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OCCUPATIONAL HAZARDS AMONG COCOA FARMERS IN THE BIRIM SOUTH DISTRICT IN THE EASTERN REGION OF GHANA

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ABSTRACT

Cocoa (*Theobroma cocoa*) is one of the major agricultural commodities in Ghana. However, its production in Ghana and Africa is faced with numerous occupational hazards and injuries. A survey of 160 cocoa farmers in the Birim South District in the Eastern Region of Ghana was carried out to identify the predominant occupational hazards and injuries faced by the farmers during pre-planting, planting, post-planting and post-harvest operations. Injuries from stumps/thorns and cutlass were the most prevalent among farmers during land clearing and planting. Insect bite (red ants bite), cutlass injury, headache and severe fever were also the major problems encountered during farm maintenance. Back/waist pains, bee/wasp sting, and headache were common problems during harvesting of pods and post harvest operations. Cutlass injury, stumps/thorns injury and back/waist pain were also found to be more debilitating accounting for an average day lost of 18, 12 and 12 from work in a cropping season respectively. Majority of respondent resorted to treatment from the hospital on injuries/hazards from cutlass, snake bite, burns and harvesting tools. However, majority resorted to self medication on injuries from stump and thorns, bees/wasp sting and fallen objects on the eye. Also nearly two-thirds of the respondents did not use protective equipment during application of agrochemicals and this resulted to difficulty in breathing, skin rashes and headaches. Cutlass injury recorded a greater number of days lost (18) per season among the respondents and took the highest treatment and days lost cost (\$ 85.4). It was recommended that Agricultural Extension Agents in consultation with Ministry of Health and other health NGOs should collaborate to educate cocoa farmers on precautionary measures and first aid operations at the farm level.

Keywords: occupational hazards/injuries, cocoa farmers, eastern region of Ghana.

INTRODUCTION

Agriculture is registered as a pivot for sustained economic and human development change. Agriculture is one of the dominant sectors in Ghana's economy contributing about 37% of the GDP (including fishing and forestry) and employs half of the world's labour force and it is estimated that 1.3 billion workers are engaged in it (Mhango, 2010; Suutarinen, 2003). In Ghana, cocoa is one of the economic pillars which account for 28% of the export earnings (Clemens and Kolavalli, 2007). According to ILO (2004) the world demand for cocoa products remains high with three corporations controlling 83% of the cocoa trade. Small families in Ghana, Ivory Coast, Nigeria, and Cameroon produce 70% of the world's cocoa supply. Cocoa is grown in six (6) of the ten (10) regions in Ghana and employs approximately 800, 000 farm families spread over these six regions (COCOBOD, 2008). Ghana government together with Cocoa Research Institute of Ghana (CRIG) had developed a package known as cocoa "Hi tech" with the sole aim of exposing farmers to soil fertility management practices as well as cocoa mass spraying exercise to increase production which had improved the livelihoods of cocoa farmers living in rural farming communities since 2003 (Bosompem, Kwarteng and Ntifo-Siaw, 2011a). Marcella (2007) also reported that the major boom of cocoa which was observed in the 2001 and 2003 season was primarily the result of the cocoa mass spraying programme, combined with a dramatic rise in fertilizer use. The cocoa sector continues to face problems such as inadequate storage facilities, pest and diseases, child labour issues, and occupational hazards.

Occupational hazards had led to the full potential of energy needed by farmers to enhance productivity often not realized, with farmers' physical capacity being reduced because of ill health from diseases or injuries attributed to work practice, work demand, or work environment (McNeill and O'Neill, 1998). Most of recent studies and programmes in the cocoa industry focus on child labour and sustainable cocoa productivity which is commendable. For instance, World Cocoa Foundation / African Cocoa Initiative (WCF/ACI) programme aims to double cocoa productivity for 100, 000 farm households through capacity-building of local and national institutions, and in doing so raise per capita income by 150-200% (WCF/ACI, 2012). However, few programmes and studies address cocoa farmers' farm safety and occupational hazards they encounter during all farm operations (pre-planting, planting, post-planting, and post-harvest). Also most studies that even reports on occupational hazards among cocoa farmers and other farmers concentrate on hazards in agrochemical applications but silent on hazards associated with other farm operations mentioned (Bosompem, Kwarteng and Ntifo-Siaw, 2011b; Biney, 2001; Gerken, Suglo and Braun, 2001; Clarke, Levy, Spurgeon, and Calvert, 1997).

