

**ASSESSMENT OF COMPLIANCE TO SELECTED SECTIONS OF OCCUPATIONAL
SAFETY AND HEALTH ACT 2007 AND SUBSIDIARY LEGISLATION AT KENYA TEA
DEVELOPMENT AGENCY REGION FIVE FACTORIES**

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Abstract

The tea industry is the largest employer in the private sector, with over 80,000 working in the estate and 3 million earning their livelihoods from the sector (KTDA annual report, 2003) The main risks posed to workers at tea factories are from unguarded machinery, chemical and biological agents as well as unfavourable working conditions like high temperatures. The study aimed at assessing compliance of tea factories to selected sections of OSHA 2007 and subsidiary legislation at Kenya Tea Development Agency factories at Region Five. The study sites were Kapkoros Tea factory, Tirgaga Tea factory, Mogogosiek Tea factory, Kapset Tea factory, Litein Tea factory, Momul Tea factory and Toror Tea factory in Bomet and Kericho counties. The study employed a descriptive design which used probability sampling methods to select 260 participants. Respondents were the factory staff in withering, boiler, billeting, cut, tear, curl (CTC) workshop, sorting, packaging and management. Structured questionnaires were used to collect qualitative data which was analyzed using statistic package for social science. The respondents 121(46.7%) had secondary school education and below, while the remaining 133(51.2%) had college education and above. Dust, injuries, poor housekeeping and Noise were the major hazards in the factories. The management admitted that there were less first aid kits in their respective factories as it was less than the recommended 5 first aid kits for a work force of 200 (Victorian OSH Act, 2004). Most of the staff in the seven tea factories reported to have been exposed to hazards such as dust, injuries and high noise levels. In terms of compliance on selected OSHA 2007 sections and other subsidiary legislation, all the seven factories were partially compliant in that they had not done noise surveys audiometric test and fire audits by the time the study was done.

Key words: Occupational, compliance, subsidiary legislation, evacuation, training

1.0 Background

Tea is a major cash crop in Kenya. In the country, tea is ranked as the third major foreign exchange earner, behind tourism and horticulture. Most tea produced in Kenya is black tea. However green tea, yellow tea, and white tea are produced on order by major tea producers.

The industry is the largest employer in the private sector with over 80,000 working in the estate and 3 million earning their livelihoods from the sector (KTDA annual

report, 2003). Tea is an indispensable beverage used the world over and is brewed from the tea plant *Camellia sinensis*. Manufacture of black tea involves several labour-intensive processes. The processes that take place in tea manufacture starts after delivery and receiving fresh tea leaves. The tea is then transferred to the processing area.

Withering: Tea leaves are placed on troughs, in which air is blown through to take away moisture and cool the tea leaves.

Cutting, treating and curing (CTC): This involves cutting and crushing of tea leaves, reducing them into small particles.

Fermentation: The process involves fermenting the crushed tea particles to attain its taste, and colour.

Drying: The fermented tea is taken through driers, which have varying temperatures for removal of moisture; a lot of dust is released at this stage.

Sorting: Dried tea is sorted at this section depending on the size of the particles, after which samples are taken for tasting. This is the dustiest section in tea processing.

Packaging: The graded tea is finally packaged in bags ready for the export market. Tea for the local market is packaged in small sachets for sale to traders.

According to Castellan *et al.*, (1981), Sifting and blending are the dustiest processes in the tea industry and the workers involved are exposed to the hazard of inhaling the dust. Inhalation of tea dust is known to give rise to both acute and chronic respiratory symptoms.

Like in any other employment sector, workers in the tea factories run the risk of being injured as a result of the type of work they do. The main risks posed are from unguarded machinery in the factory, chemical, and biological agents as well as unfavourable working conditions like high temperatures. According to Dey *et al.*, (2012), Safety and health of workers in tea production is traditionally regarded as an extraneous obligation that offsets productivity improvements. The tea industry faces challenges in ensuring occupational safety and health because of the management's mindset of accepting safety as a liability to the business and the lack of safety awareness amongst the workers.

