AN ANALYSIS OF STRUCTURE, CONDUCT AND PERFORMANCE OF AGRO-CHEMICAL MARKETING: A CASE STUDY OF NIGER STATE, NIGERIA.

BY

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DECLARATION

I hereby declare that this thesis submitted for the award of Master of Science Degree in Agricultural Economics of Ahmadu Bello University Zaria is the outcome of my research effort except, where reference has been made to published literature and duly acknowledged, it has not been presented before in any previous application for a higher degree.

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CERTIFICATION

This thesis entitled "An Analysis of Structure, Conduct and Performance of Agro-chemical Marketing: A case study of Niger State, Nigeria" by Abubakar Muhammad Bichi meets the regulations governing the award of degree of Master of Science of Ahmadu Bello University Zaria, and is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to the memory of my late Mother, Hajiya Amina Abubakar who passed this world on 26th March 2003. (May her soul rest in perfect peace. Amen)
and my father, Alhaji Abubakar Ahmed Bichi for his ever guidance and prayers.

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To God be the glory.

ABSTRACT

This study examined the marketing of agro-chemicals in Niger State, Nigeria. The state is divided into three zones, Minna, Bida and Kontagora. The main objective of the study was to analyse the structure, conduct and performance of the agro-chemical marketing in the state. In addition, the specific objectives of the study were to identify participants in the agro-chemical industry, determine the socio-economic characteristics of the marketers, identify the types of agro-chemical marketed, determine the structure and conduct of agrochemicals, identify the marketing channels and determine the marketing margins.

The study was conducted during the 2004-cropping season. From a list of 81 dealers obtained through a reconnaissance survey a sample of 35 was made and primary data were collected from them using interview schedule. The data were analysed using descriptive statistics, Gini coefficient, Lorenz curve and marketing margins. The results showed five participants the importers, the government, the wholesaler/retailer, the mobile retailers and the farmers. The wholesaler/retailer and the mobile retailers were foci of the study and are here referred to as the marketers. The socio-economic characteristics of this marketers revealed that 97% of the people are male and the average age was 40. The literacy level was 97%. The study reveals that there were 176 brands of agro-chemicals consisting of 79 herbicides, 75 insecticides, 17 fumigants, 4 seed dressing and 1fungicide, marketed in the state.

The Gini coefficient was 0.59 for the market participants and this shows that they were fairly many, but there was no evidence of collusion or monopsonistic practices among them. The Lorenz curve (Fig 4.1) showed deviation from the 45^0 line. Which was an indication that the market was fairly deregulated and tends towards pure competitive structure. The marketing channel indicated only one major path in which the commodities passed from the importers to the wholesalers/retailers, and which they passed from wholesalers to retailers and to the end-user (farmer).

The average marketing margins were 81% for the agro-chemicals companies, 1.5% for wholesaler/retailer and 14% for the mobile retailer. The Profitability as percentage of the marketing margins were 72.0% in Bida, 85.0% in Kontagora, 72.0% in Minna while the average for the state was 79.0%. The insecticides have higher margin (26.0%) than

the herbicides (15.0%). How ever, the total profit from the agro-chemical marketing was 20.0% of the total revenue.

The marketing problems identified were adulteration and faking, low producer price of farm output, bad weather, lack of training, transportation and bad debt from the mobile retailers. The study concluded that marketing of agro-chemicals was efficient, but recommended the establishment of satellite forecasting metrological station, smaller size packaging, training and enlightenments for the marketers and guarantee produce price for the farmers.

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CHAPTER ONE
INTRODUCTION

1. 1 Background

Oil has been exported out of Nigeria since 1954, but despite that, agriculture and other activities are still major sources of revenue and employment to the country. In the 1980s, the fortune of the agricultural sector however started to decline leading to a major casualty in the sector such as food scarsity, lost in foreign exchange, rural urban migration and lost of employment (Central Bank of Nigeria, 2001). Before the adoption of the economic policy reforms in the mid-1980's, there were agricultural development programmes such as, River Basin Development Authority (RBDAs, 1973), Agricultural Developments Projects (ADPs, 1976), Operation Feed the Nation (OFN, 1976), Green Revolution (GR, 1979) and Operation Back to the Land (OBL, 1980) were adopted in a bid to improve agricultural development. These were backed up by substantial budgetary allocation (Ojo and Akanji, 1996). There has been a decline in the contribution of agriculture to food production from 1985 to 2000 as evident in the current food crisis of the country (Wayas, 2001, and Obasanjo, 2001). Table 1.1 details the contribution of the agricultural sector to the Nigerian economy. The agricultural sector is currently experiencing a rapid growth in medium term as from 2001 due to the fact that there is a stable socio-political environment (Ogunaike, 2002).

The slow performance of the Nigerian agricultural sector has been attributed to some endemic and imposed problems (Onucheyo, 1998). These problems include among others; inadequate funds, poor production and storage facilities, low use and absence of improve production inputs. For any meaningful output to be achieved in agricultural production, the necessary inputs have to be made available at the right time, place, price and quantity.

An agricultural input refers to resources needed for agricultural production. They are classified into agricultural machinery and equipment's, agricultural credit and finance, improved seeds and agro-chemicals. This include (herbicides, insecticides, fungicides, and fumigants, rodenticides), fertilizers, hormone regulators, etc (Nuru, 1999)

In the past, strategies for increasing agricultural production have included

converting wild lands to croplands (extensification) and using agro-chemicals treatments to increase yield (intensification) according to Adewoye, (1999). Being a largely agrarian country, one of the policies and efforts of the Nigeria government to increase food production for its growing population has resulted in the intensification of agriculture, which involves the use of agrochemicals.

Agro-chemicals are the biologically active chemicals used in agriculture. Most of them are pesticides used for the purpose of crop protection, with the term not usually extended to cover fertilizers (Anonymous, 1999). Pesticides, in broad terms can be defined as agents used to kill or control undesired insects, weeds, rodents, fungi, bacteria or other organisms. They are classes of chemicals deliberately added to the environment with the intention of poisoning some form of life (Adewoye, 1999). Thus pesticides include insecticides, herbicides, rodenticides, fungicides and fumigants. Between 1994 and 1995, about 800 metric tonnes of pesticides were imported into the country for agricultural use. Pesticides are essential input for enhancing agricultural production (Adewoye 1999).

Marketing on the other hand, is a conscious and integral part of modern societies, and the results of its processes reflect universally in our daily lives. It is the most evident business activity linking two basic functions in the community – production and consumption (Oliver, 1990). From the Oliver's observation, marketing can be seen, as a direct response to the growing needs of the society. As the society becomes more complex, and the processes of manufacture and supply varied, the means by which the needs and wants of the community will be met have become complicated and important. Marketing activities respond in providing the means by ensuring that organizations supply the markets with the right products at the right time and place and at the right price to customers who wish to buy (Ardo, 2000). Marketing is the process of planning and executing conception, pricing, promotion, and distribution of idea, goods, services, organization, and events to create and maintain relationships that will satisfy individual and organizational objectives (Boone and Kurtz, 1998). Marketing creates utilities of form, place, time and possession with the goods and services produced (Olukosi and Isitor, 1990).

Despite the importance of marketing, there are problems in the process of

accomplishing Agro-chemical marketing. Notably among the problems is faking or adulteration. According to Hornby A.S (1998), adulteration means to make something poorer (or impure) in quality by adding another (foreign) substance(s). Thus, the new substance has lost its genuineness by alteration of its chemical content to a level of inactivity and could therefore be regarded as fake.

1.2 Problem Statement

Prior to 1970, the level of the uses of agro-chemicals was very low. This was not unconnected with low level of awareness and availability of the technology (Ogunaike, 2002). This changed between 1981 and 1989 when the multinationals were forced by the then Federal Government to participate in agricultural production so as to source their raw materials through the backward integration policy. The multinational brought expatriate and agro-chemicals in to the country in order to intensify the production. Some farmers had accessibility to these innovations and adopted it. During the period 1981 to 1989, the agro-chemical market was valued at USD 50million (Ogunaike, 2002).

Though the ADPs have been in existence they never enjoy funding as at when the multinational departed. The funding came from World Bank and Federal Government. Due to the poor planning, which resulted in the poor project execution by the ADPs, the World Bank and the Federal Government withdrew their support to the ADPs in terms of logistics and financial assistance in 1994 (Ogunaike, 2002).

Due to the low impact of the ADPs and subsequent withdrawal of the multinational companies, the agro-chemicals market declined to as low as UDS 18million. The gap created in the agro-chemicals industry gave rise to new entrants mostly; indigenous companies such as Saro, Candel, Gaskiya, Fitsco, Harvests field, Insis and Niagro but recently, some Indian (African agro and Affcot) and Lebanese (Jubaili) companies have entered the sector (Ogunaike, 2002)

The current government policies are in favour of the agricultural sector. The zero Value Added Tax (VAT) and the duty free waiver were incentives to boost the agricultural production. The Agro-chemical market is on the rise and it was estimated to be at about USD 25 million (Ogunaike, 2002).

In addition to the Federal Government efforts, the United States of America through its agencies, United States Agencies for International Development (USAID) and

International Fertilizer Development Center (IFDC) are seriously working to reform the agricultural inputs market in Nigeria by rendering all necessary logistic support and creating relevant awareness through a project tagged Developing Agric-Inputs Markets in Nigeria (DAIMINA). The programs have widened the agro-chemical market in Nigeria with an increase in awareness, consumption, safety and subsequently production.

Majority of the players and the prospective players in the industry are skeptical and wonder if this growth would be steady over the next 2-4 years. Moreover, the players are also skeptical about possible problems that may engulf the industry internally such as, adulteration, faking at the retail level, infringement of trademark and the possibility of unqualified personnel managing the industry at the import level all of which will be detrimental to the participants. It is against this background that the following research questions were asked.

(i) Who are the participants in the industry in the study area?

(ii) What are the socio-economic characteristics of the agro-chemicals marketers?

(iii) What are the types of agro-chemicals marketed in the study area?

(iv) What is the marketing structure and conduct for agro-chemicals?

(v) What are the channels for agro-chemicals?

(v) What are the margins of Agrochemicals marketing in the study area?

(vii) What are the problems associated with agro-chemicals marketing in the study area?

1.3 Objectives of the study

The broad objective of the study is to analyze the marketing system for agro-chemicals in the study area. The specific objectives are to:

(1) identify the participants in the industry

(2) determine the socio-economics characteristics of the agro-chemicals marketers in the study area

(3) identify the types of agrochemicals marketed in the study area.

(4) determine the structure and conduct for agrochemicals marketing in the study area

(5) identify the various marketing channels for agro-chemicals in the study area

(6) determine the marketing margins of agro-chemicals in the study area and

(7) identify the various problems associated with agro-chemicals marketing in the study area.

1.4 Justification for the study

A rapidly expanding human population is placing immense pressure on agriculturists to produce more food. In Nigeria like other places around the world the growing national population is expected to reach about 250 million by the year 2048 against the estimated 130 million in 2004, which must be fed.

The decline in agro-chemicals market in the developed countries will continue because genetically modified crops are starting to reach a plateau in their current strong hold. Significant expansion in agro-chemicals market is only likely in new major market in Africa such as Nigeria. The pesticides use in developing countries is still very much lower than in industrialized countries of the world when comparing the 26% share of the world agricultural land located in those countries.

The agro-chemicals market in Nigeria has witnessed both boom and burst within 80s and 90s (Ogunaike, 2002). The market is experiencing a rapid growth in the medium term. This is due to the fact that there is stable socio - political environment, steady income and money supply in the economy. More young and literate people are entering into the farming business. Despite all the opportunities, it is not certain if the growing trends will continue as anticipated. Its failure will affect the entire population of the country and the world at large it is against this background that this study is initiated.

It is pertinent therefore; to study the agro-chemicals marketing system, appraise how the marketing activities are achieving the desired goals and tackles the problems associated with the marketing of agro-chemicals. It is believed that the results will be useful to government at all levels; investors (already in and prospective), marketing agencies, policy makers, farmers, employee of the agro-chemical firms, participants in the marketing of agro-chemicals and ultimately to the researchers.

Table1.1: Indicators of the contribution of agriculture to the national economy.

