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AN ASSESSMENT OF HAZARD AND ITS CONSTRAINT TO WORK EFFICENCY IN DISASTER RISK MANAGEMENT IN MECHANIZED AGRICULTURAL INSTITUTION ILORIN NIGERIA

by

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ABSTRACT

The world concurrently is facing challenge of disasters that are increasing in frequency and severity. These hazards are predicted to increase with the negative impacts of climate change, which will worsen the incidence of associated disasters in the African region. Apart from the commonly focused hazards climatic and geological hazards such as droughts, floods, earthquakes, landslides and cyclones, there are also industrial and technological related hazards. A study to determine the awareness of hazards and its constraint to work efficiency in disaster and risk management was carried out at the National Centre for Agricultural Mechanization (NCAM), Ilorin. Questionnaire administration, in-depth interview and field survey were the methods used for data collection. The result were analyzed through pie-chart, showing percentage in terms of Hazard risk with 2015 having the highest percentage of (45.5%). 2016 (24.2%), 2017 (12.1%). The lowest hazard risk on the yearly analysis are 2018 (6.19%), 2019 (9.1%) and the least being 2020 with (3.0%). This result has clearly shown that within 2015-2020 the study area experienced decreasing pattern variations in hazards. The findings revealed that NCAM Ilorin very few staff is affected which shows efficiency of work is not perturb high degree level of preparedness was achieved through the use of hierarchy of control and administrative measure. Therefore, there is a need for provision of hierarchy of control in combination with, elimination; substitution; isolation; engineering controls; administrative controls, should be fully implemented to totally eliminate hazard risk in the Centre. The staffs

were advised to avoid working without safety materials to minimize the effects of hazards from mechanized agricultural equipment production and usage.

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INTRODUCTION

1.1 Background of the study

The world concurrently is facing challenges of disasters, which are increasing in number, frequency and severity. In Africa, there has been an escalation of hazards, particularly in terms of droughts and floods. Other sources are geological, such as earthquakes, landslides and cyclones as well as, industrial and technological. These hazards are predicted to increase with the negative impacts of climate change, which will worsen the incidence of associated disasters in the African region. Among other common disasters experienced in Africa are epidemics, storms, wildfires, extreme heat waves and insect infestation, as well as mass movements caused by both dry and wet weather events. Coastal areas are exposed to sea erosion and sea-level rises, with increasing threats to the livelihoods of coastal communities. Although Africa is not prone to major catastrophic disasters such as tsunamis and earthquakes, the continent suffers most from the effects of disasters due to increasing vulnerabilities, driven by poverty, inequality, environmental degradation, unplanned urbanization, exposure to hazardous conditions and locations, weak social organizations and weak governance systems. Small, localized disasters tend to have an impact beyond their magnitude, eroding communities' hard-earned livelihoods, assets and health, which are already threatened by multiple other factors.

Disaster is a serious disruption of the functioning of a community or society causing widespread human death, material destruction, economic and environmental losses, which exceed the ability

or capacity of the affected community/society to cope using its own resources. Disaster risk, on the other hand, is the potential of losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified time period. Therefore, disaster, if not managed could consumed the world in totality. Hence a conceptual framework and strategies were adopted to handle these unfortunate catastrophes called D.R.M. (Disaster Risk Management) at international, national and local levels.

Disaster risk management is the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. Disaster Management is the coordination and integration of all activities necessary to build, sustain and improve the capability to prepare for, protect against, respond to and recover from threatening or actual natural or human-induced disasters. It is a multi-jurisdictional, multi-sectoral, multi-disciplinary and multi-resource initiative. Therefore, it is vital that the Federal, State and Local Governments, Civil Society Organizations (CSOs) and the private sector to discharge their respective roles and responsibilities and complement each other in achieving shared goals of disaster management.

The involvement of different actors and stakeholders in disaster management requires the existence of a coordination and collaboration mechanism. The National Disaster Management Framework (NDMF) provides this mechanism that serves as a regulatory guideline for effective and efficient disaster management in Nigeria. The framework defines measurable, flexible and adaptable coordinating structures, and assigns key roles and responsibilities of disaster management stakeholders across the nation. It describes specific authorities and best practices for managing disasters, and explains a paradigm shift in disaster management beyond mere response and recovery.

National Centre for Agricultural Mechanization, Ilorin, is a mechanized Agricultural institution in charge with the Design, Fabrication, and Production of Agricultural Machines. In view of its functions it is associated with numerous risks and hazards which eventually if not controlled/managed, could lead to disaster.