The main objective of the study was to find out the trend of hazards and injuries among cocoa farmers in Birim South District in the Eastern Region of Ghana during pre-planting, planting, post-planting and post-harvest operations and the effect on farmers and their farm productivity.



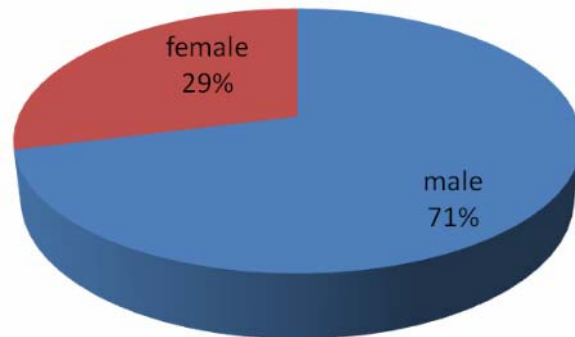
MATERIALS AND METHODS

The Birim South District is one of the newly created administrative districts in the Eastern Region of Ghana. It covers an estimated land area of 299.50 sq km. Akim Swedru is the district capital. The district falls within the semi-deciduous rainforest zone leading to high degree of rainfall for crop cultivation and human use. Cocoa is the dominant cash crop grown in the area followed by oil palm and citrus (www.ghanadistricts.com/districts, 2011). Descriptive survey design was used to collect the data. Four (4) out of the eight (8) cocoa communities (zones) in the district were randomly selected for the study. One hundred and sixty (160) cocoa farmers were selected from four communities in the district namely: Osorase zone, Achiasse zone, Swedru zone, and Akotekrom zone using non-proportionate stratified sampling. Forty farmers were selected from each zone and interviewed using a structured interview schedule made up of items that solicited for information on farmers' demographic characteristics, production constraints (hazards and injuries), opinions and attitudes. The interview was held in Akan (Twi) language and the responses translated by the researcher into English Language. The data obtained were coded and summarized to provide meaningful explanation to the situation in the study area. With the help of Statistical Product and Service Solution (SPSS version 15), frequencies, percentages, means and standard deviation used to analysis the data. These information were presented in a form tables and charts.

RESULTS AND DISCUSSIONS

Demographic characteristics of respondents

Figure-1 and Table-1 show the Sex and educational background of respondents in the study area, respectively. The cocoa farmers were male dominated. The results showed that 71% of the respondents were males and approximately 74% were above the age of forty (40) years. A majority (61%) of the respondents had attained only basic education. Few (17%) had secondary and tertiary education (Table-1). The male to female ratio is in line with other studies on cocoa farmers in Brong-Ahafo, Eastern, Ashanti and Central Regions of Ghana. For instance, Bosompem and Nunoo (2009) reported 72% male and 28% female cocoa farmers in the Brong-Ahafo Region of Ghana. Anang, Fordjour, and Fiatussey, (2011) work on Farmers' Management Practices and the Quality of Cocoa Beans in the Upper Denkyira District of Central Region, Ghana also reported 79% male and 21% female cocoa farmers. Cocoa Research Institute of Ghana (CRIG) (1995), survey in the Ashanti Region of Ghana recorded 71% male and 29% female of cocoa farmers. Bosompem (2006) reported 75% male and 25% female of 200 cocoa farmers interviewed in the Eastern Region.



Source: Field data (2011)

Figure-1. Sex distribution of respondents (n = 160).

The highest educational level among the respondents was basic education with 22% having no formal education Table-1). This seems to suggest that the literacy rate has improve over the years among cocoa farmers since Dankwa (2002) and Kumi (2003) reported that about 50-55% of cocoa farmers in Ashanti and Eastern Region of Ghana, respectively had no formal education about a decade ago. More than half of the respondents (58%) had more than 20 years cocoa farming experience. This clearly portrayed that most cocoa farmers in the study area have adequate experience in cocoa production. Bosompem *et al.* (2011b) survey in the Eastern Region of Ghana in 2006 reported that the average experience of cocoa farmers was 24 years. Anang *et al.* (2011) also found that about 25.5% of their respondents were experienced cocoa farmers with more than 21years in cocoa production in Central Regions of Ghana.

Table-1. Educational background of respondents.

