or deductive statistics. In line with this, descriptive statistic was used to analyze and summarize the data that were collected. This involves the use of measures of central tendency such as frequency distribution, mean, component bar charts, and percentages to achieve objectives 1, 2, 4 and 5.

Objective 1 which entails describing the socio-economic characteristics of arable crop farmers in the study area was achieved using frequency distribution and percentages.

Objective 2 was to determine the level of pilferage on the three selected crops of yam, maize and cassava. This was calculated using the equation

$$\text{Rate of pilferage} = \frac{\text{Total value of crops lost to pilferage}}{\text{Total value of crops harvested}} \times 100$$

Objectives 4 and 5 which are determination of effects of pilferage on arable crop farmers and identification of measures utilized by farmers' in the study area to combat pilferage were respectively analyzed using frequency distribution, component bar chart and percentages.

3.4.2 Multiple regression

Multiple regression was used to achieve objective 3. In this study only quantifiable factors hypothesized to be factors that can possibly predispose farmers produce to pilferage were included in the model and equation.

The explicit function of the model is stated as:

$$P = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + U \ldots. (i)$$

Where;

P = Pilferage measured in monetary term (naira)

a = constant

x_1 = age of farmer measured in number of years

x_2 = Farming experience in years

x_3 = Sex (1 = male, 2 = female)

x_4 = Education (number of years spent in school)

x_5 = farm size (in hectares)

x_6 = household size (in number)

x_7 = Storage place (home = 1, farm = 2)

x_8 = Inadequate security (ranking of measures.)

x_9 = nature of farm / crop variety planted (index)

$b_1 – b_8$ = regression coefficients of explanatory variables

U = error term

3.4.3 The Z-test

Z-test measures two sample means from a group to determine whether difference exist among the means. Previous researchers such as Bayo (2003) stated that in carrying out Z-test, Bartlez test must be conducted first to determine which out of equation ii and iii will be utilize.

The Z-test was used to test the hypothesis which says "there is no significant difference between the output of affected farmers and those not affected by pilferage", that is comparison of two means especially when the sample size is larger than 30. It was used to compare the mean of produce of farmers affected by pilferage and those not affected. The Z-statistics can either be expressed as equation i or ii

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad \text{..... (ii)}$$

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{sp^2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad \text{..... (iii)}$$

Where

Z = calculated z score

$\bar{x}_1$ = mean of affected farmers output

$\bar{x}_2$ = mean of output of farmers not affected

s_1^2 = variance of affected farmers output

s_2^2 = variance of output of farmers not affected

n_1 = sample size of farmers affected

n_2 = sample size of farmers not affected

$$sp^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$F_{cal} = \frac{\text{The higher or greater } s^2}{\text{The lower } s^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

Equation iv is referred to as Bartlez test. In this study Z-test was used to test the hypothesis, that is comparison of the two means. The mean of produce of farmers affected by pilferage and that of those not affected by pilferage.

Fcal was 1.62

Ftab was 1.5 hence equation ii was used to arrive at a Zcal of 2.96 and Ztab of 1.96 and since the Z-calculated was more than the Z-tabulated, the null hypothesis that there was no significant difference between the produce of affected farmers and those not affected by pilferage was rejected while the alternative hypothesis that there was significant difference between the affected farmers produce and those of farmers not affected by pilferage was accepted.

3.4.4 Measurement of variables

3.4.4.1 Independent variables

(i) Age: This refers to the approximate chronological age of the respondent as given at the time of data collection. It was measured as actual age given in years.

(ii) Level of education: Each respondent was asked to state whether they have primary education, secondary education, Grade II/Diploma certificate, HND or B.Sc. and others or whether they have not been to school at all. The response was scored as education score.

(iii) Farm size: This refers to area of land available for cultivation of maize, cassava and yam at the time the interview was conducted. It was measured in hectares.

(iv) Farming experience: This refers to the number of years the respondent has been into the growing of the three selected arable crops. The respondent was asked to indicate the years.

(v) Gender: This refers to the sex of the respondent. It is either male or female. Males were scored 2 while female were scored 1.

(vi) Security measures: This refers to the strategies adopted by farmers to help prevent pilferage of their produce ranging from fence, security guards, charms and amulets and vigilance group. Respondents were scored using ranking of effectiveness of the various measures utilized by them on their farm/storage structure. No measure was scored 1, fence solely was scored

2, vigilance group solely 3, vigilance group with fence 4, charms solely 5, charms with fence 6, vigilance group with charms 7 and finally the combination of charms, vigilance group and fence was scored 8.

(vii) Produce storage point: This refers to the actual place respondents store their produce. It is also the environment where their storage structures are actually located. It is either on the farm or at home. Home storage was scored 2 while farm storage was scored 1.