1.2 STATEMENT OF RESEARCH PROBLEM

"Hazards associated with working near or on machinery vary depending on the exact machine used and the type of work executed, in National Centre for Agricultural Mechanization Ilorin, it include, but not limited to exposure to:

i. Moving parts (e.g., risk of injuries from entanglement, friction, abrasion, cutting, severing, shearing, stabbing, puncturing, impact, crushing, drawing-in or trapping, etc.)
ii. Energy (e.g., electrical, electromagnetic, magnetic, etc.)
iii. Heat or cold
iv. Noise
v. Vibration
vi. Radiation
vii. Gas or liquid under pressure (e.g., injuries from injection or ejection by hydraulic systems, pneumatic systems, compressed air, paint sprayers, etc.)
viii. Psychosocial hazards (e.g., stress, job content, work organization, cognitive factors trauma, burn out, etc.) Because there are many different types of machines and processes, there are several report of hand amputation cutting, severing, shearing, stabbing, puncturing, impact, crushing, drawing-in or trapping, etc.) reported by operators and recorded in Clinics

1.3 Aims and Objectives

The aim of this research is to examine hazards and its constraint to work efficiency in disaster risk management in National Centre for Agricultural Mechanization Ilorin, Kwara State. The specific objectives to achieve this aim are to:

i. Examine the type of hazard associated with mechanized Agricultural Institution.
ii. Determine the cause of the Disaster in the study area.
iii. know the category of people Vulnerable to this hazard in the study area
iv. find out the Frequency of the Disaster in the study area

1.4 Scope of the Study

In terms of content, this study focuses on HAZARDS AND ITS CONSTRAINT TO WORK EFFICENCY in disaster risk management in Nigeria, it examine the level of HAZARD IN disaster risk management in Engineering and Scientific Services (ESS) and Farm Power and Machinery (FP&M) Departmental Workshops of NCAM and NCAM in general. With peculiar reference National Centre for Agricultural Mechanization Ilorin Kwara State as the spatial and geographical scope of this study, the temporal scope is between 2015 to date (6 years),

1.5 Justification and Significance of the Study

1.5.1 Justification of the Study

In view of the economic importance and problems posed by mechanization in Agriculture, it is necessary to guard against disaster risk and hazard associated with the center. The Centre runs a modest Computer Laboratory fully equipped with internet facilities and houses the Website hub of the Centre. It has an ultra- modern Technical & Scientific Services building which is fully equipped and houses the workshops and laboratories of technical and scientific departments as well as foundry and tillage research units.

The Centre also has an Instruction Centre building housing a 300-seater auditorium, lecture rooms (for training), the Root and Tuber Expansion Project (RTEP) which is partly funded by IFAD/World Bank, as well as the Extension Unit of the Centre. Engine Tractor and Farm Machine Complex building accommodates a workshop and laboratories that are very vital in the Centres activities.

There is a Library Complex, with access to more than 400 volumes of books, journals and periodicals, mostly on agricultural mechanization subject matter to facilitate research activities in agricultural mechanization and other related fields. In addition, there is a Trainee Hostel and Conference Centre with a capacity to accommodate thirty (30) participants put in place to provide a conducive environment and required facilities for hosting and conducting training programmes, seminars and related activities. The staff quarters also holds another set of training hostels with seventy two (72) rooms and a capacity for ninety (90) training participants. All these mentioned above are sources of hazard and the users are vulnerable.

1.5.2 The Significance of the Study

i. To enlighten the institution about its vulnerability to disaster
ii. To foster recommendation on the disaster risk reduction and management principles and strategies to be adopted

2.6 Literature Review

The term Mechanization is the process of changing from working largely or exclusively by hand or with animals to doing that work with machinery. Agricultural Mechanization is the process of improving farm labour productivity through the use of Agricultural Machinery.

In a study conducted by Occupational Health Safety (OHS) it was stated that Workplaces covered by the MSI Act, (Mines Safety Inspection Act) the risk management process should be

undertaken to ensure employers comply with their ‘duty of care’ obligations to provide a safe workplace.

The risk management was conducted and monitored on an ongoing basis which ensured control measures on working places and no new hazards have been introduced, when new machinery or plant was introduced, modifications are made to existing plant or machinery or changes are made to systems of work. Workers and, where they exist, safety and health representatives were consulted on safety and health matters. Their involvement in the risk management process was made important, as they are most likely to know about the risks associated with their work.

The African Union Commission and regional economic communities have made substantial progress in advancing the cause of disaster risk reduction and disaster risk management, in terms of policies or strategies and institutional mechanisms. These developments emanate from the mandates provided by the constitutive or normative instruments of the African Union and the relevant regional economic communities.

Africa has a range of instruments that guide the mainstreaming and implementation of disaster risk reduction at the regional level. These include the Africa Regional Strategy for Disaster Risk Reduction and its Programme of Action, policy frameworks on humanitarian action, disaster management and conflict management and the Africa Climate Change Strategy. These instruments address various dimensions of disaster management and humanitarian action and demonstrate the political commitment and policy and strategy efforts to address the challenge of disasters at a continental level.