Period	Agric. GDP as % total GDP	Index of agric production	Agric. exports as % of total exports	Share of agric. In total employment
1970	n.a	126.0	72	75
1975	n.a	104.3	6.4	64
1980	34.7	92.5	3.7	60
1985	40.3	104.6	2.3	58
1990	39.0	167.5	2.2	56
1995	38.6	216.8	1.6	55
1996	39.0	224.8	1.3	54
1997	39.4	234.1	1.6	54
1998	40.4	242.4	n.a	53
1999	40.4	252.0	n.a	52

Source: CBN (2000)

n.a = Not available

CHAPTER TWO
LITERATURE REVIEW

2.1 Marketing as a concept

The precise period that the concept of marketing was first conceived cannot be determined. Some people argue that marketing is one of the oldest professions, while others are of the opinion that marketing began when man first engaged in barter trading. Little or no exchange takes place as societies and families are self sufficient in all their basic needs and so there was no marketing during such periods. But as societies began to grow, the ideas of economic exchange began to improve and hence the need for division of labour and specialization. Consequently, the need to adopt marketing concept began to grow.

Marketing is generally regarded as the performance of all business activities involved in the forward flow of goods and services from the time of production to the final consumption of that product (Kohls and Downey, 1972). Marketing can also be said to consist of the process of planning and executing conception, pricing, promotion, and distribution of idea, goods, services, organization, and events to create and maintain relationships that will satisfy individual and organizational objectives (Boone and Kurtz, 1998). In general, marketing activities are all those associated with identifying the particular wants and needs of target market, customers, and then going about satisfying those customers than the competitors. This involves doing market research of customers, analyzing their needs, and then making strategic decisions about product design, pricing, promotion and distribution. Abbot and Makeham (1978), marketing is the business activities associated with the flows of goods and services from production to consumption. This means that marketing of agricultural products begins from the farm, with the planning of production to meet specific demands and market prospects. They asserted that marketing is completed with the sale of the fresh or processed product to the consumers, or to manufacturers in the case of raw materials for industries. It also includes the supply to farmers of fertilizers, herbicides, insecticides, seeds and other inputs for production; in this case the farmer is the consumer.

According to Olukosi and Isitor (1990), the micro viewpoint is concerned with the

individual participants in marketing, be it the farmer or the business firm. From this perspective, they defined agricultural marketing as the performance of all business activities, which direct the forward flow of goods and services to consumers in order to accomplish the producers' objectives. This definition makes it clear that marketing is not only equivalent to selling or transferring product to another person for a price but also includes packaging, storage, transportation, pricing, financing, risk bearing and even product design.

2.2. Approaches to studying agricultural marketing.

Scholars have postulated various analytical frameworks for the study of marketing. The various theoretical frameworks are generally attempts to breakdown marketing system into parts that can be understood more readily (Baker, 1981). These approaches include the functional approach, the problem identification approach and the structure - conduct - performance criteria approach.

The functional approach attempts to understand marketing through classifying the activities, which occur in the market process by breaking them into functions. Marketing function is referred to as a major specialized activity performed in accomplishing the marketing process (Baker, 1981).

Different bases have been applied in order to classify marketing functions. Kohls and Downy (1972), classified them into: exchange functions which is buying and selling; physical functions which include storage, transportation and processing; and facilitating functions which include standardization, financing, risk bearing and market intelligence.

Baker (1981), grouped the market functions under major and subsidiary functions. The major functions are assembly, equalization and distribution while subsidiary functions comprises processing, packaging, grading and specification, transport, storage, risk bearing, demand creation, price determination, financing, buying, selling, and provision and use of market information. Generally, however, each of the above attempts to identify how and what functions are carried out in the marketing process (Hills, 1985).

The institutional approach analyses markets by studying the various institutions, agencies and business structures that carry out the marketing process.

For as Baker (1981), has argued, marketing institutions are a wide variety of business organizations, which have been, developed to operate the marketing machinery.

This approach studies the nature of the various middlemen and related agencies as well as the arrangement of the market (Kohls and Downey, 1972).

Marketing institutions can be broken into marketing channels (Baker, 1981). These are merchants, agents, speculators and processors. Merchants are bulk purchasers of products and normally hold title to the product they handle while agents are representatives of their clients, and do not own the product they handle. Agents could either be brokers or commissioned agents, speculators are merchants who buy products with the major purpose of profiting from price fluctuation and therefore bear the risks associated with any unfavorable changes in prices. Processors are agents who change the product into a more desired form on behalf of the owners. They also take title to products in some cases. Wholesalers, retailers and jobbers are also important marketing institutions under the above classification.

The problem identification approach attempts to identify specific problems and bottlenecks that are inherent in the marketing system and relate these problems to the structure, organization and functions of the marketing system with a view to finding solutions to the problems (Kohls and Downey, 1972). Another approach to market study is the analytical approach. This approach seeks to study market problems by breaking them down into their economic elements such as demand and supply, price mechanisms and costs (Baker, 1981).

Similar to the above is the performance criteria approach. In this approach, certain criteria such as efficiency, industrial stability, growth, consumer preference and product development are used as basis for comparison between marketing systems. This is more or less a comparative market analysis.

One of the most popular approaches to market analyses is the structure - conduct - performance approach. Several studies in agricultural marketing based on the assessment of free - marketing system have been conducted using this approach (Williams, 1981).

The basic assumption of this approach is that the performance of any market is the result of the conduct of participants, which in turn is determined by the market structure. A structure - conduct - performance causal relationship is assumed to exists, even though in the view of some analysts, the relationship could be in the reverse direction: performance - conduct - structure (Pickering, 1974).

2.3 Definition and classification of agro-chemicals

According to Crop Life Nigeria (Anonymous 1999), agro-chemicals are the biologically active chemicals used in agriculture, most of them are pesticides used for the purpose of crop protection. The term is not usually extended to cover fertilizers. Agro-chemicals are chemical substances used in agricultural production to increase agricultural productivity. They are used to control, prevent or eradicate the problems of pest and disease of agricultural crops (Nuru, 1998). Agro-chemicals used for pest control are known as pesticides, crop protection chemicals or agro-chemicals. Pesticides are aids for the farmer to control organisms, which are damaging to crops, human or animal health, or which may constitute itself into a nuisance. A pest is any organism, which is in a wrong place at a particular time. According to Onyibe (1993), a pest is any organism that constitutes a nuisance to man, his crops, livestock and environment. A chemical used to control pest is referred to as pesticides.

Agro-chemicals (pesticides) can be classified into various classes based on the following:

(a) Target pest

(b) Mode of action

© Formulation

(d) Mode of application

(e) Time of application.

Details of the classification could be seen on appendix 2.

2.4 Trends in agro-chemicals marketing and distribution in Nigeria.

Agro-chemicals have been known to exist for several years in Nigeria, the most popular group of agro-chemicals is insecticide and well known in the class is Gammalin 20 (Lindane) (Ogunaike, 2002).

Agro-chemicals marketing in Nigeria can be critically analyzed under three period segments, pre 1989, 1990 to 1993, and 1994 to date (Ogunaike, 2002). The agro-chemicals market before 1989 had a turnover of about $50 MUSA, but during 1990 to 1993, the market declined due to the inconsistencies in government policies and the introduction of Structural Adjustment Program (SAP) which led devaluation of the Naira.

This period witnessed the existence of emergency distributors who utilized the subsidized government agro-chemicals stock to make fast money. The market continued to decline and fell below $18 million pre 1993. From 1994 to date, the World Bank stopped funding the ADPs, which resulted in low ADPs activities and the wearing out of the emergency distributors.

The Petroleum Trust Fund (PTF) made a significant effort though its agricultural program, which was aimed at revitalizing the agric sector under Food Supply Scheme. This changed some of the fortunes of traders or marketers of agrochemicals. Before then, there was evolution of indigenous companies that bring generic products. There has been significant increase in agricultural production, which has been attributed to agrochemicals that safeguards pre-harvests and post-harvest losses (Central Bank of Nigeria, 2001).

The bulk of agro-chemicals currently marketed in Nigeria come essentially from the industrialized countries such as Japan, U.S.A, Switzerland, France, United Kingdom, Germany, India, Taiwan, Malaysia and China. Indigenous companies like Saro, Candel, and C. zard import the agro-chemicals. There are still some multinational companies participating such as Dizengoff and Syngenta. These companies bring in products for onward distribution through the distributors before they finally reach the farmers (Nuru, 1998).

Ngur-adi (1983) was of the view that high distribution cost is one of the biggest problems of agrochemicals marketing. Distribution and marketing cost rise as a result of import cost, trans-ocean freight, and custom duty. Transportation costs have been noted to account for about 70% of the cost of distribution (Adubifa and Falusi, 1975). Due to these problems, agrochemicals became scarce and arrived late or at exorbitant prices (Adubifa and Falusi, 1975).

Government must ensure that there is an adequate and timely supply of required agrochemicals for use by the farmers and also ensure a good marketing and distribution network for these important inputs (Nuru, 1998).

2.5 The roles of marketing intermediaries

Olukosi and Isitor (1990), defined a middleman as any wholesaler, merchant, broker or agent who has to do with the distribution of goods between the places of

production to the retailer. Mortension (1977), observed that products that reach consumer from the producer might differ in form. Aisha (2000), reported that the middlemen through the various activities or functions they perform when the products are on transit accomplish these changes. Marketing intermediaries carry out marketing functions or offer marketing services (Olukosi and Isitor, 1990). Intermediaries or marketing agencies are common features of most marketing systems in the world. This is because of the very important role they play in the marketing system. Cox et al (1983), described the role of marketing intermediaries as the process of forward commercial planning to meet company objectives by determining and fulfilling consumer requirements. Middlemen perform several functions in the process of conveying goods or services from the producer to the consumer, some of these roles are assembling, processing, storing, financing, risk bearing, insuring, packaging, transportation and sorting (Olukosi and Isitor, 1990).

2.6 Marketing structure and conduct

Marketing structure, essentially relates to the degree of competition in the market, that is, whether the number of firms producing a product is large or small, whether the firms are of equal size or a small group predominates, whether entry of new firms is easy or not, and whether the buyers of the product are few or many. Structure also relates to degree of market information that is available to participants (Williams, 1971).

Clodius and Mueller (1961), see structures as relating to market channels and facilities, to geographical and temporal relationships and to the value of coefficients of elasticity in agricultural markets. Tomek and Robinson (1972), also views market structure as number, size and distribution of firms, degree of product differentiation and barrier to entry. According to Bain (1968), organizational characteristics of the market determine the relationships among and between buyers and sellers and also potential new entrants. The relative large number of buyers and sellers observed in the study area makes the soya bean market less competitive. According to Alamu (1995), the high values given by the Gini ratio (0.59) for the merchants, (0.36) agents and (0.32) for the farmers showed that much of the concentration was explained by inequality in the middle and high range of the curvature of the Lorenz curve. The degree of concentration among the buying agents was slightly lower with Gini coefficient showing 36% (0.36) and the

coefficient of variability showing 34% (0.34) .The measures showed high degree of equality among the sellers with Gini coefficient showing 23% (0.23). This means the level of concentration among buyers is high while greater equality exists among sellers. It also revealed that a major proportion of purchases in the market were accounted by a few firms although the level of concentration among the buyers was not high enough as to suggest an oligopolistic situation. The estimated Gini ratio shows that traders at one of the market were having more monopsony power (28%) then traders at the other market (25%) (Abu, 1996). Munkaila (1998), reported that the Gini ratio of 0.60 and 0.75 for merchants and tanneries respectively showed the presence of buyer concentration, there was no evidence of collusion and monopsonistic practices. In addition, other structure measures such as the presence of many buyers and sellers; free entry and exit conditions and the availability of market information suggest that the resulting market structure be of pure competition.

Conduct refers to pattern of behavior of firms in adjusting to market conditions. It concerns such issues as collusive or restrictive practices such as price rings and other methods of determination of prices and output, tactics against established and potential rivals and product policy. The market integration analysis shows that the net price correlation estimates between these five markets were significantly less than unity at 5%. The result suggested that the markets functioned with high degree of imperfection (Abu, 1996). According to Munkaila (1998), the hide and skin market was found to be imperfect in conduct as far as unit of measure is concerned. There was no standard unit of measure for the sale of hides and skin

2.6.1 The Gini coefficient

The Gini coefficient is the technique that gives a more precise measure of market structure. It shows the degree of monopoly power in the market. It is a standardized coefficient such that zero equals perfect in equality. The Gini coefficient has a possibility of values from 0 to 1 and expresses the extent to which the market is concentrated. A value of 0 means price monopoly while Gini coefficient value of 1 means a pure competitive market structure.