(viii) Household size: This refers to the actual number of persons who feed from the same pot in the respondents' house. It is in other words called effective family size. This was measured by indicating number of persons.

(ix) Attractiveness of farm/crop variety: This refers to the level of attractiveness of farmers' farm and variety of crops used. Farmers who weeded their farms throughout and utilized hybrid varieties were scored four (1), those who weeded partially and used hybrid varieties where scored three (2), those who weeded throughout but used local varieties were scored two (3), while those who used local variety and weeded partially were scored one (4).

3.4.4.2 Dependent variables

(i) **Pilferage:** This is the deliberate and fraudulent act of making away with a proportion of another person's property on a continuous basis with a view to making the owner unsuspecting until the loss reaches an alarming

extent. Pilferage was measured by multiplying the quantity of produce lost to thieves by the monetary market value in Naira (₦).

(ii) **Abandonment of farming activities:** This is the act of deciding to quit farming business as a result of pilferage. It was determined by counting the number of respondents who have taken the decision of not continuing farming any longer.

(iii) **Withdrawal from certain crops:** This refers to action by respondents not to grow one crop or the other as a result of susceptibility of such crops to pilferage. This was measured by counting the number of respondents who actually made up their mind against growing either yam, cassava or maize.

(iv) **Unwillingness to adopt technology:** This is the lack of zeal on the part of respondents to accept package or technique from extension agents that will enhance expansion of farm land or better farming method to boost productivity for fear of pilferage. This was also determined by counting the number of farmers unwilling to go into large scale production for fear of pilferage.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of Farmers

4.1.1 Age of farmers

The age of the farmers was investigated in order to find out the age group mostly involved in arable crop production (yam, cassava and maize). The result in Table 3 revealed that 10 % of the farmers were between the ages of 20 – 29 years while 21.82 % and 41.32 % were between the ages of 30 – 39 years and 40 – 49 years respectively. Results also showed that 20.91 % and 05.45 % were between the ages of 50 – 59 years and $\geq$ 60 years respectively. The youthful age (20-49 years) form a reasonable proportion cumulating to 73.64 %. This finding agrees with that of Umaru (1992) that youths constitute a very significant proportion of the population of rural communities all over the country. Yahaha (2002) validates this assertion when he reported that farmers between 20 – 50 years are the most active age group in agricultural practices. The mean age of arable crop farmers was 43.50 years. This implies that young and active men and women dominate arable crop farming in the study area. Their relatively young age may make them receptive to innovation that can possibly checkmate pilferage unlike the older ones who usually expect the adherence to social control measures.

Table 3: Distribution of arable crop farmers according to age

Age (years)	Frequency	Percentage
20 – 29	11	10.00
30 – 39	24	21.82
40 – 49	46	41.82
50 – 59	23	20.91
> 60	06	05.45
Total	110	100.00

4.1.2 Educational status of arable crop farmers

Education plays a major role in creating awareness among farmers and it influences the adoption of strategies and techniques that can boost productivity. Result from the study as shown in Table 4 indicated that 23.64 % of the farmers had no formal education while 39.09 %, 25.45 %, 22.00 % had primary, secondary/Grade II and tertiary education respectively. Although majority (73.36 %) of the farmers had formal education, only 22 % had tertiary education.

The study equally revealed that the rate of pilferage was almost evenly spread among the different levels of education. This is an indication of the fact that educational status or attainment does not play any role in susceptibility to pilferage.

Table 4: Distribution of farmers according to level of education

Level of education	Frequency	Percentage (%)	Victims of pilferage (No)	Percentage (%)
No formal education	26	23.64	19	73.07
Primary education	43	39.09	30	69.76
Secondary / Grade II	28	25.45	20	71.42
Diploma / NCE	09	08.18	06	66.67
HND / B.Sc / B.A	04	03.64	03	75.00
Total	110	100.00	78	

4.1.3 Farm size

One major characteristics of small scale farmers is fragmented land holdings. Hitherto farmers in the area had various sizes of farm land ranging from 0.25 hectares to 3.0 hectares however after a serious land crises that lasted 2 years among ten agrarian communities within the study area, no farmer was allowed to have more than an hectare. Land was shared to farmers in three categories viz; 0.25 hectares, 0.5 hectares and 1 hectare. The results in Table 5 show that 60.09 % of the farmers owned farm size of less than 1 hectare while 30.91 % of the farmers owned 1 hectare. The mean farm size owned by farmers was 0.575 hectares. It then implied that 30.91 % had large farm size, 37.37 % had average farm size while 31.82 % had small farm size. Farm categorization is justified only in the context of the particular environment. The measure of size to be used depends on the objectives of the farm size comparison. The inclusion of

farm size in this study is relevant because it determines the harvest or yields which in turn determine susceptibility to pilferage.

