ASSESSMENT OF OCCUPATIONAL HAZARDS AMONG CASSAVA PROCESSORS IN IFO LGA OF OGUN STATE, NIGERIA

Ewebiyi, I. O[1.,] Odunuga, A. O[2.,] Fowomola, T. D[3]
1, 3 Department of Agricultural Science,
1,3 Tai Solarin University of Education, Ijagun, Ogun State, Nigeria.
E-mail: tayoewebiyi@yahoo.com
Phone No: +2348055210068
2 Department of Agricultural Extension and Rural Development,
University of Ibadan, Ibadan, Oyo State, Nigeria.
Corresponding E-mail: azeezodunuga@gmail.com
Phone No: +2348131917077

Abstract

Occupational hazard in work place or environment has gained attention among scholars and researchers with its consequential effects on health and low productivity. Thus, the study therefore assessed the occupational hazards among cassava processors in Ifo LGA of Ogun State, Nigeria. The sample comprises of cassava processors who produce either for commercial or home purposes. Questionnaire was administered to one hundred and twenty-five respondents to obtain primary data and data was analysed using descriptive and inferential statistical tools. Result shows that most of the respondents had mean age of 50 years, majority (72.0%) of the respondents were female, majority (91.2%) of the respondents were married, majority (78.4%) of the respondents had no formal education, majority had mean household size of 6 persons, majority had mean monthly income of ₦29, 080, majority had mean years of processing experience of 13 years, 40.0% of the respondents used self-labour for their processing activities, 44.8% used personal savings for their processing activities, majority (58.4%) of the respondents engaged in trading as their secondary occupation and most of the respondents earned mean monthly income of ₦14,000 from their secondary occupation. Most of the respondents were engaged in garri processing (2.00). Most of the respondents were faced with fatigue as a result of strenuous nature of processing (2.34). Majority (60.8%) of the respondents felt high level of occupational hazards. A significant relationship between types of occupational hazards associated with cassava processing (r=0.438, p=0.002) and level of occupational hazards on cassava processing. The study therefore conclude that the level of occupational hazards was high (60.8%) among the respondents. It is therefore recommended that most of the respondents should be trained and supported on the use of health friendly processing techniques in the study area.

Keywords: Assessment, occupational hazards, cassava processors, processing activities

Introduction

Agriculture employs about two-third of Nigeria's total labour force, contributed 42.2% of Gross Domestic Products (GDP) and provides 88% of non-oil earnings (Yakubu and Akanegbu, 2015).

The contribution to agricultural GDP is in the following proportion; crops (85%), livestock (19%), fisheries (4%) and forestry (1%). Also, more than 90% of the agricultural output is accounted for by small-scale farmers with less than two (2) hectares under cropping (World Bank, 2015). Among the crops that contribute to 85 per cent of Nigeria's GDP, cassava (Manihot spp.) is recognized together with yams, rice, maize, sorghum, and millet as the main staple food crops in Nigeria.

Cassava (*Manihot esculenta* Crantz) is a perennial vegetative propagated shrub grown throughout the lowland tropics for its starchy, thickened roots. Global production of cassava amounted to about 278 million metric tons in 2018 out of which Africa's share was put at about 61% (FAOSTAT, 2020). The world's cassava production has been on the increase from about 240 million metric tons from the year 2010. In the same period, Nigeria alone produced about 42.5 million metric tons which is estimated to be about 18% of total global production. Nigeria's share of world production had risen to 21.5% of world production by 2018. FAO projects that by the year 2025, about 62% of global cassava production will be from sub-Saharan Africa (FAOSTAT, 2020).

Cassava is an important staple crop in sub-Saharan Africa (SSA). It is Africa's second most important food staple in terms of calories consumed per capita and a major source of calories for roughly two out of every five Africans (Rosenthal and Ort, 2012).

The growth in cassava production in Nigeria has been primarily due to a number of factors: rapid population growth, large internal market demand complemented by the availability of high yielding improved varieties of cassava. Other factors include a relatively well-developed market access infrastructure, the existence of improved processing technology and a well-organized internal market structure (Nigerian Federal Department of Agriculture, 2007).