The Gini coefficient as observed in most marketing studies usually employs the total value of sales from commodities obtained from a sample of traders for the period of

the study as an index of measurement. Other indices such as the value of total business assets and the level of employment can also be used. The value of sales however, is often preferred because of its ready to ascertain ability and for reliability (Okereke and Anthonia, 1988). The Gini coefficient was used to measure level of buyer and seller concentration in the market in order to determine the degree of competition or monopoly in the market (Abdulhadi, 1993). The further away the curve is from the 45° line, the greater the level of concentration of the participant in the market. When there is perfect equality of size distribution of sellers in the market, the curve coincides with the 45° line (Abdulhadi, 1993). The relatively large number of sellers and buyers observed at Wannune, Tsekucha, Tyowanye and Gboko makes the soya bean market to be perfectly competitive. The Gini ratio of (28%) and (25%) indicated that the two markets Wannune and Twyowanye were monosopnistic (Abu, 1996). According to Munkaila (1998), the Gini coefficient of 0.60 and 0.80 for merchants and tanneries respectively showed the presence of buyer concentration, and no evidence of collusion and monopsonistic practices. This suggests that the market was purely competitive. Orer (2004), concluded that the market structure was purely competitive due to the results, which showed that the Gini coefficient were 0.50, 0.50, and 0.53, for whole sellers, retailers and the pooled yam traders respectively. In addition the many sellers and buyers, homogeneous products, relatively free entry and exit conditions and the corresponding Lorenz curve attest to the perfect competition.

2.7 Marketing margin

This shows the fraction of the consumer's expenditure on a commodity that is received by the producer and each of the market agents (distributors). Marketing margin could also be defined as the differences between the price paid by the consumer for one unit of a certain product of a specific quality and the price received by the producer for the farm equivalent of the unit Olukosi and Isitor (1990). Marketing margin is a very useful indicator of marketing efficiency, but are not in themselves a direct measure of efficiency of marketing firm. However, it could be used in analyzing the performance of the marketing firm. According to Williams and Oludimu (1988), provided that the following questions could be asks with respect to any firm,

are the functions for which marketing costs are incurred genuine ones?

are the functions effectively performed?

Are profits reasonable?

If the answers to these questions are affirmative, then the firm performance is high. According to Habashy and Salwa (1982), the marketing margin also allows for identification of costly sectors in the system and areas where saving can be made.

Performance refers to the economic results that are achieved in the industry. Common criteria of assessing performance include whether returns to capital are excessively high or excessively low, whether all potential economics of scale in the industry are being exploited and whether prices are optimum (Williams, 1971; Bain, 1968; Clodius and Mueller (1961). According to Habashy and Salwa (1982), a market is performing efficiently if it satisfies the conditions of pricing and productive efficiency. Pricing efficiency refers to exchange mechanism, which produces prices that conform to competitive standards. Productive efficiency on the other hand is achieved when firms adequately use their capacity and take full advantage of economies of scale. According to Munkaila (1998), the market was considered to perform efficiently base on the margin, which indicated that 14.0%, 13.0% and19.1% of the consumers expenditure on apiece of hide, sheepskin and goat skin respectively. The performance of the marketing system in terms of marketing margin indicated that 78% of retail price went to producers while 22% went to the intermediaries. The average marketing profit was 70%; efficiency was 48% (Orer, 2004).

CHAPTER THREE
METHODOLOGY

3.1 Study area

Niger State was created on 3rd February 1976, from the defunct North -Western State. The state lies between latitude 3.2° East to 6° West and longitude 10° South and 11.3° North. It is bordered at the North by Zamfara State, Northwest by Kebbi State, South by Kogi State and South-West by Kwara State. Kaduna and Federal Capital Territory Abuja border the state both to North – East and South-East respectively. The state shares a common boundary with the Republic of Benin at Babanna in Borgu Local Government Area. These gives rise to inter-border trade with the state. Niger State covers a land area of 74,244 square kilometres, which represents 8% of the total land area in the country (Niger state of Nigeria, 1999). Based on the available information 85% of the land is arable, which represents about six million hectares of land. The projected population is 3,243,961 people in 2004.

The growth of the Federal Capital Abuja is an influencing factor in the increasing population of the state. The state has 25 local governments' areas. The state has Sandy-loamy soil, which could be used for agricultural practices.

Niger state has two distinct seasons: dry and wet. The state has annual rainfalls varying from 1,100mm to 1,600mm from North to South. The mean maximum temperatures, which do not exceed 40°C: are between March and June while the lowest minimum temperatures are usually between December and January. Duration of wet seasons ranges from 150 days or more in the northern parts of the state to 210 days or more in the Southern parts of the state, (Niger state of Nigeria, 1999).

The climate, soil and hydrology permit the cultivation of most of Nigeria's staple crops such as rice, yam, cassava, cocoa yam, cowpea, maize, sorghum and millet. However Niger State is mainly known for maize, rice, yam, cowpea and groundnut crops. She also has ample grazing land and fresh water for fishing and forestry. The dry season commences in October and the humidity could be as low as 140mm between December and February, (Niger state of Nigeria, 1999).

Farming is the main occupation of the people. About 85% of the populations are

involved while 15% are engaged in other vocations such as white-collar job, business, crafts and arts. The favourable climate, rich soil, rich annual rainfall and availability of wide varieties of mineral and agricultural resources are evidence of its capacity to sustain a broad spectrum of industries.

Farming is conducted on small - scales, and mostly financed through household income, labour and supervision. The cropping system in the state is sharply divided into three zones. The zones are naturally favoured by the climate, soil, ethnic and cultural difference. The Minna zone is dominated by Gwari speaking people who predominantly cultivate yam and maize, Bida zone is dominated by Nupe speaking people who predominantly cultivate maize, rice and cowpea, while the Kontagora zone is dominated by Hausa speaking people who cultivate cowpea, sorghum and maize. These crops are mostly cultivated in mixtures. The differences in the cultivation patterns have made Niger State to house majority of agro-chemicals participants in the country. Different types of agro-chemicals are found in the markets in the state.

3.2 Sampling technique

As mentioned earlier the cropping system divided the state in to three zones, which is also based on tribe and climate that ultimately differentiated the crops cultivated in each of the zones. These three zones were included in the study namely – Minna, Bida and Kontagora. About 81 agro-chemicals marketers (wholesalers/retailers and mobile retailers) were identified in the state via a reconnaissance survey: Minna 23, Bida 27 and Kontagora 31. This formed the sample frame for the study and using a modified proportional sampling method, Ten (10) marketers were selected from Minna, Twelve (12) from Bida and Thirteen (13) from Kontagora zones. A total of 35 marketers were used for the study.

3.3 Data collection

Primary data were used for the study. Data were collected using interview schedule administered on the agro-chemicals marketers (wholesalers/retailers and mobile retailers). The variables on which the primary data were collected include:

Participants and socio-economic characteristics: (name and nature of responsibilities, age, sex, marital status, household size, educational status, other occupation, and experience) and

Marketing variables (unit price and quantity of agro-chemicals purchased and sold, distribution channel, capital, credit facility, source of agro-chemicals and types, marketing cost, marketing margins, returns, fake agro-chemicals, and problems of agro-chemicals marketing).

3.4 Analytical techniques

Descriptive statistics.

This is the use of frequency distribution, means and percentages. This tool was used to achieve objectives 1, 2, 3,5 and 7.

Gini coefficient.

The Gini coefficient was used along with Lorenz curve to measure the level of retailer's concentration. This was used to determine the degree of competition or monopoly in the market. Therefore, the Gini coefficient was used to achieve objective 4.

The Gini coefficient (G) is given by:

$G = 1 - \Sigma xy$

Where G = value of Gini coefficient

X = Percentage of retailers per period of the Study.

Y = Cumulative percentage of the retailers sales revenue per period of the study

The G has a possibility of values ranging from 0 to 1 expressing the extent to which the market is concentrated. The value of G is 0 when there is perfect competition in the size of distributors. The G equals to 1 when there is perfect monopoly in the market. The value of Gini coefficient is the same as the ratio of the area between the Lorenz curve and 45° line to the total area above or below the line (shaded area). Accordingly, when there is perfect competition of distributors in the market, the curve coincides with the 45° line. The further away the curve is from the 45° lining the greater the level of concentration in the market.

Marketing margin

This is the difference between what the importers (producers) received for a particular product and the amount the farmers (consumers) pay for an equivalent amount of the product.

It also shows the fraction of the consumer's expenditure on a commodity that is received by the producer and each of the market agents (distributors). Though, it is not a

direct measure of marketing efficiency it is more or less an indicator of the market performance as it allows comparison between the benefits received by each of the market participants in relation to their costs. The marketing margin can be expressed either in nominal terms or in percentages. The percentage was used in this study to achieve objective (6). It is given by:

$$M = \frac{(P1 - P2)}{P1} \times 100$$

Where M= Marketing margin

P1 = Selling price

P2 = Supply price.

The total marketing margin is given by:

$$TMM = \frac{TP}{TR} \times 100$$

Where TMM =Total marketing margin

TR = Total revenue

TP = Total profit

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results of the participants in the industry, socio-economic characteristics, types of agro-chemicals marketed, marketing structure, marketing channel, marketing efficiency, marketing margin, and problems associated with agro-chemicals marketing in the study area.

4.1 PARTICIPANTS IN THE INDUSTRY

4.5.1 Importers

These are the agro-chemicals companies in Nigeria. These companies get their products from the manufacturers and import the agro-chemicals packaged in containers of various sizes usually 5, 1, 0.5, or 0.1 litres. The agro-chemicals are usually transported into the country by sea, mostly through the ports in Lagos. The agro-chemicals companies pay in dollars to the manufacturers. Appendix 1 shows the names of importers in the study area.

4.1.2 Wholesaler / retailers

These are the dealers that have the required capital to procure large volume of agro-chemicals, and they usually serves as the linkage between the mobile retailers and the agro-chemicals companies, they are mostly based in the cities or rural areas they do also sell directly to the farmers.

4.1.3 Mobile retailers

The mobile retailers are mostly found in the rural areas and villages; where they leave in the farming communities. The mobile retailers are the linkages between the farmers and the wholesaler / retailers. They make the agro-chemicals available to the farmers. The mobile retailers have low capital base, hence some have shops from where they sell while some move around the various markets on market days with their wares for sale.

4.1.4 Farmers

Farmers are the consumers (end-users) of the products they determine what to cultivate and subsequently what chemical to buy.

4.1.6 Government

Government runs some Agricultural Development Projects under which chemicals are made available to the farmers. In addition to purchase of chemicals the government serves as policy formulator and also regulator of some activities in the industry. Government is the largest single buyer of agro-chemicals at a time in the country.

In this study the wholesalers/retailers and the retailers were considered and grouped as marketers.

4.2 SOCIO-ECONOMIC CHARACTERISTICS OF AGRO-CHEMICAL MARKETERS

4.2.1: Sex of the marketers

The result shows that 97% of the agro-chemicals marketers interviewed were male. Out of the 35 people interviewed, only one was a female. Although sales girls were found in most of the shops but they were not the proprietors of the business. Because of the nature of the agro-chemical business as a rural business that requires movement and some level of caution due to the toxicity, it was not a surprise to find that the only female dealer came from Minna, the capital of the state.

4.2.2: Age of the marketers

Age is very important in determining the socio -economic activity of people. It determines the organization, planing, approach, behaviour and level of alertness of an individual.

From the marketers interviewed, the average age of the agro-chemical marketers is 40 years. This is within the middle age group, which shows that agro-chemical marketing is a business that requires some level of physical strength in terms of movement, organization, thinking and safety. See Table 4.1.

Table 4.1: Age distribution of agro-chemicals marketers in the study area.

Age range/ years	Frequency	Percentage
25-34	11	31
35-44	16	46
45-54	5	14.4
55 and above	3	8.6
Total	**35**	**100**

Source: Field survey 2004.

4.2.3: Marital status

Among all the agro-chemicals marketers interviewed, 86% were married while 14% were single. Those whose children were15 years and above involved them in the business activities. This helped the marketers to reduce the cost of the sales staff (Table 4.2).

Table 4.2: Marital status among the agro-chemicals marketers in the study area.

Marital status	Frequency	Percentage
Married	30	86
Single	5	14
Total	**35**	**100**

Source: Field survey 2004.

4.2.4: Educational level

One of the most important socio- economic variables upon which agricultural business depends is the level of education. See Table 4.3 and Table 4.4.

