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OCCUPATIONAL SAFETY AND HEALTH HAZARDS IN MECHANIZED PADDY RICE PRODUCTION: EVIDENCE FROM IBAJI, KOGI STATE, NIGERIA.

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Abstract

Farm work related injuries resulting from poor implementation, practicing and monitoring of health and safety policy (HSP) on mechanized agricultural farms had overtime impeded the productive efficiency of concerned workers. These among other factors, affects farmers' agricultural productivity negatively. It was in accordance to these perspectives that safety hazards (SH) associated with mechanized paddy rice production by farmers in Ibaji agro communities was studied. 120 respondent-paddy rice farmers were chosen at random, questionnaires on SH and physical interview were adopted for data collation purpose. The research revealed the male gender populated farmers of about 61.7%. Poor occupational safety culture was recorded only for agrochemical handling operations. This was characterized by low hazard awareness – 12.7%, safety training - 16.7%, literacy levels - 23%, use of personal protective equipment (PPE) - 13.7%, low SH policies implementation and monitoring of about 19% and 24% respectively. These consequently resulted to about 90% of SH accident incidences recorded annually among the farmers. 85% of these incidences were attributed agrochemical attack resulting to burns, while 67% were of chronic obstructive pulmonary diseases (COPD). Farm machinery and equipment (FM&E) operations recorded high safety culture compliance measures as shown in figure 2; resulting to only 19% of accident incidences. These incidences stemmed from SH were observed to be affiliated with mechanized operation adopted by the paddy rice farmers in their farming operations.

Keywords: Farmers, Occupational Safety, Health hazards, Paddy rice, Production and Ibaji

1. Introduction

Paddy rice operations and associated safety concerns

Numerous issues pose a threat to the Nigerian green revolution implementation towards paddy rice sustainable production (Ngigi, 2024). The immediate impacts of these issues on the sustenance of paddy rice security are worsened with high SH mitigating it mechanized productivity. Among the Nigerian paddy rice farmers, over 5,000 SH accident incidences of casualties occurs annually resulting to two to three days' absenteeism from farm work place (Olowogbon, et al., 2023). Paddy rice production encompasses farming operations ranging

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from nursery, transplanting and direct seedbed planting, crop protection practices, harvesting and post harvesting operations (ILO-OSH, 2010). Its operations employ huge labour force that has recorded worst SH casualties (McKnight and Melvin 2010).

According to Muilerman, S. (2013), increasing SH accident incidences and death occurrences in agriculture operations among emerging nations is worrisome. Next to the construction sector, the agro production sector holds high work fatalities incidences for ill-health and accident injuries for occupational health and safety (OHS). These casualties were stemmed from integrated mechanized operations endangering farmers' safety owing to high exposure risk equaling to or surpassing those of the mining and construction industries. Frequent utilization of agrochemicals against plant pest, disease and soil nourishment and the use of machines are two significant 21st century developments that has influenced SH risk affiliated to paddy rice farming activities in the view of increasing productivity outputs (McKnight and Melvin, 2010).

Paddy rice farmers' hazards exposure

Farmers' exposure to these SH risks had overtime resulted to casualties ranging from musculoskeletal disorders from poor ergonomically designed farm machinery and faulty ones where designs were initially right. More so, dusts emanating from farm machinery operations effects had given rise to diseases like byssinosis, asthma, pneumonitis and non-specific chronic obstructive pulmonary diseases (COPD). These occurrences had placed serious SH concerns on paddy rice farming operations with respect to its food security (Chris, 2008). SH accident incidences reduced productivity, hinders farmers' efficiency and lowers farm production output. Increased farm productivity and efficiency can be achieved through efficient HSP implementation. This has been connected to favourable performance metrics (Smallman and John, 2001). For the Nigerian paddy rice production sector to meet its food safety goals through productivity, farm work safety (FWS) is consequently a key concern. As paddy rice farming technology advances, there is an increasing health risk from farmers who use hazardous and unsophisticated methods and have little or no understanding of agricultural FWS thereby, putting millions of farmers at risk of injuries sufferings and most likely dying (Mostafa, 2023).

Hazards mitigating paddy rice mechanization in Ibaji

Paddy rice farming operations in Ibaji is moderately mechanized using variety of agricultural machines and equipment extensively both indoors and outdoors in a range of climates. Farming operations could be dangerous due to unsafe and reactive attitudes regarding accidents occurrences and associated injuries. The main causes of illness and accidents among these farmers are:

- Operating heavy machinery and its requisite equipment;
- Being exposed too high levels of noises and vibrations;
- Slipping and tripping
- Heavy weight lifting and other tasks that can lead to musculoskeletal conditions
- Contact with dust, agrochemicals, organic materials and pathogenic agents.
- Being exposed to high temperatures and bad weather around the farm vicinity.

Research aim and scope:

This research finding is aimed at investigating safety hazards associated with farm

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machinery operations in mechanized paddy rice production among farmers within Ibaji agro-community.