In the year 2013, United Nations International Strategy for Disaster Reduction (UNISDR) estimates put economic losses from 147 recorded disasters, over the previous two years at about US$ 1.3 billion (UNISDR, 2013). However, disaster risk reduction (DRR) measures continue to be inadequately integrated into the framework of developmental policies and strategies at various levels, while poor implementation of those that do exist has grave consequences for food

security, economic growth, poverty reduction, attainment of the Millennium Development Goals and over all sustainable development. Disaster reduction policies and programmes are designed to rebuild societies with increased resilience to hazards, and ensure that development activities do not unwittingly increase vulnerability to such hazards. Governments will have to find effective means by which a much more comprehensive and multi sectoral approach can be adopted.

Africa was prepared within the framework of the United Nations Development Account project on mainstreaming disaster risk reduction into national and regional development strategies in support of efforts to meet the Millennium Development Goals and attain sustainable development goals in Africa. The project was jointly conceived by the Economic Commission for Africa (ECA) and the United Nations Office for Disaster Risk Reduction (UNISDR). The assessment was commissioned jointly by ECA and UNISDR in partnership with the African Union Commission (AUC) and the United Nations Development Programmed (UNDP). The findings in the report were disseminated at the pre-conference event on "Disaster Risk Reduction Mainstreaming and Investment for Resilient Structural Transformation in Africa", which was held in the lead to the Fifth Africa Regional Platform on DRR (AfRP5), in Abuja, Nigeria in May 2014. ECA jointly with UNDP and in partnership with (UNISDR)

2.5 Mechanization of Agriculture

In G.D. Aggarwal's words, "Farm mechanization is a term used in a very broad' sense. It not only includes the use of machines, whether mobile or immobile, small or large, run by power and used for tillage operations, harvesting and thrashing but also includes power lifts for irrigation, trucks for haulage of farm produce, processing machines, dairy appliances for cream separating, butter making, oil pressing, cotton ginning, rice hulling, and even various electrical home appliances like radios, irons, washing machines, vacuum cleaners and hot plates."

2.5.1 Disaster Risk Management (DRM) Based Activities Undertaken in the Agriculture Sector

Due to its unpredictable characteristics, DRM in the agriculture sector has historically been a rather secondary topic in many countries development programs. Institutions operating in agriculture and environment do not necessarily directly work in the DRM-Ag sector, preferring to address related humanitarian issues such as drinking water supply, relief food and medicine distribution during the response phase. Nevertheless, some actions are taken in the agriculture sector. When disaster occurs, rapid assessments of needs are carried out by the government through the DPC structures and by local and international institutions and NGOs. Disaster assessment data are generally used to elaborate appropriate disaster relief projects to be submitted to the international and national communities

3.5 Sources of Hazards Relevant to Machinery in the National Centre for Agricultural Mechanization (NCAM) Ilorin

The first step in the risk management process is identifying hazards. This involves identifying anything that may cause injury or harm to the health of a person. Amongst those are identifying all machinery and plant used; Start by identifying all items of machinery and plant used at the workplace. An inspection was carried out looking for any of these items. Include common items that may not normally be thought of as ‘machines’ or ‘plant’.

There are three broad sources of hazards relevant to machinery and plant that are used in National Centre for Agricultural Mechanization (NCAM) Ilorin, namely;

(1). Hazards related to the machinery or plant, materials or items being processed or internal sources of energy, for example:

i. drawing in or trapping hazards;

ii. Entanglement hazards;

iii. Shearing hazards;

iv. cutting hazards;

v. Impact hazards;

vi. Crushing hazards;

vii. Stabbing and puncturing hazards;

viii. Friction and abrasion hazards;

ix. Hot or cold hazards;

x. Ejection hazards;

xi. Other contact hazards;

xii. Noise hazards; and

xiii. Release of hazardous substances;

(2). Hazards related to the location of the machine or plant, for example:

i. Its stability, for instance, whether it could roll or fall over;

ii. The environment in which it operates; and

iii. Its proximity to other structures; and

(3). Hazards related to systems of work associated with the machine or plant, for example manual handling injuries caused when putting materials into them.

Critically each piece of machinery and plant and the way it is operated was inspected, to identify any parts, processes, operating procedures or workplace activities and any related danger zones, such as moving parts of machinery and plant that may cause harm. Common injuries associated with machines are crushing, cutting, shearing, puncturing, abrasion, burns, tearing, stretching or a combination of two or more of these. Other common injuries include electric shock, hearing loss and ill health from the release of hazardous substances or lack of oxygen.