The majority (88%) of cassava produced in Africa is used for human food, with over 50% used in the form of processed products (Oyewole and Eforuoku, 2019). Other uses in animal feed and for industrial purposes (starch, ethanol) are as yet very minor. Although the crop is considered as a staple in many countries, this situation is changing in some countries where cassava is now an industrial and cash crop (Reincke, Vilvert, Fasse, Graef, Sieber and Lana, 2018).

Cassava is produced largely by small-scale farmers using rudimentary implements. The average landholding is less than two hectares and for most farmers, land and family

labour remain the essential inputs. Land is held on a communal basis, inherited or rented; cases of outright purchase of land are rare. Capital is a major limitation in cassava production in the southwest Nigeria; only few farmers have access to rural credit (Oguntuase, Adebowale and Sanni, 2015).

As a food crop, cassava has some inherent characteristics which make it attractive, especially to the smallholder farmers in the south-west of Nigeria. First, it is rich in carbohydrates especially starch and consequently has a multiplicity of end uses. Secondly, it is available all year round, making it preferable to other, more seasonal crops such as grains, peas and beans and other crops for food security. Compared to grains, cassava is more tolerant of low soil fertility and more resistant to drought, pests and diseases. Cassava is usually consumed in processed forms. Cassava processing by traditional methods is labour-intensive but the increasing application of improved processing technology has reduced processing time and labour and encouraged increased production. Industrial utilization of cassava products is increasing but still accounts for less than 5% of the total production (Shittu, Alimi, Wahab, Sanni and Abass, 2016). Any excess cassava is either processed on the farm or sold to local processors. The average production figures per hectare in Nigeria were 10.5 MT/ha in the early 1970s, 11.5 million MT/ha in the 1980s, 10.5 million MT/ha by the end of 1980s, and 11.5 million MT/ha in the 1990s and up to 17.3 million MT/ha in 2004 (Igberi and Awoke, 2013, Ashaye, Adeyi, Willoughby, Ola and Ayodele, 2018). According to FAO estimates, Nigeria generally produces about 50 million MT annually from a cultivated area of about 3.7 million ha.

However, the processing of cassava into various products comes with a lot of environmental as well as occupational health hazards to the environment, consumers and especially the processors (Koledoye, Deji, Owombo and Toromade, 2012). Cassava processing entails numerous steps which include harvesting, peeling, grating, dewatering, fermentation, roasting or drying and finally packaging for sales (Abass e*t al*, 2012). Reportedly, the most widely adopted method (traditional method) of cassava processing has led to various pathological issues ranging from general body aches, pains and fatigue, and high body temperature due to exposure to smoke in the roasting environment. Thus, processing of cassava has its occupational health hazards and must be given high consideration as cassava products is inseparable from man and animals especially in the developing countries where it is the cheapest staple food used to combat hunger. The study by Adedeji, Olopade, Farayola and Adejuwon (2011) reported various occupational hazards in cassava processing to include; physical/environmental hazards such as excessive noise from machines that can cause permanent noise-induced hearing loss or deafness; excessive cold that could lead to hypothermia, frostbite and chilblains

and excessive heat which could generate heat cramps, heat exhaustion, heat stroke and heat dermatomes Adedeji, Olopade, Farayola and Adejuwon (2011).

Furthermore, Akangbe and Komolafe (2015), opined that occupational hazard comprises of cuts or injury sustained from farm tools, malaria due to mosquito bite, and general body pain which reduces productive activities. He further reported that vibration from machines could lead to hand-arm vibration syndrome (HAVS), which are more prevalent among farm workers.

Objectives of the study

The main objective of this study was to assess the level of occupational hazards among cassava processors in Ifo LGA of Ogun State, Nigeria while the specific objectives are to:

1. Identify the socio-economic characteristics of the respondents in the study area.
2. Identify the general processing activities of cassava processing in the study area.
3. Identify occupational hazards associated with cassava processing in the study area.