2. Methodology

Ibaji is an agrarian local government area with an approximated 1,377 km² landmass in the southern region of Kogi state at 6°52'N 6°48'E geographically; bordered with Anambra and Edo states respectively with an estimated population of about 128,129 (<http://www.en.wikipedia.org/wiki/ibaji>; 2026).

A multi stage random sampling technique was employed. In the first stage, four (4) major rice producing communities within Ibaji were purposively selected based on the concentration of mechanized rice farming activity. In the second stage, a simple random sampling technique was used to select individual farmer respondents from the list of mechanized rice farmers obtained from the local Agricultural Development Programme (ADP) office and farmer cooperative groups. A total sample size of 120 mechanized paddy rice farmers was drawn, proportionately distributed across the four selected communities. Farmers' demography, interviews, structured questionnaire on SH was utilized for primary data collation purposes; while, related online research publications and studies were adopted as secondary data collation source.

For data analysis purpose, basic statistics like mean, mode and Likert scaling were employed.

3. Results

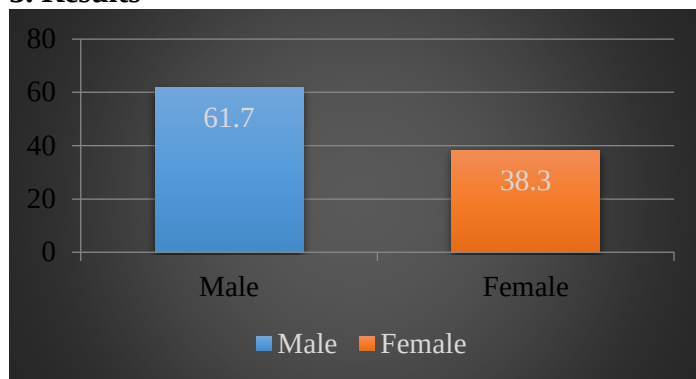


Figure 1 Paddy rice farmers Demography



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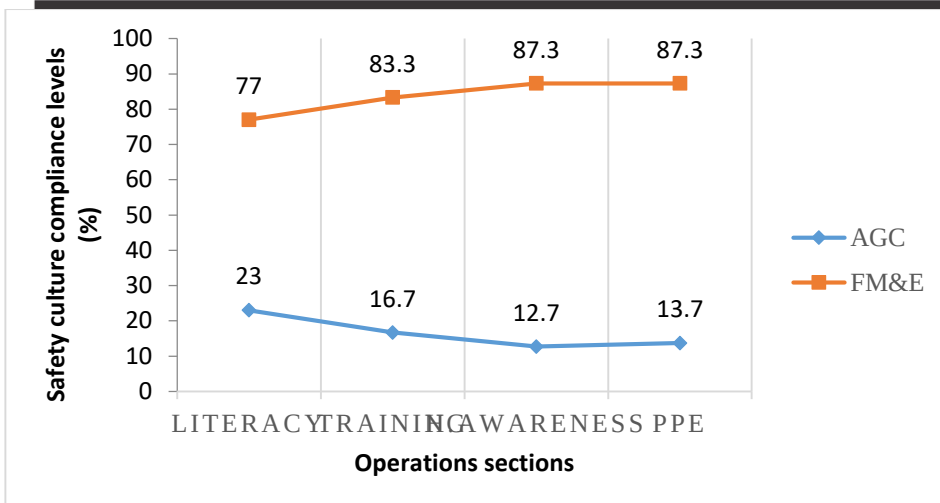


