INVESTIGATION OF ACCIDENTS ON SELECTED MECHANISED FARMS IN NIGER, KWARA, KADUNA STATES AND FEDERAL CAPITAL TERRITORY

BY

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A PROJECT SUBMITTED TO DEPARTMENT OF AGRICULTURAL ENGINEERING,
SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY,
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
NIGER STATE, NIGERIA.
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ENGINEERING (B.ENG.)

DECLARATION:

I hereby declared that this project write up is my original work and has never been presented elsewhere for the award of degree.

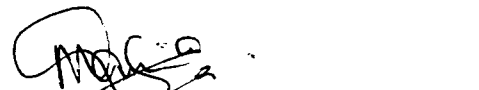
Information derived from published and unpublished work have been acknowledged in the test.

Joshua 16/3/98

JOSHUA C.A.

CERTIFICATION

I hereby certify that this project write up was carried out by Joshua C.A. And that I have supervi approved this project work which is proper in scope a the partial fulfilment of the award of bachel Agricultural Engineering.



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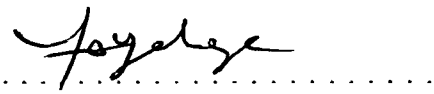
Date



External Examiner

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DEDICATION.

This project write up is dedicated with love to my dearly parents, Mr and Mrs M.A. Joshua for being with me through the thin and large of my life.

played some vital roles and whos only the lord Himself can reward. Therefore, I pray that God will reward every one who was an instrument to the success of this project.

Finally, I am grateful to Mallam Mohammed Ibrahim Emiran (Niger State Secretariat) who accepted to type the project.

Thanks you all

Joshua Christiana Alami
Federal Univeristy of Technology,
Minna.
1998.

LIST OF FIGURES.

ABSTRACT:

The purpose of this project work is to find out the causes of accidents, types of farm accidents, damage done by accidents, cost of farm accidents and ways of reducing farm accidents on selected mechanised farms in Kwara, Niger Kaduna States and Federal Capital Territory. Certain research questions were asked to achieve this purpose.

Investigative Survey Research Approach (ISRA) was used. The data collection instrument was a questionnaire, containing 12 questions in section A and 15 questions in section B. The first part of the questionnaire aimed at demographic variables to address the background information and the second part of the questionaire aimed at gaining insight into the description of accidents to address the purposes mentioned above. Both sections address the objectives of this project.

Findings of the project show that majority of the respondents are males, the major cause of farm accidents is human factor 40.0% type of farm accident is environmental factor, 40.0% damage done by minor accidents is slight damage, 54.5%, damage done by major accidnet is time losses, 72.72%, Cost of farm accident is property damage, 45.0%. Ways of reducing accidents are properly stated under recommendation.

The results obtained in this project are in agreement with the discoveries in previous studies outside Nigeria.

CHAPTER ONE

INTRODUCTION

1.0: General:

Accidents occurring in the farm may be viewed as something of utmost importance to the farmers and farming environment in which life is made unpleasant. Farm accidnets means something urpleasant or damaging, that happens unexpectedly or by chance and may result into property damage, life loss, intangible loss, time loss in the farm.

Farm accidents sometimes result in death, sometimes in permanent disability and in many cases slight injuries resulting in a few days absence from work. Even if an accident does not render the victim unfit for work, it makes him or her liable to infection or anyother form of the illness sustained. In addition to causing pains and suffering, accidents produce economic and social loss, impair individual and group productivity, cause inefficiency and gradually retard progress.

Moreso, in the recognition for the importance of farm accidents as emphasized by the survey of the Health and safety Executives (HSE) in britain, several attempts have been made on tractor overturning accidnets in Engalnd and Wales, due to the fact that through the years from 1968 to 1973, there was a continous upward trend in the number of accidents (Owen and Gilfillan, 1979).

Thereofre, emphasis on the farm accidents has been realised as the link necessary to facilitate the development of any farming environment.

Chapter one of this work centres on the introduction of farm accidents as something of utmost importance, scope of study, problem statement, causes and types of farm accidnets.

Chapter Two centres on literature review, project aims and objectives, and project justification.

Chapter Three describes the methodology of the study, questionnaires and analysis of the questionnaires.

Chapter Four deals with results and discussion and case study.

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Chapter five developed basically on conclusion, recommendation and finally references and appendix.

With tractors the chief causes of accident are carelessness in hitching implements, failure to fit proper shields over power drive shafts and overturning. The operator who attempts to operate his clutch and also to guide the implement drawbar over the tractor draw plates takes a big risk. His foot may slip; and if this happens he will be fortunate if he escapes being crushed. Many lives have been lost in this way. Farmers should either see that the driver carries a handy block of wood or a Jack to support the implement drawbar, or should send a second person to help with the hitching (Claude Culpin, 1976.)

1.1: Statement of the Problem.

With the emerging of many studies on farm accidents in developing Countries, there is a growing concern for Nigeria, so as to reduce the number of farm accident caused by tractors, implements, human factors, tools and environmental factors. From the study done so far, it is now clear that machinery handlers exercise a certain level of control on the safety operation of these machinery.

In earlier surveys conducted, it was found that breakdowns due to worn out parts, poor adjustment and operation of equipments, and poor field conditions consitituted the major features of frequent accidents of farm trctors,(

In the light of forgoing, it was found necessary to investigate farm accidents in Nigeria. Kwara, Niger and Kaduna States and Federal Capital Territory were selected to start the study.

1.2: Scope of study:

The investigation would cover Kwara State, Niger State, Kaduna State and Federal Capital Territory. There is a need to know the causes of farm accidents, the types of farm accidents, cost of farm accidents and also a clear understanding of the importance of farm accidents.

The study will involve administering of questionnaires and analysis of same.

1.3: Causes of farm accidents:

The causes which could be responsible for farm accidents in Nigeria are enumerated as follows: improper operation of the equipment, exceeding the limitation of equipment, environmental conditions and human factors.

1.3.1: Improper operation of the Equipment:

It is certain that when an equipment lacks proper maintenance, then it is not properly operated. Improper operation of equipment could also be caused by lack of spare parts, inadequate training of operators and poor operator performance.

1.3.2; Exceeding the Limitation of Equipment:

Operating a tractor or an equipment on a slope beyond its static stability is an example of how the capability of an equipment could be exceeded.

1.3.3: Environmental Conditions:

These conditions could cause farm accidents through the land- soils; topography of the area, size and shape of land, water control - Rainfall amount and distribution,, irrigation water, length of growing season, pest and diseases, access roads.

1.3.4: Human Factors:

Driving a tractor or equipment at night without light is a careless behaviour. Fire, chemical, noise and explosions cause many deaths and have serious consequences. Numerous explosions have occurred in farm shops because gasoline was used for cleaning, also welding may cause an explosion. Farmers subject themselves to many dangers in using electricity. Since electricity is being used more and more on farms, it is essential that farm workers learn the precautions necessary for using electricity safely. When spraying on the farm, there are some chemicals that are poisonous and so extra care should be taken. Carbon monoxide is a poisonous gas and it is produced by gasoline engines, stoves and furnaces. One or two parts of carbon monoxide in 1000 parts of air will cause death if breathed continously for several hours.

.4: Type of Farm Accidents:

Accidents occurring in the farm could be classified into ifferent types, these are; Tractor failure, Implement failure, ractor-Implement failure, tools and accidents caused by nvironmental facotrs.

.4.1; Tractor Failure:

This could be as a result of improper maintenance of tractor nd lack of spare parts which result in redundancy of machines due o minor faults. Improper maintenance of the tractor may be ttributed to material fatigue. The basic failure caused by normal luty or overhead or noisy running. Improper lubrication of bearing aused by dirts or wrong kind of lubrication or too much of nadequate lubrication. Also gear failure, and lastly hydraulic oil ailure, this means lack of hydraulic oil may cause tractor steering stiffness.

.4.2: Implement Failure:

This type of farm accidents could be caused by improper itching of implements. Improper hitching of heavy implements to tractor results in rearward overturning of tractors. The accepted principles of save tractor hitching include, never to hitch a drawbar load at or above the rear axle and the stability of a tractor will be increased by lowering the hitch point. Therefore, if the hitching of implement to tractor hitch linkages is not done properly, there is tendency of accidents occurring when working with the implement.

1.4.3: Tractor - Implement Combination:

This type of farm accident involves the tractor with other implements. Munter and Owen, (1983) reported on various types of farm accidents involving tractor - implement combinations on slopes. Trailed equipment reduces the control loss slope for a tractor especially if the trailed equipment is balanced as in tractor drawbar. Therefore, tractor - implement failure can be caused by both the tractor failure and implement failure.

1.4.4: Tool Failure:

This type could be due to hand tools and powers tools. Hand

tools include hammer, file, chisel, plane, wrenches, screw driver and the power tools include the grinder, drill press and saw. Tools failure can be avoided by following the general safety precautions in the workshops. Accidents due to tools failure can be prevented by neat working habit and staying alert.

1.4.5: Environmental Factors:

Environmental factors as a type of farm accidents could be through the climatic conditions as been referred to in this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Literature review

A good amount of cases of farm accidents have been reported, as a result of an increase in civilization in human society, also people change from period to period, and this call for technological advancement in Nigeria as well, hence an appropriate technology on farm accidents prevention becomes eminent. Appropriate technology is a technology that is applicable both technologically, socially and economically to any particular enviroment at any given time. Any historic review of agricultural mechanization development in Nigeria cannot overlook the importance of farm accidents.

There are more accidental death in agriculture than in any of the other major industries, and farm mechanization activities are the source of the majority of the accidents in farming. At one time most frequent cause of accidents on farm was animals. At present the most frequent source of injuries in farming is farm machinery this is because they are operated under different terrain condition,

Despite claims on inventions and a renewed drive for self sufficiency in mechanization, set targets have not been met. Many accidents have been caused by tractor which reared and overturned backwards if the clutch was too rapidly engaged. This type of accident can still easily occur if an implement is immovable or if rear wheels are held in grips. So far as the operator is concerned, the danger may be avoided by careful use of the clutch, (Claude Culpin, 1976). Also great care is needed when a tractor is driven on a silage clamp. The temptation to save time may be great, but on the farm, as in the factory, the motto should be "Safety First". It simply does not pay to take unnecessary risks with any power driven machinery (Claude Culpin, 1976).

Owen and Hunter (1983) reported that a tractor overturning

accident always has serious consequences for the farmer. The tractor driver may be killed, or he may be injured and unable to return to work, perharps for months. Tractor and other equipment involved may be severely damaged and need major repairs. It is clear that even when damage is slight, time is lost in fighting the tractor and making it serviceable again. It is also developed that the majority of agricultural tractor overturning accidents on slopes are of two types. The first known as a stability loss accident, when the tractor overturns directly and the second, known as a control loss accidents when the tractor runs away out of control before overturning (Hunter and Owen, 1983).

However, there remained the growing concern of the need to improve agricultural mechanization through improved technology and machines. Hence investigations were undertaken on cause and types of overturning accidents. Overturning accidents arise from reaching the limit of static stability, reaching stability limit under dynamic conditions, or sliding out of control. The directions in which an agricultural tractor may overturn are rearwards, sideways and/ or forward directions. Of all the three situations of overturning accidents sideways overturning have been discovered to occur most often resulting in about 70% of the total overturning accidents (YISA AND TERAO, 1995).

Jain and Rai (1980) made it clear that there is no way in which we can measure the suffering and unhapiness caused by acciddents either on the farm, in the workshop or during transit. A large proportion of victims of accidents are young people, representing a greater percentage of the nation and this cause a great loss to the nation. The tragedy in accidents is that they are caused by little acts of thoughtfulness or ignorance and can be prevented by carefulness. Moreso, it is expensive to learn safety by accidents, one should take the advantage of other experience. Unfortunately less thought has been given to accidents prevention in farming than in any other occupation. Farmers and the people around the farms need to become "Safety Minded". This was developed and described by Jain and Rai (1980).

Statistics indicated that of all the total accidents in agriculture the greatest number is due to tractor overturning and killing the driver or the tractor operator other reasons are fall from tractor, crushing between the tractor and any other subjects and wrapping with power take off (PTO) operated machine.