Further investigation as shown in table 5 revealed that 94.11 % of 34 farmers with one hectare of farm land became victims of pilferage while 87.80 % of the 41 farmers with half a hectare of farm land suffered pilferage. The least pilferage level was suffered by 28.57 % of the 35 farmers with a quarter of a hectare of farm land. This indicates that farmers with large farm size suffer more susceptibility to pilferage than those with small farm size.

Table 5: Distribution of farmers according to size of land owned and utilized for arable crop production

Farm size	Frequency	Percentage (%)	Victims of pilferage (No)	Percentage (%)
0.25	35	31.82	10	28.57
0.50	41	37.27	36	87.80
1.00	34	30.91	32	94.11
Total	110	100.00	78	

4.1.4 Farming experience

On the variable relating to farming experience, Table 6 shows that 41.82 % of the farmers had been into arable crop production (maize, yam and cassava) for 1 – 5 years, 23.64 %, 10.00 %, 10.00 % and 7.27 % had been in arable crop farming for between 6 – 10 years, 11 – 15 years, 16 – 20 years and 21 – 25 years respectively, while 7.27 % had been into arable crop farming for over 25 years. Although the mean arable crop farming experience by the farmers was 10.00

years, about 72 farmers out of 110 farmers studied had below 11 years experience. Farming experience is used as a measure of management ability. The more experienced a farmer is, the more his ability to make farm decision. The highest pilferage level was suffered by 44 farmers representing 95.65 % of those with less than 6 years experience. Those with above 25 years experience did not suffer pilferage at all indicating that farm experience is a predisposing factor to pilferage.

Table 6: Distribution of farmers according to farming experience

Farming experience (years)	Frequency	Percentage	Victims of pilferage (No)	Percentage
1 – 5	46	41.82	44	95.65
6 – 10	26	23.64	23	88.46
11 – 15	11	10.00	05	45.45
16 – 20	11	10.00	05	45.45
21 – 25	08	07.27	01	12.50
> 25	08	07.27	-	00.00
Total	110	100.00	78	

4.1.5 Gender categorization

The ratio of female farmers to male farmers was studied. It was discovered that the number of male arable crop farmers surpasses that of their female counterparts in the study area. This is in contrast with the work of Banji and Okunade (2005) that women farmers in Africa constitute more productive

force in subsistence agriculture participating actively in the primary production of food crops, animal production, and transportation of food crops from the farm to the house, processing, storage and marketing. Thus 36 farmers representing 32.73 % were female while 74 farmers representing 67.27 % were males. Studies also revealed that most female arable crop farmers in the area were either single parents, widow or divorces. It is generally believed that women are of weaker sex hence the inclusion of gender in the study to determine their susceptibility to pilferage on this account or otherwise. The result however showed that 26 out of 36 women farmers suffered pilferage representing 72.22 % females while 52 out of 74 male farmers suffered pilferage representing 70.27 %. This indicates that gender does not count in predisposition to pilferage in the study area.

Table 7: Distribution of respondents according to gender and level of pilferage by each

Gender	Frequency	Percentage	Victims of pilferage (No)	Percentage
Male	74	67.27	52	70.27
Female	36	32.73	26	72.22
Total	110	100.00	78	

4.1.6 Security measure adopted to reduce or curb pilferage

Various measures are employed by people to protect their properties from being tampered with or stolen. The type and number of measures adopted by a person determines the level of predisposition of his property to criminals. Three

measures were adopted by the six communities studied for pilferage prevention. These included erecting of fence round the farm/storage structure, the use of vigilance and the use of charms and amulets. Farmers in the areas studied pay on a monthly basis to a group of youths who protect their farms especially at nights (vigilance group). The study revealed that 7.27 % of farmers studied depended on vigilance and fence, 04.54 % depended on charms and vigilance, while 4.54 % depended on fence, vigilance and charms. Only 13.64 % of farmers relied solely on fence, 3.64 % farmers relied on fence and charms. The percentage of farmers that relied on charms solely and vigilance solely was 11.82 % and 20.00 % respectively. This is an indication of the peoples' believe in the effectiveness of fence and vigilance. A total number of 38 farmers who relied on none out of the three measures as shown in Table 7 stated that they were aware of pilferage but that there was nothing they could do but pray for divine intervention.

Further investigation revealed that 94.74 % of farmers who utilized none of the three measures were affected by pilferage. Among the 15 farmers who relied on fence solely, 86.67 % became victims of pilferage. In a similar manner among the 22 farmers that depended on and employed the services of vigilance group for pilferage prevention, 81.82 % were affected. None out of the 5 farmers who utilized the three measures for pilferage prevention was affected. From this analysis one would be right to state that in order of ranking, out of the three measures, charms solely ranks first followed by vigilance group and lastly fence.