Hypothesis: There is no significant relationship between types of occupational hazards associated with cassava processing and level of occupational hazards on cassava processing.

Methodology

The study was carried out in Ifo LGA of Ogun State, Nigeria. The target population consisted of cassava processors in the study area. Multistage sampling technique was used to select 125 respondents that were involved in the study. Data were collected using a structured questionnaire administered in the form of interview to elicit information from the respondents.

Respondents were asked to indicate the occupational hazards they encounter during processing activities among the list of options presented to them such as inhaling of smoke while frying garri, fatigue as a result of strenuous nature of processing, joint pain while stirring/pounding fufu, eye irritation due to smoking during garri processing, body exposure to excessive heat while frying or cooking cassava and cuts while peeling cassava among others. This was measured using a 3-point scale of always, rarely and never. Score of 2, 1 and 0 was assigned respectively. Mean of each occupational hazard was found and was used to rank them based on occurrence.

The dependent variable for the study was level of occupational hazard among cassava processors in the study area. Respondents were asked to respond to list of occupational hazards associated with cassava processing such as itching, body pain, body heat,

hearing problem, headache, stings from insects, eye irritation, cut from processing tools, burning and how often they expose to these hazards, using a-three-point scale of frequently, occasionally and not at all with scores of 2, 1 and 0 respectively. Total score of the respondents was calculated and mean score was also calculated. On the basis of mean score, respondents' level of occupational hazard was determined using below and above mean criterion. Respondents whose scores fall below the mean score are categorized as having low level of occupational hazard while those scores fall on mean and above are categorized as high level of occupational hazard.

Both descriptive (mean, frequencies and percentages) and inferential (Chi-square and Pearson Product Moment Correlation) statistical tools was used to analyse the data for this study.

Results and Discussion

Socio-economic characteristics of the respondents

Result of age on Table 1 shows that 34.4% of the respondents were within the age range of 48 to 52 years, 28.8% were within the ages of 53 to 57 years, 24.0% were within the ages of 43 to 47 years. Also, same proportion of the respondents was within the ages of 38 to 42 years and 58 to 62 years of age. The mean age of 50 years implies that most of the respondents were still in their productive active years and this could influence their active involvement in cassava processing. This implies that on the average, the respondents are in their active years and are expected to be actively involved in farming and processing activities as reported by Onasanya (2009) in a study that farmers in the age range participated actively in production and processing of agricultural products. This finding is also in accordance with the findings of Enimu, Igiri and Oduma, (2015) who found out active age group in their study that could easily be engaged in field crop production to cater for their needs and that of their families. Result of sex on Table 1 shows that majority (72.0%) of the respondents were female while 28.0% of the respondents were male. This implies that more female were involved in cassava processing in the study area than the male. This finding agrees with Ndubueze-Ogaraku and Edema (2015) which found that about 78.6 percent of cassava processors are female, as processing of agricultural products is generally seen as a female job. This could be explained by the role played by women in farming families as the principal producers in its subsistence agricultural production especially in developing countries. They are also the prime producers of staple food in most Africa countries. Result on marital status on Table 1 reveals that majority (91.2%) of the respondents were married, 8.0 divorced while 0.8% were widow. This result implies and shows more involvement of married women in cassava processing in the study area. The study also agrees with the findings of Korir (2011) which showed that married individuals participated actively in