LLOYD and COOK (1976) reported that most farm accidents resulting from farm mechanics activities may be prevented by the development of safe habits and following the general safety precautions. Some common cause of accidents on farm are reaching on ladder, tripping over objects, not watching your steps, slipping on grease, make shift step ladder, no guard rail, open wells, cluttered stairway, defective floors or steps.

Farming is a dangerous occupation, and farmers do not always appreciate the prime importance of systematic attention to care and maintenance of the tractor. Farmers and tractor drivers should never forget that limbs and lives may be endangered unless precautions are taken in handling power driven machinery and other equipment. One of the cause of accidents in the farm is clearing blockage with power driven engaged. Most working accidents due to slopes occur on firm grass land. Another frequent cause of deaths and injuries is the operating of a tractor on steep inclines and on treacherous banks. Adjusting and getting in front of mowing machines while they are in gear is also a frequent cause of serious accidents. Accidents in the farms being expressed by LLOYD and COOKS can be caused by machinery and equipment, fire and explosions, electricity, chemical, environmental conditions, like sunlight, this means excessive exposure of the body to the sun. Also noise, tools can also result into accidents in the farm a frequent cause of an accident with a drill press in the failure to remove the chuck wrench before the press is started. The frequent accident with a power saw is getting hands into the blade, accidents from grinder often result from their improper use. Also using improper tool for the job and sorting tools for the tool desired often cause injuries in the farm workshop and this results into accidents. Hammer, hatchets, axes may cause serious injuries

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if left lying on the floor.

Owen and Hunter (1983) reported on some case studies to show most types of stability and control loss accidents. A tractor with front loader was being used to lift and move a heavy tree trunk. The tree trunk was not lifted centrally on the front loader but was balance with its centre of gravity to one side. As the tractor was turned down hill on a slope of 8% (5°) the tractor overturned side ways. The heavy weight of the trunk had moved the overall centre of gravity so forward and to one side that the static stability limit had become very low. The accident is obviously unusual and the case is included here solely to illustrate that static stability loss on smooth ground is not common. Another accident was reported on dynamic stability loss. A tractor was being used with drag harrows working directly up a slope of 20% (10°). The surface was dry, loose soil with a few stones. Without warning the tractor overturned rearwards. Under static conditions, for instance when moving forward at steady speed up the slope, the tractor is stable and unlikely to overturn. A forwards acceleration of 0.6g is not large and can easily occur perharps due to losing grip temporarily on the loose soil and then regaining grip, as confirmed experimentally at the Scottish Institute of Agricultural Engineering (SIAE).

Dynamic stability loss during cornering is a type of accident which occurs frequently to tractor with mounted mowers. A case study was reported on accident by dynamic cornering. A tractor was being used with a monnted drum mower to cut grass for silage. The field slope was 12% on polar diagram. The stage stability diagram applies when the tractor is driven at steady speed is a straight line. The diagram is not symmetrical because the mower is quite stable on the accident slope. The tractor overturns. The overturn occurs when the tractor has nearly completed its turn. At the start of the turn the mower is on the up slope side of the tractor (heading angle 0°). The tractor turns through the straight down hill position (heading angle 180°) and reaches a position with the mower on the down slope side of the tractor (heading angle 230°)

before it overturns. Analysis and experimental work at higher speeds show that a tractor can overturn when cornering on ground which is nearly flat [Owen 1981a]. The cause of overturning accident is cornering at high speed. Some farmers may find it acceptable to keep the mower in work during turning so that the mower can act as a prop if the tractor starts to overturn [Owen and Hunter, 1981].

A tractor with roller was driven across slope of 15% (14°). When the tractor was turned down hill the roller pushed the tractor out of control and the tractor overturned at the bottom of the slope. The reduction in control loss slope is greatest when balanced trailed equipment is also heavy relative to the tractor. An extreme example of this is a forage harvester and trailer driven in-line behind a tractor, and the combined weight increases continuously as the trailer is loaded with forage [Owen and Hunter 1980]. Also the accident which prompted the Scottish Institute of Agricultural Engineering (SIAE) development of stability and control loss analysis was an accident with a two wheel drive tractor (Gilfillan and Spencer, 1975). The tractor was in use for experimental work on a grass slope of 32% at the top, easing to 21% at the bottom. The tractor had been driven up and down the slope on many occasion. The tractor was driven up to the top of the slope and then turned to head straight downhill. Suddenly without warning the tractor began to slide down hill out of control. Fortunately, because the slope eased, speed was not built up and the driver was able eventually to halt the tractor. The accident illustrated the classic case of control loss accident where equipment may be driven safely in one direction on a slope but runs out of control in another direction.

An accident on steep slope where a four wheel drive tractor can be driven is likely to be very severe, and also when trailed equipment is used the safe slope for any tractor is reduced. A four wheel drive tractor was being used as a trailed dung spreader to spread dung in a steep field. The steepest part of field was on a slope 62% (32°). The driver had already worked the less steep parts of the field he started to cross the 62% (32°) slope in a

direct traverse in order to spread dung there. The dung spreader began to slip sideways on the grass and in attempting to correct for this the driver turned the tractor partly uphill. The dung spreader and tractor slip backwards out of control, overturned many times and ended in the bottom of the valley. The driver should never have attempted to use any tractor, four-wheel drive or otherwise, with a trailed dung spreader on a 62% (32°) grass slope. The equipment he was using was quite unsuitable for the intended work.

Stability and control loss slopes sometimes coincide. A case study was reported and devloped by owen and Hunter (1980). A tractor with mounted fertilizer spreader was being used in two fields, one of 47% (25°) slope and the other of 36% (20°). In the steeper field gate opened directly unto the 47% (25°) slope downhill. At the top of the slope the tractor was out of control. Fortunately the field slope was less in the lower part of the field so the driver was able to regain control of the tractor and continue spreading fertiliser more safely. In the other field the slope was uniform and the driver was able to take three bouts at the edge of the field before working the remainder. He started from the gateway at the top of the field travelled once down, once up, and once again down. He then worked across the field turning uphill at the headlands until he reached the top again. When the front wheels lifted he lost stability because he was in danger of overturning rearwards and he lost control because he could no longer steer. As the spreader emptied he began to lose control when working down hill and so he devised his system of working only across and turning uphill. The control loss boundary moves depending on the ground conditions.

A tractor was drawing a silage trailer to collect our forage blown from a separate forage harvester drawn by a second tractor. The farmer was working round the outside of the field first and he had reached a place where the tractor and trailer had to run on a rough waste area of sloping land at the edge of the field, by this time trailer was full but unevenly loaded because the forage was

all blown in from one side. The trailer overturned in the rough ground.

A tractor with mounted fertiliser spreader was being used to spread fertilizer on a part prepared used bed. The ground was ploughed, dry and rough. The gradient was between 3° (6%) and 6° (10%), i.e only moderately sloping. Due to the tractor's speed the off side wheels of the tractor bounced off the ground and the tractor overturned to its nearside.

Analysis and expermental work at higher speeds show that a tractor can overturn when cornering on ground which is nearly flat (Owen, 1981a). Although the mower does off set the stability diagram to extent, the cause of overturning is cornering at speed. Speed should be reduced when cornering especially on slope of 6° (10%) or more. With a mower, a three point turn is safer for turning at head lands than a U-turn or loop turn. Some farmers may find it acceptable to keep the mower during turning so that the mower will act as a prop if the tractor starts to overturn.

Since the mid-1970's there has been a notable accelaration of both demand and local assembly of agricultural tractors and implements in Nigeria (Makanjuola,et.al 1982). However, there is still the need to streamline the current efforts in local manufacture, marketing and usage of agricultural equipment. An improvement on mechanization can reduce farm accidents in Nigeria.

2.1 Project justification

Majority of the studies surveyed on farm accidents failed to meet the requirement of our local farmers. This is because most of the data existing accidents are for the advanced countries. Investigatin on farm accidents has not been done in Nigeria.

As a solution to the above agricultural problems, the researcher find it necessary to investigate the causes of farm accidents, types of farm accidents, extent of damage of farm accidents, to reduce the farm accident cause and how to manage agricultural implements. To a large extent, these reflect on the inadequacy of the national policy on agricultural mechanization of greater significance, however, is the absence of appropriate data or

the numerous problems faced by both manufacturers and farmers.

2.2 Project Aims and Objectives.

This investigation was proposed to achieve the following aims and objective bearing in mind the handicaps of prevoius studies in advanced countries.

1. To collect information on the nature and the causes of farm accidents in selected states in Nigeria.
2. To determine the extent of damage done as a result of these accidents occurring in the farm.
3. To know the cost of repairs and the time spent in putting the equipments back to normal position.
4. To know the cost of farm accidents that are common in Nigeria.
5. To pinpoint the ways of reducing farm accidents.

CHAPTER THREE

3.0 METHODOLOGY

The methodology adopted in this survey is the Investigative Survey Research Approach [ISRA]. The survey data generated was composed of a series of issues directed to the accomplishment of the desired aims and objectives. Framework for adopting the Investigative Survey Research Approach involves data collection and analysis of the results obtained. Respondents were given an opportunity to comment on several issues relating to the research title farm accidents such as cases of the accidents and suggestions on ways of reducing the accidents. We anticipated that the level of education of respondents, level of education of the handler of the equipment, complexity of an establishment and bureaucratic procedures might affect both the return rate and quality of data To this end, the questionnaire were administered by personal contact to the different areas in the three (3) States, Kwara, Niger, Kaduna and Federal capital Territory

3.1 Questionnaire

The questionnaires designed for this purpose were in two sections. The first part is the background information with regards to name of the establishment, Location of establishment, State, equipment types and number, establishment ownership and the types of equipment involved in the accident. The second part of the questionnaire was more detailed, it is based on the description of farm accidents in terms of causes of farm accidents, types of farm accidents, cost of repairs of equipment involved in the accident, time spent in putting the equipment back to normal position, cost of the accidents done and the extent of damage done by the farm accidents. The questionnaire was composed of a series of issues directed to the accomplishment of the desired objectives.

3.2 Consideration of Questionnaire

3.2.1 Section A of the questionnaire.

The name of the establishment, state and local government area are very important so as to know the actual location of the

establishment, this means, the full description of the establishment, sex distribution of the repondent is to know if the person answering the questionnaire is male or female. Moreso, age of both the respondent and the person involved in the accident is important so as to know how old the person is. Age relates to the maturity of the person and maturity determines the approach of a person to a particular problem, educational qualification relates to how qualified the person answering the questionnaire is, it is always better to use qualified person so as to get the required standard. Years of working experience of both the repondent and person involved in the accident will make us to understand the range of the respondent and operators in the various establishment. Number of tractors, number of other equipment (machinery) determine how big the establishment is. And types of the tractor makes us to understand the type that is commonly involved in accidents occurring in the farm, establishment ownership being the final question under section A makes us to know the particular establishment that obeys the safety precautions most and to know where the farm accidents are common either government ownership, Private ownership or Joint ownership.

Governmmnet ownership- refers to systems where by farms are owned and managed by government, be it Local, State or Federal

Private Ownership - The farm belongs to an individual or a group of individuals. The farmer(s) is or are in complete control of the machines following full payment of the cost of equipment.

Joint Ownership - is a system where by the machine or equipment is joint owned by government and the private sector. This is most common in limited liability plantations in which the private sector is actively involved.

3.2.2 Description of farm accidents

The description of farm accidents is done terms of type of/ causes of farm accidents, cost of farm accidents, extent of damage done by farm accidents, ways of reducing farm accidents.

This sector enables us to determine the type of accidents in the selected states covered by this research. We are also able to

understand the causes either due to tractor failure, as a result of improper maintenance, with implement failure, improper working of implement and lack of spare part like pins, tractor implement failure, involved causes of tractor failure and implement failure, tools failure as a result of dirty working habit, and finally, environmental conditions as a result of chemical, sound, noise, fire, electricity.

Who is involved ? The actual person involved in the accidents, so as to determine the category of people commonly involved, whether it is common with the operator as a result of carelessness or any other person not trained as operator

Level of training of the handler of the equipment this enables us to know if accidents occurring are common with skilled operators or unskilled operators Skilled operators are operators with proper adequate training and unskilled are those with inadequate training

Where do the accidents occurred ? actually helps to determine the common place where farm accidents occur whether it is common on fields, farm workshops farmshed or during transits

Have you as an establishment attempted to minimize farm accidents? this enables us to know the establishments that have been making attempts to reduce farm accidents.