In a similar manner in order of ranking for the combination of measures, the three measures rank first followed by vigilance group with charms and then charms with fence and finally fence with vigilance. The worst measure is to adopt no strategy at all. Conclusively charms appears to be the most effective measure for pilferage prevention in the study area in line with the work of Onasanya (1995) who pointed out that charms was the most effective measure for pilferage prevention in Ijebu North Local Government Area of Ogun State.

Table 8: Distribution of farmers according to security measures adopted for pilferage prevention

Level of education	Frequency	Percentage	No. of farmers affected (victims)	Percentage
Fence alone	15	13.64	13	86.67
Charms alone	13	11.82	04	30.77
Vigilance group alone	22	20.00	18	81.82
Fence with charms	05	04.54	01	20.00
Fence with vigilance	08	07.27	05	62.50
Charms with vigilance	04	03.64	01	25.00
Fence / charms and vigilance	05	04.54	-	0.00
No measure at all	38	34.55	36	94.74
Total	110	100.00	78	

4.1.7 Produce storage point/venue

Farmers are known to store their produce either at home or in the farm, it was assumed that produced stored at home would not be predisposed to external pilferage and those stored at the farm will not be predisposed to internal

pilferage however the study revealed that 71 % of farmers stored their produce at home while 29 % stored theirs on the farm. While a total of 70.5 % of the farmers who stored their produce at home lost their produce worth ₦691,966.67k to pilferage, 71.9 % of farmers who stored their on the farm lost produce worth ₦345,033.33l to pilferage. As shown in Table 9, percentage loss to farm storage and home storage were 15.60 percent and 15.64 percent respectively. Total percentage loss was 15.63 %. This indicates that pilferage is rampant both at home and on the farm storage.

Table 9: Distribution of farmers according to storage point and loss incurred by each group to pilferage

Storage point	No of farmers	Victims of pilferage (No)	Produce worth before, pilferage (₦)	Produce worth after, pilferage (₦)	Produce worth lost to pilferage (₦)	Percentage loss (%)
On farm storage	32	23	2,211,033	1,865,999.67	345,033.33	15.60
Home storage	78	55	4,422,067	3,730,100.33	691,966.67	15.64
Total	110	78	6,633,100	5,596,100.00	1,037,000.00	15.63

4.1.8 Household size

Apart from being the main source of farm labour in the rural settings, household size also may contribute to pilferage as internal pilferage is mostly attributed to family members as reported by Banwo (1995). The number of persons that feed from a common pot on a daily basis in a home refers to household size or family size. Since pilferage perpetuated by family members constitute internal source while that perpetuated by outsiders constitute external source, household size was included to determine the level of internal pilferage. Responses on this variable as shown in Table 10 indicates that 12.73 % of the farmers had 1 – 5 people in their family, 16.36 % and 38.18 % had 6 – 10 people and 11 – 15 people respectively. While 27.28% and 05.45 % farmers had 16 – 20 people and above 20 people as their household size respectively, the mean household size of the entire arable crop farmers in the study area was 13. This finding is in contrast to the report by Nweke (1989), that the average family size in Africa is 9 people per household. The reason for the increase may be due to improvement in primary health care delivery to the rural areas thereby reducing mortality rate.

Further investigations as shown in table 10 shows that farmers with household size of 11 – 15 people, 16 – 20 people and above 20 persons suffered pilferage of 90.47 %, 90.00 % and 83.33 % respectively. However, the lowest pilferage of 14.28 % was suffered by farmers with household size of 1 – 5 people while farmers with household size of 6 – 10 people suffered pilferage of 33.33 %.

The result indicates that the more the household size, the higher the level of pilferage. Thus household size may be considered as a predisposing factor to pilferage. This also indicates that internal pilferage is more rampant in the study area than external pilferage.

Table 10: Distribution of farmers according to household size and pilferage level by each

Household size (No)	Frequency	Percentage	Victims of pilferage (No)	Percentage
1 – 5	14	12.73	02	14.28
6 – 10	18	16.36	06	33.33
11 – 15	42	38.18	38	90.47
16 – 20	30	27.28	27	90.00
> 20	06	05.45	05	83.33
Total	110	100.00	78	

4.1.9 Attractiveness of farm/crop variety

While Kleptomanias pilfer or steals because it has become part and parcel of them as reported by Olusanya *et al*. (1995), some other persons pilfer or steal as a result of discovering an attractive or unique article they do not have. It was assumed that farmers who use hybrid varieties of crop in a local setting where most farmers use local variety would have their produce predisposed to pilferage. The result on Table 11 shows that 39 farmers representing 35.45 % utilized hybrid variety and weeded their farm throughout the gestation period.