It was observed that the common situations resulting in injury or harm to people include:

i. Coming into contact or entanglement with parts of a machine or plant, for example a worker being drawn into a machine or item of plant or being drawn into a position where they might sustain further injury;

ii. Being caught between a moving section of machine or plant and the material being used to manufacture a product;

iii. Coming into contact or entanglement with material being used in the machine or plant to manufacture a product;

iv. Being caught between a machine, plant, machine part or plant part and a fixed structure such as a wall, column or fixed machine;

v. Being struck by parts of the machine or plant during its failure or break-up;

vi. Being struck by material ejected from the machine or item of plant; and

vii. Being struck as a result of a release of potential energy in machine components or materials being processed.

viii. Tasks undertaken such as operating, clearing blockages, cleaning, adjusting, setting up, maintaining, repairing or working on a machine or item of plant;

ix. Location such as proximity to other machines and work processes, fixed plant, portable plant and tools;

x. Installation of the machinery or plant so it is safe and has been done correctly;

xi. Production processes such as forming and finishing;

xii. Walkways and pedestrian access in the vicinity of plant, including access for routing operating and Maintenance activities;

xiii. Use of mobile plant;

xiv. Safe transportation of mobile plant; and

xv. If appropriate, individual factors such as age, background and self-management skills of those who might be operating or come into contact with the machinery or plant and levels of instruction, training and supervision that might be required.

STUDY AREA AND METHODOLOGY

3.1 STUDY AREA

The National Centre for Agricultural Mechanization (NCAM) is situated at kilometer 20, along llorin -Lokoja Highway in the ancient and historic city of Ilorin, the capital city of Kwara State, Nigeria. It occupies a land area of about 950 hectares, on longitude 8.3896*N, and latitude 4.6905*E. It lies within the region of tropical climate, and it is characterized by double rainfall maxima, and has tropical wet and dry climate (Olanrewaju, 2009). Relative humidity at Ilorin in the wet season is between 75 to 80% while in dry Season it is about 65%.

3.3 Methodology

3.3.1 Reconnaissance Survey

A reconnaissance survey of the study was carried out, and served as a preliminary assessment visit to the area.

3.3.2 Type of Data

The data types required for this study included:

i. Socio-economic and demographic characteristics of respondents such as age, sex, marital status, level of education and income, occupation etc.
ii. Concept of Disaster preparedness
iii. Information on nature and type of disaster in the study area,

iv. Information on people Vulnerable to Disaster in the study area.

v. Information on the Centre's Clinic on the cases and frequency of hazards injuries, bad accidents, fall from height, and sudden death from/on the course of duty

3.3.3 Sources of Data

The main research tools included the questionnaire and the oral interview.

i. Primary Sources of Data

The main research instrument here was the questionnaire which was administered in the study area. The questionnaire was divided into four sections. The first section dealt with the personal data of respondents. The second section part explored information on the role of traditional leaders on conflict resolution in the area. The questionnaire consists mainly of an open and close-ended questions with options provided to make things easy for respondents. Oral interview was conducted with selected respondents who were unable to fully comprehend and answer the questionnaire provided.

ii. Secondary Sources of Data

The secondary source of data was obtained from existing official and unofficial records both national and international journals, articles, websites, past projects, thesis, publications, textbooks as well as newspapers publications among others.

3.3.4 Sampling Techniques and Sample Size

The sample size was determined based on the population distribution of the staffs of the institutions in the study area which was 362. The researcher decided to use the population of the entire Area, that is the population of the wards and their sampled population respectively. Sample

size could be described as the total number of people selected from the research population in order to serve as respondents to the questions asked by the researcher. A selected sample size of the population is necessary, as it was impossible getting the view of everybody due to time and other unavoidable inherent factors.

To determine the sample size (SS), the Yamane sampling formula for sample size determination shall be used.

$$SS = \frac{N}{1 + N(e)^2}$$

Where SS = sample size

N= total population

e = level of precision at confidence level at 0.05 significance

Therefore SS = $\frac{362}{1 + 362(0.05)^2}$

SS = 199

A total of 200 (Two Hundred Questionnaires) was administered in the study area. Although not systematically defined, this quotation is justified by the size of the sampled population and the need to reach the diverse group of people. This is because of time and financial constraints. However, fair representation of the entire population was put into consideration in the collection of data.

3.3.5 Method of Data Analysis

The data collected through the one hundred seventy two questionnaires that was retrieved from the field was analyzed using descriptive statistics, i.e. the use of simple percentages and for data presentation, frequency tables and charts was employed in order to display the results.

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

Data from the questionnaires are presented in tabular form showing number of respondents, frequencies and percentages of their responses on question earned.