How does the establishment prevent the accident? The specific measures taken by the establishment to prevent or reduce the accidents in the farm are determined.

Number of accidents help us to know the number of accidents that have so far occurred in the establishment so as to determine the percentage of accidents occurrence.

Description of farm accident in terms of causes is determined with the question nine under the section B. What is the major cause of farm accidents in the establishment With this we determine the cause of accident that is common with establishment, farms in these selected states. In this case we have five causes of farm accident stated as; improper operation of the equipment, due to lack of proper maintenance of equipment. Exceeding the limitation of the equipment, this means to go beyond the limit allowed for the equipment.

Id...

Carelessness of operator, as a result of improper training of operators. Environmental factors, these are as a result of electricity hazard, noise, snakes bite, insect invasion, fire hazard. Lastly, human factors, due to inexperience of the person involved in the accidents, and not obeying safety precautions.

When accidents occurred, how are they handled? This question provides an understanding of the type of attention given to the person involved in the accidents whether it is first aid treatment or clinic attention in case of serious accidents.

Roll-Over Protective Structure is a kind of device which act as safety device for protecting the operator and even the tractor. Roll-Over Protective Structure (ROPS) can be in form of frame or safety cab. By this we intend to establish whether the tractor involved in accidents are equipped with ROPS.

As stated in the questionnaire, cost accident to the establishment can be in terms of time losses, property damage like the case of insect invasion causes property damage because lots of crops are destroyed. Medical attention, and intangible losses.

Other questions relate to the frequency of the accidents. We also identify whether accidents are fatal, major and minor accidents. Fatal accidents are accident that involve loss of lives. Major accidents involve severe damage and major repair is carried out and minor accident involve slight damage with minor repairs.

Extent of the damage done is to know the damage done and how serious or how slight the damage.

Cost of repairs in righting the equipment help us to know the amount spent in putting the equipment back to normal position so as to determine the economic loss of the accident since it is relating to cost analysis of the equipment.

Time spent in righting the equipment is also determined in days, weeks, months or years.

Presence of other accident that do not involve equipment was also a subject of investigation to know accident caused by implements and those caused by other things. The form of which these occur are stated as fire, electrical hazards, chemical and

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snakes bite, also how often such accident occur and the extent of damage done by such acciddents.

Finally, the opinion of the establishment were sort on how they think accident could be prevented. They were also to comment on the questionnaires.

A copy of the questionnaire could be found in the appendix.

CHAPATER FOUR

4.0: RESULTS AND DISCUSSION:

4.1: Introduction:

Data processing is the link between data collection and data analysis. This chapter focuses on the analysis of the data collected from various establishments through the questionnaire administered.

However, not all the establishments visisted were able to give adequate and appropppriate information on the investigation of farm accidents.

The data were analysed in two sections: general attitude of respondents by demographic characteristics. The analysis in the first section is done by cross tabulating the attitude of respondents against the demographic variables. These variables are: gender, and tractor types. This first section addressed the first analysis shows the analysis relating to the second part of the questionnaire. These include, analysis of causes of farm accidents areas under investigation, analysis of the types of farm accidetnts, analysis of the extent of damage, minor and major accidetns, ways on how to manage agricultural implements and case study.

A total of 54 establishement were visited.

4.2: Genrral Attitude of Respondents by Demographic variables for Kwara State.

4.2.1. Sex Distribution of Respondents.

A total of 21 establishment were surveyed. All the respondents were males but in three establishments. Table 4.2.1 depicts the distribution for the state.

4.2.2. Educational Status of Respondent.

Gender of Respondents	Number (n)	% of Total
Male	18	85.70
Female	3	14.30
Total	21	100.00.

The analysis on educational status of respondent is indicated in Table 4.2.2 below.

The distribution of the respondent takes the following order, Diploma and below 47.60%, Bachelor's degree 23.80%, master's degree 14.30% and Phd and other 14.10%. It is not surprising that there is no single person with no education among the repsondents

Table 4.2.2: Educational status of respondnets.

Educational Status	Number (n)	% of Total
Diploma and Below	10	47.60
Bachelor's Degree "	5	23.80
Master's "	3	14.30
Ph.D and others	3	14.30
Total	21	100.00

4.2.3 Age of Respondnets/Victims.

The analysis of age of respondents and people involved in farm accidents is indicated in Tables 4.2.3a and 4.2.3b respectively.

As could be observed from Table 4.2.3a the bulk of respondents were between 21-30 years, 42.00%. For 31-40 years, 38.10%, under 20 years, 9.50% and above 40 years 9.50%.

Table 4.2.3a: Age of Respondents.

Age of Respondents	Number (n)	% of Total
Under 20	2	9.50
21 - 30	9	42.00
31 - 40	8	38.10
Above 40	2	9.50
Total	21	100.00

The Table 4.3.3b shows the percentage of the age of people involved in farm accidents. It is noted from the data collected that people between 21-30 years or 38.10% and 31-40 years or 33.30% are mostly involved in any farm accidents.

Table 4.2.3b. Age of Victims.

Age of Victims	Number (n)	% of Total
Under 20	2	18.18
21 - 30	6	54.54
31 - 40	3	27.28
Above 40		
Total	11	100.00

4.2.4: Establishement Ownership.

The analysis of the establishment ownership for different establishments is shown in Table 4.2.4. The different establishment ownership include government ownership, private ownership and joint ownership.

Table 4.2.4: Establishment Ownership.

Establishment Ownership	Number (n)	% of Total
Private	4	19.00
Government	17	81.00
Joint		
Total	21	100.00

Over 80% of the establishments surveyed were government owned while less than 20% belongs to private ownership.

Table 4.2.5: Causes of Farm Accident.

Causes of Farm Accidents	Number (n)	% of Total
Environmental conditions	9	43.00
Human factors	5	24.00
Improper Operation of Equipment.	3	14.00
Exceeding the limitation of equipment.		
Total	21	100.00

The response of the respondents on the major causes of farm accidents to their establishment. My investigation shows that about 19.00% of the farm accidents are caused by Human factors, 84.00% environmental factor.

Improper operations of equipment 38.00% and exceeding the limitation of equipment. It is clear from the data collected that sub-standardization of sensitive spare parts in the market also contribute immensely to farm accidents. This is indicated in Table 4.2.5.

4.2.6. Type of farm accidents.

Based on the response got from questionnaire, the types of accidents occurring in the farm in all the establishments visited in Kwara State are enumerated as shown in Table 4.27. The most common types of farm accidents are tractor failure 38.00% and environmental condition 38.00%, others include implement failure 19.00%, tractor/implement failure 5.00%. It is noted that there is no accident as a result of using tools.

Table 4.2.6: Types of Farm Accident.

Types of Farm Accidents	Number (n)	% of total
Tractor Failure	8	38.00
Implement Failure	4	19.00
Tractor/Implement	1	5.00
Tools		
Environmental Conditions	8	38.00
Total	21	100.00

4.2.7: Cost of farm accident.

The cost of farm accidents is analysed as a result of the

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response of the respondents in different establishments. The cost of farm accidetns which is in terms of time loss, medical attention, hired help, property damage and intangible loss. The cost is therefore analysed as shown in Table 4.2.7. From the table shown below, the major cost of farm accidents is property damage 62.00%, followed by time losses 33.00%, and medical attention 5.00%.

Table 4.2.7. Cost of farm Accident.

Cost of Farm Accidents	Number (n)	% of Total
Time Losses	7	33.00
Property Damage	13	62.00
Medical Attention	1	5.00
Intangible Losses		
Total	21	100.00

4.2.8: Types of tractor/Implement involved in Accidents.

This analysis involves the different types of tractor/implement involved in accidents occurring in the farm. From the table, 19%, fiat, 10% steyr and the major types is implement.

Table 4.2.8: Types of tractor/Implement Involved in Accidents.

Tractor/Implement Involved	Number (n)	% of Total
Steyr	2	10.00
Ford	3	14.00
Fiat	4	19.00
Massey Fergurson		
Implements	8	38.00
Environmental	4	19.00
Total	21	100.00

4.3: Analysis of questionnaire for Niger State.

4.3.1: Sex distribution of respondents.

The analysis of the sex distribution of the respondents is shown in Table 4.3.1 below. 80% of the respondents were males and 20% were female. A total of 15 establishments were surveyed.

Table 4.3.1: Sex Distribution of respondents.

Gender of Respondent	Number (n)	% of Total
Male	12	80.00
Female	3	20.00
Total	15	100

4.3.1. Educational status of respondents.

The analysis of the educational qualification of respondents is indicated in Table 4.3.2 below. The qualification of respondents takes the following order; Diploma and below 40.00%, Bachelor's degree 34.00%, master's degree 13.00% and Phd and others 13.00%. There is no single person with no education among the respondents.

Table 4.3.2: Educational status of Respondents.

Education Status	Number (n)	%n of Total
Diploma and Below	6	40.00
Bachelor's	5	34.00
Master's	2	13.00
PhD and others	2	13.00
Total	15	100.00

4.3.3. Age of respondents/Victims.

The analysis of the age of respondents and person involved in

farm accidents is indicated in Tables 4.3.3. below and from the Table 4.3.3a the bulk of respondents were between 21 30 years or 33.00% and 31.40 years or 33.000%, under 20 years, 20.00% and above 40 years, 20.00%.

The Table 4.3.3b shows the percentage of the age of people involved in farm accidents. From data collected, people between 31-40 years or 40.00% are mostly involved in any farm accidents 21-30 years or 26.70% under 20 years or 13.30% and above 40 years 20.00%.

Table 4.3.3a Age of Respondents:

Age of Respondents	Number (n)	% of Total
Under 20	2	13.00
21 - 30	5	33.00
31 - 40	5	33.00
Above 40	3	20.00
Total	15	100.00

Table 4.3.3b: Age of Victims:

Age of Victims	Number (n)	% of Total
Under 20	2	13.00
21 - 30	4	26.70
31 - 40	6	40.00
Above 40	3	20.00
Total	15	100.00

4.3.4: Establishment Ownership.

The analysis showing the ownership of the different establishment is indicated in Table 4.3.4. below. Over 70% of the establishments surveyed were government owned while less than 30%

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belongs to private ownership.

Table 4.3.4: Establishment Ownership.

Establishment Ownership	Number (n)	% of Total
Private	4	26.7
Government	11	73.3
Joint		
Total	15	100.00

4.3.5: Causes of farm accidents:

The major causes of farm accidents in Niger State are enumberate in Table 4.3.5. The investigation shows that about 60.00% of the farm accidents are caused by human factors, environmental factor, 33.3% improper operation of equipment 6.70%, Exceedidng the limitation of equipment, zero.

Tasle 4.3.5: Causes of Farm Accidents:

Causes of Farm Accidents	Number (n)	% of Total
Environment Factor	5	33.30
Improper operation of equipment	1	6.70
Exceeding the Limitation of Equipment		
Human Factor	9	60.00
Total	15	100.00

4.3.6: Type of farm accidents.

The different types of farm accidents are enumerated in Table 4.3.6. The survey conducted shows that over 30% of farm accidents are due to environmental conditions, over 20% due no tractor/implement failure, 20% due to tractor failure.. and 13.3%

and 0.70% for implement failure and tools respectively.

Table 4.3.6: Types of Farm Accidents.

Types of Farm Accident	Number (n)	% of Total
Tractor Failure	3	20.00
Implement Failure	2	13.30
Tractor/Implement Failure	4	26.70
Tools	1	6.70
Environmental Conditions	5	33.30
Total	15	100.00

4.3.7. Cost of accidents.

The analysis is done as in Table 4.3.7. The investigation shows that the major cost of farm accident in Niger state is property damage, 40.00%, followed by time loss, 33.00%, and medical attention 26.70%.

Table 4.3.7: Cost of Farm Accident

Cost of Farm Accident	Number (n)	% of Total
Time losses	5	33.30
Property Damage	6	40.00
Medical Attention	4	26.70
Intangible Losses		
Total	15	100.