Table 4.3: Level of education among agro-chemical marketers in the study area.

Level of Education	Frequency	Percentage
Informal Education	1	3
Formal Education	34	97
Total	**35**	**100**

Source: Field survey 2004.

Table 4.4: Level of formal education among agro-chemicals marketers in Niger state.

Formal Education	Frequency	Percentage
Ordinary level and below	25	73.5
Ordinary diploma level and above	9	26.5
Total	**34**	**100**

Source: Field survey 2004.

4.2.5: Major occupation

Most of the respondents interviewed took the agro-chemicals business as the core business but because it is seasonal, majority of them integrates with other businesses especially at the off-season. The main complementary businesses are veterinary drugs sales and foodstuff. Details could be seen on the Table 4.5.

Table 4.5: Other occupation among agro-chemicals marketers in the study area

Occupation	Frequency	Percentage
Veterinary drugs	28	80
Food stuff and others	7	20
Total	**35**	**100**

Source: Field survey 2004

4.2.6: Experience

Majority of the respondents interviewed had gained a reasonable experience in the business. (Table 4.6). Majority had 6-10 years experience in the business, but they have little technical -know-how of the products in terms of dosage, usage, efficacy and trademark or active ingredients of composition. Majority runs the business as single proprietorships.

Table 4.6: Level of experience among agro-chemicals marketers in Niger State Nigeria.

Level of experience	Frequency	Percentage
1 – 5	8	22.9
6 – 10	16	45.7
11 – 15	9	25.7
Above 15 years	2	5.7
Total	**35**	**100**

Source: - Field survey 2004

4.3 TYPES OF AGRO-CHEMICALS MARKETED IN THE STUDY AREA

The study shows that there are five types of agro-chemicals being marketed. They are: herbicides, insecticides, fungicides, fumigants and seed dressing.

Appendix 3 shows the various types of agro-chemicals found in the study area. .

Tables 4.7: Available share of different class of agro-chemicals in the study area*:*

Agro-chemicals	Quantity/ class	% Share
Herbicides	79	45
Insecticides	75	43
Fumigants	17	9.7
Seed dressing	4	2.2
Fungicides	1	0.1
Total	**176**	**100**

Source: -Field survey 2004.

4.4 MARKET STRUCTURE AND CONDUCT

Various approaches were made to determine the market structure of agro-chemicals market in the study area. The study used the following approches to determine the markets structure.

4.4.1: Market number and concentration.

The number of marketers engaged in agro-chemicals business in the study area was significant compared to that of the importers. The value of the Gini coefficient (Table 4.8) was (0.59), which shows that the level of concentration of agro-chemicals marketers in the study area was more than average (59%). Likewise, the result of the

corresponding Lorenz curve (Fig 1) shows that the curve deviated fairly away from the 45° line. Therefore, the result suggested that the market is fully deregulated and tends towards pure competition structure. This finding was similar with Gini coefficient result finding of Alamu (1996), Abu (1996), Munkaila (1998), and Orer (2004), who studied on marketing of pepper, onion and tomato in fadama areas, soya beans marketing where the estimated Gini ratio shows that the traders at Wannune market were having more monopsony power (28%) than traders at Tyowanye market (25%), hide and skin marketing where the Gini coefficient of 0.60 and 0.75 for merchants and tanneries respectively showed that the market was perfectly competitive and yam marketing where the Gini coefficient of 0.51, 0.52 and0.53, for wholesalers, retailers and pooled yam traders respectively suggested that the market was purely competitive respectively.

4.4.2 Condition of entry and exit

The study reveals that there was no any condition governing entry and exit into the industry. Any body that has capital and interest to enter the firm at any giving time is free to do so. Likewise, he could get out of the business at his/her own will. This is because the actual guiding factors to entry or exit are either profit or loss. Though the National Agency for Food Drugs and Administration Control started making initiatives to sanitize the industry, it has not rolled out any guidelines yet on entry and exit procedure in the industry.

4.4.3 Product differentiation

Most of the products marketed by the marketers are generic products that are not patent, though a few patent products exist. Majorities of the products are only differentiated in terms of packaging, color, and name of importing company and the brand name. Though could be referred to as differentiating since factors the active ingredients remains the same, the containers not registered and there was no trademark rule followed. Hence in some cases, infringement of packing, brand names and sub standardization was very common.

4.4.4 Market information

No firm can singly dictate the total affairs of the industry. Market information is readily available. A change in any activity (prices, products, packaging, and credit) could be easily noticed and obtained through careful observation and inquiry.

4.4.5 Number of farmers

The consumers of the agro-chemicals are the farmers and to some extent the pest control personnel for domestic purposes. In general, the number of buyer is extremely large. The level of patronage is limited by awareness and adoption of the products.

Table 4.8: Distribution of agro-chemicals marketers by monthly sales

Sales range N	No of marketers	% of marketers (x)	Cumulative % of marketers	Total value of monthly sales N	% of total sales	Cumulative % of total sales (Y)	EXY	/EXY/ 10,000
0-200,000	2	5.71	5.71	90,000	1.01	1.01	5.80	0.0005
200,001 – 400,000	2	5.71	11.42	275,000	2.81	3.80	21.70	0.0021
400,001 – 600,000	3	8.57	19.99	455,000	4.64	8.40	72.00	0.0072
600,001 –800,000	5	14.98	34.27	790,000	8.07	16.50	247.20	0.0247
800,001 – 1,000,000	4	11.42	45.69	916,000	9.36	25.90	295.77	0.0295
1,000,001- 1,200,0000	5	14.28	59.97	1130,000	11.54	37.40	534.10	0.0534
1,200,001-1,400,000	4	11.42	71.39	1315,000	13.40	50.80	580.10	0.0580
1,400,001- 1,600,000	4	11.42	82.81	1,415,000	14.50	65.30	745.70	0.0746
1,600,001 -1,800,000	3	8.57	91.38	1,600,000	16.30	81.60	699.30	0.0699
Above 1,800,000	3	8.57	100	1,800,000	18.40	100	857.00	0.0857
Total	**35**	**99.95**		**9786000**	**100**			**0.4056**

Gini coefficient = 1 - ∑XY

Gini coefficient = 1- 0.4056

= **0.5944**

Table 4.8 showed the distribution of agro-chemical marketers by monthly sales. The sales range is the region within which the various classes of the agro-chemical marketers fell as far the value of sales on monthly basis. This is not actual but hypothetical. The next column is the frequency of the customers that belongs to each of the class base on the actual sales recorded. The percentage of marketers (x) is the proportion of each class relative to the total number of the sample multiplied by hundred. The cumulative percentage of the marketers is the summation of the preceding class with the next class. The total value of the monthly sales is the actual value of the sales observed from each of the agro marketers interviewed. The proportion of each class sales relative to the total sales recorded from the whole sample multiplied by hundred. The cumulative percentage of the total sales (Y) is the summation of the preceding class with the next class. The summation of the summation of the percentage of marketers (X) and the cumulative percentage of total sales (Y) produce next column. The whole aim of the exercise is to deduce the Gini coefficient, which must either be one or less than one. In order to obtain that each class was divided by a factor of ten thousand and the summation of all deducted from one to obtain the Gini coefficient. From the above Table 4.8 the Gini coefficient, was found to be one less than 0.41,that is 0.59.

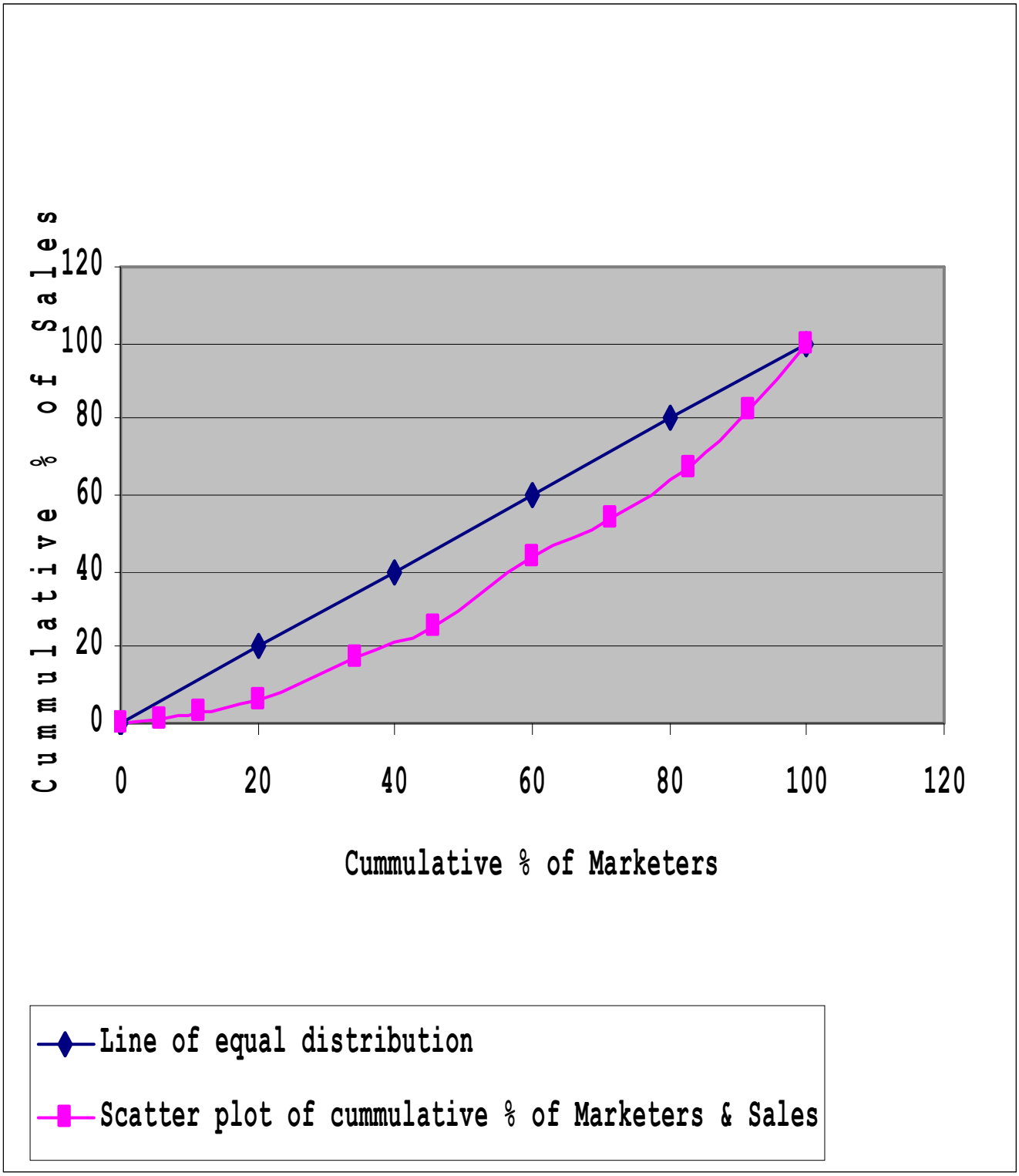


Fig4.1: Lorenze curve showing the level of agro-chemical marketers concentration in Niger state Nigeria.

4.5 MARKETING CHANNEL

The aim of any marketing activity is delivering of goods or services from the manufacturer to the consumer. In the process of achieving the desired objectives, there are stages that are followed. The product moves from the producer and ultimately to the end-user (consumer). These various stages are very important in evaluating marketing systems because they indicate how each of the market participants is performing his roles towards achieving the goals of moving the product from the producer to the final consumer.

In the study area, the path that agro-chemicals pass through from the importer to the farmers is shown in figured Fig4.2. Two distinct channels were discovered .The regular (usual) and the irregular (unusual); these were referred to important and less important channels respectively.

1. Important channel: This channel was the most frequent occurring. The agro-chemicals came through the port from oversea where the manufacturing companies are based. The agro-chemicals marketing companies (importers) picked their delivery of the products at the port in Lagos after the necessary clearing processes. The agro-chemicals companies distribute the products through various networks in the country; these networks are been manage mostly by their sales representatives that sells the products to the wholesalers / retailers. The wholesalers/retailers sell to the mobile retailers. The mobile retailers usually dwell in the rural areas. Some mobile retailers have shops while some have not but they generally move around from one market to the other to sell their wares. The retailers were last contact to the end-user (farmers). The mobile retailers serve as sources of vital information in the industry for development.