agricultural production. This is also supported by the findings of Enimu, Edet, and Ofem, (2016) who found more married women in their study suggesting the chances of getting family labour in abundance for use in their production activities. Table 1 further reveals that majority (78.4%) of the respondents had no formal education, 20.0% had primary education while 1.6% had secondary education. The result shows that majority of the respondents had low level of education. This implies that majority of the respondents are illiterate and this could affect their understanding of the occupational hazards and adopt a better safety measures to reduce its effect. This negates the findings of Khonje, Mkandawire, Manda and Alene (2015) who found out that education not only facilitates adoption of new measures but also enhances productivity, especially among adopters of improved technology among processors. Result of household size on Table 1 shows that majority (60.0%) of the respondents had between 6 to 7 persons in their household. Also, 28.0% had between 7 to 8 persons, 11.2% had between 3 to 4 persons while 0.8% had between 9 to 10 persons in their households. The mean household size of 6 persons implies that most of the respondents had fairly large household size. This implies that cassava farmer had an average of 6 persons in their households. This likely due to the fact that agriculture is generally a labour-intensive venture hence do encourage large family size which is usually used as source of labour especially in crop farming. This corroborates with the findings of Nwaiwu, Ohajiaya; Orebiyi, Obasi, Lemchi, Ibekwe, Onyeagocha, Ukoha, Osuji, and Kadiri (2012) that most farmers had large household size used for farm labour. This means that, the bigger the size of the family in a household the higher the chances of adopting safety measures to increase production. Result of monthly income on Table 1 shows that majority (60.0%) of the respondents earned between ₦20, 000 to ₦40, 000 monthly. Also, 31.2% earned less than ₦20, 000 monthly, 8.0% earned between ₦40, 001 to ₦60, 000 while 0.8% earned above ₦60, 000 monthly. The mean monthly income of ₦29, 080 implies that most of the respondents were earning low income monthly. This is in line with Oyewole and Oforuoku, (2019) who found out that low income of farmers in their study. Result of years of processing on Table 1 shows that 46.4% of the respondents had between 7 to 10 years of processing experience, 22.4% had between 15 to 18 years of processing experience, 16.0% had between 19 to 22 years of processing experience. Also, 13.6% had between 11 to 14 years of processing experience while 1.6% of the respondents had between 23 to 26 years of processing experience. The mean years of processing experience of 13 years shows that most of the respondents were experienced in cassava processing. This result corroborated the findings of Ayinde and Oyesola (2014) that farming experience affects farm managerial know how and decision-making process of farmers. This means that an experienced farmer will most likely identify the occupational hazards relative to cassava processing over a period of time. Result of source of labour on Table 1 shows that 40.0% of the respondents used self-labour for their processing activities, 31.2% used family labour,

24.8% used hired labour while 4.0% used hired and self-labour. This could mean because most of the respondents had more persons in their households that may likely be used as source of labour in their processing activities. Result of source of credit on Table 1 shows that 44.8% used personal savings for their processing activities, 36.0% sourced credit from cooperative and 12.0% sourced credit from family and friends. Also, 6.4% sourced credit from cooperative and used their personal savings while 0.8% sourced credit from bank. This implies that majority of the respondents make use of their personal money especially the profit made from their enterprise to finance the next seasonal cultivation which may be due to lack of collateral in obtaining loan from banks in the study area as this is supported by the findings of Ayinde and Oyesola (2015) who found similar result in their study

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage	Mean	SD
Age			50	5
38-42	8	6.4		
43-47	30	24.0		
48-52	43	34.4		
53-57	36	28.8		
58-62	8	6.4		
Sex				
Male	35	28.0		
Female	90	72.0		
Marital status				
Married	114	91.2		
Divorced	10	8.0		
Widow	1	0.8		
Education				
No formal education	98	78.4		
Primary education	25	20.0		
Secondary education	2	1.6		

Household size			6	2
3-4	14	11.2		
5-6	75	60.0		
7-8	35	28.0		
9-10	1	0.8		
Monthly income (₦)			29,080	20,000
Less than 20,000	39	31.2		
20,000-40,000	75	60.0		
40,001-60,000	10	8.0		
Above 60,000	1	0.8		
Years of processing experience			13	4
7-10	58	46.4		
11-14	17	13.6		
15-18	28	22.4		
19-22	20	16.0		
23-26	2	1.6		
Source of labour				
Family	39	31.2		
Hired	31	24.8		
Self	50	40.0		
Hired and self	5	4.0		
Source of credit				

Bank	1	0.8
Cooperative	45	36.0
Friends/family	15	12.0
Personal savings	56	44.8
Cooperative and personal savings	8	6.4

Source: Field survey, 2020

General processing activities of cassava processing

Result of general processing activities of cassava processing in Table 2 reveals that most of the respondents engaged in garri processing (2.00). This is in tandem with the findings of Ola and Adedayo (2020) who found out majority of the respondents in their study engaging in garri production. This is followed by cassava flour processing (1.97) and fufu processing (1.97). However, the least processing activities involved by the respondents were tapioca processing (0.20) and abacha processing (0.19).