4.3.8. Types of Tractor/Implement involved in Accidents

The analysis of different types of tractor and implements involved in farm accidents in various establishments is shown in table 4.3.8. From the table Steyr and Fiat are of the percentage 20% each and Massey Ferguson of lowest percentage 6.70%.

Table 4.3.8: Type of Tractor/implement involved in accidents.

Type of Tractor/Implement Involved	Number (n)	% of Total
Steyr	3	20.00
Ford	3	20.00
Fiat	2	13.30
Massey Ferguson	1	6.70
Implements	3	20.00
Environmental	3	20.00
Total	15	100.

4.4 Analysis of questionnaire for Federal Capital Territory.

4.4.1: Sex Distribution of Respondents.

The sex distribution of respondents in Federal Capital Territory is shown in Table 4.4.1. From the table shown below all the respondents were females but in one establishment. A total of three establishments were surveyed.

Table 4.4.1: Sex Distribution of Respondents.

Gender of Respondent	Number (n)	% of Total
Male	1	33.3
Female	2	66.7
Total	3	100

4.4.2: Educational Status of respondents.

The educational qualification of respondents for the various establishments visited is shown in Table 4.4.2. 66.70% of the respondents have the qualification of diploma and below, 33.30%, Bachelor's degree, master's degree zero%, no respondents under PhD and others.

Table 4.4.2. Educational Status of Respondents.

Educational Status	Number (n)	% of Total
Diploma and Bwlow	2	66.7
Bachelor's Degree	1	33.3
Master's "		
PhD and others		
Total	3	100.

4.4.3: Age of respondents/victims.

The analysis for the age of respondents is shown in Table 4.4.3a and that of victims is shown in Table 4.4.3b . It is clear from Table 4.4.3a that 66.70% of the respondents are of the age 31 40 years, none under 20 years and 33.30% between 21 30 years. and from Table 4.4.3b, all the people involved in farm accidents are between the ages of 21 and 30 years, i.e 100%

Table 4.4.3a: Age of Respondents:

Age of Respondents	Number (n)	% of Total
Under 20		
21 30	1	33.3
31 40	2	66.7
Above 40		
Total	3	100

Table 4.4.3b Age of Victims.

Age of Victims	Number (n)	% of Total
Under 20		
21 30	3	100
31 40		
Above 40		
Total	3	100

4.4.4: Establishement Ownership

The analysis of establishment ownership is shown in Table 4.4.4 and this shows the most frequent place of farm accident occurrence. 100% of farm accidents occurred in government owned establishments.

Table 4.4.4. Establishment Ownership.

Establishment Ownership	Number (n)	% of Total
Private		
Government	1	100
Joint		
Total	1	100

4.4.5. Causes of farm accidents.

The table 4.4.5, is used to enumerate the analysis of causes of farm accidents in Federal Capital Territory. 66.70% are caused by human factors, 33.30% by environmental factors. No accident as a result of exceeding the limitation of equipment

Table 4.4.5: Causes of Farm Accidents.

Causes of Farm Accidents	Number (n)	% of Total
Environmental Condition	1	33.3
Improper Operation of Equipment Exceeding the limitation of equipments		
Human Factor	2	66.7
Total	3	100.

4.4.6: Types of Farm Accidents.

The different types of farm accidents are enumerated in Table

4.4.6. The survey conducted shows that 33.33% of farm accidents are due to tractor/implement failure, 33.33%, due to tractor failure 33.33%, due to environmental conditions. No accident due to implement failure and tools.

Table 4.4.6: Types of Farm Accidents.

Types of Farm Accidents	Number (n)	% of Total
Tractor Failure	1	33.3
Implement Failure		
Tractor/Implement failure	1	33.3
Tools		
Environmental conditions	1	33.3
Total	3	100.

4.4.7. Cost of Farm Accidents.

The analysis is done as in Table 4.4.6. My investigation shows that the major cost of farm accident is Federal Capital Territory are time loss, 33.33%, and Medical attention 66.67%.

Table 4.4.7: Cost of Farm Accidents.

Cost of Farm Accidents	Number (n)	% of Total
Time losses	1	33.3
Property Damage		
Medical Attention	2	66.7
Intangible Losses		
Total	3	100.

4.4.8. Types of Tractor/Implement Involved in Accidents

The analysis is to determine the type of tractor and implement involved in farm accidents. From Table 4.4.8, the Steyr, Fiat and Ford are of the percentage 33.3% each. No accident as a result of environmental factors.

Table 4.4.8: Types of Tractor/Implement Involved in Accident.

Type of Tractor/Implement Involved	Number (n)	% of Total
Steyr	1	33.3
Ford	1	33.3
Fiat	1	33.3
Massey Ferguson		
Implements		
Environmental factor		
Total	3	100.

4.5: Analysis of questionnaire for Kaduna State.

4.5.1: Sex distribution of Respondents.

A total of 15 establishments were surveyed. All the respondents were males but in one establishement. Table 4.5.1 depicts the distribution for the State.

Table 4.5.1: Sex Distribution of Respondents

Gender of Respondents	Number	% of Total
Male	14	93.33
Female	1	6.70
Total	15	100.

5.2: Educational Status of respondents.

The analysis on educational status of respondents is indicated in Table 4.5.2 below. The distribution takes the following order, Diploma and below 33.33%, Bachelor's degree 40.00%, Master's degree 26.70%. There is no single person with PhD and others

Table 4.5.2: Educational status of respondents.

Education Status	Number (n)	% of Total
Diploma and Below	5	33.33
Bachelor's	6	40.00
Master's	4	26.70
PhD and others		
Total	15	100.00

4.5.3: Age of respondent/victims.

The analysis of age of respondents and people involved in farm accidents is indicated in Tables 4.5.3a and 4.5.3b respectively.

As could be observed from Table 4.5.3a, the bulk of respondents were between 21-30 years, 33.30% and above 40 years, 33.30% others are 31-40 years, 23.70% and under 20 years 10.70%.

The table 4.5.3b shows the percentage of the age of people involved in farm accidents. It is noted from the table clearly that people between 21 - 30 years of 54.00% are mostly involved in farm accidents, 31 - 40 years is 33.00%, while for 20 years 13.00

Table 4.5.3a: Age of Respondents.

Age of respondents	Number (n)	% of Total
Under 20	4	10.70
21 - 30	9	23.70
31 - 40	13	33.30
Above 40	13	33.30
Total	39	100.

Table 4.5.3b: Age of Victims.

Age of Victims	Number (n)	% of Total
Under 20	2	13.00
21 - 30	8	54.00
31 - 40	5	33.00
Above 40		
Total	15	100.00

5.4: Establishment Ownership.

This is to determine the establishment ownership for various establishments visited in Kaduna State. Over 10% of the establishment surveyed were government owned while less than 40% belongs to private ownership

4.5.3: Age of respondent/victims.

The analysis of age of respondents and people involved in farm accidents is indicated in Tables 4.5.3a and 4.5.3b respectively.

As could be observed from Table 4.5.3a, the bulk of respondents were between 21 30 years, 33.33% and above 40 years. 33.30% others are 31-40 years, 6.70% and under 20 years 26.70%.

The table 4.5.3b shows the percentage of the age of people involved in farm accidents. It is noted from the data collected that people between 21 30 years or 54 .00% are mostly involved in farm accidents, 31 40 years or 33.00%, and under 20 years 13.00%.

Table 4.5.3a: Age of Respondents:

Age of respondents	Number (n)	% of Total
nder 20	4	26.70
1 30	5	33.30
1 40	1	6.70
bove 40	5	33.30
otal	15	100.

able 4.5.3b. Age of Victims.

ge of Victims	Number (n)	% of Total
nder 20	2	13.00
1 30	8	54.00
1 40	5	33.00
bove 40		
otal	15	100.00.

.5.4: Establishment Ownership

This is to determine the establishment ownership for various establishments visited in Kaduna State. Over 60% of the establishment surveyed were government owned while less than 40% belongs to private ownership.

Table 4.5.4: Educational Ownership.

Establishment Ownership	Number (n)	% of Total
Private	5	33.30
Government	10	66.70
Joint		
Total	15	100.

4.5.5: Causes of farm accidents.

The Table 4.5.5 is used to analyse the causes of farm accidents in Kaduna State. 53.3% of farm accidents are caused by human factors, 20% by environmental condition, 20% by improper operation of equipment and 6.70% by exceeding the limination of equipment.

Table 4.5.5: Causes of Farm Accidents.

Causes of farm Accidents	Number (n)	% of Total
Environmental condition	3	20.00
Improper operation of equipment	3	20.00
Exceeding the limitation of equipment	1	6.71
Human factors	8	53.30
Total	15	100.00.

5.0: Types of farm accidents.

This is to analyse the types of farm accidents in Kaduna state. This is shown in Table 4.5.6 below. From the table, the major type of farm accidents on selected mechanized farms in Kaduna state is environmental condition of 47%, tractor/implement failure 33.3%, tractor failure and implement failure, 13.70%

Table 4.5.6: Types of Farm Accidents

Types of Farm Accidents	Number (n)	% of Total
Tractor Failure	2	13.33
Implement Failure	2	
Tractor/Implement failure	1	7.13
Tools		
Environmental conditions	0	0.0
Total	15	100.

4.5.7: Cost of Farm Accidents.

The major cost of farm accident in Kaduna State is property damage 33.3%. Time loss, 20.7%, medical attention, 20.7% and intangible losses 13.3%. The analysis of cost of farm accidents is shown in Table 4.5.7 for the State.

Table 4.5.7: Cost of Farm Accidents.

Cost of Farm Accidents	Number (n)	% of Total
Time losses	3	20.70
Property Damage	5	33.33
Medical Attention	3	20.70
Intangible Losses	2	13.30
Total	15	100.

4.5.8: Types of Tractor/Implement Involved in Accidents

The analysis is shown in Table 4.5.8. From the table the tractor make is steyr of 20%, the major type involved in accident is implements of 33.33%.

Table 4.5.8: Types of Tractor/Implemt Involved in Accidents.

Type of Tractor/Implement Involved	Number (n)	% of Total
Steyr	3	20.00
Ford	2	13.33
Fiat	2	13.33
Massey Ferguson	1	6.70
Implements	5	33.33
Environmental	2	13.33
Total	15	100.

4.0; Comparative Analysis of Farm Accidents in Kwara State, Niger State, Kaduna State and Federal Capital Territory

This involves the general comparison of the selected states, the analysis in one state is compared with other.

Table 4.0.1: Sex Distribution

Sex of Respondent	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Male	85.7%	90.0%	88.8%	89.0%
Female	14.3%	10.0%	11.2%	11.0%
Total	100	100	100	100

It is clear that in Kwara state, Niger state and Kaduna state, the percentages of the male respondents is very high as against the female respondents. In Kwara and Niger states, the males are 80% and above and that of female less than 20% in Kwara state. In Federal Capital Territory, the percentage of female is over 10% and in Kaduna state per cent of male is over 90% and female less than 10%.

Table 4.1.1: Educational Status

Sex of Respondent	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Diploma & Below	47.0%	40.0%	40.7%	33.0%
Bachelor's	21.3%	24.0%	31.0%	40.0%
Master's	14.7%	23.0%		16.7%
PhD & Others	14.0%	13.0%		
Total	100	100	100	00

Comparing Kwara and Niger States, it is clear that the percentage of Diploma and below is 47.0% and 40% respectively. In Kaduna State and Federal Capital Territory, the percentage is less than 33.3% and about 01.7% respectively. From the table, it shows that in all the selected states, the educational status is Diploma

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nd below except Kaduna State that is bachelor's degree

Table 4.0.3a: Age of Respondents.

Sex of Respondent	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Under 20	0.50	10.00		20.7
21 - 30	42.00	33.00	33.30	33.30
31 - 40	30.10	35.00	66.70	6.70
Above 40	0.50	20.00		33.33
Total	100	100	100	100

Using Table 4.0.3a, the age of respondents is analysed. In Kwara, Niger and Kaduna States, the age of respondent is between 21 - 30 years and in Federal Capital Territory it is between 31 - 40 years

Table 4.0.3b: Age of Victims

Age of Respondent	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Under 20	20.00	10.00		11.00
21 - 30	30.10	20.70	100	54.00
31 - 40	33.10	40.00		13.00
Above 40		20.00		
Total	100	100	100	100

From Table 4.0.3b, the age of victims is analysed. In Kwara and Niger State, the age of victims is between 21 - 30 years and 31 and 40years respectively. This show that majority of victims are of age between 21 and 30 years in Kwara State and in Niger State between 31 and 40 years. In Federal Capital Territory and Kaduna State, majority of the victims are between 21 and 30 years which represent a great loss to the nation.