According to Angelica and Vecchio (2007), communication allows people, tasks, processes and systems to interact purposively and cooperatively to achieve health and safety objectives. There are a number of common safety hazards and health issues associated with the blending, processing and packaging of tea. Safety hazards such as machine guarding, physiological effects of vibration, noise and dynamic physical load, slips and falls and lifting-related injuries are quite common within the food industry (Kurulashvili and Fedorov 1991). Everyday workers all over the world are faced with a multitude of health hazards, such as: dust, gases, noise, vibration, and extreme temperatures (ILO/EFC 1997). Noise pollution is defined as unwanted electromagnetic signal that produces a jarring or displeasing effect and

which interferes with human communication, comfort and health (Bahita, 2001) The noise prevention and conservation rules of 2005 stipulates that no worker should be exposed to a noise level of over 90 dB(A) in an 8 h day. Noise at a level of more than 90 dB(A) has also been reported among workers engaged in sifting or screening process in a study that was done by (Gu Xue, 1983). This exposure to loud noise lowers employee morale and productivity. Hence the straight forward approach recommended to be used for noise control is the source-path-receiver concept (Liu, 1999). The OSHA 2007 state that it is the employer's obligation to provide a safe working environment for the workers. According to (Boateng and Amedofu, 2004) negative effects of noise on human beings are generally of a physiological and psychological nature. Hearing losses are the most common effects among the physiological ones, hence an exposed person should be subjected to audiometric test.

Piombino (2005) reported that training of workers on safe work practices is important in reducing worker exposure to hazardous conditions and injuries. Employers have duties concerning the provision and use of personal protective equipment (PPE) at work. The provisions by OSHA act 2007 provides that every workplace should be registered, carry out safety and health audit, should have procedures for recording accidents, carry out risk assessment, form safety and health committee, carry out noise survey, fire audit, OSH training, provide first aid facilities, carry out assessment of hazardous substances and do medical examination during pre- employment and periodical. Compliance to these provisions ensures that workers are productive, insurance premiums and absenteeism is reduced.

The aim of this study was to establish compliance of tea factories to OSHA 2007 and subsidiary legislation in the Kenya tea development agency factories in region five.

2.0 Materials and Methods

2.1 Study Design

A descriptive cross sectional study design was employed for this study because the research was a fact finding survey and this type of research design is the most recommended (Wiegmann *et al.*, 2007).

2.2 Study Site

The study was done at seven selected tea processing factories in region five as per KTDA clustering. Region five includes Kericho and Bomet counties which have a total of 12 tea processing factories. Kericho County is in western part of Kenya approximately 280 km south east of Nairobi. It has 6 KTDA factories. Bomet County is approximately about 255 km South East of Nairobi and has 6 KTDA factories.

2.3 Study Population

There are twelve tea processing factories in this region employing more than 1800 workers which were considered in the study. Workers who participated in this study were chosen from seven selected tea factories. The management team which comprise of managers, supervisors and safety and health officers were sampled as category one. The second category included workers in different departments like withering, sorting, packing, billeting, cut tear, and curl, and workshop. Estimation of sample size was based on Fischer *et al.*, (1998) formulae.

$$n = \frac{Z^2 P (1-P)}{d^2} \quad (\text{Fischer } et al., 1998) \quad n = \frac{(1.96)^2 (0.50) (1-0.50)}{0.05^2} = 384$$

Since the target population is not more than 10,000, Mugenda and Mugenda sample determination formula was used.

$$n_f = \frac{n}{1 + (n-1)/N}$$

For this study the sample size use was,

$$\frac{384}{1 + (384-1)/800}$$

n =259 The estimated population size used for this study was 260

2.4 Sampling Method

Purposive sampling was used to choose the seven companies that were sampled in the study. The tea processing factories were clustered in terms of departments/units and in each cluster, simple random sampling method was used to select the study participants. The clusters were the management team, technical, packaging, loading and the workshop.