Educational level	Frequency	Percentage
No formal education	36	22.5
Basic education	97	60.6
Secondary education	10	6.3
Tertiary education	17	10.6
Total	160	100

n=160, Source: Field data (2011)

Table-2 shows that about 72% of the cocoa farmers were above forty (40) years old while 26% were 40 years and below (20-40). This shows that the aged dominate in cocoa production in the Birim South District in the Eastern Region of Ghana. Marcella (2007) also reported that most cocoa farmers in Ashanti and Brong-Ahafo regions of Ghana are aged (65-70 years).

**Table-2.** Age distribution of respondents.

Age	Frequency	Percentage
20-30	18	11.2
31-40	23	14.4
41-50	36	22.5
51-60	31	19.4
Above 60	52	32.5
Total	160	100

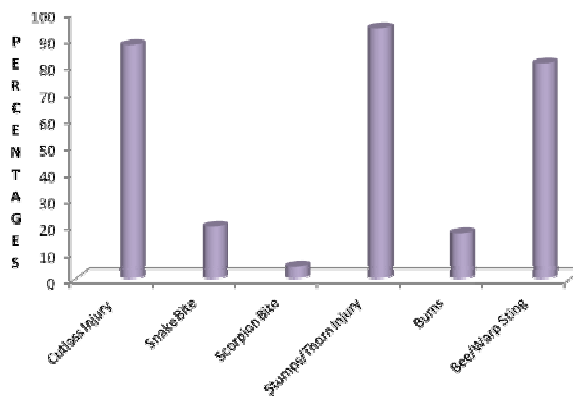
n=160, Source: Field data (2011)

Hazards and injuries faced by cocoa farmers during the performance of major cocoa farming operations

The study focused on four (4) main major farm operations in cocoa production. These were 1. Pre-planting and planting (land clearing, burning, felling of trees and destumping, lining and pegging and planting of seedlings), 2. Post-planting (weeding, thinning, pruning, control of mistletoe, application of agrochemicals) 3. Harvesting (plucking and gathering of pods, breaking of pods and scooping of cocoa beans) and post-harvest (fermentations, transportation, drying and sorting of beans and bagging). For the purpose of emphasis, the study isolated the hazards in agrochemical application from the post-planting operations.

Hazards and injuries associated with pre-planting and planting operations in cocoa production

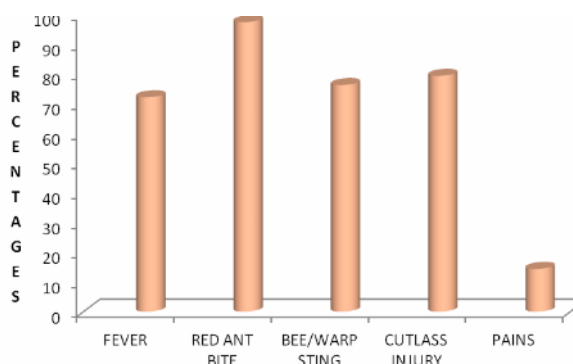
Figure-2 shows hazards and injuries associated with land clearing and planting in cocoa production. The major hazards and injuries faced by the respondents were cutlass injury (88%); stumps/thorns injury (94%) and bee/warp sting (81%). These disorders were attributed to farmers not using or wearing appropriate personal protective equipment. About 60% of the respondents complained that they do not wear the Wellington boot regularly because it is too heavy and does not make them move fast when performing farm task. The respondents rather wear bathroom sandals to farm hence the prevalence of stumps/thorn injuries. The prevalence of thorns/stumps and cutlass injury also confirms a work done by McNeill and O'Neill (1998) that cutlass and stumps injuries are very predominant during land preparation in their occupational disorders in Ghanaian subsistence farmers.



Source: Field data (2011).

Figure-2. Hazards and injuries associated with land preparation and planting (n=160).

Figure-3 shows hazards and injuries associated with farm maintenance. The major hazards/injuries complained by the respondents were ant bite (97.5%), cutlass injury (79.4%), bee/warps sting (76.3%) fever. About 80% of the respondents complained that the red ants are usually on the cocoa trees and during cutting of mistletoes on the cacao tree, weeding and pruning they splash on their body and bite which is very disturbing when performing the aforesaid maintenance activities in the farm. ILO (2004) also found in their work that the major safety and health hazards in cocoa farming include skin abrasions, snake and insect bites, injuries from cutting tools and high levels of sun exposure which can result in skin cancer and heat exhaustion.



