

Research Paper

Impact analysis of occupational hazard on the productivity of Rubber tappers in Rubber Research Institute of Nigeria, Iyanomo, Benin City

M. Umar H. Y., Agbonaye O. E*., Uwumarongie A. M. D. and Eboigbe G.

Rubber Research Institute of Nigeria, PMB 1049, Benin City, Nigeria.

*Corresponding Author E-mail: otasagbons@gmail.com

Received 2 December 2015; Accepted 16 January, 2016

The study assessed the impact of occupational hazard on the productivity of rubber tappers in Rubber Research Institute Nigeria (RRIN), Iyanomo. Sixty-five tappers were selected by a multi-stage random sampling technique out of the hundred tappers in RRIN. Data for this study were obtained from primary sources, using questionnaires administered on the respondents. Data collected included gender, age, household, accident and type of accidents, number of times absent from job, quantity of latex produced, quantity of coagular produced, and salary/wages of the tappers. The data were analyzed using descriptive statistics. Results of the analysis indicate that tapping was dominated by male as indicated by 81.5% of the total respondents. The average family size of the respondent was 5 persons which represent 56.9% of the total respondents.

The analysis on accidents revealed 81.5% of the tappers had one form of accident or the other, most of which resulted from the use of cutlass/knife (43.1%), this was due to the fact that these items are the most common implement used by the tappers. The study suggested that the rate of accident can be reduced by the proper plantation management and also by employing more workers, in order to reduce the work load on individual tappers and the possibility of accidents. There is need also for regular workshop training on the best technical methods of tapping to minimize the incessant hazard and injuries among the tappers.

Key words: Hevea, hazard, productivity, occupational, tappers and research.

INTRODUCTION

Natural rubber (*Hevea Brasiliensis*) was introduced into Nigeria from Kew gardens, England in 1895 and has become increasingly important since the beginning of the 20th century (Umar et al, 2011). Rubber tapping is the process of collecting latex from a rubber tree through a cut made in the tree's back by an instrument (tapping knife). The incision is done through the tree's vessels to allow the product (latex- liquid) flows out from the tree that are usually trapped into containers (tapping cups). The latex is thereafter removed from the cups for further

processing into either coagula or rubber sheets. Tapping is therefore a controlled wounding of rubber tree without a serious damage to the tree cambium so as to guarantee quick back re-generation after tapping (Edgar, 1947). Latex is produced by special cells in rubber trees called laticifers, these cells are thought to be a defense mechanism against insect pathogens and possibly, a medium for depositing metabolic waste of the tree. Nigeria rubber is mainly produced for export. The industry thus provides employment opportunities, serves as

foreign exchange earner for the country (Abolagba et al, 2006).

Occupational hazards refer to those experienced conditions in the place of work which encompasses all types of chemical, biological, environmental and other physical hazardous factors that the worker has to live with during the process of carrying out his duty. Tapping task in rubber industries is highly demanding. It is usually done very early in the morning to maximize latex flow from the tree, and requires much energy in cutting the tree back. These invariably exposes tappers to the risk many health hazards (Reddy et al., 2012).

Occupational hazard leads to unpleasant conditions during the course of doing a job, or a working condition that can lead to illness or death. Unfortunately, many industries focused only on maximum level of productivity rather than safety and health of its workers (Cabrera et al., 2011). The study therefore aimed to analyse the hazards rubber tappers in Rubber Research Institute of Nigeria (RRIN) faces and the consequential effects on the output and revenue generation to the Institute as they are very crucial in the sustenance of the natural rubber industry in Nigeria.

METHODOLOGY

The study was carried out at Rubber Research Institute of Nigeria main station Iyanomo, Benin City, Edo State, Nigeria. The area falls within latitude 6° and 7° North of the Greenwich meridian, 5° and 7° East of the Greenwich meridian. It is within the humid rainforest zone with mean annual rainfall of 2000 mm. Rainfall has two peaks annually in the months of July and September, but there is a usual break in the first or second week of August. The soils are mainly Ultisols with pH range of between 4.0 and 5.5.