Thirty three farmers representing 30.00 % and 22 farmers representing 20.00 % used hybrid variety but weeded partially and used local variety but weeded throughout the gestation period respectively. However, only 16 farmers representing 14.55 % utilized local variety and did not keep their farms weed free throughout the gestation period.

The result further revealed that 36 farmers from a total of 39 farmers who used hybrid variety and kept their farm weed free throughout representing 92.31 % suffered pilferage. In a similar manner 29 farmers out of 33 that used hybrid variety but did not keep their farms weed free throughout representing 87.87 % suffered pilferage. In contrast to this high pilferage level suffered by the farmers discussed, the number of their counter parts who did not use hybrid variety that suffered pilferage was as low as 8 from 22 farmers and 5 from 16 farmers representing 36.36 % and 31.25 % respectively. This result is an indication of the fact that the use of hybrid variety and maintenance of clean farm is a predisposing factor to pilferage.

Table 11: Distribution of respondents according to attractiveness of farms/crop variety used

Attractiveness of farm/crop type	Frequency	Percentage	No of pilferage victims	Percentage
Weeded throughout/used hybrid variety	39	35.45	36	92.30
Weeded partially/used hybrid variety	33	30.00	29	87.87
Weeded throughout/used local variety	22	20.00	08	36.36
Weeded partially/used local variety	16	14.55	05	31.25
Total	110	78	78	-

4.2 Objective 2: Rate of Pilfering on yam, maize and cassava

Table 10 shows the total monetary value of cassava, yam and maize obtained by farmers after harvest. The table also shows the value of cassava, yam and maize that was pilfered. Based on the table, it was observed that 11.32%, 22.86% and 14.75% of cassava, yam and maize respectively were pilfered. Thus, yam has the highest percentage of the crops pilfered with 22.86 % while cassava was the least with 11.32 %. The average rate of all the crops pilfered was 16.27%. This could discourage any farmer.

Table 12: Total harvest value, value pilfered and pilferage rate on arable crops.

Crops	Total value	Harvest value pilfered	Pilferage rate
Yam	2,520,578	576,110	22.86%
Maize	1,326,620	195,660	14.75%
Cassava	2,785,902	315,230	11.32
Gross total	6,633,100	1,087,000	16.4%

Source: Field survey data, 2007.

4.3 Objective 3: Socio-economic Factors that Predispose Farmers Produce/Crops to Pilferage

Empirical results from socio-economic factors that predisposed farmers' produce / crops to pilferage were obtained by means of multiple regression analysis.

The regression results (Table 11) indicates that about 71.5 percent of the variability in pilferage was accounted for by the explanatory variables in the

model. The regression signs for farming experience, education, farm size, household size, storage place, security measures and attractive farm/crop variety shows positive relationship with disposition or susceptibility to pilferage, while that of age of farmer and sex showed negative relationship.

Farming experience is significant at 10% level because the more experience a farmer has the more his knowledge on strategies employed by pilferers. Sequel to this he develops strategies to curb or reduce pilferage on his produce/farm. Conversely an inexperienced farmer is easily beaten by pilferers to the gimicks of pilferage.

That household size is significant at 5% level is because pilferage is of two dimensions - external and internal pilferage. While external pilferage is that perpetuated by outsiders, internal pilferage constitute those perpetuated by family members hence the more the household size the higher the susceptibility of the produce to internal pilferage even though large household may mount enough security against external pilferage.

Farm size, Security measures and Attractive farm/crop variety are significant predisposing factors to pilferage at 1% level because the greater the farm size, the more the harvest and the more the harvest the less likely a farmer is able to keep an eye on his produce. So also the kind of security measures adopted by a farmer determines susceptibility of his produce to pilferage because when thieves are aware of a farmer having effective and solid security measures, they look elsewhere. Charms was discovered to be effective as a single

sole measure in reducing and curbing pilferage in the study area, while the combination of charms, vigilance group and fence was discovered to be most effective. Finally farmers having hybrid variety of crops conspicuously displayed on their farms are prone to pilferage since thieves prefer the best especially in local setting where most farmers use local varieties. Education, age and sex were not significant. This is because pilferers do not care to know educational qualifications, age and sex of their victims before plundering on their farms/produce.

Based on the above analysis, the socio-economic factors of farmers which predispose their crops/produce to pilferage in the study area were determined to be farming inexperience, large household size, inadequate/inappropriate security measures and the use of attractive variety of crop in a clean farm. The F-value which measures the joint significance of all the explanatory variables in the model was 23.4 and it was significant at 1 percent level of probability.