4.2 Bio-data of Respondents

Table 4.1 Distribution of Respondents by: Age Bracket

Response	Frequency	Percentage
18 -29Yrs	30	17.4
30 -39Yrs	39	22.7
40 -49Yrs	71	41.3
50-yrs and above	33	19.2
Total	**172**	**100.0**

Source: Field Work, 2019

As displayed in Table 4.1, 17.4% of the respondents are within the age bracket of 18-29 years, while 22.7% are within ages 30-39 years.71 representing 41,3% falls within the age bracket of 40-49 years and 19.2% are 50 years or above. This shows that the researcher collected data from all categories of population in the local government area, on the role of traditional rulers in conflicts management in the study area. The majority of the respondents ages, range from 30 and above.

Table 4.2: Distribution of respondents by: Gender

Response	Frequency	Percentage
Male	123	71.5
Female	49	28.5
Total	**172**	**100.0**

Source: Field Work, 2019

As can be seen in table 4.3, a total of 71.5% of the respondents are male and the rest 49

representing 28.5% are female. This implies that, most of the respondent chosen, men filled the questionnaires more than their female counterparts.

Table 4.3:Distribution of respondents by: Religion

Response	Frequen	Percentage
Islam	96	55.8
Christianity	76	44.2
Total	**172**	**100.0**

Source: Field Work, 2019

From the responses in table 4.4, 106 representing 55.8%re Muslims, while 44.2% of the respondents are Christians. The data reveals that Muslims have the higher population in the study area.

Table 4.4: Distribution of respondents by: Occupation

Response	Frequency	Percentage
Student	23	13.4
Civil Servant	49	28.5
Business	36	20.9
Farmers	56	32.6
Others	8	4.7
Total	**172**	**100.0**

Source: Fieldwork, 2019

On respondent's occupational status, that is table5.5, total of 13.4% are students and 28.5% are civil servants while 20.9% represent business, 32.6% are farmers and the 4.7% are in other occupation. This shows that most of the respondents are farmers followed by civil servants, businessmen and students. It is important to know that, the study captured every segment of the study population based on the occupation of the respondents.

Table 4.5: Distribution of respondents by: Educational Qualifications

Category	Freque ncy	Percentage

Secondary	53	30.8
Tertiary	104	60.5
Others	15	8.7
Total	**172**	**100.0**

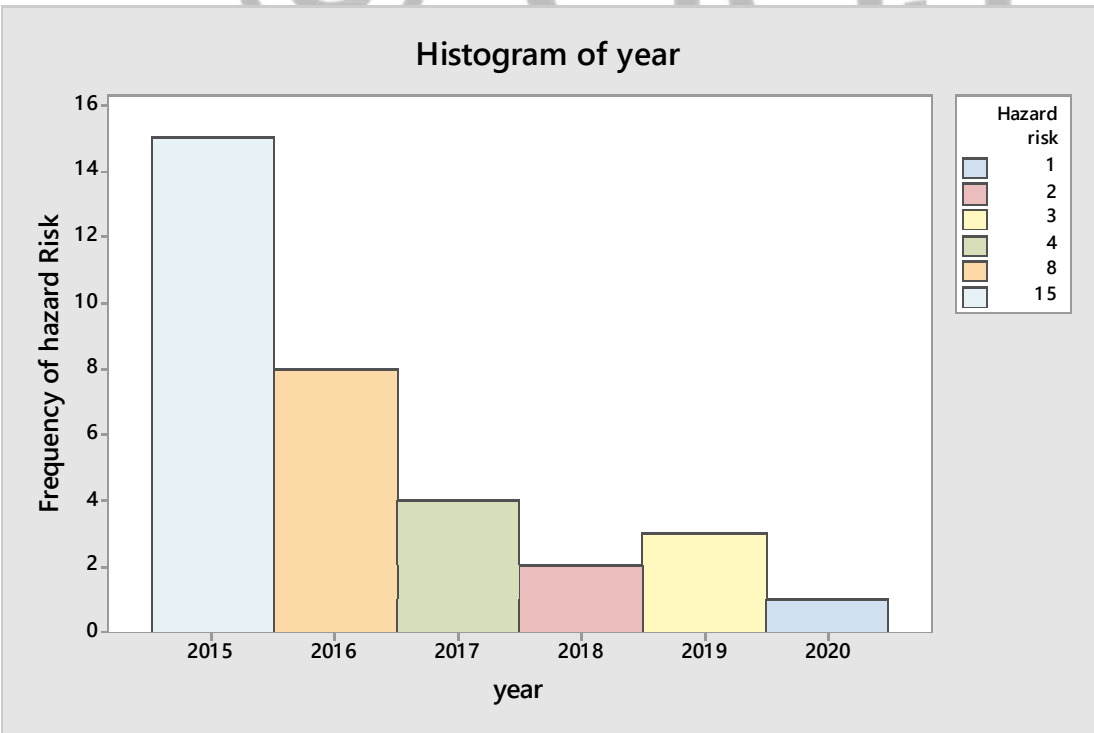
Source: Field Work, 2019

Table 4.6 shows that, a total of 30.8% of the respondents are holders of secondary education while, 60.5% are holders of tertiary education and the rest representing 8.7% are others. It obvious from data majority of respondents attained tertiary education.