2. Less important channel: This channel hardly occurs, but in some cases used to be prevalent and also important because its activity usually results in creating some of the problems discovered in the study. At times the state government import products directly from the manufacturer while, in some cases purchase the products from the agro-chemicals marketing companies. These products were made available to the farmers directly. Another unusual chain was scarce products been made available to the wholesalers / retailers by the mobile retailers. The structure of the market participants in the product channel is described.

4.5.1 Importer

These are the agro-chemicals companies in Nigeria; in this case they are the producers. These companies get their products from the manufacturers and import the agro-chemicals packaged in containers of various sizes usually 5, 1, 0.5, or 0.1 litres. The agro-chemicals are usually transported into the country by sea, mostly through the ports in Lagos. The agro-chemicals companies pay in dollars to the manufacturers. The agro-chemicals companies distribute the products to the wholesaler / retailer and retailers and sometimes to government agricultural agencies and farmers through their various networks in the country, which are managed by sales representatives.

4.5.2 Wholesaler / retailer

These are the dealers that have the required capital to procure large volume of agro-chemicals, and they usually serves as the linkage between the mobile retailers and the agro-chemicals companies, they are mostly based in the cities or rural areas they do also sell directly to the farmers.

4.5.3 Mobile retailers

The mobile retailers are mostly found in the rural areas and villages; where they live in the farming communities. The mobile retailers are the linkages between the farmers and the wholesaler / retailers. They make the agrochemicals available to the farmers. This group of participants is the most important in the agro-chemicals marketing chain because they are the last in the chain and they provide little technical services to the farmers, though in most cases their advice used to be for their own selfish interest. The mobile retailers have low capital base, hence some have shops from where they sell while some move around the various markets on market days with their wares for sale.

4.5.4 Farmers

The whole purpose of marketing is to deliver the right product, at the right place in the right time, at the right price. Agro-chemical marketing is only completed when the products reach the farmers hand. Farmers are the consumers (end-users) of the products they determine what to cultivate and subsequently what chemical to buy. The farmers usually purchase their chemicals from the mobile retailers, but sometimes they buy directly from the wholesalers / retailers in places where they are accessible. Government also makes some chemicals available to the farmers at subsidized prices.

4.5.6 Government

Government runs some Agricultural Development Projects under, which chemicals are made available to the farmers. It is part of the government agricultural policy to also make some input available to the farmers. Government is the largest single buyer of agro-chemicals at a time in the country.

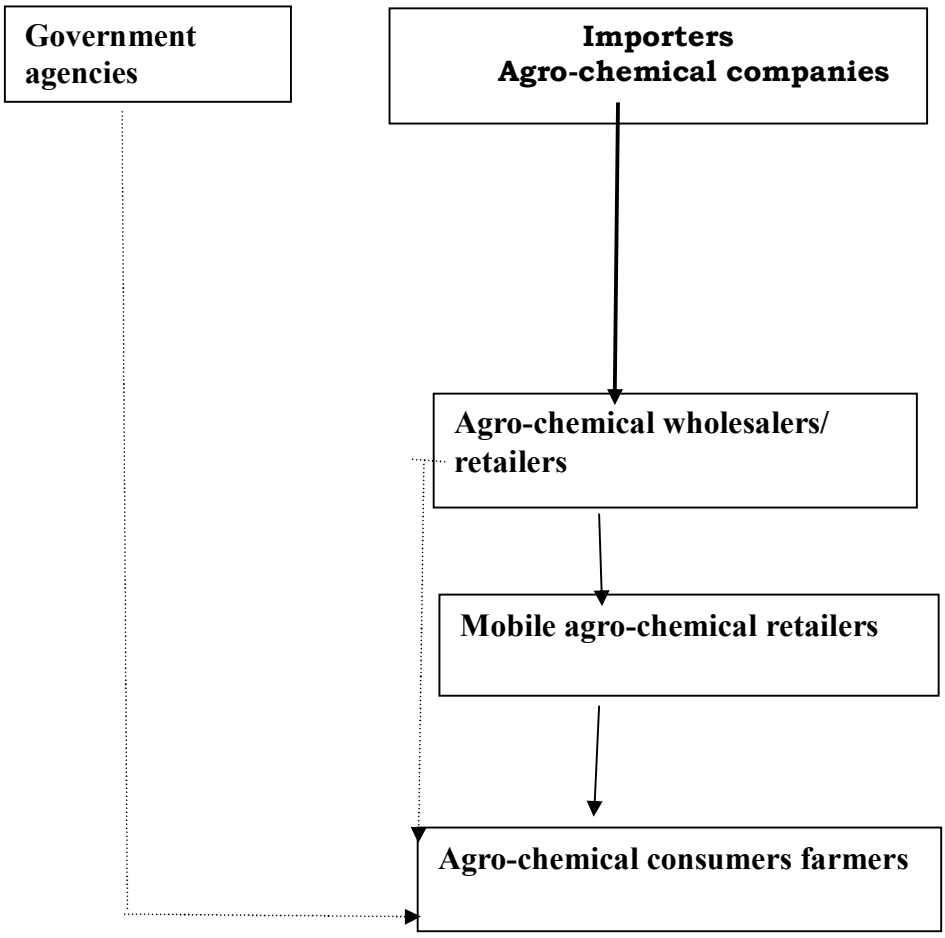


Fig 4. 2: Showing agro-chemicals marketing channel in Niger state

Less important.

Important

4.6. MARKETING MARGINS OF AGRO-CHEMICAL MARKETING

Using the proportional sampling technique 20 agro-chemicals was selected from each class. Herbicides had been the highest followed by insecticides; fumigants and seed dressing were selected. The average supply prices and selling prices were calculated. This was used to determine the marketing margin. The total marketing margin was found to be 20.0% (=N= 656) for the state. Insecticides had a percentage margin of 26.0% compared to herbicides that has 15.0% marketing margin.

The selection process of each product was done randomly in an unbiased manner. Tables 4.9a, b and c and 4.10 were used to derive tables 4.11 and 4.12. The average marketing margin that goes to the importer and other market intermediaries in the distribution chain for each of the three zones was calculated. The importers margin was =N= 138.0, =N= 545.0 and =N= 119.0 for Bida, Kontagora and Minna zones respectively. The average amount that goes to the importers in the state was =N= 175.0. The average total cost of marketing for Bida, Kontagora and Minna were =N= 45.0, = N= 51.0 and =N= 39.0 respectively while, the average for the state was =N= 45.0. Similarly, the average margin of the wholesaler/retailer for Bida, Kontagora and Minna were =N= 2.0, =N=14.0 and =N= 2.0 respectively whiles, the average for the state was =N= 3.0. The margin of the mobile retailer was =N=16.0, =N= 116.0 and =N= 14.0 respectively. The state average was =N= 30.0. Table 4.11 shows the average marketing margin (Naira and percentages). The importer's margin for Bida, Kontagora and Minna are 84.0%, 78.0% and 85.0% respectively, while the average for the state was 81.0%. The share that went to marketing cost for Bida, Kontagora and Minna were 5.0, 3.0% and 4.0% respectively, while the state average was 4.1%. The wholesalers/retailer for Bida, Kontagora and Minna were 1.0%, 2.0% and 2.0% respectively, while that of the state was 2.0%. Finally the mobile retailers' share for Bida, Kontagora and Minna were 10.0%, 17.0% and 10.0% respectively, while that of the average for the state was 14.0%. The marketing profit as percentage of marketing margin were found to be 72.0% for Bida, 85.0% for Kontagora, 72.0% for Minna and 79.0% for the state.

The result is similar with the findings of (Munkaila, 1998) and (Orer, 2004) on structure, conduct and performance of hide and skin marketing system where the result of the distributive marketing margin indicated that middlemen received 14.0%, 13.0% and

20.0% of the consumers expenditure on a piece of hides and sheep skin and goatskin respectively and the structure, conduct and performance of yam marketing system where the marketing margin indicated that 78.0% of retail price went to importers while, 22.0% went to the intermediaries respectively.

Table 4.9 (a): Average supply price and selling price of agro-chemicals in Bida zone

S/n	Product	Supply price (N) /litre	Selling price (N) /litre
1	Grammoxone	740.00	900.00
2	Weedoff	745.00	900.00
3	Sarosate	820.00	950.00
4	Force Up	700.00	830.00
5	Select	550.00	700.00
6	Vestamine	530.00	650.00
7	Propan	680.00	800.00
8	Propercare	650.00	750.00
9	Primextra	820.00	930.00
10	Premium	700.00	800.00
11	Atrylone	650.00	750.00
12	Ravage	720.00	850.00
13	Fusilade	1,800.00	2,000.00
14	Unicrown	1,500.00	1,700.00
15	Transmit	650.00	850.00
16	Atraz	700.00	850.00
17	Nuvacron	1,000.00	1,300.00
18	Sniper	850.00	1,100.00
19	Best	560.00	750.00
20	Monocrown	600.00	900.00
	Total	**15,965.00**	**19,260.00**
	Average per litre	**798.25**	**963.00**

Source: Field survey 2004

Table 4.9(b): Average supply price and selling price of agro-chemicals in Minna zone

Sn		Supply (N) / litre	Selling price (N) / litre
1	Grammoxone	740.00	900.00
2	Weedoff	740.00	900.00
3	Sarosate	830.00	900.00
4	Force Up	700.00	820.00
5	Slasher	670.00	800.00
6	X-trazine	650.00	750.00
7	Atraz 50 WP	680.00	800.00
8	Cutlass	1,150.00	1,450.00
9	Primextra	860.00	920.00
10	Premium	690.00	850.00
11	Atrylone	660.00	800.00
12	Ravage	710.00	800.00
13	Terminator	850.00	1,000.00
14	Thionex	950.00	1,200.00
15	Touch down	850.00	900.00
16	Atraz	700.00	800.00
17	Smash	800.00	900.00
18	Glycel	680.00	850.00
19	Roundup	900.00	1,200.00
20	Ravage	750.00	760.00
	Total	14,810.00	17,490.00
Average per litre		779.40	920.50

Source: Field survey

Table 4.9 ©: Average supply price and selling price of agro-chemicals in Kontagora zone.

	Product	Supply Price (N) /litre	Selling Price (N) /litre
1	Gramoxone	740.00	900.00
2	Weedoff	750.00	900.00
3	Transmit	650.00	900.00
4	Glycel	700.00	950.00
5	Atraz force 80WP	650.00	850.00
6	Best	550.00	800.00
7	Fusilate	1,800.00	1,950.00
8	Monocrown	980.00	1,000.00
9	Phos Kill	600.00	1,000.00
10	Cypertex	700.00	1,100.00
11	Karate	1,300.00	1,600.00
12	Kombat	1,050.00	1,500.00
13	Phostoxin	5,700.00	7,500.00
14	Nuvacron	1,000.00	1,500.00
15	Nuvan	1,150.00	1,400.00
16	Acteilic	1,400.00	1,900.00
17	Cyber – Di force	690.00	830.00
18	Callisulfan	650.00	900.00
19	Monocrot	650.00	900.00
20	Act force	900.00	1,200.00
	Total	**22,610.00**	**29,580.00**
	Average per litre	**1,130.50**	**1,479.00**

Source: Field survey 2004

Table 4.10: Average marketing cost of agro-chemicals in three zones of Niger State

S/n	Factor/=N=	Zone		
		Bida	**Kontagora**	**Minna**
1	Transportation	20.00	30.00	10.00
2	Handling charges	4.00	5.00	3.00
3	Storage	1.00	0.50	1.50
4	Statutory	0.02	0.02	0.06
5	Labour	20.00	15.00	25.00
6	Promotion*	0.20	0.15	0.15
7	Advertisement	0.20	0.15	0.15
	Total =N=	**45.42**	**50.82**	**39.86**

*Cost of promotion and advertisement for some products are shared with marketers in some cases.

Source: Field survey 2004.