2.5 Data collection Tools

2.5.1 Questionnaires

Closed ended questionnaires were used to collect wide array of first hand information using a five point Likert Scale to address the respondents' perception of the safety and health systems in the tea factories. The questionnaire items were put on a 5-point Likert scale ranging from 1 (strongly disagree), 3 (unsure) to 5 (Strongly agree) (Gibbons *et al.*, 2006). A total of 260 questionnaires were distributed.

2.5.2 Secondary Data

This data was collected through scrutiny of documents e.g. General Registers, Health and Safety policies, various statutory audits and other safety and health literature.

2.5.3 Study Procedure

The factory unit manager was approached by the principal investigator and the overall objective of the study explained to obtain consent. Information was passed

to the participants who included staff in management, packaging, loading, withering, sorting, billeting and workshop for them to participate in the study. The study participants were then approached and explained to about the study. When the participant accepted to volunteer for the study, he then provided his name and signed the consent form provided by the investigator.

2.5.4 Data Analysis

Statistical Package for Social Science version15 was used for advanced analysis. Pearson chi square was used to test the P values and show if there was significant relationship between the variance used. Results obtained were presented in tables, and figures.

3.0 Results

3.1 Occupational safety and health Act 2007 Compliance and Subsidiary Legislation

Compliance of tea factories to selected sections of OSHA 2007 and subsidiary legislation

Thirteen (5%) of the staff strongly disagreed that first aid facilities were available, 22(8.6%) disagreed with this statement, 9(3.6%) were uncertain, 151(57.9%) agreed while 65(25%) strongly agreed (Figure 4.1).

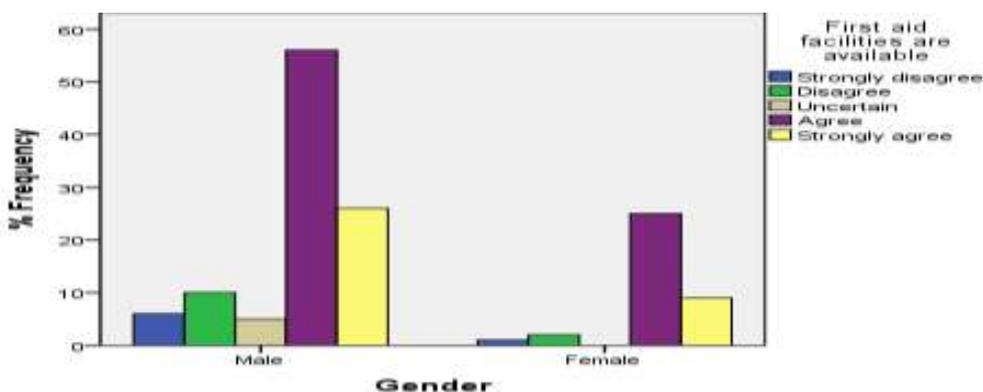


Figure 4.1: First aid facilities

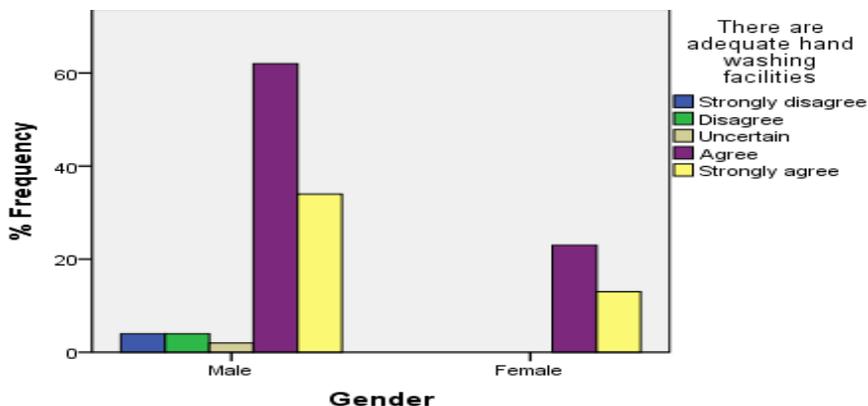


Figure 4.2: Hand washing facilities

Seven (2.8%) staff members strongly disagreed and disagreed respectively, that there were adequate hand washing facilities, 4(1.4%) were uncertain, 156(59.9%) agreed while 86(33.1%) strongly agreed (Figure 4.2).