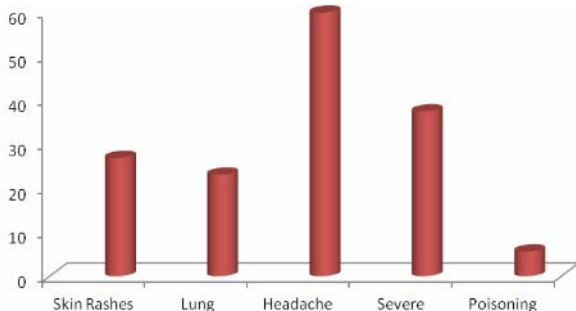
Source: Field data (2011)

Figure-3. Hazards and injuries associated with maintenance of farm (n=160).

Figure-4 shows hazards and injuries associated with application of agro-chemicals. Majority of the respondents complained severe fever (37.5%), skin rashes/irritation (29%) and headache (60%) as the greatest disorder encountered during application of agro-chemicals. About 80% of the respondents do not use personal protective equipment such as nose guide, overall (coat) and hand gloves during application of agro-chemicals. Others also use handkerchiefs for nose guide



and plastic bags for hand gloves however, McNeill and O'Neill (1998) reported that there is no concise evidence to support the effectiveness of these practice.



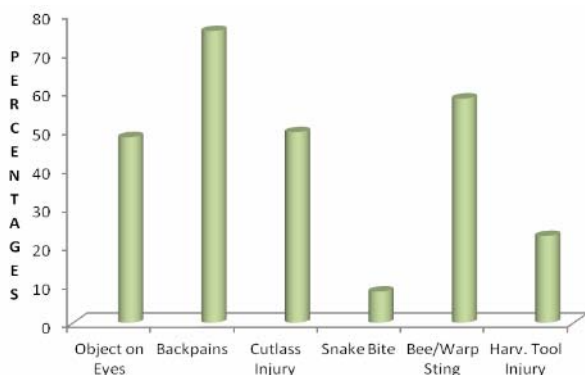
Source: Field data (2011)

Figure-4. Hazards and injuries associated with application of agro-chemicals (n=160).

The prevalence of headache, skin rashes/irritation severe fever also confirms or seems to be in line with a work done by Tijani (2006) that cocoa farmers usually face the problem of skin rashes, headache and lungs problems during application of agro-chemicals, especially when they do not put on personal protective equipment

Hazards and injuries associated with harvesting of cocoa

Figure-5 shows hazards and injuries associated with harvesting of cocoa. The predominant hazards and injuries that affected respondents were back pains (75.6%), bee sting (58%), fallen objects on the eyes (48%) and cutlass injuries (49.4%). Approximately 76% of the respondents complained of back pain as the major problem during harvesting. Some of the respondents also attributed it to repetitive body motion during harvesting. Sonii (2008) had reported in a study in occupational safety and health in cocoa production in West Africa that back pain was one of the major disorders faced by cocoa farmers during harvesting.

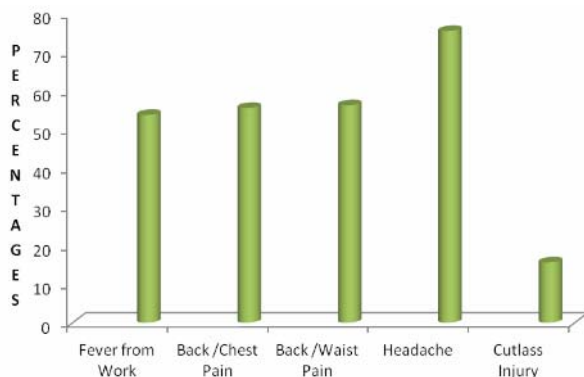


Source: Field data (2011)

Figure-5. Hazards and injuries associated with harvesting of cocoa. (n=160).

Hazards and injuries associated with post harvest operations in cocoa production

Figure-6 shows hazards and injuries associated with post harvest operations in cocoa production which included breaking of pods, fermentation, drying, carrying and bagging into jute sacks.



Source: Field data (2011)

Figure-6. Hazards and injuries associated with post-harvest operations in cocoa production (n=160).

The greatest problems faced by the respondents were headache (75.5%), back and waist pains (56%), chest pains (55.6%) and fever from work (53.8%). The incidence of headache, back and waist pain, chest pain and fever from work could be linked to long exposure to sun during drying of beans as well as carrying of heavy loads, bending for long hours during scooping of beans from the pod and walking long distances to bring the beans home. These hazards and injuries also confirms a report released by ILO(2004) that cocoa farmers usually face musculoskeletal injuries(back pains, waist pain, etc) from repetitive forceful movement, lifting and carrying heavy or awkward loads.