Table 13: Multiple regression results of socio-economic factors predisposing farmers produce to pilferage

Variables (Predisposing factors to pilferage)	Regression coefficient	SE	T-value	Level of significance
Constant	5.651	0.578	9.785	0.000
Age of farmers (x_1)	-2.955	0.013	236	0.814
Farming experience (x_2)	0.247	0.147	1.677	0.098*
Sex (x_3)	-110	0.149	-733	0.466
Education (x_4)	2.894	0.078	0.371	0.712
Farm size (x_5)	2.006	0.308	6.504	0.000***
Household size (x_6)	7.426	0.030	2.499	0.015**
Storage place (x_7)	5.485	0.078	0.701	0.483
Security measures (x_8)	0.702	0.088	7.975	0.000***
Attractiveness of farm (x_9)	2.002	0.304	6.304	0.000***

***coefficient statistically significant at 1% level R = 71.8%

**coefficient statistically significant at 5% level R^2 = 71.5

*coefficient statistically significant at 10% level F = 23.4

4.4 Objective 4: Effects of Pilferage on the Welfare Status of Arable crop Farmers in the Study Area

4.4.1 Financial loss

As can be viewed from Table 12, 78 farmers representing 70.91% suffered pilferage of their produce worth ₦1,037,000. This implied that on the average, each farmer suffered a loss of ₦13,294.87k and earned ₦51,051.28k rather than ₦64,346.15k. Hence the rate of financial loss per farmer stands at 20.66%. Thus, 70.9 % farmers suffered 20.66 % loss of their supposed income to pilferage. This loss of finance is in line with Olusanya *et* al. (1995) who identified effects of pilferage on the victims to include financial losses. The result also corroborates

that of Esimokhai (1986) who put losses to individuals in Nigeria from pilferage at 7 – 11 % annually.

Table 14: Comparison of the output of affected farmers and those not affected by pilferage

Category of farmers	Frequency	Total produce value before pilferage (₦)	Total produce value after pilferage (₦)
Affected farmers	78	5,019,000	3,982,000
Unaffected farmers	32	1,614,100	1,614,100
Total	100	6,633,100	5,596,100

4.4.2 Abandonment of farming activities

From the study carried out, one of the effects of pilferage on farmers in the study area was abandonment of farming activities of the farmers studied, 10% had made up their mind to abandon farming as a result of high rate of loss due to pilferage. This result is in line with the work of Banwo (1995) who reported that a single incidence of pilferage was capable of discouraging a farmer.

4.4.3 Withdrawal from growing certain crops

The study revealed that 35 yam farmers and 24 maize farmers representing 31.82 % and 21.82 respectively stated categorically that owing to high susceptibility rate of both crops they will not engage themselves in the cultivation of these crops subsequently.

4.4.4 Unwillingness to adopt technology that will lead to expansion

As reported by Adedoyin (1995), it is true that people refuse to accept, adopt and put innovations into use or discontinue the use of earlier adopted ones due to some reasons. From the study carried out, 18 farmers representing 16.37 % stated that they were not ready to accept or adopt any technology that will increase or expand their scale of operation for fear of pilferage.

It is worthy of being noted here that 22 farmers representing 20.00 % planned to maintain their business as usual attitude as they continue to pray for divine intervention.

Table 15: Table of other effects of pilferage on arable crop farmers apart from financial loss

Effects	Frequency	Percentage
Abandonment of farming activities	11	10.00
Withdrawal from growing yam	35	31.82
Withdrawal from growing maize	24	21.82
Unwillingness to adopt technology	18	16.36
Prayers for divine intervention	22	20.00
Total	100	100.00

4.5 Objective 5: Measures taken by Farmers to reduce or Curb Pilferage

Different communities have different measures for combating crimes and defiant behaviours however the measures available for pilferage prevention among the communities studied as depicted in Table 16 are the use of high fence

around storage structures, vigilance group, charms and a combination of two or more of these measures. The study revealed that 40 farmers representing 36.36% believed in and utilized vigilance group for pilferage prevention. Other farmers who believed in and utilized fence and charms were 32 and 27 representing 29.09 % and 24.55 % respectively.

Table 16: Distribution of farmers according to measures adopted for pilferage prevention

Effects	Frequency	Percentage
Fence	32	29.09
Charms	27	24.55
Vigilance group	40	36.36
No measure	38	34.55

In order to determine the most effective of these measures and their combination, the number of farmers that use them and the number affected by pilferage was identified and shown in Figure 2.