4. 2. The Frequency of the Hazard Risk

The frequency of the disaster that occurred in the study area from 2015 to 2020 are presented in figure 4.1, 4.2 and figure 4.3 below:

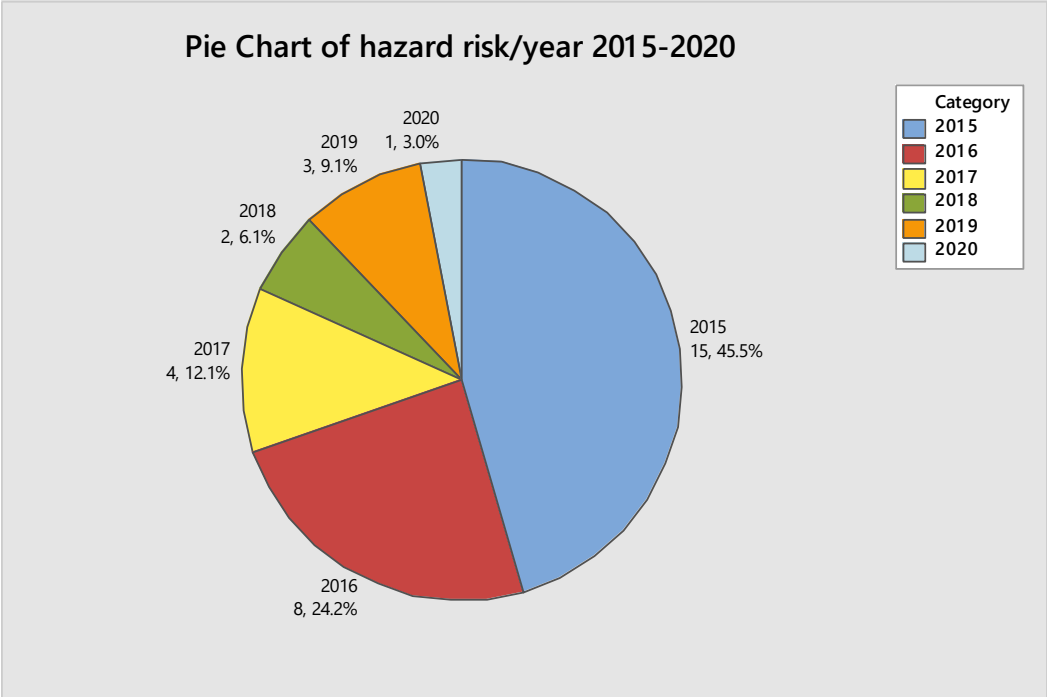
Figure 4.1 Shows the distribution of hazard in frequency



The Frequency of Hazard Risk for Different Years
Source: Author's field work, 2020

Figure 4.1 represents the outcome of hazards risk in terms of frequency. The following hazards: Amputation, trapping, Entangle, shearing, cutting, impact, pinching, stabbing, abrasion, Ejection etc were displayed on a bar chart based on yearly differences in occurrences. However, the chart clearly shows that the frequency of occurrences of hazard risk for 2015 is (15). As the years progresses into 2016 the occurrences of hazards risk dropped to as low as (8). The trend continued to 2017 with a value of (4), 2018 has a value lower than that of 2017 with a value of (2). There was a tremendous fall in the rate of occurrences of hazard risk towards the end of the study period in which 2019 presented a value of (3) and the year with the least hazard risk is 2020 with a lower value of (1)

Figure 4.2: Shows the distribution of hazards in percentage



The Pro452portion of Hazard Risk for Different Years

Source: Author's field work,

Figure 4.2 represents the outcome of hazards risk in terms of percentage.

As shown in figure 4.2 the years with the leading percentage in terms of Hazard risk are 2015 (45.5%). 2016 (24.2%), 2017 (12.1%). The lowest hazard risk in on the yearly analysis are 2018 (6.19%), 2019 (9.1%) and the least being 2020 with (3.0%). This result has clearly shown that within the study period of 2015-2020 he study area experienced variations in hazards risks.