Table 4.11: Average prices and cost of agro-chemical in the three zones of Niger state in Naira per litre

	Description (=N= /Litre).	Bida	Kontagora	Minna	Average
a.	Importer /Company price	798.25	1130.50	779. 40	902.70
b.	Marketing cost				
1	Transportation	20.0	30.0	10.0	20.0
2.	Handling charges	4.0	5.0	3.0	4.0
3.	Statutory	0.02	0.02	0.06	0.03
4.	Labour	20.0	15.0	25.0	20.0
5.	Storage	1.0	0.5	1.5	1.0
6.	Promotion	0.20	0.15	0.15	0.16
7	Advertisement	0.20	0.15	0.15	0.16
	Total cost of marketing (b1to b7)	45.42	50. 82	39.86	45.37
C	Whole sales prices	950.00	1,450. 00	910.00	1103.3
D	Retail price (selling price)	963. 00	1,479. 00	920.50	1,120.8
e	Marketing margin (d-a)	164.75	348.50	141.10	218.10
f	Marketing profit (e-b)	119.33	297.68	101.24	172.73
g.	Profit as % of marketing margin (%).	72.43	85.42	71.75	79.20

Source: Field survey 2004

Table 4.12: Average marketing margins of 1litre of agro-chemicals in Naira and percentage in the zones in Niger State.

Marketing margin/ cost/Litre	Bida		Kontagora		Minna		Average	
	%	=N=	%	=N=	%	=N=	%	=N=
a, Importer margin = a/c x 100	84.02	138.4	77.96	545.4	84.67	119.46	80.54	175.23
b. Marketing cost margin = b/c x100	4.70	7.81	3.40	23.78	4.30	6.07	4.10	8.29
c. Wholesaler/retailer share d-c /d x 100	1.30	2.10	2.00	13.99	1.14	1.61	1.48	3.22
d. Mobile retailer share {100 – (a+b+c)} or c- (a+b)/d x100	9.98	16.44	16.64	116.41	9.89	13.95	13.88	30.20
Total	**100**	**164.75**	**100**	**699.60**	**100**	**141.10**	**100**	**217.60**

Source: Calculated from Table 4.11.

Further analysis was done to determine the class of agro-chemicals between herbicides or insecticides with the highest marketing margin. The result shows that insecticides had a higher marketing margin of 26.0% compared to herbicides with a marketing margin of 15.0%. Tables 4.13 and 4.14 show the detail of the analyses.

Table 4.13:Average supply and selling prices of agro-chemicals (herbicides) in Niger state Nigeria.

S/n	Product	Supply (N) /litre	Selling price (N) /litre
1	Grammoxone	740.00	900.00
2	Weedoff	745.00	
3	Sarosate	820.00	950.00
4	Force Up	700.00	
5	Select	550.00	700.00
6	Vestamine	530.00	650.00
7	Propan	680.00	800.00
8	Propercare	650.00	750.00
9	Primextra	820.00	930.00
10	Premium	700.00	800.00
11	Atrylone	650.00	750.00
12	Ravage	720.00	850.00
13	Fusilade	1,800.00	2,000.00
9114	Unicrown	1,500.00	1,700.00
15	Transmit	650.00	850.00
16	Atraz	700.00	850.00
17	Agroxone	700.00	850.00
18	Vestrazine	630.00	700.00
19	Cutlass	1150.00	1450.00
20	Fusilade	1800.00	1950.00
	Total	**17,235.00**	**20,160.00**
	Average per litre	**861.75**	**1008.00**

Source: Field survey 2004

Determination of marketing margin for herbicides (Mh)

$$M\ (herbicides) = \frac{(P1 - P2) \times 100}{P1}$$

$$M\ (h) = \frac{1008 - 861.75}{1008} \times 100$$

$$M\ (h) = 14.50\%$$

Table 4.14: Average supply price and selling price of agro-chemicals (insecticides) in Niger state.

	Product	Supply Price (N) /litre	Selling Price (N) /litre
1	Smash	720.00	900.00
2	Perfecthion	950.00	1300.00
3	Endoforce	650.00	900.00
4	Termicot	570.00	850.00
5	Endocel	680.00	900.00
6	Best	550.00	800.00
7	Sniper	850.00	1,000.00
8	Monocrown	680.00	1,000.00
9	Phos Kill	600.00	1,000.00
10	Cypertex	700.00	1,100.00
11	Karate	1,300.00	1,600.00
12	Kombat	1,050.00	1,500.00
13	Phostoxin	5,700.00	7500.00
14	Nuvacron	1,000.00	1,500.00
15	Nuvan	1,150.00	1,400.00
16	Acteilic	1,400.00	1,900.00
17	Cyber – Di force	690.00	830.00
18	Callisulfan	650.00	900.00
19	Monocrot	650.00	900.00
20	Act force	900.00	1,200.00
	Total	**21,440.00**	**28,980.00**
	Average per litre	**1,072.00**	**1,449.00**

Source: Field survey 2004

Determination of marketing for insecticides (Mi)

$$M\ (\text{insecticides}) = \frac{P1 - P2}{P1} \times 100$$

$$M\ (i) = \frac{1449 - 1072}{1449} \times 100$$

$$M\ (i) = 26.02\%$$

Total marketing margin (TMM)

The result of the total marketing margin analysis shows that

$$TMM = \frac{\sum \text{of (e)}}{\sum \text{of (d)}} \times 100$$

$$= \frac{164.75+141.10+348.50}{963.00+920.50+1479.00} \times 100$$

$$= \frac{654.35}{3{,}362.50} \times 100$$

= 19.50% (=N= 655.69) of the total revenue.

4.7 PROBLEMS OF AGRO-CHEMICALS MARKETING

Despite the numerous advantages of the agro-chemicals marketing there were some problems that are detrimental to the growth of the sector. Unless something is done to check these problems, the expected growth of the industry will be illusive and consequently, the corresponding growth of the agricultural sector may never be realized. The marketers highlighted the following problems.

4.7.1: Adulteration and faking: -

This is the practice of administering foreign substances to original product. This cut across all categories of the pesticides irrespective of their formulation. The respondents believed that it is a great danger to the industry. On reasons for the adulteration, the respondents believed that it was due to ignorance, economic situation, high demand for a product, mode of packaging, popularity and effectiveness of a brand, mode of storage, market competition, disposal of used package, lack of monitoring agents, standard outlets, expensiveness, lack of enforcement of legislation, several importers and manufacturer, lack of patent, over dependence on synthetic pesticides, poor handling, poor ways of transportation and to long a time in stores and making them it available to the farmers when they had already expired.

Though faking is almost synonymous to adulteration, a good product not in its original container but another product container (usually past moving product container) is regarded as fake. This act is committed in the same way as adulteration. This finding is similar with the finding of Okunade (2002).

4.7.2: Poor transportation network: -

The entire 35 respondents complained that they believed that if the transportation cost could be eliminated or reduced to a very minimum level, the price of the products would also reduce. Most of the agrochemicals companies were located in cities and in fact apart from Saro and Candel that were both located in Suleja and Gongoni in Minna, no any other company is located in the state. Majority of the marketers, about 70% of them said that they do source the products either from Abuja, Kaduna, Kano, Ibadan or Ilorin. The distance and the bad roads made the transport cost to be high. Majorities of the rural roads were also in poor condition; hence delivering these products to the rural community where the end users are based is another extra cost on the products. The

consequence is delay in moving the products, artificial scarcity, which in turn increases price, damage, theft and losses to the marketers. This finding conform to (Ngurdi, 1983) and (Abdulhadi, A, 1993) that transportation / distribution takes 70% of the cost of marketing.

4.7.3: Large amount of capital: -

The agro-chemicals business is a capital-intensive business. The entire respondent agreed with this finding. Majorities of them started with a little saving and credit facility from agro-chemicals companies. About 80% of the marketers enjoyed credit facilities from the various agro-chemicals companies, which runs to millions of naira with different agreement attached to it. It was also discovered that all the marketers do also advance credit among themselves. This credit in some cases turns to bad debt (40%). Only 5% of the marketers take bank loan to increase their capital base. These findings is similar with (Nuru, 1998) that agro-chemicals marketing and distribution is a very capital-intensive business and that those who have a better financial base often have wide and large stock in their stores. Therefore, capital is a limiting factor to the performance of agro-chemical marketers.

4.7.4: Subsidy: -

All the respondents believed that government intervention in making these products available to the farmers affects their business. Whenever government makes available products into the markets, the marketers have to wait until the government consignment finished before they sell their wares. In some cases, this could take a longer time and ultimately distorting the whole market. Majority of fakers and adulterators capitalized on this opportunity by offering their fake products to the farmers at a lower rate to connote that it as government subsidized products.

4.7.5: Unfavourable seasonal change: -

This particular problem was one of the worries of most of the marketers interviewed. The agro-chemicals seasons commences with first rain, which usually comes up in the last week of March or the second week of April. The season takes off with the sales of seed dressing and pre emergence herbicides. Post-emergence herbicides commences by the mid of June up to the end of August while the insecticides season which is very short commences in September and usually ends in October. Fumigant that

is storage chemicals commences late October to the second week of November after which the season is over. Between mid November and end of March, there is no agro-chemical business. This is a problem to the agro-chemicals marketers and only 20% of the marketers interviewed, disagreed with seasonality as a problem. These 20% are among those that integrated veterinary drugs or foodstuff businesses with agro-chemicals.

4.7.6: Lack of awareness and adoption: -

The population of Nigeria in 1991 was 88,992,220 people and was projected to be 130million people in 2002 (Akpoko, 2002). Majorities of the populace are sustained by agriculture as the main employer. Considering the population, the quantity of agro-chemicals consumption is very low. This is a problem that limits the potentials of the agro-chemicals marketers in the study area that has a population of over 3million people, 85% of whom are farmers.

4.7.7: Bad debt: -

All the respondents complained of bad debt. The mobile retailers (middlemen) that take the products to the end users hardly pay back their credit fully. In some cases, the payment comes in bits while in other cases, it end up as bad debt. Majority of the mobile retailers after recording bad debt with a particular wholesaler / retailer runs to another in a different location. Due to the competitive nature of the trade they may get another credit before the awareness of the other.

4.7.8: Low price of farm produce: -

All the marketers interviewed, agreed that whenever the prices of the farm produce drop drastically especially cash crops, the level of patronage become very low. During the period of study, the prices of the commodities were average. Although the farmers hardly keep record, they usually prorate the cost of production with the profit margin and this determines how much to spend on the next farming season.

4.7.9: Poor government policy: -

This is important because it affects all the participants. All the respondents agreed that, government policy determine the available wealth and the general demand of the farm inputs.

4.7.10: Lack of training and product support service: -

Training is very relevant. The entire respondents agreed to this, 86% of them were not trained on the basic information as regards to the agro-chemicals. It is worthy to note that this industry deals with products that special training is needed to handle. Level of education does not necessarily means that no training is required.

4.7.11: Bad weather: -

The favorability of weather determines the consumption of agro-chemical generally. Whenever the weather becomes unfriendly the consumption of agro-chemical is very low. Lack of good weather forecast is inimical to overcoming the fear of the marketers and the farmers on what to stock and cultivate.

Summary of these problems could be seen on Table 4.15.

Table 4.15: Assessment of problems of agro-chemicals marketing by the retailers in the study area.

	Problems	Respondent ranking 1 2 3 4 5	No of respondent	% Of respondent	
1	Bad weather	35 - - - -	35	100	1st
2.	Adulteration /faking	35 - - - -	35	100	2nd
3	Low farm price	35 - - - -	35	100	3rd
4	Lack of training	30 5 - - -	35	100	4th
5	Poor government policy	26 7 2 - -	35	100	5th
6.	Large amount of capital	25 8 - - 2	21	100	6th
7.	Poor transportation network	24 11 - - -	35	100	7th
8.	Subsidy	15 10 10 - -	35	100	8th
9.	Bad debt	15 7 10 3 -	35	100	9th
10.	Lack of awareness and adoption	7 10 15 3 -	35	100	10th
11.	Unfavourable seasonal change	28 - - - -	28	80	11th

Source: Field survey 2004

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 : Summary:

The results of the study revealed that there are five major participants in the agro-chemical industry: the agro-chemical companies, wholesaler/retailers, mobile retailers, farmers and government. Agro-chemical marketers were mostly male (97%) with an average age of 40 years (46%); those with average age of 30 years (31%) followed the dominant class. All the marketers interviewed were literate 97% possessed formal education while 3% have informal education. Agro-chemical marketers also sell veterinary drugs (80%) and foodstuff (20%) aside the agro-chemical business. Average experience was between 6-10 years.

Due to the various type of crops cultivated in the study area 176 agro-chemicals were found to be marketed. The 176 agro-chemicals marketed 45%, 43%, 9.7%, 2.2%, and 0.1% were herbicides, insecticides, fumigants, seed dressing and fungicides respectively.

The findings of the study revealed that the agro-chemicals market in the study area is a fully liberalized market with a pure competition, free entry and free exist with almost homogeneous products that were just differentiated by little packaging but of more brand names.