Twenty two (8.3%) of the staff members strongly disagreed that the management took care of their health, 5 (1.7%) disagreed, 13 (4.8%) were uncertain, 145 (55.9%) agreed while 50 (19.3%) strongly agreed see Figure 4.3.

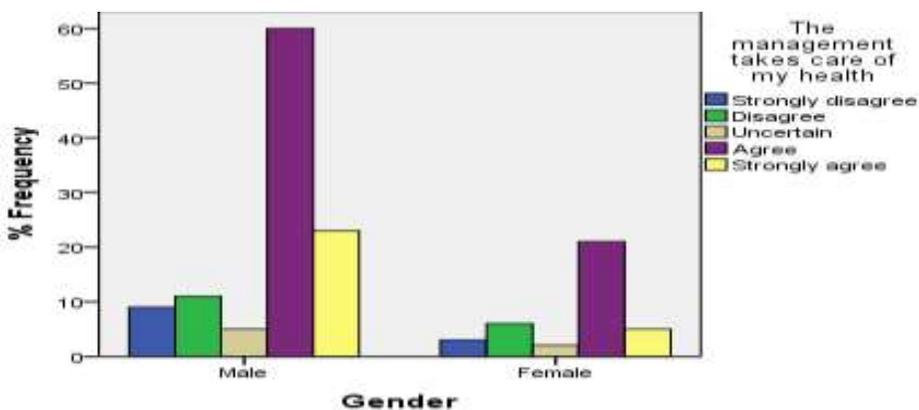


Figure 4.3: Management takes care of workers health

Five (2%) of the of the staff members strongly disagreed that they were offered medical examination before employment, 4(1.4%) of them were uncertain, 151(58.1%) agreed while 100(38.5%) strongly agreed (Figure 4.4).

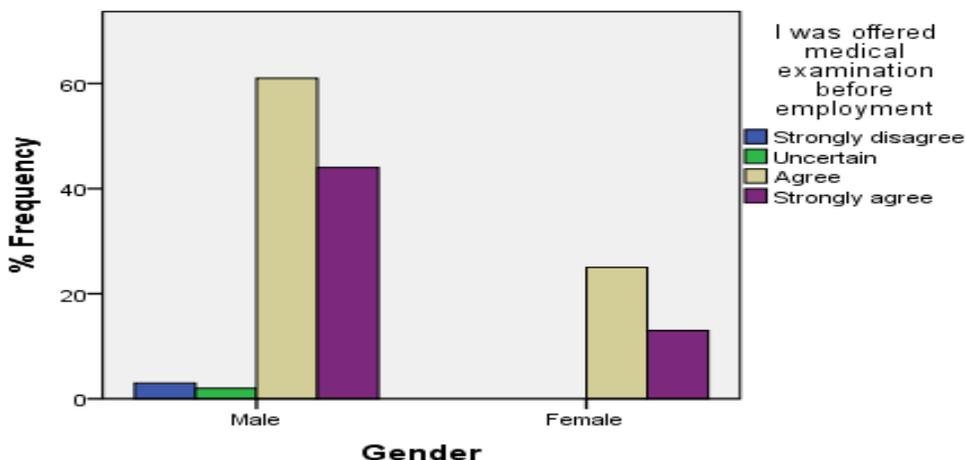


Figure 4.4: Medical examination before employment

Four (1.4%) of the staff members strongly disagreed that they underwent periodical medical examination regularly, 5(2%) of disagreed with this statement, 7(2.7%) were uncertain, 145(57.1%) agreed while 95(36.7%) strongly agreed (Figure 4.5).