Table 2: General processing activities of cassava processing

Processing activities	Regularly	Occasionally	Never	Mean	Rank
Garri processing	125 (100.0)	0 (0.0)	0 (0.0)	2.00	1st
Fufu processing	121 (96.8)	2 (1.6)	1 (1.6)	1.95	3rd
Starch processing	13 (10.4)	21 (16.8)	91 (72.8)	0.37	4th
Abacha processing	1 (0.8)	22 (17.6)	102 (81.6)	0.19	6th
Cassava flour processing	123 (98.4)	1 (0.8)	1 (0.8)	1.97	2nd
Tapioca processing	3 (2.4)	19 (15.2)	103 (82.4)	0.20	5th

Source: Field survey, 2020

Occupational hazards associated with cassava processing

Result of occupational hazards associated with cassava processing on Table 3 shows that most of the respondents were faced with fatigue as a result of strenuous nature of processing (2.34). This is followed headache due to strenuous work while processing (1.85), inhaling of smoke while frying garri (1.72), joint pain while stirring/pounding fufu (1.64), body exposure to excessive heat while frying or cooking cassava (1.60), cuts while peeling cassava (1.31) and insect bite while processing cassava (1.24). This is in accordance with the findings of Adepoju, Oladeebo and Toromade (2019) who found majority of the respondents in their study (98.15%, 94.88% and 94.42%) claimed to be faced often with problems of fatigue, headache, inhalation of smoke while frying garri, cuts. However, exposure to the hazardous cyanide content during dewatering of cassava (1.03) and sustained injury while transporting Cassava to the processing unit (1.02).

Table 3: Occupational hazards associated with cassava processing

Occupational hazards	Always	Rarely	Never	Mean
Inhaling of smoke while frying garri	93 (74.4)	29 (23.2)	3 (2.4)	1.72
Fatigue as a result of strenuous nature of processing	106 (84.8)	16 (12.8)	3 (2.4)	2.35
Joint pain while stirring/pounding fufu	83 (66.4)	39 (31.2)	3 (2.4)	1.64
Eye irritation due to smoking during garri processing	64 (51.2)	56 (44.8)	4 (4.0)	1.55
Body exposure to excessive heat while frying or cooking cassava	79 (63.2)	43 (34.4)	3 (2.4)	1.60
Cuts while peeling cassava	42 (33.6)	80 (64.0)	3 (2.4)	1.31
Insect bite while processing cassava	31 (24.8)	94 (75.2)	0 (0.0)	1.24
Burns and scalds from cooking/boiling fufu	24 (19.2)	96 (76.8)	5 (4.0)	1.15
Skin irritation due to excessive heat while frying	18 (14.4)	104 (83.2)	3 (2.4)	1.12
Headache due to strenuous work while processing	107 (85.6)	18 (14.4)	0 (0.0)	1.85

Hearing loss due to excessive noise while grinding cassava	43 (34.4)	56 (448)	26 (20.8)	1.13
Malaria and typhoid due to insect infestation while processing cassava	20 (16.0)	104 (83.2)	1 (0.8)	1.15
Catarrh while sieving cassava flour	27 (21.6)	94 (75.2)	4 (3.2)	1.18
Sustained injury while transporting cassava to processing unit	18 (14.4)	105 (84.0)	2 (1.6)	1.12
Exposure to the hazardous cyanide content during dewatering of cassava	17 (13.6)	95 (76.0)	13 (10.4)	1.03
Damage to the lungs due to inhalation of smoke while frying garri	10 (8.0)	40 (32.0)	75 (60.0)	0.48
Cyanide food poisoning due to improper dewatering	21 (16.8)	52 (41.6)	52 (41.6)	0.75
Death due to snake bite while processing cassava	9 (7.2)	42 (33.6)	74 (59.2)	0.48
Sustained injury while transporting Cassava to the processing unit	10 (8.0)	108 (86.4)	7 (5.6)	1.02
Poisoning of food due to cyanide content in the cassava if not properly dewatered	20 (16.0)	52 (41.6)	53 (42.4)	0.73