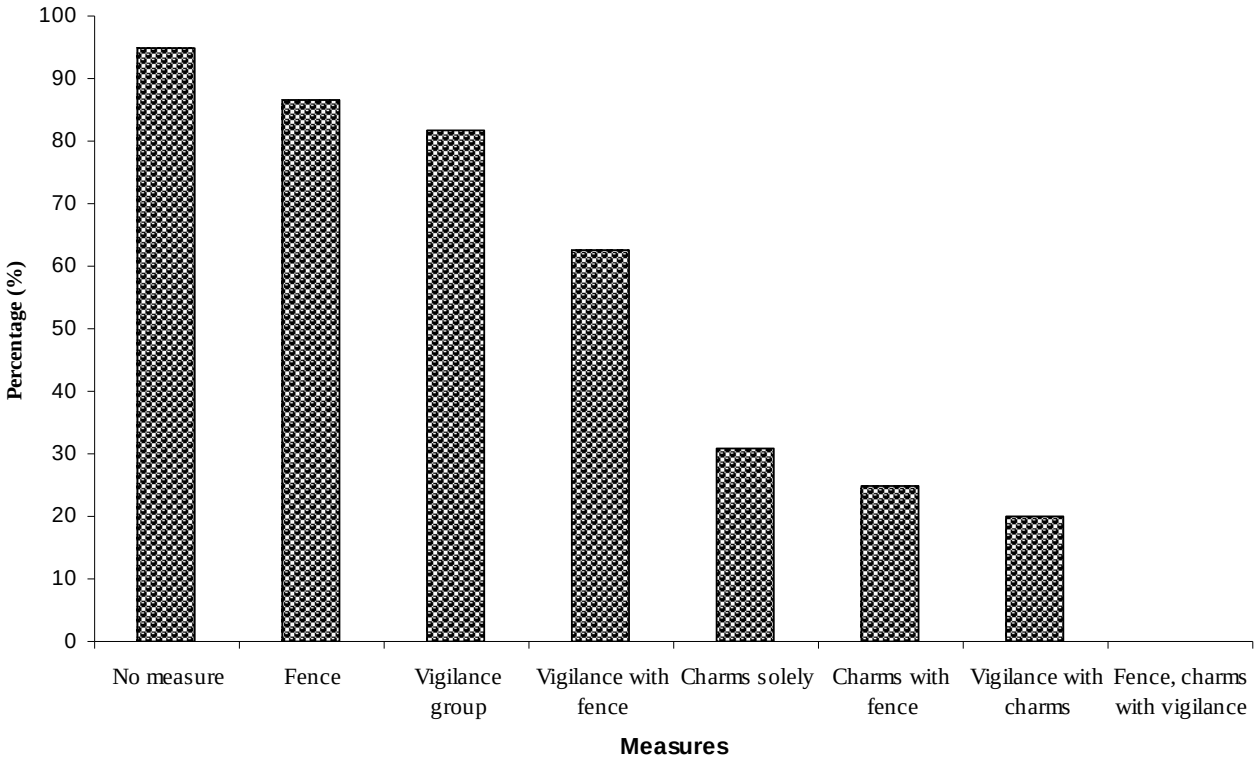


Fig. 2: Measures adopted by farmers for pilferage prevention

Figure 2 indicates that the most appropriate measure is the use of the 3 measures with 100 % effectiveness followed by vigilance group with charms with 80 % effectiveness. Other measures in order of ranking include charms with fence, charms solely, vigilance with fence, vigilance group solely, fence solely and finally no measure with 75 %, 69.33 %, 37.50 %, 19.12 %, 14.33 % and 05.26 % level of effectiveness respectively.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This study was designed to assess the effects of pilferage on selected arable crop farmers in Idah Local Government Area of Kogi State. One hundred and ten respondents were randomly selected in the study area. Ten percent each from the population of farmers in the six villages that were highly into arable crop production were selected using the Kogi State Agricultural Development Fertilizer Distribution List. Primary data were used for the study which were collected with the aid of a structured questionnaire and interview schedule. Descriptive statistics and multiple regression analysis were the tools employed for the analysis.

The results showed that about 33% of the households were female headed while about 67 percent were male headed. While about 73.64 % were within the age group of 20 – 49 years, the mean age was 43.50 years. About 76% of the respondents had one form of formal education or the other. The average household size was thirteen (13). About 20 % of the respondents had between 11 - 20 years farming experience while the mean farming experience was 10 years. Respondents with half a hectare of farm land was 37.27 %.

Result of the regression analysis showed that large farm size, inadequate / inappropriate security measures and attractive farm / crop variety (at

1% level), large household size at 5% level and farming inexperience at 10% level were significant predisposing factors of farmers produce to pilferage

About 71.5% of the variations observed in pilferage were accounted for by the variables included in the model.

5.2 Conclusion

From the study carried out, pilferage occurs in the six villages located in Idah Local Government Area of Kogi State. The cause of this high rate of deviant attitude or behaviour, in line with the theory of anomie propounded by Durkheim as one of the three perspectives of the theoretical concepts of deviance utilized in this work is that the traditional form of social control in the study areas has become ineffective. It is ineffective because social control itself has become weakened or broken down.