Figure 2. Farm work safety culture

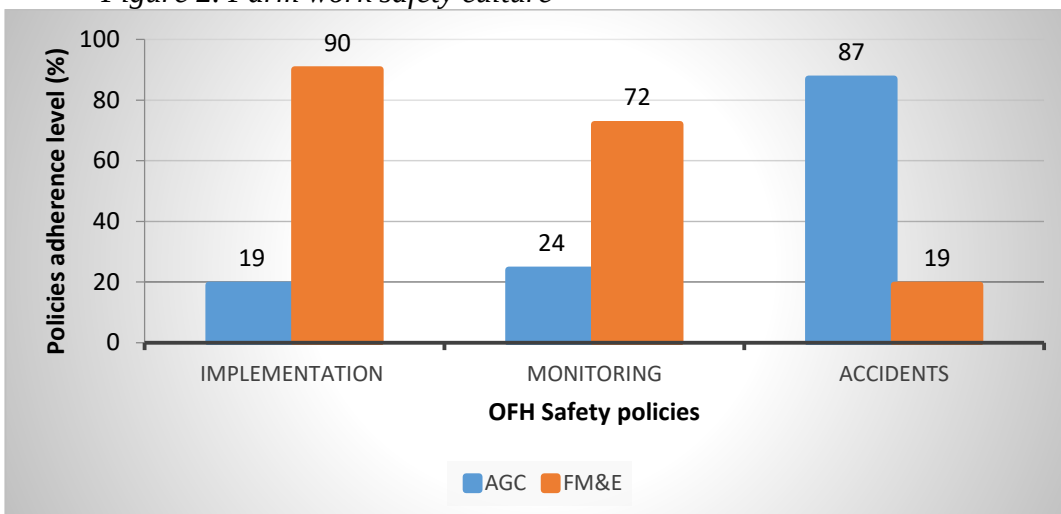


Figure 3. SH safety policies

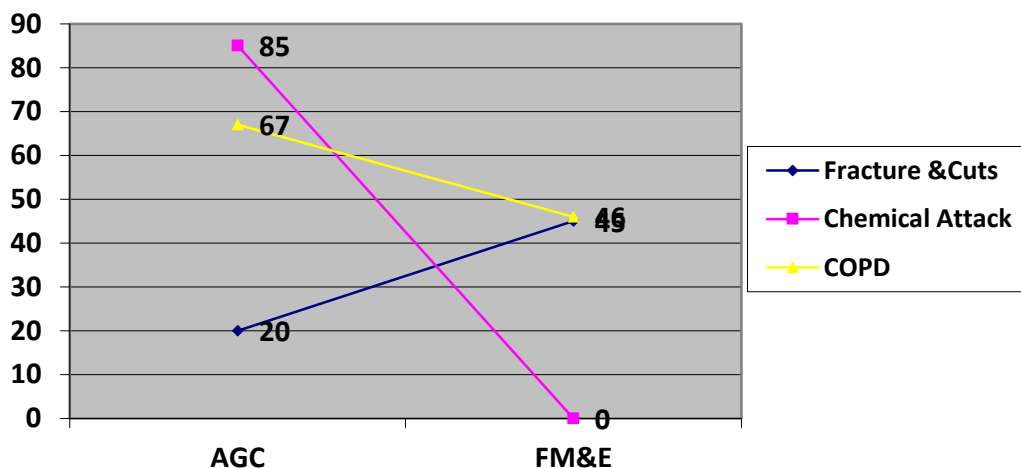


Figure 4 Occupational Farm Hazard Accidents

4. Discussions

FM&E and AGC represented farm machine and equipment and agro-chemical sections respectively.

Figure 1 revealed 62 % and 38 % respondent farmers population under this research study were male and female respectively. It is a male gender dominant farming population with ages ranging from 25 to 55 years respectively.

According to figure 2, safety culture compliance level recorded for agrochemical operations such as the use of personal protective equipment (PPE), agro-chemical hazards awareness, safety trainings and farmers literacy on farm work safety culture were: 13.7%, 12.7%, 16.7% and 23% respectively. Farmers' under this research survey had basic formal education with no professional safety trainings on handling and application of agrochemicals even though they had good instinct of severe dangers these agrochemicals exhibits. These resultant effects of these poor safety culture factors were high accident incidences of about 85% agrochemical attack and 67% related to chronic obstructive pulmonary diseases (COPD) recorded according to figure 4. Also, according to figure 3, agrochemical SH safety policy implementation and monitoring levels were rated very low at 19% and 24% respectively resulting in about 97% of overall accident incidences recorded during operation.

According to Muilerman, S. (2013), due to the agriculture industry's pervasive underreporting of fatalities, injuries, and occupational illnesses, official data may not accurately reflect the true state of SH concerns for paddy rice farmers.

According to figure 2, high safety culture compliance levels were recorded; 87.3% for PPE utilization during FM&E operations, fracture, 87.3% of farmers had cuts and laceration hazards awareness, 83% had safety trainings on the use of applicable farm machinery and equipment, and 77% of farmers' were literates on safe FM&E operations and their relevant applications. Farmers under this survey had good literacy level on the operations and the use of PPE for various FM&E that were utilized for their farming operations. More so, they had

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adequate SH awareness, professional technical and operational procedural trainings for these FM&E.

According to figure 3, SH safety policy implementation and monitoring levels were rated high at 90% and 72% respectively.

According to figure 4, only 45% accident incidences were recorded for bone fracture from impact, cuts and lacerations from sharp cutting edges among operators of these FM&E; while only 46% of COPD accident incidences were recorded owing to dusts and carbon mono-oxide fumes from operated FM&E. The overall accident incidence recorded was 19% compared to agrochemical operations according to figure 3.

Paddy rice farmers are involved in around half of the over 300,000 SH related casualties that occur globally each year from agrochemical and FM&E (ILO, 2011).

5. Conclusion and Recommendations

It is impossible to overstate how crucial paddy rice farmers' health and safety is to the Nigeria rice production output and its contribution to national food security. Since paddy rice's mechanized productivity output is dependent on human capital well-being, investing in OHS trainings, implementation and monitoring as a proactive measure to mitigate SH for agrochemical operations becomes of necessity gains than being reactive to it unhealthy and unsafe casualties.

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