The soils have been described as the “acid sand belt” derived from unconsolidated grits and stones containing clay beds in varying proportions (Giroh and Adebayo, 2007). Data for this study were obtained from primary sources, with the aid of questionnaires administered on the respondents. Questions on tappers socio-economic variables such as age, education, tapping experience, family size, and gender; including tappers productivity (latex and coagula in kg), salary or wages (man days) and also occupational hazard and types of occupational hazard tappers encountered were captured in the questionnaire, which were used for the study. Random sampling technique was adopted in eliciting information from the respondents and, a total of 65 respondents out of 100 tappers were interviewed using the structured questionnaire which were filled and returned. The data collected from these questionnaires were subjected to descriptive statistic for analysis.

RESULTS AND DISCUSSION

The study revealed that male tappers dominated the rubber industries by 81.5% while the female had only 18.5% of the total respondent (Table 1).

Table 1. Sex of respondents.

Sex	Frequency	Percentage (%)
Male	53	81.5
Female	12	18.5
Total	65	100

Source: Field Survey, 2015.

Table 2. Age of respondents.

Age range	Frequency	Percentage (%)
20-30	21	32.3
31-40	33	50.6
41-50	10	15.3
51-60	1	1.5
Total	65	100

Source:Field Survey, 2015.

Table 3. Household size of respondents.

Household size (Range)	Frequency	Percentage (%)
1-3	22	33.8
4-6	37	56.9
7-9	5	7.7
≥10	1	1.5
Total	65	100

Source:Field Survey, 2015.

This reveals that tapping is a male dominated job. Table 2 indicates that, tappers within the age bracket of 31 to 40 were the majority (56.9%) in rubber tapping in RRIN, while those in the age range of 51-60 had only 1.5%. This implies that the elderly worker were retiring and leaving the job for the younger generation, this means that as young people are more in the tapping job, and higher productivity is expected.

The household size range of 4 to 6 had a percentage of 56.9%. This explains that rubber tappers had a medium family size which could be as result of the economic situation of the country. Only a rubber tapper had family size of 10 and above (Table 3).

The Table 4 indicates that 81.5% of the tappers had one form of accident or the other during the process of tapping. The implication of this is that a number of man/days were lost due to accident by the tappers, and this means reduced numbers of tapped rubber trees per day, hence poor productivity and income/revenue to the institute.

Table 4. Accidents and types of accidents encountered by respondents.

Types of accident	Frequency	Percentage (%)
Snake bite	5	7.2
Scorpion sting	2	3.6
Ant sting	9	13.8
Honey bee attack	12	18.5
Cutlass/knife cut	28	43.1
Wood cut	3	4.6
Road accident	3	4.6
Others	3	4.6
Total	65	100

Source: Field Survey, 2015.

Table 5. Numbers of times Absent from Tapping.

Days Range	Frequency	Percentage (%)
1-3	3	4.6
4-6	11	16.9
7-9	51	78.5
Total	65	100

Source: Field Survey, 2015.

The common implement used by rubber tappers is the tapping knife and the cutlass; this is why 43.1% of the accidents were from these implements. This was closely followed by honey bee attacks which have 18.5% of the respondents. The accident from the honey bees in the rubber plantation is not unconnected with the farming system that encourages the farming of honey bees under matured rubber plantation (Integrated farming system) after the canopy has closed and it was discovered that the introduction of honey bee into the plantation increased the profitability of the enterprise due to higher returns from the farm (Esekhade et al., 2012).

A lot of days/weeks/months are lost as a result of either accident during rubber tapping or sickness resulting from it. Table 5 shows that the range 7-9 had the highest numbers of times absent from job, with a frequency of 51 and a percentage of 78.5%.

The estimated man days lost by the 65 respondents together is 469 days during the period under consideration, hence from the calculation below; 20% of useful man days wasted which it is a clear indication of wastage in terms of human resources and waste of useful man hour that could have been converted to generate income to the Institute.

65 (Respondents) by 365 (total no of days in a year) = 2340.