Table 4.0.4: Establishment ownership.

Sex of Respondent	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Private	10.10	20.70		33.30
Government	60.00	70.00	100	66.70
Joint				
Total	100	100	100	100

Comparing Kwara and Niger States, the percentages of establishments are higher under the government ownership, likewise in Federal Capital Territory and Kaduna state, majority of the accidents occurred in government establishments. It is also clear that in all the selected states, there is no establishment with joint Ownership.

Table 4.1.5: Causes of Farm Accidents:

Causes of Respondents	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Environmental Conditions	30.00	11.33		20.11
Improper Operation of equipment.	20.00	6.70		20.11
Exceeding the limitation of equipment				1.10
Human Factor	24.00	60.00	10.7	50.00
Total	100	100	100	100

In Kwara and Niger States, the major cause of farm accidents is environmental condition/improper operation of equipment and human actors respectively. It is also clear that in Niger state accidents can be caused by environmental conditions. In Federal apital Territory and Kaduna State, the major cause of farm accidents is human factors. In all the selected states, it is clear hat human factor and environmental conditions are the causes of arm accidents.

Table 4.6.6: Types of Farm Accidents.

Type of Accident	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Tractor Failure	10.00	20.00	33.3	10.00
Implement Failure	10.00	13.00		10.00
Tractor/ Implement	5.00	20.70	33.3	30.00
Tools		3.70	-	
Environmental Conditions	80.00	33.00	33.3	40.00
Total	100	100	100	100

In Kwara and Niger States, the types of farm accidents commonly found are associated with environmental conditions while in Federal Capital Territory and Kaduna State the type is tractor/implement failure and environmental conditions respectively.

Table 4.6.7: Cost of Farm Accident.

Cost of /Accident	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Time losses	30.00	33.30	33.3	30.70
Property damage.	60.00	40.00		50.00
Medical attention	5.00	20.70	66.7	20.70
Intangible losses				10.00
Total	100	100	100	100

Comparing the cost of farm accidents on selected mechanised farms in Kwara and Niger States, the percentages of property damage are over 60% and 40% respectively. In Federal Capital Territory, medical attention 66.7% and for Kaduna State, time loss and medical attention, 20.7% .

Table 4.6.8: Extent of Damage Done Minor Accidents

Extent of D/Done	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Slight Damage	57.10	33.00	66.70	50.10
Time loss	33.00	10.70	-	33.30
Medical Attention	9.50	20.00	33.33	11.10
Total	100	100	100	100

The extent of damage done by minor accidents in Kwara and Niger States is associated with slight damage, of over 50%. In Federal Capital Territory and Kaduna State, it is slight damage of 66.7% and over 50% respectively

Table 4.6.9: Extent of damage done-major accidents

Extent of D/Done	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Life losses		5.70		
Intangible losses	10.00	20.00	11.30	20.10
Time losses	71.40	75.30	88.70	80.00
Total	100	100	100	100

The extent of damage done by major accidents in Kwara and Niger states is associated with time loss of over 70%. In Federal Capital Territory 88.7% and Kaduna state 80%.

Table 4.6.10: Type of Tractor/Implement involved in Accidents.

Type of Tractor/Implement involved	Kwara % of Total	Niger % of Total	FCT % of Total	Kaduna % of Total
Steyr	10.00	50.00	33.3	20.10
Ford	14.00	30.00	33.3	10.00
Fiat	40.00	10.30	33.3	40.10
Massey Ferguson	-	5.70	-	1.70
Implement	30.00	20.00		30.10
Environmental	10.00	70.00		10.10
Total	100	100	100	100

From the table, implements form the major type involved in

accident in Kwara, Niger and Kaduna State.

4.7: General Analysis.

The analysis is to compare the analysis for the different states and is represented using barcharts for the variables in the selected states.

4.7.1: General attitude of Respondents by Demographic Variables

On simple demographic variables, male and female respondents constituted 81.00% and 19.00% respectively. Majority of respondents, 36.40% are aged between 21 - 30 years. Another 27.20% are aged between 31 - 40 years while only 10.00 are above 40 years and under 20 years. Few of the victims, above 40 years are involved in farm accidents. Nevertheless, it is observed that 10.0% of victims between 21 - 30years are involved in the accidents in the establishments investigated. This percentage shows that majority of the people involved in the accidents are the young working class people, this represent a great loss to the establishments and the nation as a whole.

The Majority of all the accidents occured in the government establishments. Over 70% accidents occurred in government ownership establishments and over 20% accidents occurred in private. No accident is recorded for joint ownership.

It is clear, from the analysis that all the accidents in Kwara, Niger, Federal Capital Territory and Kaduna States are due to farm implements.

4.7.2: Analysis of the Description of farm Accidents.

The importance of description of farm accidents in any farming environment cannot be over emphasized. Since majority of the population are farmers, there is every need to find out the accidents with the different establishments and this leads to solutions to the problems. This part gives the general analysis based on the second part of the questionnaire.

The conducted survey shows that about 42.00% of the farm accidents in these selected areas are 71.00% ingrogen operated of equipment, and 1.00% excluding the irrigation of the equipment

The major type of farm accident in the selected States is by environmental conditions, over 30%. This is followed by operator failure, less than 30%, tractor implement failure less than 20%, implement failure less than 20 and tools less than 1%

The cost of farm accidents is analysed, and the following percentages was obtained. Time losses 22.40%, property damage 44.00%, medical attention 20.00% and intangible losses 3.60%. The major cost of farm accidents in the States is property damage.

The analysis of extent of damage done by farm accidents indicates the seriousness of injuries done and this depends on whether accidetns caused are fatal, major and minor, Time losses formed the damage caused by major accidents, over 70%, followed by intangible losses, 25.40%, and life loss of 4.00%. Damage done by major accidents in various establishments include slight injury which include slight injury, more than 50% time losses 10.1%, and medical attention, 14.75% It is also clear that in all the establishments in the states mentioned earlier, the major extent of damage done by farm accident is time losses. In most establishments the damage caused by total accident was not available since no accident was recorded to be fatal.

4.0 Case Study.

This section includes cases of different farm accidents in selected mechanised farms in the states mentioned earlier.

Case study 1 A two wheel drive tractor was returning from the farm in the night, along Ilda Lafiaregi road, this tractor was driven in the night without head lights, as a consequence of this as result of this the tractor collided with an oncoming 10 wheel truck loaded with fertilizer. The damage caused by this accident is that one of the victim died, other three victims were seriously injured and the tractor was completely damaged. The 10 wheel truck was damaged and all fertilizer bags were wasted. The tractor involved in the accident is massey ferguson. This accidents happened in August, 1997 and the tractor involved in the accident owned by Kaikunkela Local Government Area. Drawings are included this case study to make it more detailed.

...2...

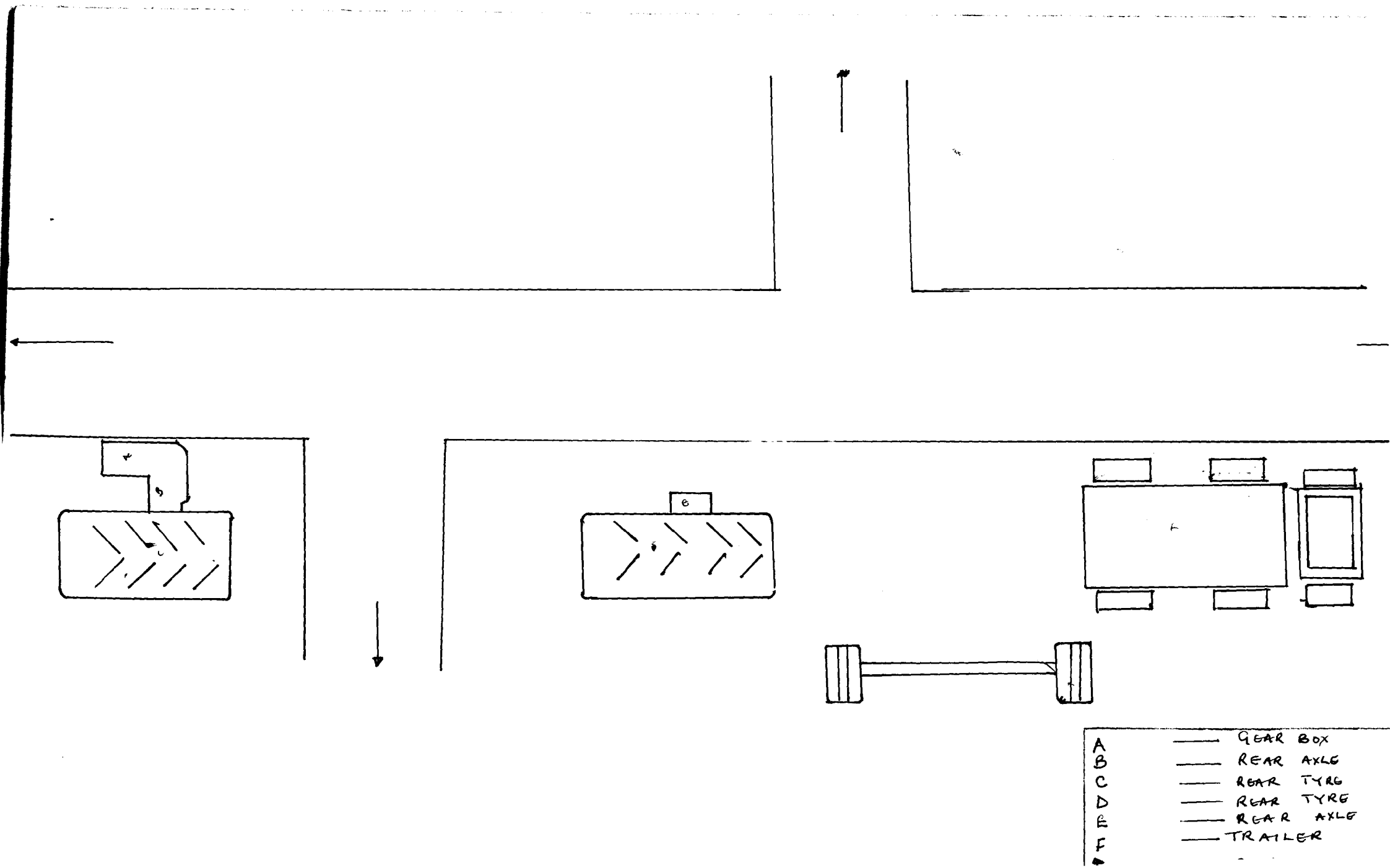
Case Study 2 - The tractor involved belong to Maikunkele local government area and the tractor make is fiat. Three men were involved in this accident, when they were trying to fix rear tyre of a tractor, the jack for lifting the tyre failed resulting in the tractor falling. But fortunately for the victims under the tractor, the tractor fell on top of the tyre which at that time was upright. The tyre act as a form of safety for the victims. The tyre rested on the hand of one of the men and was under medical attention for period of time. At the time the survey was conducted, the damaged part had been repaired and so no drawing of the case study.

Case Study 3 - This farm accidents occurring in Paikoro Local Government Area in Niger State, no tractor, no implement was involved, so no drawings, photographs, was taken of the accident. The accident was as a result of environmental factor flood disaster in some areas under the Paikoro local government area in 1994. This result in crops damage and crops wastage. The time involved in righting the situation was closed to another planning season. Also another case of accident was taken in Paikoro local government area, this occurred as far back as 1950's. The accident was as a result of Army Worms and this destroyed a greater percentage of crops in the affected area under the local government area.

Case Study 4 This accident occurred in National Centre for Agricultural Mechanisatin (NCAM) in Ilorin local government area. A tractor and no implement was involved. This happened in July 1990. The cause of the accident is human factor. The Fulani's during the grazing of their cows set fire in bushes which later extended in the farms around and cause serious damages to crops. Several farms personnal and experimental plots were affected. As of the time the survey was conducted, no record keeping and the affected land was already in productive use, so no drawings and no photographs.