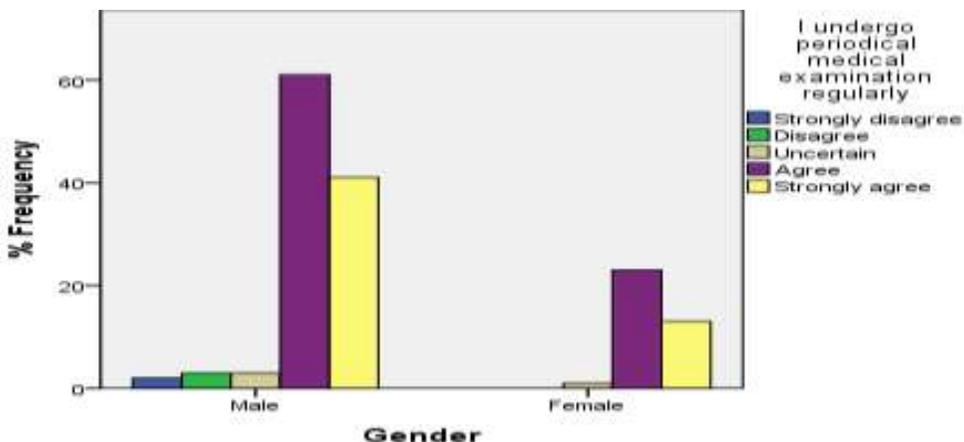


Figure 4.5: Periodical medical examination

Seven (2.8%) of the staff members strongly disagreed and disagreed, respectively that assessment of hazardous substances used at the premises had been carried, 31(11.9%) were uncertain, 167 (64.3%) agreed while 47 (18.2%) strongly agreed with the statement (Figure 4.6).

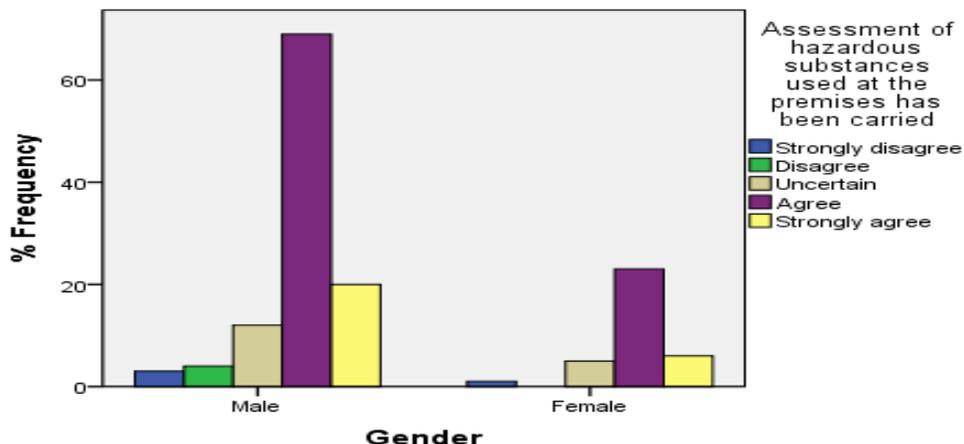


Figure 4.6: Assessment of hazardous substances

On workers special clothing; 21 (8%) of the staff members in the survey strongly disagreed that special clothing were offered during work, 20 (7.5%) disagreed with this statement, 23 (8.8%) were uncertain, 147 (56.5%) of them agreed while (49) 22.4% of them strongly agreed (Figure 4.7).