Man days lost = 469 days (product of mean of the range by the frequency)

Percentage man days lost = $469 \div 2340 \times 100 = 20\%$.

The range of 1-3 had the lowest number of times absent from job, with a percentage of 4.6% and a frequency of 3 as shown in the (Table 5).

The quantity of latex produced by the tappers fall within the range of 20-30 liters per/man/day, this has a percentage of 66%. The range of 41-50 liters per/man/day has the lowest percentage of 1.5%. The variation in the quantity of latex produced could be attributed to the lost of precious man/ hour as a result of accidents involved by tappers during the process of tapping (Table 6).

Table 6. Quantity of latex produced (liters).

Latex in liters tapped per man /day	Frequency	Percentage (%)
20-30	43	66
31-40	21	32.5
41-50	1	1.5
Total	65	100

Source: Field Survey, 2015.

The coagula is gotten by adding ammonia to the latex liquid, and the range of 0-100 kg of coagula from the latex had the highest percentage of 60%, while the lowest percentage was 1.5 % and a frequency of 1 from the arrange of 301-400 kg/per/day as shown in the (Table 7). A salary range of 10-30 (thousand in naira) had the highest of 41.5% ((Table 8), while the ranges of 71-90 and 111-130 had the lowest frequency which is 1 and corresponding percentages of 1.54%. This implies that

Table 7. Quantity of coagula produced per day (kg).

Coagula produced per man/day in kg	Frequency	Percentage (%)
0-100	40	60
101-200	21	34
201-300	3	4.5
301-400	1	1.5
Total	65	100

Source: Field Survey, 2015.

Table 8. Tappers salaries/wages. (Naira).

Naira in thousands	Frequency	Percentage (%)
10-30	27	41.5
31-50	23	35.38
51-70	11	16.92
71-90	1	1.54
91-110	2	3.07
111-130	1	1.54
Total	65	100

Source: Field Survey, 2015.

most of the tappers (92.80%) were low salary/wages earners who earn between #10,000 and #70,000 per month. Based on the economic hardship in the country it is obvious that these tappers are financially handicapped in meeting their family financial obligations. Consequently, this will surely affect their productivity.

CONCLUSION AND RECOMMENDATION

The rate of accident can be reduced by the improvement in plantation management and also by employing more workers, hence reducing the task per tappers as this will help to reduce the stress on the tappers and also reduce the rate of accidents. Specific factors especially education, training and salary increment, as these would enable tappers improve their productivity and reduce the rate of accidents, also policies to make tappers literate through training in institution of high learning should be put in place.

AUTHORS' DECLARATION

We declare that this study is an original research by our research team and we agree to publish it in the journal.

REFERENCES

Abolagba EO, Aigbekaen EO, Omokhafa KO (2006) Farm Gate Marketing of Natural Rubber in the South East Rubber Growing zone of Nigeria, *Nigeria Journal of Agriculture and Rural Development*, 6:40-48.

Cabrera IT, Myers M L, Stellman J (2011). Plantations in Farming Systems. In *Encyclopedia of Occupational Health and Safety*. Geneva, Switzerland: International Labour Organization.

Edgar AT (1947). "Manual of Rubber Planting (Malaya)" The Incorporated

Esekhade TU, Idoko SO, Lalabe BC, Abolagba EO (2012) .“ Profitability of bee-keeping under matured rubber plantation in Edo State. Nigeria.”*Journal of Agricultural Production and Technology*.1(1):23-28.

Giroh DY, Adebayo EF (2007). Analyzing the Technical efficiency of Rubber tapping in Nigeria. *J Agric. and Soc Sci*, 3(4):107-111.

Reddy VD, Kumar B S, Uzma N (2012). Lung function parameters, neck pain and associated factors among male rubber tapping workers in kerala. *International Journal Of Pharma Medicine And Biological Sciences*, 1(2):43-48.

Umar HY, Giroh DY, Agbonkpolor NB, Mesike CS (2011). An overview of world Natural Rubber Production and Consumption: An implication for economic empowerment and poverty Alleviation in Nigeria. *Journal of Human Ecology*. 33(1) :3-59.