Case Study 5 - This happened in Kaduna south local government in Kaduna State. This happened as a result of the topography of the area which is under envirnmental factors. The implement

olved in the accident was harrow i.e. disc harrow. When the erator was harrowing the soil (a virgin land) which was having a of roots, tree stumps, as a result of this there was a breakage the disc harrow this means one of the beams got broken


A
B
C
D
E
F
GEAR BOX
REAR AXLE
REAR TYRE
REAR TYRE
REAR AXLE
TRAILER

Male Female
80 15

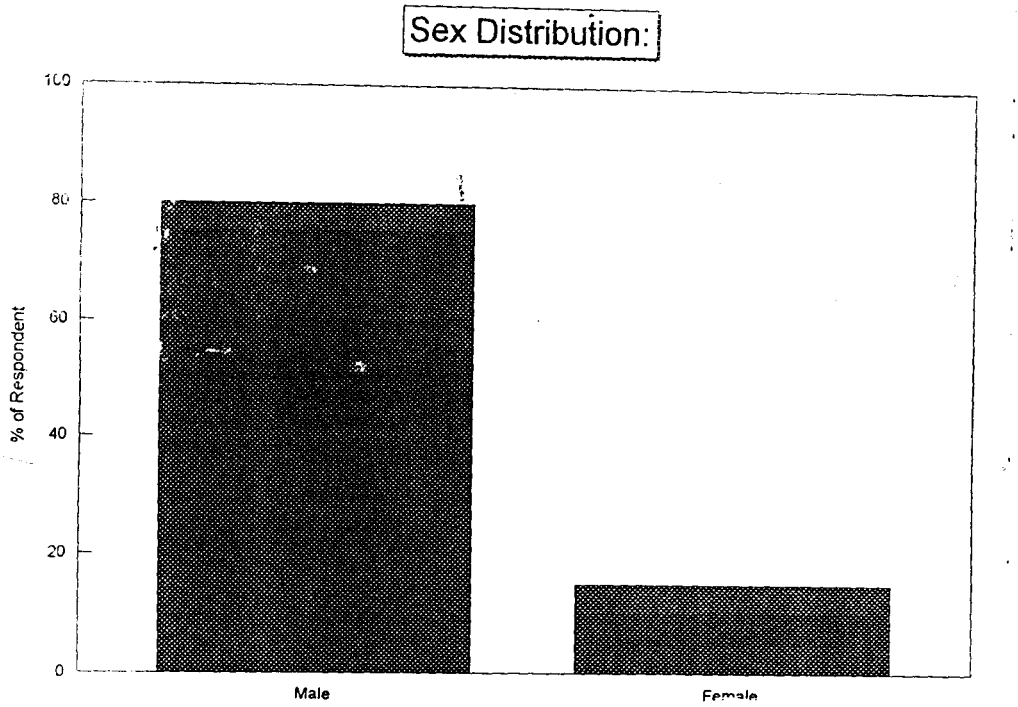


Fig. 1: Sex Distribution:
When one combine all the selected states, upto 81.8% of the respondents are males and less than 20% are Females.

Diploma and Below Bachelor's Master's PhD's
45 35 25 10

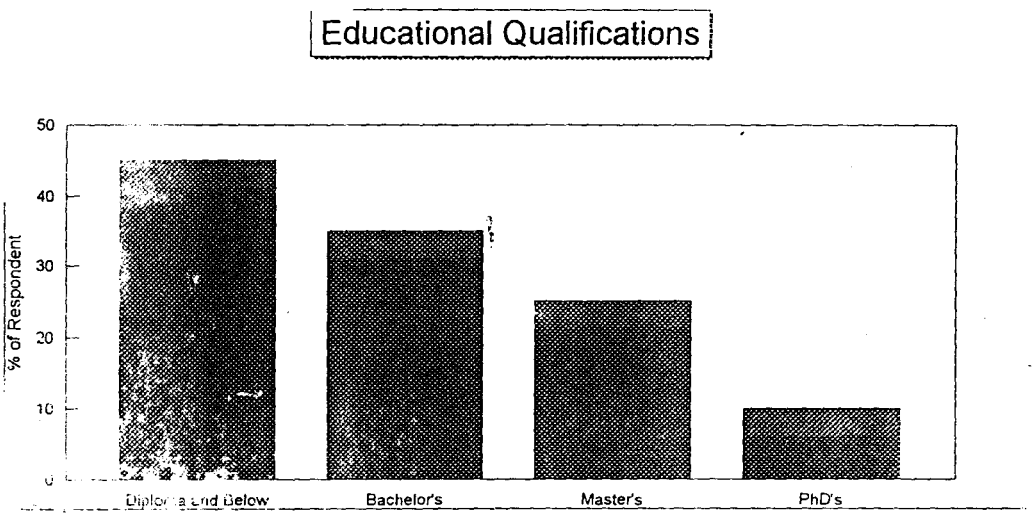


Fig. 2: Educational Qualifications:
From Fig. 2, upto 41.8% of the respondents have Diploma and below degree, in Kwara, Niger, Kaduna states and FCT.

Under 20	20 - 30	31-40	Above 40
20	50	25	5

Fig 3: Age of Victims:
Combining the selected states, upto 49.1% are involved in Farm Accidents of ages between 21 - 30 years.

Private	Government	Joint
30	70	0

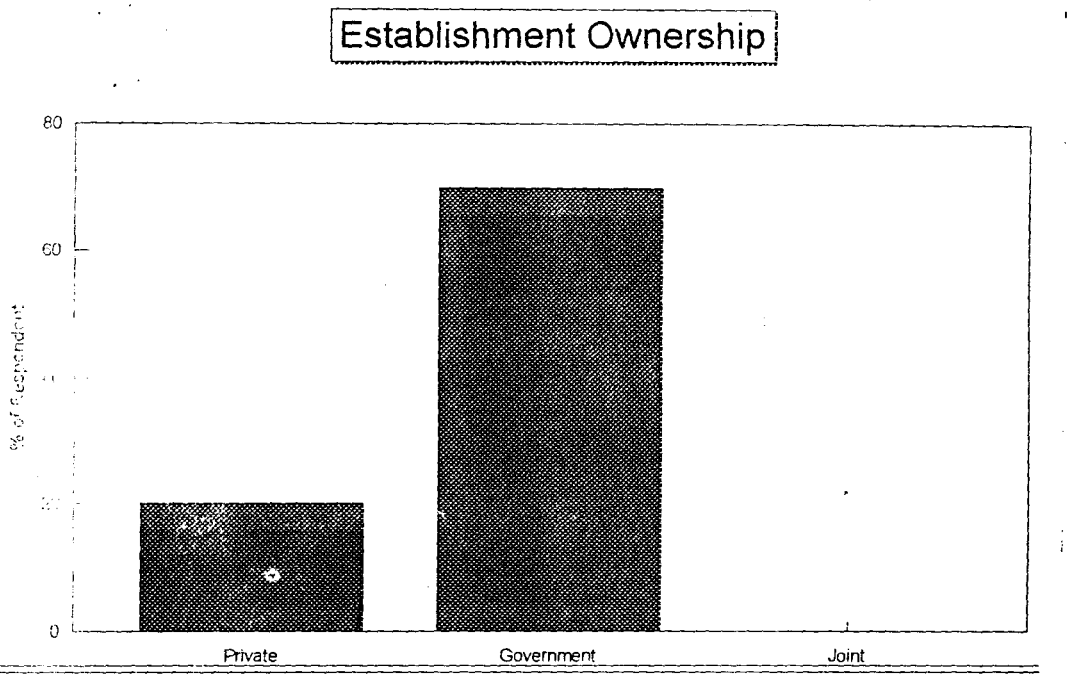


Fig. 4: Establishment ownership

Tractor	Implement	Tractor implement	Tools	Environmental
25	15	20	2	35

When one combine all the selected states, up to 76.4% of the establishments are government owned that is, a government ownership establisments are mostly involved in farm accident

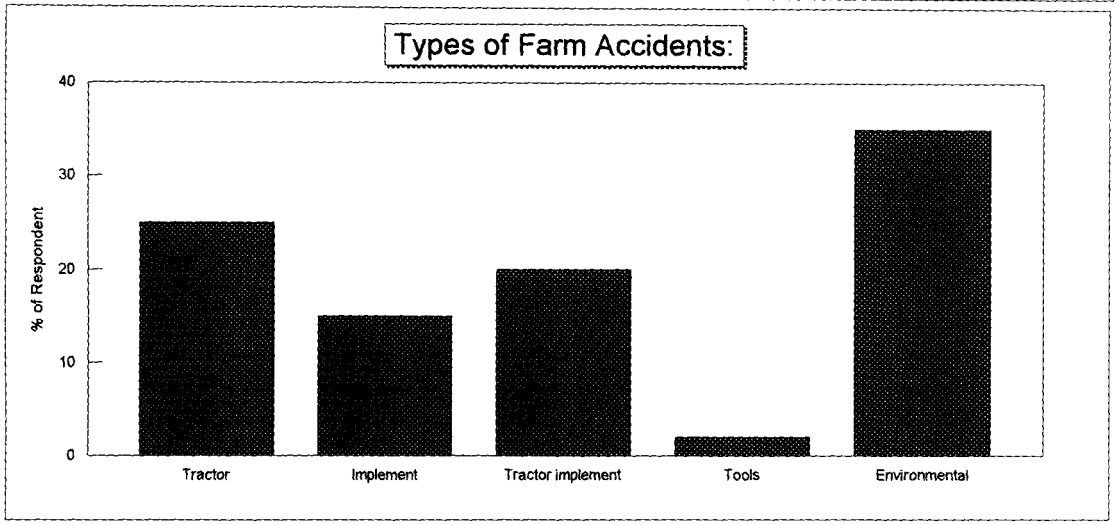


Fig. 5: Types of Farm Accidents:
When one combine all the selected states, up to 36% of farm, accidents are due to environmental conditions.

Carelessness	Environmental condition	Improper Operations	Exceeding the limitation	Human Factor
35	30	20	2	10

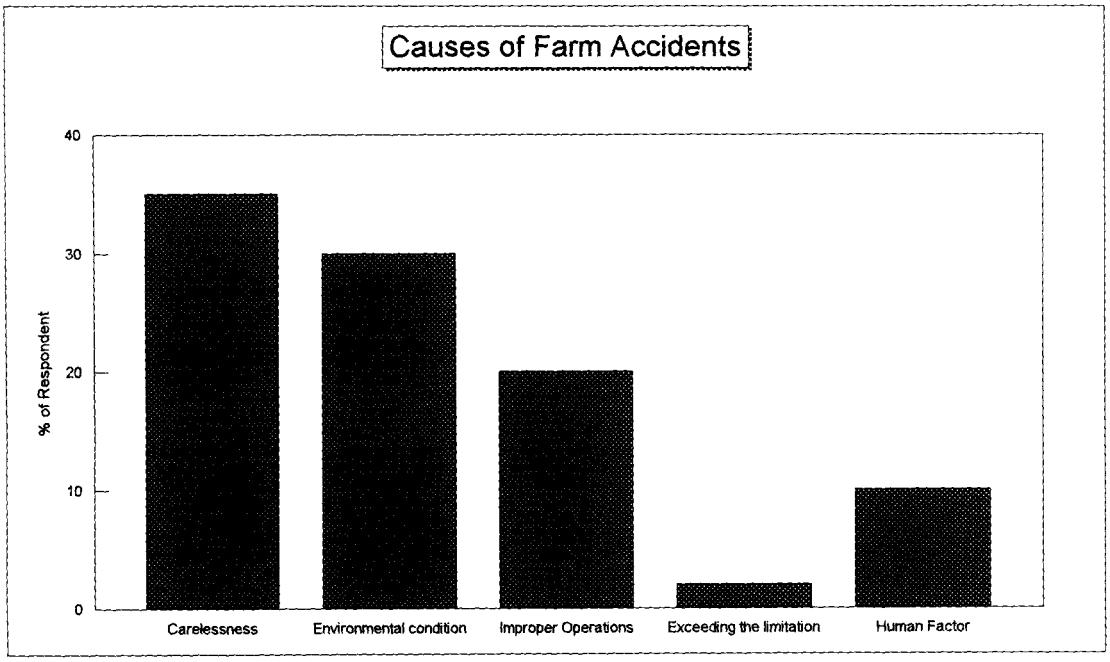


Fig 6: Causes of Farm Accidents:

Combining all the selected states, up to 43.6% accidents are caused by human factors which form the major cause of farm accidents in these states.