Source: Field survey, 2020

Level of occupational hazards among cassava processors

Result of level of occupational hazards among cassava processors on Table 4a reveals that most of the respondents were majorly faced with body pain (1.97). This is followed headache (1.94), body heat (1.68) and itching (1.50). However, eye irritation (0.92), stings from insects and hearing problem (0.81). Further result on Table 4b shows that majority (60.8%) of the respondents felt high level of occupational hazards while 39.2% of them felt low level of occupational hazards. This is in accordance with the findings of Mercy, Obinna and Zelda, (2020) who found out that respondents in their study felt high level of occupational hazards.

Table 4a: Level of occupational hazards among cassava processors

Occupational hazards	Frequently	Occasionally	Not at all	Mean
Itching	77 (61.6)	34 (27.2)	14 (11.2)	1.50
Body pain	122 (97.6)	3 (2.4)	0 (0.0)	1.97
Body heat	95 (76.0)	21 (16.8)	9 (7.2)	1.68
Hearing problem	32 (25.6)	38 (30.4)	55 (44.0)	0.81
Headache	118 (94.4)	7 (5.6)	0 (0.0)	1.94
Stings from insects	1 (0.8)	111 (88.8)	13 (10.4)	0.90
Eye irritation	35 (28.0)	45 (36.0)	45 (36.0)	0.92
Cut from processing tools	11 (8.8)	114 (91.2)	0 (0.0)	1.08
Burning	24 (19.2)	80 (64.0)	21 (16.8)	1.02
Bruises	5 (4.0)	118 (94.4)	2 (1.6)	1.02

Source: Field survey, 2020

Table 4b: Categorization of level of occupational hazards among cassava processors

Hazard level	Frequency	Percentage	Minimum	Maximum	Mean	SD
Low (17-12.7)	49	39.2	8	17	12.8	2.1
High (12.8-17)	76	60.8				
Total	125	100.0				

Source: Field survey, 2020

Results of Hypotheses Testing

There is no significant relationship between types of occupational hazards associated with cassava processing and level of occupational hazards on cassava processing.

4.2.3: Pearson correlation result between types of occupational hazards associated with cassava processing and effects of occupational hazards on cassava processing

Table 5 shows that there was a significant relationship between types of occupational hazards associated with cassava processing (r=0.438, p=0.002) and level of occupational hazards on cassava processing. This implies that types of occupational hazards had an influence on level of occupational hazards on cassava processing.

Table 5: Pearson correlation result between constraints faced by the respondents and their participation in extension activities

Variables	r value	p value	Decision
Types of occupational hazards	0.438	0.002	S

Source: Field survey, 2020

Conclusion and Recommendations

Conclusion

Most of the respondents were in their productive years, female, married, illiterate, had fairly large numbers of persons in their households, earned low monthly income, were experienced in cassava processing, used self labour, used their personal savings, engaged in trading as their secondary occupation and also earned low income from their

secondary occupation. Also, Most of the respondents were faced with fatigue as a result of strenuous nature of processing. The study therefore concludes that the level of occupational hazards was high (60.8%) among the respondents in the study area.

Recommendations

Based on the empirical findings of this study, the following recommendations are put forward to curb the occupational hazards faced by cassava processors in the study area:

1. Cassava Processors should be more enlightened by the extension agents on occupational hazards relating to processing and the safety measures which can help minimize the hazards.
2. Cassava processors are advised to use personal protective equipment such as protective coat, apron and wearing of eye glasses to reduce exposure to occupational hazards relating to cassava processing. This is expected to increase the average life expectancy of cassava processor.
3. There is also need to subsidize the cost of processing machines by the government, NGOs and encourage processors to adopt improved postharvest cassava processing technologies. This would enable better understanding of occupational hazards and reduce it appreciably.

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