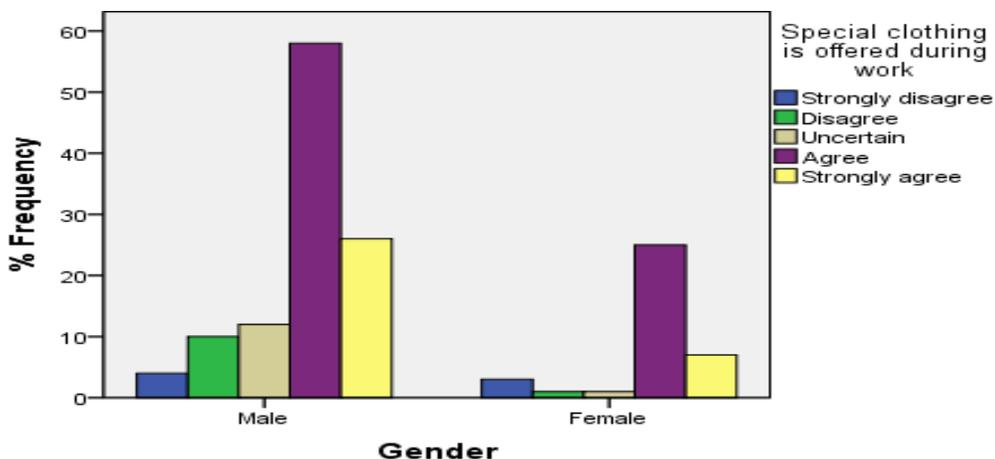


Figure 4.7: Clothing for work

On proper ventilation and lighting; 3 (1.25%) of the staff members strongly disagreed that there were adequate lighting in the production area, 8 (3%) of them disagreed with the statement, 9 (3.6%) of them were uncertain, 153 (58.8%) of them agreed while 87(33.3%) strongly agreed (Figure 4.8).

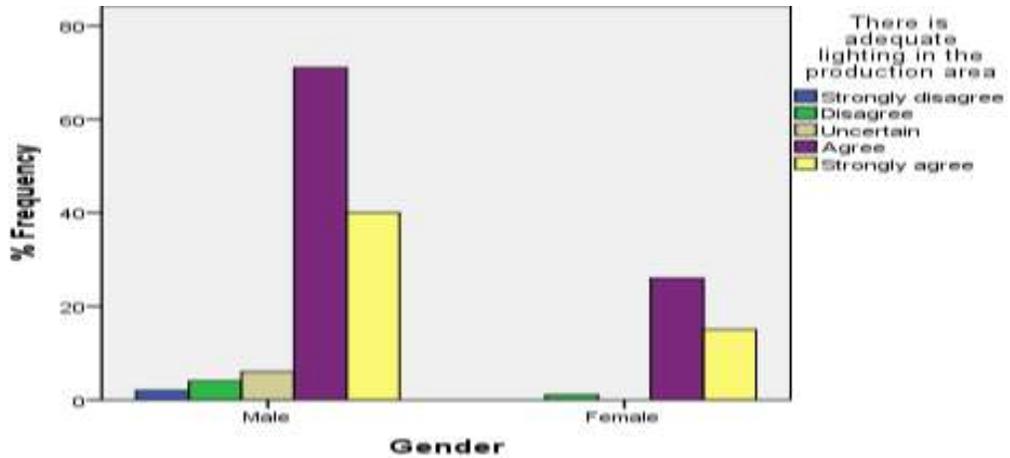
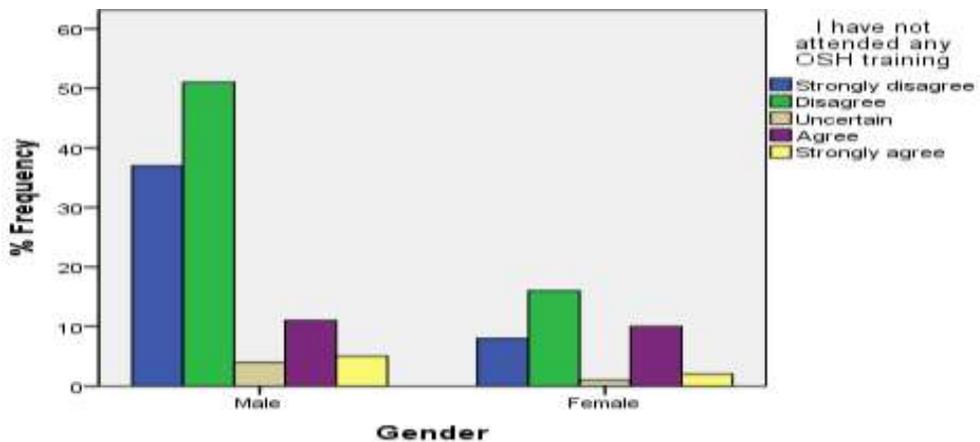