SEASONAL CALENDER SHOWING RESULTS FROM (2015-2020)

Hazard Risk For 2015													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation				**x**									**1**
Trapping				**X**				**x**		**x**			**3**
Entangle		**x**											**1**
Shearing													
Cutting		**x**			**X**					**x**			**3**
Impact			**X**			**X**			**X**				**3**
Pinching													
Stabbing													
Abrasion													
Hot/Cold													
Ejection													
Noise	**X**						**X**		**x**				**3**
Substances													
Fall					**X**								**1**
Total													**15**

4.1 DISCUSSION OF SEASONAL

There was only one record of amputation in six (6) years which was recorded 2015 around April, and 14 others victims of hazard in the same year. The summation of hazard that was recorded of

different victims of hazard risk, amputation during the whole six years covered by the research work was 33. There was a decrease in hazard of operation recorded from 2016 to 2020. This was not un-connected with the increase measure of mitigation and preparedness put in place by the management of the center to increase the capacity of the operators decrease their vulnerability towards hazards.

The peak of hazard recorded was 2015, with 15 victims and it kept on decreasing with the implementation of appropriate measures to 8 victims in 2016, to 4 victims in 2017, to 2 victims in 2018, however 2019 recorded an increase to 3 victims and by 2020, there was only 1 victim of hazard risk recorded in the center.

Hazard Risk 2016													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation													
Trapping				**x**									**1**
Entangle													
Shearing													
Cutting			**x**			**X**							**2**
Impact													
Pinching		**X**							**x**				**2**
Stabbing													
Abrasion													
Hot/ Cold													
Ejection													
Noise					**X**							**x**	**2**
Substances													
Fall										**x**			**1**
Total													**8**

In the second year (2016), there was a decrease in the trend of hazard risk as explain earlier, but trapping occurred in April which could be as a result of the peak of activities and function executed by the type of machine involved, normally trapping occurred in winter and November to January.

The numbers of cutting decrease to 2 victims, pinching also to 2 victims, and there are no victims of entangle, shearing, stabbing, abrasion, or dangerous substances during the year. Certain activity under taking act a particular period of the day, month, or year could responsible for the occurrence of specific type hazard risk.

Hazard Risk For 2017													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation													
Trapping													
Entangle													
Shearing													
Cutting				**x**					**X**				**2**
Impact													
Pinching													
Stabbing													
Abrasion													
Hot/Cold													
Ejection				**x**									**1**
Noise							**X**						**1**
Substances													
Fall													
Total													**4**

This 2017 comparatively with the previous year recorded less victims of hazard (4). Source during the interview explained that, there was an intensive training on the general conduct of work shop and machine operations.

There was no victims of fall from height during operation, no stabbing, impact, and ejection from the machines nor was pinching also recorded through the whole year. Upon enquiry, it gathered that, the training that was conducted coupled with strike supervision was responsible.

Hazard Risk For 2018													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation													
Trapping													
Entangle													
Shearing													
Cutting								**x**					**1**
Impact							**X**						**1**
Cutting													
Stabbing													
Abrasion													
Hot/Cold													
Ejection													
Noise													
Substances													
Fall													
Total													**2**

By the year 2018, the Centre almost celebrate a free hazard year in the workshop, were it for the victim of impact and cutting in the months of July and August respectively.

There were no victims of coming in contact with cold or hot substances, irrespective of the none stop yearly event.

Hazard Risk For 2019													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation													
Trapping													
Entangle													
Shearing													
Cutting							**X**						**1**
Impact													
Pinching				**X**									**1**
Stabbing													
Abrasion													
Hot/ Cold													
Ejection													
Noise													
Substances													
Fall								**x**					**1**
Total													**3**

The trend of hazard in the year 2019 changed due to the introduction of additional machine unfamiliar to the industrial attachment operators, imagine in one single machine pinching victim in April, cutting victim in July and another hazardous victim of fall from height in August.

Hazard Risk For 2020													
Hazards	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Amputation													
Trapping													

Entangle													
Shearing													
Cutting							**X**						**1**
Impact													
Pinching													
Stabbing													
Abrasion													
Hot/Cold													
Ejection													
Noise													
Substances													
Fall													
Total													**1**

At the end of the research year 2020, there was a victim of mild cutting which was treated at the Centres Clinic as usual, nevertheless the Centre celebrates minimal hazard victims year.

VULNERABLE PEOPLE TO HAZARD (2015 to 2020)													
Hazards	**O**	**SP**	**SS**	**JS**	**IT**	**CP**	**AD**	**HOD**	**DR**	**MS**	**CS**	**SC**	**Remark**
Amputation				**X**									
Trapping	**X**												
Entangle	**X**												
Shearing													
Cutting	**X**				**X**								
Impact													
Pinching	**X**												

Stabbing													
Abrasion													
Hot/Cold													
Ejection													
Noise	**X**												
Substances													
Fall	**X**												
Total													**8**

KEY

O =operators **AD =admin officer**

SP =supervisors **HOD =head of dept.**

SS =senior staff **DR =driver**

JS =junior staff **MS =messengers**

IT =industrial attaché **CS = casual staff**

CP = NYSC **SC =secretary**

4. 2 DISCUSSION OF VULNERABILITY

There is only one record of amputation in six (6) years which was recorded 2015 around April, and 14 others victims of hazard in the same year, among which 7 victims are operators. There are 32 different victims of hazard risk and one amputation junior staff during the whole six years of the research work.