Time losses	Property damage	Medical attention	Intangible Losses
32	43	20	3

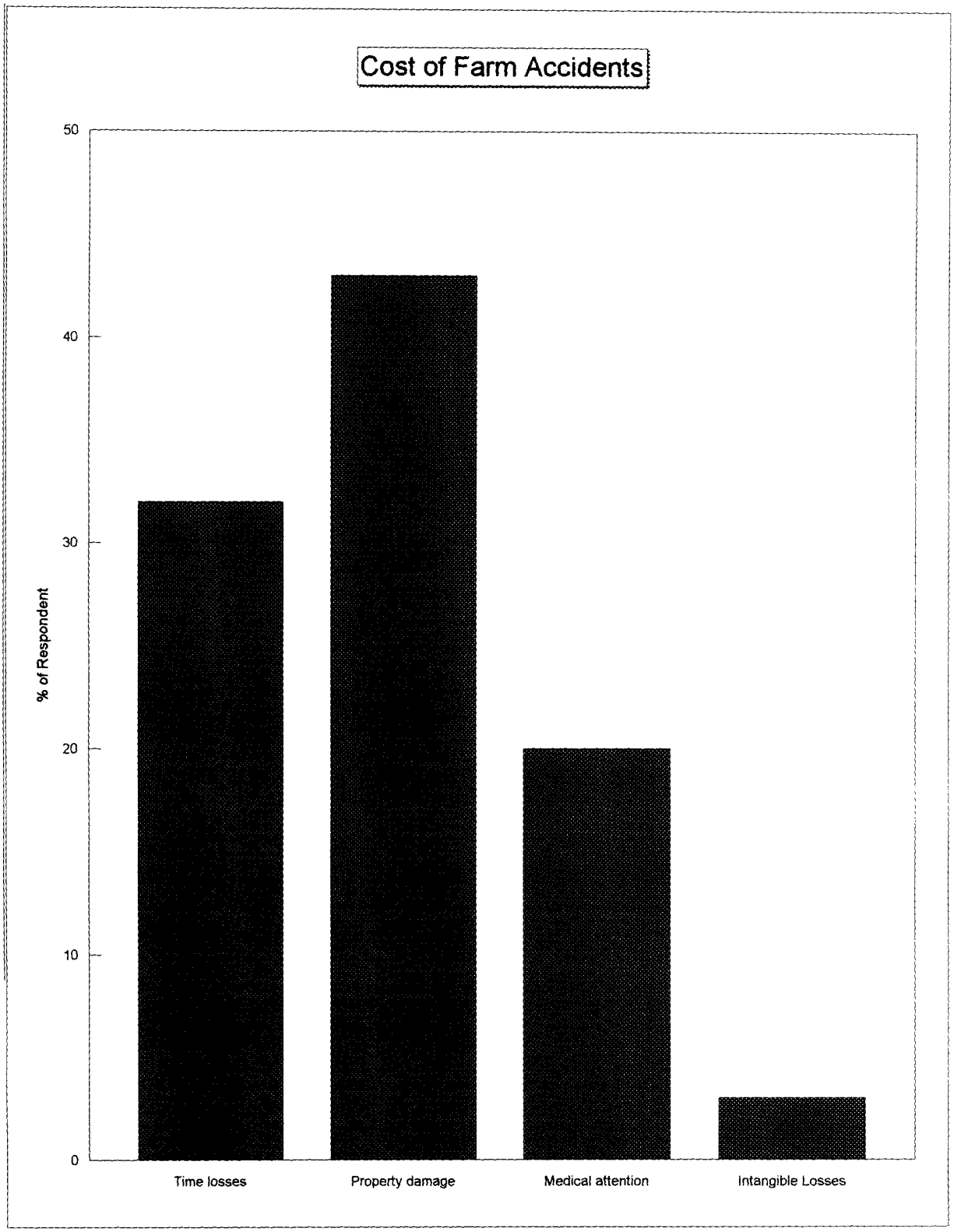


Fig. 7: Cost of Farm Accidents:
When one combine all the states, the major cost of Farm Accidents is property damage.

Life losses	Time losses	Property Damage
2	25	70

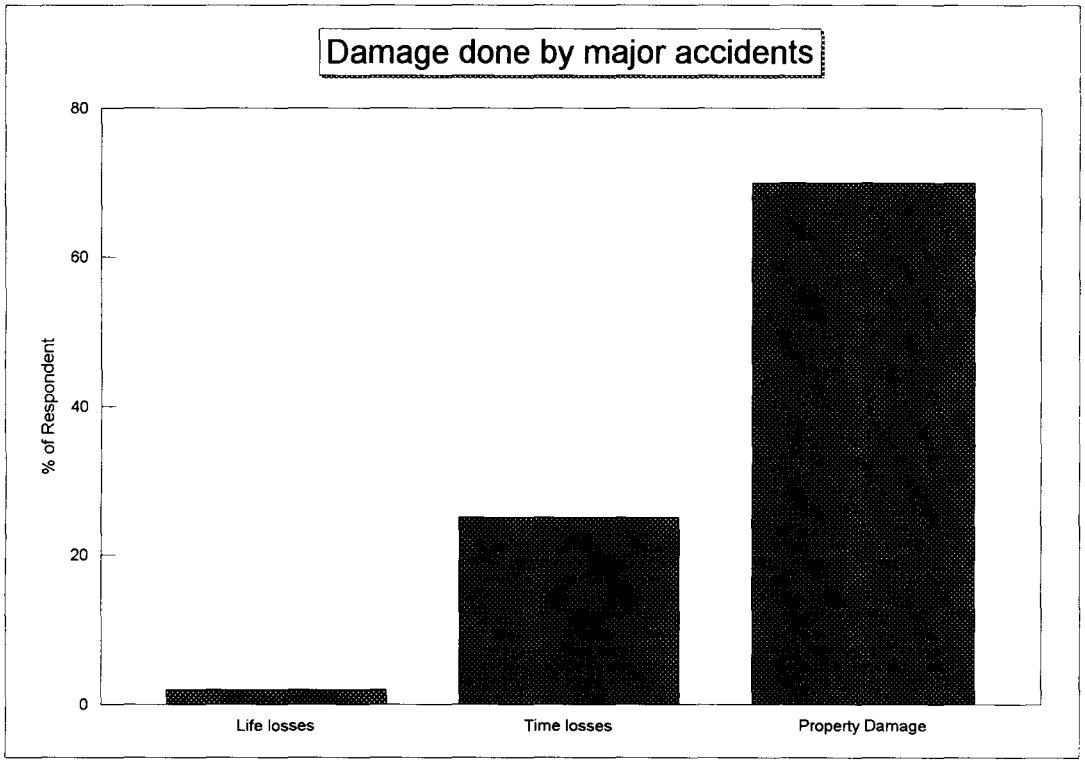


Fig. 8: Damage done by major accidents:
When one combine all the selected states, upto 72.72% of the Farm Accidents result in time losses.

Slight damage	Time losses	Medical attention
55	30	10

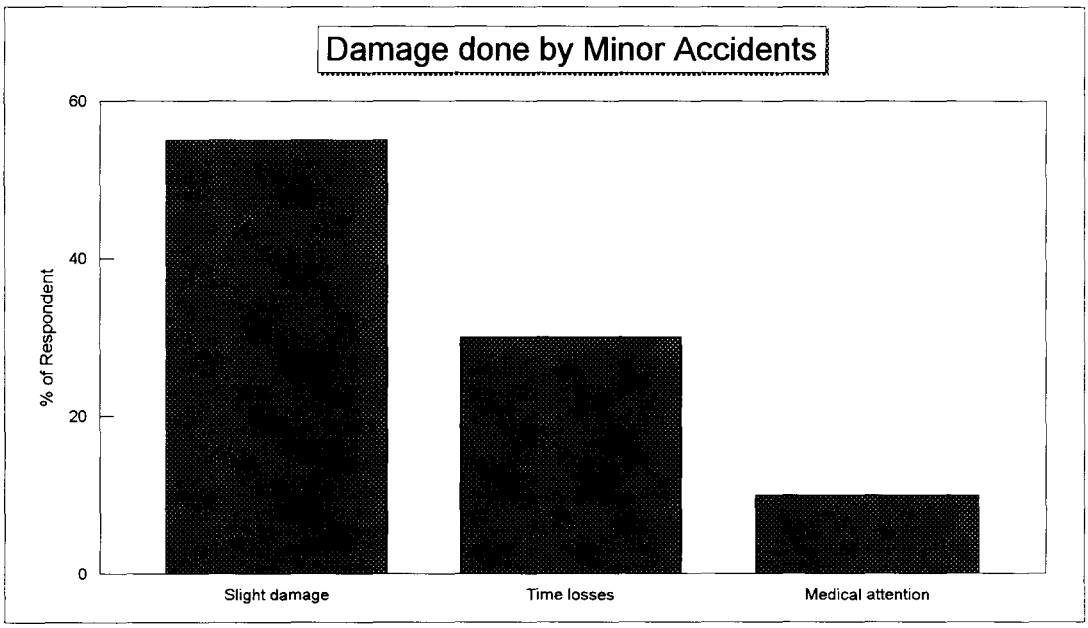
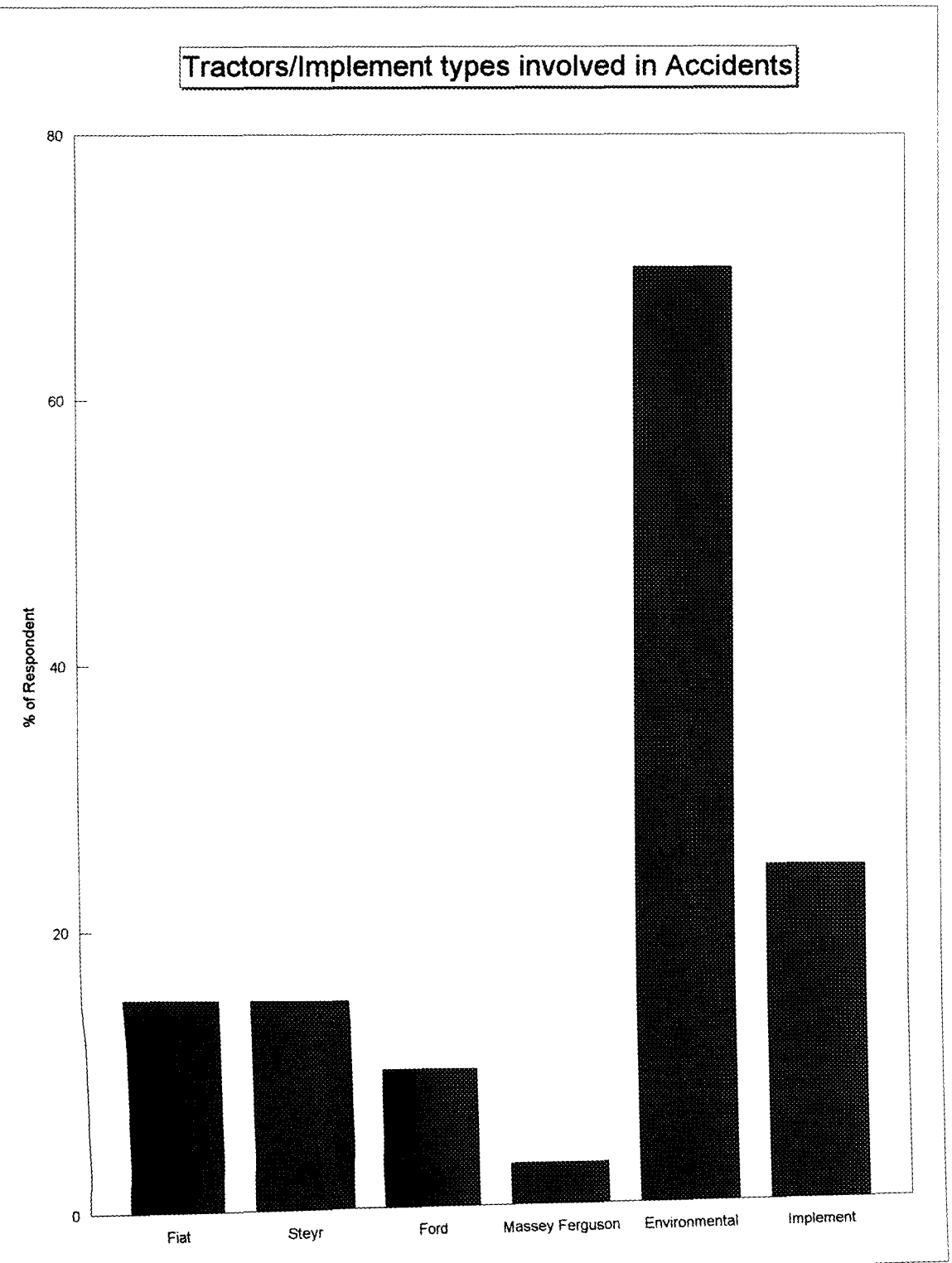


Fig. 9: Damage done by Minor Accidents

Combining all the selected states, upto 54.5% of the minor Farm Accidents results in slight damage.