Figure 4.8: Adequate lighting in production department



On OSH training; 81 (31%) of the staff members in the survey strongly disagreed that they had not attended any OSH training, 120 (46.2%) disagreed with this statement, 9 (3.4%) of them were uncertain, 38 (14.5%) of them agreed, while 12 (4.8%) strongly agreed (Figure 4.9).

Figure 4.9: The OSH training

Table 4:6 provision of drinking water and sanitary facilities

WATER AND SANITATION									
Status	Gender	Strongly disagree (%)	Disagree (%)	Uncertain (%)	Agree (%)	Strongly agree (%)	Total (%)	χ^2	p-value
The toilets in the factory are clean	Male	2.8	5.5	5.5	52.3	33.9	100.0	2.46	0.652
	Female		8.3	2.8	61.1	27.8	100.0		
	Total	2.1	6.2	4.8	54.5	32.4	100.0		
The drinking water is sufficient	Male	2.8	2.8	3.7	48.1	42.6	100.0	1.48	0.830
	Female	2.7	2.7	2.7	59.5	32.4	100.0		
	Total	2.8	2.8	3.4	51.0	40.0	100.0		

From the table, the Pearson Chi-square test values with p-value were as follows $\chi^2_{(4)} = 2.46$, $p = 0.652$; $\chi^2_{(4)} = 1.48$, $p = 0.830$. Since all the p values were greater than 0.05, we retain the null hypothesis and conclude the relationship between water and sanitation and their status was statistically insignificant.

3.2 Compliance of Tea Factories to Selected OSHA Regulations and Guidelines

From the study the seven tea factories had complied with the registration of workplaces under OSHA 2007, carried out health and safety audits, had general register for recording accidents, health and safety committees holds quarterly meetings and have carried out risk assessments in their respective factories. The main non-compliance was that they had not done noise-mapping, audiometric tests and fire audits.

4.0 Discussions

4.1 Compliance of Tea Factories to Selected Sections of OSHA 2007 and Subsidiary Legislation

All workplaces are required to comply with OSHA 2007 and other standard practices as per the government rules and regulations. According to (Taiwo, 2010) workplace safety and health has a great influence on the productivity of the entire manufacturing activity. Therefore, safety and health in the tea industries need to be improved on urgent basis. From the findings of this study it was established that all the 7 tea factories agreed that they do not have enough first aid kits as provided by Victorian act 2004 and St John ambulance. The provisions are that Low risk workplaces:-one kit for 10 to 50 employees, one additional kit for every additional 50 employees up to 200 and after 200, one additional kit for every addition 100 employees. The welfare provisions like Toilet, changing room, hand washing and drinking water were provided as every employee and management agreed to that in the seven factories. Medical examinations were also offered to the employees

except that audiometric, lung function and eye test had not been done by the time of the research. Majority of the respondents (55.7%) believed that the management took care of their health by providing periodical medical examinations against 8.3% who disagreed.