There was a decrease in hazard of operation recorded from 2016 to 2020. This was not un connected with the increase measure of mitigation and preparedness adopted. The management of the center adheres to the principles of OHS, which implies at increase the capacity of the operators decrease their vulnerability towards hazards.

The peak of hazard recorded was 2015, with 15 victims and among which 14 are operators, it kept on decreasing with the implementation of appropriate measures to 8 victims in 2016, (7) operators one industrial attaché, to 4 victims in 2017 all of which are operators, to 2 victims in 2018, with same trend. However 2019 recorded an increase to 3 victims and by 2020, there was only 1 victim of hazard risk recorded in the Centre.

SUMAMARY, CONCLUSSION AND RECOMMENDATION

5.1 Summary

The world concurrently is facing challenge of disasters, and is increasing in number, frequency and severity. Due to escalation of hazards, particularly droughts, floods industrial, technological and geological, such as earthquakes, landslides and cyclones, these hazards are predicted to increase with the negative impacts of climate change, which will worsen the incidence of associated disasters in the African region. The Conceptual Framework of Disaster Risk Management (DRM) and Disaster Risk Reduction (DRR) aimed at minimizing vulnerabilities of disaster risks throughout a society, to avoid (prevention) or limit (mitigation and preparedness) the adverse impacts of hazards within the context of sustainable development. (ISDR)

This project highlight the result of a research conducted in National Center for Agricultural Mechanization (NCAM) Ilorin Nigeria on the topic “An Assessment of HAZARDS AND ITS CONSTRAINT TO WORK EFFICENCY in Disaster Risk Management in Mechanized Agricultural Institution Ilorin Nigeria.

A reconnaissance’s survey was conducted within the centre in two main departments, which is the Centre’s fabrication hub, namely (ESS) Engineering & science Services Department, And (FP&M) Farm Power and Machinery Department’s workshop. Interview was conducted in the Centres Clinic, questioner distributed and data obtained covers the period of six years (2015 - 2020) were analysed. From the analysis, the peak of hazard recorded was 2015, with 15 victims

and it kept on decreasing with the implementation of appropriate preparedness measures to 8 victims in 2016, to 4 victims in 2017, to 2 victims in 2018, however 2019 recorded an increase to 3 victims and by 2020, there was only 1 victim of hazard risk recorded in the centre. The result were further analysed through pie-chart, showing percentage in terms of Hazard risk with 2015 having the highest percentage of (45.5%). 2016 (24.2%), 2017 (12.1%). The lowest hazard risk on the yearly analysis are 2018 (6.19%), 2019 (9.1%) and the least being 2020 with (3.0%). This result has clearly shown that within 2015-2020 the study area experienced decreasing pattern variations in hazards.

Conclusively, from the data collected analysis conducted IN NCAM Ilorin *very few staff is affected which shows efficiency of work is not perturb AND* high degree level of preparedness achieved through the use of hierarchy of control and administrative measure. The researcher further recommended that, 'hierarchy of control' in combination with, • elimination; • substitution; • isolation; • engineering controls; • administrative controls, should be fully implemented to totally eliminate hazard risk in the Centre etc.

5.2 Conclusion

From the research work, it was observed thru source of data collected analysis conducted, that in NCAM Ilorin efficiency of work is not affected by hazard due to high degree level of preparedness achieved through the use of hierarchy of control and administrative measure

5.3 Recommendation

When considering risk control, there is some recommended order of control measures needed to be implemented, ranging from the most effective to the least effective, to eliminate or reduce the risks of injury or harm.

i. The researcher recommended that, 'hierarchy of control' in combination with, elimination; substitution; isolation, engineering controls; administrative controls, should be fully implemented to totally eliminate hazard risk in the Centre.

ii. Raised awareness of disaster management and helped the staff to develop disaster mitigation, preparedness, and response plans in the institution.

iii. Special attention must be given hazards such as Sharp related injuries, psychological trauma as they are the common hazards suffered by workers of the institutions.

iv. Attention should be given to the provision and usage of standard universal precautions and preventive barriers in the workplace as the absence of these and their usage are responsible for the prevalence of hazards in the Mechanized Agricultural Institution.

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The use of machinery in a workplace exposes workers, hazards. CSA standard Z432-16 defines machinery.

This OSH Answer fact sheet is based on CSA standard Z432-16 Safeguarding of machinery.

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