Fiat	Steyr	Ford	Massey Ferguson	Environmental	Implement
15	15	10	3	70	25



) Tractor/Implemets types involved in Accidents: Environmental
bining all the selected states, upto 76.4% of accidents are due to environmental factors
tractor make mostly involved in accidents are Fiat and Steyr.

robability

if, in [illegible], there [illegible] successes, there [illegible]
x) failure, so that

$X + (N - X) = N$

$\frac{X}{N} + \frac{N - X}{N} = 1$

$\frac{X}{N}$ = Number of accidents occurring

$\frac{N - X}{N}$ = Number of accidents not occurring

P (A) + P (not A) = 1

State: Probability of accidents occurring

$\frac{X}{N}$ = Number of accidents in the State / Total number of accident.

$\frac{24}{75} = 0.32 =$ P (A) = 0.32

Probability of accident not occurring.

$\frac{N - X}{N} = \frac{75 - 24}{75} = 0.68 =$ P (not A) = 0.68

r State: Probability of accidents occurring.

$\frac{X}{N} = \frac{31}{75} = 0.41 =$ P (A) = 0.41

bility of accident not occurring.

$\frac{N - X}{N} = \frac{75 - 31}{75} = 0.59.$ P (not A) = 0.59

l Capital Territory: Probability of accidents occurring

$\frac{4}{75} = 0.05 =$ P (A) = 0.05

lity of accident not occurring

$\frac{N - X}{N} = \frac{75 - 4}{75} = 0.95 =$ P (not A) = 0.95

F.....

ble 33 Total Number of Accidents.

ates	Number [illegible]	% of Total
ara	[illegible]	[illegible]
iger	31	[illegible]
[illegible]	[illegible]	[illegible]
aduna	10	21.38
otal	[illegible]	[illegible]

From the table above Niger state have the highest number of accidents of 41.0% and [illegible] have the lowest number of accidents [illegible]

ble 34. Total Number of Tractors.

tates	Number [illegible]	% of Total
wara	103	37.
iger	44	[illegible]
CT	10	[illegible]
aduna	106	[illegible]
otal	[illegible]	27.

Combining all the selected states [illegible] Niga [illegible] have the highest number of tractors, [illegible] [illegible] with the lowest numbe[illegible]

able 35: Total Number of [illegible]

tates	Number [illegible]	% of Total
wara	[illegible]	[illegible]
iger	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
aduna	[illegible]	[illegible]
otal	[illegible]	[illegible]

Combining all the selected states [illegible] highest number of equipment [illegible] [illegible]

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APPENDIX

QUESTIONNAIRE.

RESEARCH TITLE: - INVESTIGATION OF FARM ACCIDENTS IN KWARA STATE, NIGER STATE, FEDERAL CAPITAL TERRITORY, AND KADUNA STATE.

RESEARCHER : - JOSHUA CHRISTIANAH .A.
DEPARTMENT OF AGRICULTURAL ENGINEERING,
FEDERAL UNIVERSITY OF TECHNOLOGY,
MINNA.

Dear Respondents,

This questionnaire seeks information on the farm accidents in Kwara, Niger, Kaduna and Federal Capital Territory.

The extent of the damage done by farm accidents has been a subject of discussion as it affects the economy of the nation/ It is noted that a large proportion of victims of farm accidents are young people, representing a great oloss to the nation. Cost of farm accidents is in terms of time, medical attention, hireddelp, property damaged and intangible losses.

This questionnaire is proposed to achieve the following aims; to know the Nature and causes of farm accidents, to know the extent of damage, to detect ways of reducing farm accidents, to detect cost of farm accidents in Nigeria and how to manage Agricultural implements.

I will appreciate everyminute you spare to answer the following questions. Please be sure your response will be treated in confidence.

Thanks for your cooperation.

SECTION A.

Background information (please circle the correct place that correcsponds with your response)

1. Location :Name of Establishment_____

   State_____L.G.A._____

2. Sex of respondent:

   Male 1 Female 2

3. Age of respondent

   Under 20 years 1

   21 - 30 years 2

   31 - 40 years 3

   over 40 years 4

4. Age of person involved in the accident.

   Under 20 years 1

   21 - 30 years 2

   31 - 40 years 3

   over 40 years 4

5. Educationnal qualification:

   Sec. School 1

   N. C. E 2

Master's Degree 5
PHD 6

5. Years of working experience of respondent.
Less than one year 1
One to five years 2
Six to Ten years 3
Over Ten years 4

7. Years of working experience of the person involved in the accident.
Less than one years 1
One to Five years 2
Six to Ten years 3
Over Ten years 4

8. Number of Tractors in the Establishment_____
9. Number of other equipment/machinery._____
10. Types of Tractor in the Establishment._____
11. Types of other equpment/machinery_____
_____. Type of Equipment / Tractor Involved in the accident
12. Establishment ownership
Government ownership 1
Private ownership 2
Joint ownership 3

SECTION B.

Description of farm Accidents.

1. Does farm accident occur in the Establishment
Yes 1 No 2
2. If yes, what is the type of farm accident occurring in the Establishment.
Tractor Failure 1
Implement Failure 2
Tractor-implement Failure 3
Toels 4
Environmental condition 5
3. Who is involved in the accident
Operator 1
Any other 2
4. Level of training of the handler of the Equipments.
Skilled 1
Unskilled 2
5. Where do the accidents occurred.
Fields 1
Farm Workshop 2
Farm Shelds 3
During Transit 4
6. Have you as an establishment attempted to minimize farm accidents.
Yes 1 No 2
7. How does the establishment prevent the accident_____
_____.
8. How many accidents have so far occurred in the establishment_____
_____.
9. What is the major cause of farm accidents in the establishment.
Improper operation of the Equipment. 1
Exceeding the limitation of the equipment. 2
Carelessness of operator

10. When accidents occurred, how are they handled

First Aid Treatment	1
Clinic	2
Any Other	3

11. In case of any tractor accidents, does the tractor have a Roll Over protective structures (ROPS).

Yes 1 No 2

12. In what form is the cost of accidents to the establishment?

Time losses	1
Property Damage	2
Medical Attention	3
Intangible losses	4

13. How often do fatal accidents occur in the establishment?

Less than 2 times per year/season	1
3-6 times per year	2
7-10 times per year	3
Over 10 times per year	4

14. How often do major accidents occur in the establishment?

Less than 2 times per year	1
3-6 times per year	2
7-10 times per year	3
Over 10 times per year	4

15. What is the extent of the damage done by the major accidents?

Life Losses	1
Intagible Losses	2
Times Losses	3

16. How often do the minor accidents occur in the establishment?

Less than 2 times per year	1
3-6 times per year	2
7-10 times per year	3
Over 10 times per year	4

17. What is the extent of the damage done by the minor accidents?

Slight Damage	1
Time Losses	2
Medical Attention	3

18. What is the cost of repairs in righting the Equipment_____.

_____.

19. What is the time spent in righting the equipment? _____

_____.

20. Are there other accidents that do not involve equipment?

Yes 1 No 2

21. If Yes in what form ?

Fire	1
Electrical Hazard	2
Chemical	3
Snake Bites	4

22. How often do such accidents occur ?

Less than 2 times per year	1
3-6 times per year	2
7-10 times per year	3
Over times per year.	

23. What is the extent of damage caused by such accidents ?

Time Losses	1
Property Damage	2
Medical Attention	3
Slight Damage	4

24. What suggestions

una State 24.?% and [illegible]

una State: Probability of accident occurring

$\frac{A}{N} = \frac{1?}{75} = 0.2?$ P (A) = 0.2?

obability of accident not occurring

$= \frac{N - A}{N} = \frac{75 - 1?}{75} = 0.7?$ P (Not A) = 0.7?

ble 26. Number of Tractors involved in Accidents.

tates	Number (A)	% of Total
wara	6	[illegible]
iger	10	[illegible]
CT	[illegible]	[illegible]
aduna	[illegible]	[illegible]
otal	[illegible]	[illegible]

In Kwara State, out of 100 tractors, [illegible] tractors were involved in accidents , in Niger State 10 tractors out of 144 tractors were involved in accident. In FCT, [illegible] tractors were involved in accidents and finally, in Kaduna State out of 100 tractors, [illegible] tractors were involved given a number of [illegible] tractors out of a total of [illegible] tractors.

CHAPTER FIVE

5.0 RECOMMENDATION AND CONCLUSION

5.1 Conclusion.

This study conducted has shown that the major cause of farm accidents on selected mechanized farms in Niger, Kaduna, Kwara states and Federal Capital Territory is human factor, the main type of farm accident based on the selected states is the one by enviromental conditions, the extent of damage; minor accident is slight damage, major accidents is time losses, fatal acciddent is life loss, cost of farm accident is property damage. Majority of people involved in farm accidents are male victims and between 21-30 years, the establishments mostly involved in farm accident are the government sectors. ways of reducing farm accident are recorded under recommendation, if properly carried out will reduce farm accident to a drastic level.

The following problems are encountered when administering the questionnaire; lack of proper and adequate information in some establishment, poor record keeping, all establishments being to had no proper record of case of farm accident. This might be the major cause of the lack of co-operation and could attitude of most of the establishments to the exercise. Also during data compilation and analysis, it was discovered that no establishment was recorded to be owned by joint ownership.

The total number of mechanized farms available in the selected states that responded was 54. Kwara state recorded the largest number with 21, followed by Niger and Kaduna states with 15 each and Federal Capital Territory with 3.

Investigation shows that higher number of tractors and farm implements are recorded for government owned establishment. In the privately owned and managed establishment, the situation is quite different as farm tractors and implements were not easily available. Niger

states have the higher number of equipment ownership and higher number of accidents.

5.2 Recommendation

For any meaningful study to be done, no single research project can adequately and sufficiently exhaust everything about a social phenomenon. It is suggested that the investigation should be carried out in another form different from the way it was done in this study.

The study should be conducted using a larger sample size than that used in the present study. This means that more establishment should be visited, diagrams and photographs should be used to suggest survey carried out.

It is also suggested that this study be conducted in other Local Government, giving room for comparison and characteristics than those used in the questionnaire, as this will obtain a higher measure of validity and reliability.

It is strongly recommended that efforts should immediately be intensified to generate standardized formats for keeping records of farm accidents.

Since majority of the establishment involved in farm accident are government owned, the government should endeavour to look into ways of reducing farm accident in Nigeria. These ways of reducing farm accidents include

Proper training of operators/equipment handle and how to use alertness.

By constant updating of the operators and making the operators to acheive to acquire more knowledge on tractor handling.

Only skilled operators and tractor mechanic should be employed in tractor working unit all the time.

Operator should not operate at high velocity light.

Manufacturers instruction should be strictly followed when driving farm machinery.

Insurance service in the Local Government is encouraged.

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