There were several participants, the sellers, the buyers, the marketing companies and the manufactures. The empirical result of the Gini coefficient (0.59) 59% and the Lorenz curve elaborate the mentioned statement. The availability and free access to information in the industry also support the pure competitive nature of the industry. This explains the marketing conduct.

The calculated mobile retailers marketing margin share in all the three zones were 10.0, 17.0, and 10.0 Bida, Kontagora, and Minna respectively. The result showed that the marketing profit in Bida was =N = 119.0 (72.0%), Kontagora =N= 298.0 (85.0%), Minna =N= 101.0 (72.0%) and the average was found to be =N=173.0 (79.0%). This showed that the marketing of agro-chemicals is efficient. Further analysis of marketing margin showed that insecticides have 26.0% compared to 15.0% for herbicides. The total marketing margin was found to be 20.0% of the total revenue.

The marketing channel was found to be decentralized where by the retailers buys from the wholesalers/retailers. Likewise, the wholesaler/retailers procure from the agro-chemicals companies that intern import the product into the country.

Various problems were enumerated as bottles neck to maximum achievement of agro-chemicals marketing in the study area; the most pronounced problems were weather, adulteration and faking, low price of farm produce, training, government policy, capital, transportation, subsidy, bad debt, awareness and adoption and seasonal change.

5.2: Conclusion:

Based on the findings of this study, it is concluded that the marketing of agro-chemicals in the study area composed many marketers and buyers. There are enough brands (176) of agro-chemicals and there was no evidence or monopolistic practices instead the market tended towards pure competition structure. The marketing margin indicated that the agro-chemicals marketing in the area is efficient. The marketing profit as percentage of marketing margin showed that the average was 79.0%, which was an indication that new entrants may be attracted in to the industry. Though there are various inhibiting factors inimical to the realization of the full potential of the market. The enumerated problems are constraint to the pure competitive nature of the market; this suggested that the market could do better with proper tackling of the problems. Some of the problems mentioned like awareness and adoption are necessary to be overcome for the sector to grow.

The growth of the sector is directly correlated with the growth of the agricultural sector and attainment of the food security programme of the nation. The agro-chemicals sector can grow multiples times then it is current level.

The population of the study area was projected as 3.2million people out of whom 85% are farmers. When this was prorated with volume of product consumed, the volume is insignificant.

5.3: Recommendations

In view of the identified problems, it is recommended that the government should take measures against adulteration and faking which is the most serious problem of agro-chemicals marketing. All the participants should be educated and have technical know how of the chemicals they sell. This will minimize the abuse or misuse of agro-

chemicals. In addition, this will solve the problem associated with hazard of poisoning during the process of encountering with the chemicals. Government should make loan available for various participants of agro-chemicals because the business is capital intensive.

There is need to establish a very effective meteorological station at local levels or use of satellite that can be updating and forecasting the weather condition for farmers and the agro-chemicals participants, so as to know what to plant and consequently what chemical to be made available.

Adulteration and faking must be eradicated from the industry so that it will not erode the confidence that the peasant farmers have on all the participants. The following ways should be adopted: -

Education and enlightenment: - All pesticides handlers should be educated on the danger and implication of the practice of adulteration. Those in the real business of faking/adulteration should also be involved in this enlightenment programme.

Packaging of pesticides: - Employing smaller packaging will abate repackaging of the products (hence adulterating it) all in the name of "helping" smaller buyers. For example Aluminum phosphide packages in 10, 20 and 30 tablets. Similarly DDVP (Dichlorvous) could be packed in 50, 100mls.

Availability of pesticides: Pesticides in high demand should always be made available in enough quantities to reduce the incidences of faking them.

Regular training: Proper training and accreditation of those involved in pesticides outlets from time to time is very important. This will acquaint them with recent developments in pesticides usage.

Pesticides packaging/labeling: This should be slightly complex and such that it is difficult to fake by even the best color photocopy. The logo of the manufacturer should be securely inserted on it. Study the labels and packaging on pesticides before buying and or usage. Literate people will benefit more from this. Pesticides in damaged or questionable packages should not be purchased. Avoid buying or using pesticides in repackaging or unsuitable form and suspicious containers. Original containers of pesticides should be destroyed immediately after use. This will prevent being reused (for adulteration).

Other pest controls measures: Other pests control measures with less emphasis on pesticides should be encouraged. This includes Integrated Pest Management (IPM).

Guarantee the price of farm produce to the farmers' even before planting rather then at harvesting period: This will enable the farmers to plan in terms of hectarage and inputs to be use. The introduction of a commodity exchange by the Obasanjo government is a well come initiative, as it will guarantee prices of commodities, which will lead to increase level of production and subsequently the level of inputs. This will enhance the farmer's income, which will serves as incentives to farmers to produce more by increasing acreage of cultivation and applying all necessary inputs.The consequent increased viability of the agricultural sector would attract more investment, as commercial banks would be interested in financing the agricultural sector at a very favorably lending rate. In addition, the establishment of a commodity exchange will improve the standard of living of the farmers, as their income will be guaranteed through appropriate pricing and ability to contain price fluctuation.

Improvement of our transportation and communication facilities will help a lot in reducing the various cost associated with agro-chemicals marketing.

Government should provide loans to the agro-chemicals participants at a favorable lending rate: through some of the agricultural finance house such as Nigerian Agricultural and Rural Development Bank (NARDB).

Government should remove its hand completely: from the agro-chemicals industry in terms of procurement and subsidy. These two factors were found to be inimical to the development of the sector. Instead of that the government should create a standard in the sector in terms of quality outlets, importation and policy administration. Government can provide incentives to the participants in terms of soft loan, duty free, VAT free, free returns tax and free extension services so as to help the industry grow and consequently reduce the price of the product at the end user point.

Extension activities: Manufactures / distributors should encourage extension activities in the rural areas by establishing pesticides outlets intensify on campaign to increase the awareness and adoption of the technology. This could be done through the use of extension agents and media and any other government agencies. Involvement of opinion leaders will also help.

Government should encourage local production of agro-chemicals in Nigeria so as to reduce the cost of the products, supply lag and create employment.

Limitation of the study

The following were the limitations of the research.

1. The time (season) at which the study was conducted also affect data. During scarcity period the price tends to be higher and vise versa. Because of that it is important to conduct the study through out the season or use secondary data.
2. The analytical tools that assumed pure competition are also limiting factor to the study.

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Appendix 1:Names of importers (agro-chemicals companies) found in the study area

1.Saro Agrochemicals

2.Candel Company

3.Dizengoff West Africa

4.Jubaili Agro-tech

5.African Agro

6.Hervestfield

7.Insis Agrochemicals

8.Amanik

9. Hausawa

10.Affcot

11.Bethsaida

12.CAPL

13.Unique Agrochemicals

14.C.Zard

15.Fitsco

16.Osi Agro

17.Sygenta

18.NGC

19. Gongoni

Appendix 2:Classification of agro-chemicals

2.1.1: Classification according to target pest

Target pest	**Name of agro-chemicals**
Mites, spider and ticks	Acaricide
Trees and shrubs	Aboricides
Birds	Avicides
Bacteria	Bactericides
Fungi	Fungicides
Weeds	Herbicides
Insects	Insecticides
Nematodes	Nematicides
Eggs of insects	Ovicides
Rodents.	Rodenticides.

2.1.2: Classification according to mode of action

Mode of action	**Description of the action**
Contact pesticides	Kills the target pest by hitting them directly or after they come in contact with the treated surface
Systemic	Translocated into the plants' system by absorption pest take up a toxic dose when feeding
Selective	It selects, it destroys organism that are harmful and leaves the beneficial organism unharmed
Stomach acting	Kills the pest after it has fed on treated materials
Repellant	Makes the surface unattractive to the pest
Fumigant	Acts through attacking the respiratory system of the pest.
Non selective	Kills all organisms (plant) it comes in contact with.

2.1.3: Classification by formulation

Formulation	**Description.**
Wettable powder (WP.)	Powder that needs to be dissolved in a solvent.
Emulsifiable concetrate (EC)	Comes in liquid form containing a concentrate amount of the active ingredient

	and can be mixed with either water or oil based solvent before application
Soluble concentrate (SC)	Comes in solution form containing a concentrated amount of the active ingredient
Dispersible grains (granule DG)	Comes in granule form usually containing active ingredient and inert material.
Ultra low volume (ULV)	Spray able formulation that requires special ULV for their application.
Aerosol	Spray able formulation that are applied through special pressurized containers
Baits	Either in solid or powdery form, placed at specific points.

2.1.4: Classification by mode of application

Mode of application	**Description**
Foliar	Applied to the leaves.
Residual	Applied to bare soil. They remain active in or on the soil for several weeks.

2.1.5: Classification by time of application

Time of application	**Description**
Pre – plant	Applied at land preparation prior to cropping
Pre – emergence	Before emergence of the crop and before or after weed emergence

Appendix 3:Types of agro-chemicals marketed in the study area.

S/n	Brand name	Active /Ingredient	Category	Marketer
1	Weedoff	Paraquat	General herbicides	Saro
2.	Gramoxone	,	,	C.zard
3.	Proxone	,	,,	Candel
4.	Agroxone	,,	,,	CAPL
5.	Paraforce	,,	,,	Jubaili
6.	Ravage	,,	,,	Insis
7.	Paraquat	,,	,,	Dizengoff
8.	Weed crusher	,,	,,	Harvest field
9.	Slasher	,,	,,	Unique
10.	Premium	,,	,,	African agro
11.	Atraz 80wp	Atrazine powder	General herbicide	Saro
12.	Delzine 80wp	,,	,,	Candel
13.	Atranex 80wp	,,	,,	Dizengoff
14.	Aterylone 80wp	,,	,,	Insis
15.	X-trazine 80wp	,,	,,	NGC
16.	Atrazine 80wp	,,	,,	African agro
17.	Atra force 80wp	,,	,,	Jubaili
18.	Atrafitis 80wp	,,	,,	Fitsco
19.	Unicorn 80wp	,,	,,	Unique
20.	Vestrazine 80wp	,,	,,	Harvest field
21.	Rhonazine 80wp	,,	,,	Rhodia
22.	Sarosate	Glyphosate	,,	Saro
23.	Bush Fire	,,	,,	Unique
24.	Uproot	,,	,,	Unique
25.	Roundup	,,	,,	Candel
26.	Delsate	,,	,,	Candel
27.	Forceup	,,	,,	Jubaili

28.	Glycel	,,	,,	African agro
29.	Clear weed	,,	,,	Harvest field
30.	Glycot	Glyphosate	,,	Affcot
31	Fitscosate	,,	,,	Fitsco
32.	Rhonasate	,,	,,	Bethsaida
33.	Glyphader	,,	,,	SEEPC
34.	Sweep	,,	,,	Osi Agro
35.	Glyphogan	,,	,,	Dizengoff
36.	Touch down	,,	,,	C.zard
37.	Select	2,4-D Amine	Selective herbicide	Saro
38	60-SL	,,	,,,	Rhodia
39.	Herbex D-SL	,,	,,	Fitsco
40.	2,4-D	,,	,,	NGC
41.	Aminoforce	,,	,,	Jubaili
42.	Vestamine	,,	,,	Harvest field
43.	2,4-D Amine	,,	,,	African agro
44.	Cotchlor	Butachlor	,,	Affcot
45.	Delmine	,,	,,	Candel
46.	Propan	Propanil	,,	Saro
47.	Orizo	,,	,,	Candel
48.	Orizo plus	Propanil + 2,4-D	,,	Candel
49.	Orizo extra	,,	,,	Candel
50.	Rhonil	Propanil	,,	Rhodia
51.	Agronil	,,	,,	Osi agro
52.	Propanil	,,	,,	Dr. Eze
53.	Anilorguard	Andofos	,,	Patliz
54.	Basagran	Propanil + Bentazone	,,	C. Zard
55.	Teer	Butachlor	,,	Gaskiya
56.	Ronstar	Oxidiazion	,,	Saro