Thus the result revealed that farmers in the area have been loosing on the average about twenty percent (20%) of their produce to pilferage. Some of the factors found to predispose the produce of these farmers to pilferage include large farm size, large household size, attractive farm/good variety of crop, inadequate/inappropriate security measures and farming inexperience.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made:

1. The need for community/village heads and elders of good repute to have a meeting with a view to strengthening social controls in their communities

that will checkmate defiant behaviours like pilferage is highly essential and recommended.

2. Results from the study indicated that large farm size, large household size, attractive farm/crop variety, inadequate/inappropriate security measures and farming inexperience predispose farmers produce to pilferage. In view of this, farmers with large farm size should take the issue of security of their produce very seriously by constructing adequate and solid storage structure located in a highly secured location. Susceptibility of produce to pilferage as a result of large household size is as a result of internal pilferage. Farmers with large household size must be taught the rudiments of effective family management, otherwise as noted by conflict theory, one of the three perspectives of deviance guiding this study, family members will resort to pilferage as a result of perceived depravity and exploitation by the household head. Also young farmers are advised to approach experienced farmers to be educated on the most appropriate strategies they can adopt to curb or prevent pilferage before venturing into arable crop farming.

5.4 Suggestion For Further Studies

1. This research was carried out on six communities in Idah Local Government Area of Kogi State, it is recommended that other researchers carry out same study on other locations.
2. Other researchers can also compare pilferage among urban farmers and rural farmers because this study was limited to rural farmers alone.

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APPENDIX
QUESTIONNAIRE FOR ARABLE CROP FARMERS IN SIX VILLAGES LOCATED WITHIN IDAH LOCAL GOVERNMENT AREA OF KOGI STATE

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Topic: Assessment of Effects of Pilferage on Arable Crop Farmers in Idah Local Government Area of Kogi State, Nigeria

Instruction: This questionnaire is for research purpose only, tick ( ) or fill in the blank spaces as appropriate.

Questionnaire No:…….. Village:…….

LGA: …….. Date of Administration: ……..

Name of respondent (optional): ……..

DEMOGRAPHIC DATA

1. Sex: Male [ ] Female [ ]
2. How old are you? ……..
3. Marital status: Single [ ] Married [ ]
4. Number of wives ……
5. Number of children ……
6. Level of Education

i. No formal education [ ]

ii. Primary education [ ]

iii. Primary education [ ]

iv. Secondary education [ ]

v. Tertiary (ND or NCE) [ ]

vi. Tertiary (HND or Degree) [ ]

vii. Any other. Specify: ……

SOCIO-ECONOMIC DATA

7. What is your occupation?
8. What is the size of your farm

9. How long have you been into arable crop farming
10. What is your average produce harvested in the last 3 years?
11. What is the total value of crop you harvested last year?

    Yam = ₦

    Maize = ₦

    Cassava = ₦
12. Where do you store harvested produce?
13. What is your labour source?
14. What is the estimated value of your produce consumed

    Yam = ₦

    Maize = ₦

    Cassava = ₦
15. What is the estimated value of your produce given out

    Yam = ₦

    Maize = ₦

    Cassava = ₦
16. What is the estimated value of your produce spoilt during storage

    Yam = ₦

    Maize = ₦

    Cassava = ₦

PILFERAGE DATA

17. What is the estimated value of your produce lost to thieves during storage?

    Yam = ₦

    Maize = ₦

    Cassava = ₦
18. What reason do you think make people take to pilferage

    Poverty [ ]

    Greed [ ]

Laziness [ ]

Kleptomania [ ]

Bad company [ ]

Unemployment [ ]

Wickedness [ ]

19. Who do you think is responsible for pilferage

Colleagues [ ]

Students [ ]

Workers on the farm [ ]

Neighbours [ ]

Family members [ ]

Outsiders [ ]

20. What are the effects of pilferage on you

Financial loss [ ]

Discouragement from continuing farming [ ]

Discouragement from adoption [ ]

Withdrawal from growing [ ]

i) Yam [ ]

ii) Maize [ ]

iii) Cassava [ ]

Others*(specify) ……..

21. What do you rely on for pilerage prevention

Fence round farm / storage structure

Security guards [ ]

Vigilance group [ ]

Use of charms [ ]

Divine intervention [ ]

22. Suggest possible measures that can cur pilferage ……

23. When is pilferage more rampant in your opinion?

Time of sowing	[ ]
Gestation period	[ ]
Harvest period	[ ]
Storage period	[ ]

24. What category of human person is more likely to take to pilferage

Children	[ ]
Adolescents	[ ]
Youths Adult	[ ]