Hygiene practices were also maintained in that every employee was provided with personal protective equipments. Noise survey as provided by noise reduction and prevention rules of 2007 had not been done by the time of the audit. These should be done to identify areas with high noise levels that is more than 85dBa. Most of the employees are aware of the existence of the safety and health committees and agrees that they have been trained on the safety and health required of them while in the work place. From the findings it was evident that most of the employees (46.2%) agreed that they had been trained on OSH. Training is normally done during induction of new employees. The factories are well ventilated; this has been achieved by use of dust extractors and cyclones which removes dust.

Safety and health audits, Risk assessments and assessment of hazardous substance have been done in all the factories. These are normally done annually. Fire safety audits and fire drills as provided by the act had not been done by the time of the survey.

5.0 Conclusions

All the tea factories in region five are partially compliant with OSHA as regards safety and health rules and regulations.

Recommendations

- (i). The management should ensure they carry out fire safety audit and create awareness of safety measures in case of fire and evacuation procedures as per the fire risk reduction rules of 2007.
- (ii). Carry out noise conservation programmes as provided in noise conservation rules of 2005.
- (iii). Carry out medical examination as provided by Medical Examination Rules LN 24 of 2005.

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References

- Angelica M. and Vecchio sadus (2007). Enhancing safety culture through effective communication. CISRO Minerals clayton Australa. Safety science monitor article II
- Bahita, S. C. (2001). Environmental pollution and control in chemical process industries. Khanna ub, , Delhi, pp.365-391.
- Boateng C.A and Amedofu G.K (2004). Industrial Noise pollution and its effects on the hearing capabilities of workers: A study from saw mills, printing presses and corn mills. *Afri J Health Sci*; **11**: pp.5-60.
- Castellan RM, Bochlccke BA, Petersen MR, Thedell TD, Merchant JA (1981). Pulmonary function and symptoms in herbal tea workers. *Chest*; **79**: 81-85.
- Dey S.K., and R.Gupta, (2012). Development of Safety and Productivity Correlation Model for Tea Industries of Barak Valley, Assam. *IOSR Journal of Engineering* e-ISSN: 2250-3021, p-ISSN: 2278-8719, Vol. 2, Issue 12 (Dec. 2012), ||V3|| pp.21-28
- Factories and other places of work (Medical examination rules) 2005
- Factories and other places of work (Noise prevention and control rules) 2007
- Fischer, A.A, Laing J.E, and Stroker J.E (1998) Hand book for family planning operation research design in sampling. *population council*, pp.40-45
- Gibbons, A., Von Thaden, T., and Wiegmann, D. (2006). Development and initial validation of a survey for assessing safety culture within commercial flight operations. *The international journal of Aviation Psychology*, **16** (2), pp.214-238.
- Gu Xue-Qi. (1983) Tea industry. In: Encyclopedia of Occupational Health and Safety. Geneva:
- ILO/EFC (1997). Plantation Safety and Health Monitoring Project International Labour Office; Vol. **2**: pp.2153-4.
- KTDA annual report, (2003). Kenya Tea Development Authority Annual Report. Government Printer.Nairobi.
- Kurulashvili MD, Fedorov AV (1991). Physiological and hygienic evaluation of combined effects of vibration, noise and dynamic physical load in tea-picking machine operators. *Gig Tru i Prof Zabol*; **6**: pp.9-11
- Liu, D.H.F. (1999). Environmental Engineers. Handbook.Noise pollution. CRC Press LLC. (Eds), pp.470-525. New Jersey.
- Mugenda, O. and Mugenda, A. (2003). Research methods; quantitative and qualitative approaches; Research guidelines
- Occupational Safety and Health act (2007). The Government Printer Nairobi.
- Piombino, L.(2005). Tea industry. Encyclopedia of occupational health and safety, (5th edn).International Labour Organization, Geneva
- The factories and other places of work (fire risk reduction) rules, (2007)
- Wiegmann, D. A., Thaden, T. L. V. & Gibbons, A. M. (2007). A review of safety culture theory and its potential application to traffic safety. Victorian *OHS Act, 2004*