57.	Stomp	Pendimenthalin	,,	C.Zard
58.	Butastar	Butachlor	,,	African agro
59.	Proper care	Propanil	,,	African agro
60.	Rilof	Propanil + Piperophos	,,	Sygenta
61.	Atraz 50fw	Atrazine 50FW	General herbicide	Saro
62.	Delzine 50FW	,,	,,	Candel
63.	Premais	Atrazine+metolachlor	,,	Candel
64.	Atrazine 50FW	Atrazine	,,	CAPL
65.	Lasso	Atrazine +Alachlor	,,	Candel
66.	Primextra	Atrazin +Metalachlor	,,	Sygenta
67.	Igrancombi	Metalachlor +Terbutryn	Selective herbicides	Sygenta
68.	Gadoprim	Terbuthyrazin+Atrazine	,,	Sygenta
69.	Galex	Metabramoron+ Metolachlor	,,	Sygenta
70.	Raft	Terbuthylazin +Atrazine	General herbicides	Niagro
71.	Diutop	Diuron	,,	Candel
72.	Atrafits 50WF	Atrazine 50WP	,,	Fitsco
73.	Primagram	Atrazine + Metolachlor	,,	Sygenta
74.	Atrazine 50WF	Atrazine + Alachlor	,,	Dizengoff
75.	Dual	Metolachlor	Selective herbicides	Sygenta
76.	Codal	Metolachlor +Prometryn	,,	Sygenta
77.	Fusilade	-	,,	Sygenta
78.	Unicrown	Oxidiazon	Selective herbicides	Unique
79.	Cutlass	Diuron +Paraquat	General herbicide	Insis
80.	Cypertex 10EC	Cypermethrin	Insecticide	Saro
81.	Cyperun 10EC	,,	,,	Unique
82.	Delthrin 10EC	,,	,,	Candel

83.	Cypermethrin10EC	,,	,,	Several
84.	Best 10EC	,,	,,	African agro
85.	Luxathrin 10EC	,,	,,	Harvest field
86.	Cyperforce 10EC	,,	,,	Jubaili
87.	Balathrin 10EC	,,	,,	Balas
88.	Cypercal 10EC	,,	,,	HDF
89.	Monocrot	Monocrotophos	,,	Saro
90.	Monocrown	,,	,,	African agro
91.	Phoskill	,,	,,	Affcot
92.	Nuvacron	,,	,,	Sygenta
93.	Monoforce	,,	,,	Jubaili
94.	Delphos	,,	,,	Candel
95.	Sherpa plus	Cypermethrin + Dimethoate	,,	Saro
96.	Super plus	,,	,,	Osi
97.	Upper coff	,,	,,	Candel
98.	Cyper-Di-Force	,,	,,	Jubaili
99.	Perfeckthion	Dimethoate	,,	C-zard
100	Dime force	,,	,,	Jubaili
101.	Decis	Deltamethrin	,,	Gongoni
102.	Thionex 50EC	Endosulfan	,,	Dizengoff
103.	Endocel 35EC	,,	,,	African agro
104.	Endoforce 35EC	,,	,,	Jubaili
105.	Endofalm 50EC	,,	,,	
106.	Thiodan 50EC	,,	,,	Saro
107.	PolytrinC 336Ec	Cypermethrin + Profenophos	,,	Several
108.	Polytrin D	Cypermethrin +Demethoate	,,	Several
109.	Capsitox 20EC	Lindane	,,	Saro
110.	Gammalin 20EC	,,	,,	CAPL
111.	Luxan 20EC	,,	,,	Harvest field
112.	Endocarp 625EC	Endosulfan	,,	Candel

113.	Callisulfan 35EC	Endosulfan	,,	Several
114.	Sniper 1000EC	Dichlorvos	,,	Saro
115.	Delvap 1000EC	,,	,,	Candel
116.	Nuvan 1000EC	,,	,,	Sygenta
117.	Melsect 1000EC	,,	,,	Konez
118.	Agrosect 1000EC	,,	,,	Osi
119.	Vapit 1000EC	,,	,,	Insis
120.	D.D. Force 1000EC	,,	,,	Jubaili
121.	Konavap 1000EC	,,	,,	Konez
122.	Shooter 1000EC	,,	,,	Niagro
123.	No pest 1000EC	,,	,,	CAPL
124.	Smash 1000EC	,,	,,	African agro
125.	Rhonclov 1000EC	,,	,,	Rhodia
126.	D.D.V.P 1000EC	,,	,,	Dizengoff
127.	Vopolux 1000EC	,,	,,	Harvest field
128.	Covos 1000EC	,,	,,	
129.	Fravan 1000EC	,,	,,	Franbet
130.	Delta force	Deltamethrin	,,	Jubaili
131.	Termex 48EC	Chlopyriphos	,,	Saro
132.	Termicid 48EC	,,	,,	Candel
133.	Act force 48EC	,,	,,	Jubaili
134.	Tricel 48EC	,,	,,	African agro
135.	Pyrinex 48EC	,,	,,	Dizengoff
136.	Terminator 48EC	,,	,,	CAPL
137.	Trivap 48EC	Cypermethrin +Dichlovous	,,	Candel
138.	Wovmforce	Carbofuran	,,	Jubailli
139.	Delfuran	,,	,,	Candel
140.	Karate	Lamdacyhlothrin	Insecticide	C.Zard
141.	Zap	,,	,,	Candel
142.	Kombat	,,	,,	Saro

143.	Carat force 2.5 E	,,	,,	Jubaili
144.	Procarb	Carbaryl	Storage insecticide	Candel
145.	Prime	Primphos methyl	Storage insecticide	African agro
146.	Actellic 25E	,,	,,	Syngenta
147.	Actellic dust	Primphos methyl	,,	C.zard
148.	Coopex dust	Permethrin	,,	Gongoni
149.	Actex dust	Primphos methyl	,,	Niagro
150.	Phostoxin	Aluminium phosphide	Fumigant	Gongoni/Saro
151.	Force foxin	,,	,,	Jubaili
152.	Aluphos	,,	,,	Saro
153.	Protex	,,	,,	Candel
154.	Quick phos	,,	,,	NGC
155.	Gastoxin	,,	,,	Gaskiya
156.	Fitscophos	,,	,,	Fitsco
157.	Cellphos	,,	,,	African agro
158.	Apron plus	Furathiocarb + carboxin	Seed dressing	Sygenta
159.	Apron star 2DS	Thiamethoxan + Metalaxym+Difenoconazole	,,	Sygenta
160.	Dress force	Imidacloprid + metalaxy-m+ Tebuconazole	,,	Jubaili
161.	Stop – Rat	Brodifacoum	Rodenticide	CAPL
162.	China	Zinc phosphide	,,	Several
163.	Dursban		Insecticides	Several
164.	Ridomil 72WP	Copperoxide + Metalaxy	Fungicide	Sygenta
165.	Basudin 600EC	Diazinon	Insecticide	Sygenta
166.	Diazol 600EC	Diazinon	,,	Dizengoff
167.	Cypaz 10EC	Cypermethrin	,,	,,
168.	Sevin 85	Carbaryl	,,	Rhodia

169.	Ultracide	Methidathion	,,	Sygenta
170.	Sinovap 1000EC	Dichlorvos	,,	Osi
171.	Capsin 20EC	Lindane	Insecticide	Candel
172.	Pestoff 1000EC	DDVP	,,	Harvest field
173.	Vestinon 600EC	Diazinon	,,	,,
174.	Cyperphos 186EC	Cypermethrin + Triazophos	,,	Several
175.	Cypercal D	Cypermethrin + Dimethoate	,,	Several
176.	Padrin dust		Soil insecticide	

Appendix 4 : Research questionnaire

Instruction:

Please could you oblige to answer the following questions for me? I wish to assure you that any information given will be treated for only academic research work and will also be treated as confidential. Please tick where necessary and respond freely where you deem fit.

A. *Background information*

a. Questionnaire number……

b. Date:……

…..

c. Zone:……

…..

d. Local Government Area/Village:……..

B. Personal characteristics of distributor/agro-chemical marketer

a. Name:……

……

b. Sex:……

……

c. Age:……

……

d. Marital Status:……

e. No. of Children:…….

f. Educational Qualification:…….

g. Off agro-chemical marketing employment:……

h. What is your business name?…….

i. Are you in the business as an individual or as a corporate body?……

……

j. For how long have you been in the business?……..

C. Marketing operations

C1. Types of agro-chemicals marketed.

What types of agro-chemicals do you market? Please specify as given below in the table.

S/n	Product	Active ingredient	Product category	Marketer or manufacturer	Quantity procured in 2003
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
31.					
32.					

33.					
34.					
35.					
36.					
37.					
38.					
39.					
40.					

C.2. Marketing channel, structure and conduct

a. How do you obtain \ procure your products? (Please tick)

i. By importation? [ ] Name countries ----------
ii. From agro-chemical companies [ ] Name the company----------
iii From other distributors [ ] Name the distributors----------
iv. From government agencies/stores [ ] Name the govt. agency----------
v. Others (specify)

……...

b. In general how many firms / companies did you know that are in agro-chemical business? Please can you name them? ----------
---

---

j. Please can you give me the various stages that products pass through from the manufacturer up to the farmers (end users) ----------

k. Where do you belong in the above process? ----------

C.3. Marketing margin and performance

a. Please could you provide the average cost of marketing a unit of a product?

S/n	Cost item	Herbicide	Insecticide	Fungicide	Bactericide	Others
1	Product price					
2	Transportation					
3	Insurance					
4	Warehousing					
5	Handling					
6	Damage/spillage					
7	Cost of fund					
8	Administrative					
9	Sundry expenses					
10	Others (specify)					

b. What is the average retail price/litre of each of the products sold?

i. Herbicides / litre:…….

ii. Insecticides / litre:……

iii. Fungicides /litre/kg:……

iv. Bactericides /litre/kg:…….

v. Fumigants ----------

vi. Others /litre/kg:……..

c. How long does each of these products stay on the shelve after procurement and

d. What time of the year do you procure each?

S/n	Product	Time of procurement	Shelve period
1.	Herbicide		
2.	Insecticide		
3.	Fungicide		
4.	Bactericide		
5.	Fumigants		
6.	Others (specify)		

e. What is your source of capital for the agro-chemical marketing activity?

i. Share capital [ ]
ii. Personal saving [ ]
iii. Bank loan [ ]
iv. Credit [ ]

Others (specify) ……

f. Do you intend to invest more in the coming two (2) to three (3) years in agro-chemical business?

If yes, why

……

……

……

If no, why?

……

……

Do you sell on credit?

i. No [ ]

ii. Yes [ ] If yes,

i. To what period?……...

ii. What amount of credit?……...

iii. Do you take collateral? [ ] If No, how do you secure the credit?……
……

iv. Do you charge interest on credit sales? If Yes, what percentage?……..

v. In case of default, what measures do you take?……..
……

g. How long do you receive an order after request?
   i. Days [ ] specify:…….
   ii. Weeks [ ] specify:……
   iii. Months [ ] specify:…….
   iv. Annually [ ] specify……..

h. Do you think that the private sector has done well in providing the solution to pest problems?
   i. Yes [ ]
   ii. No [ ]

i. How soon do you get relevant information with regards to the business?

   i. Immediately [ ]
   ii. Less than a week [ ]
   iii. More than a week [ ]
   iv. Monthly [ ]

j. How do you react to these information received?----------

-

C4 ***P***roblems and general issues

a. What factors contributed to your success or failure in the business?
……
……
……
……

b. What are the specific problems of agro-chemical marketing?
   i. Capital intensive [ ]

ii. Credit facility [ ]
iii. Product availability [ ]
iv. Adulteration [ ]
v. Educational level [ ]
vi. Transportation [ ]
vii. Debt management [ ]
viii Seasonally [ ]
ix. Others [ ] Specify:

……..

……..

c. Among the problems stated above, if you believe that item (iv) is a problem what are the causes?

……
……
……
……
……
……

d. How is it committed?

……
……
……

e. How do you identify fake / adulterated chemicals?

---

f. At what level of product transfer to end - user is it committed? ----------
---

g. Please could you suggest the possible means of reducing or eradicating the problem?

---

h. How do you dispose fake / adulterated chemicals? ----------
---

i. What measures are you taking to check adulteration? ----------
---

j. Do you know that agro-chemical are poisonous / hazardous products? ----------
---

k. If you agree with the above, what measures do you take to ensure your safety and that of other participants and the environment in general? ----------
---

l. Please could you suggest or advice any of the following organs or participants in the business? ----------
---

i. Agro-chemicals companies----------

--

ii. Government ----------

-----

iii. End -users----------

----

iv. Marketers (distributors and intermediates) ----------

-

v. New entrants into the business ----------
---

m. Lastly, suggest ways that you think agro-chemical market could be improved?

Thank you and God bless.