The use of personal protective equipment by respondents

Table-3 shows the use of protective equipment by respondents during application of agro-chemicals.

Table-3. Personal protective equipment used by respondents.

Equipment	Yes		No	
	F	%	f	%
Overall (coat)	57	35.6	103	64.4
Wellington boot	105	65.6	55	34.4
Hand gloves	57	35.6	103	64.4
Nose guide	60	37.5	100	62.5

Yes = use No = Do not use
n = 160: Sources; Field data (2011)



Majority of the respondents do not wear hand glove (64.4), nose guide (62.5%) and overall (coat) (64.4%) during application of agro-chemicals. Approximately 66% of the respondents wear Wellington boot to farm. Most of them complained that it is too heavy which sometimes makes them feel uncomfortable when using it to walk long distances to their farms. The absence of nose guide, hand gloves and overall (coat) usage among most of the respondents could suggest the high incidence of headache, severe fever, skin rashes/irritation, chemical inhalation and spillage on their bodies. Olowgbon (2011) reported in his study 'Health and Safety in Agriculture and Food Security Nexus' in Nigeria that 65% of his respondents do not use Personal Protective Equipment (PPE) in their farming activities.

Mode of treatment of hazards and injuries by respondents

Table-4 present the various ways respondents treat the various hazards and injuries when they occur. Majority of the respondents use self medication when faced with the following injuries and problems: back/chest pain (58.3%), back and waist pain (55%), stumps and thorns injury (62%), bee /warp sting (87%), skin rashes (55%) and fallen object on eyes (74%). However, majority of the respondents seek medication from the hospital when faced with the following: cutlass injury (54%), snake bite (82%), burns (54%), difficulty in breathing (51%), headache (65%) and severe fever (60%).

Table-4. Mode of treatment of hazards and injures faced by the respondents.

Hazard and Injury	Self medication (%)	Hospital treatment (%)	Both (%)
Cutlass injury	42.2	54.4	3.4
Snake bite	12.3	82.4	8.8
Scorpion sting	-	4.4	-
Stump and thorns- injury	62.5	37.5	-
Burns injury	46.2	53.8	-
Bee/warp sting	87.7	12.3	-
Skin rashes	54.8	45.2	-
Difficulty in breathing	48.6	51.4	-
Headache	30.8	64.7	4.5
Severe fever	36.4	59.5	4.1
Harvesting tool injury	41.9	58.1	-
Back and waist pains	54.5	39.7	5.8
Fallen object on eyes	74.1	23.5	2.5
Back and chest pains	58.3	41.7	-

n = 160, Source: Field data (2011)

A survey of about 25581 individuals in Ghana of which 6167 fell ill or got injured, 3253 (about 52%) resorted to self-medications and this includes farmers (van den Boom, Nsowah-Nuamah and Overbosch, 2004). Salisu and Prinz (2009) reported that, when ill, most Ghanaians apply self-medication rather than consulting a health care provider. Most patients may go to a drug store or a drug peddler and buy drugs on the advice from the operators whose healthcare knowledge is sometimes questionable.

Effects of hazards and injuries on farmers farm productivity

Table-5 shows summary of the mean days lost cost and the injury treatment cost of various hazards and injuries in a cropping season. Cutlass injury recorded a greater number of days lost (18) among the respondents and took the highest treatment and days lost cost (\$ 85.4). Stumps/thorns injury and back/waist pain were the next with days lost of 12 and total cost of treatment and days lost cost of 58.9 and 69.3 US dollars respectively. It was also observed that when respondents only have a limited window, dictated by climatic and environmental changes, in which to undertake certain activities, an injury or illness that is sustained at these times can have serious implications in the productivity of the cocoa farm.

**Table-5.** Summary of mean days lost and injury treatment cost.

Hazards/injuries	M.D.L/I	M.F.O	T.D.L	S.D	M.L.C/D	T.C/D.L	M.C.T	S.D	T.C.I
Cutlass injury	9	2	18	5	4.04	72.72	12.72	8	85.4
Bee/warp sting	4	2	8	0.4	4.04	32.32	9.25	6	41.6
Severe fever	5	2	10	1	4.04	40.40	13.87	8	54.3
Scorpion sting	4	1	4	0.4	4.04	16.16	7.51	5	23.7
Snake bite	5	1	5	1	4.04	20.20	8.09	7	28.3
Headache	4	2	8	0.4	4.04	32.32	8.09	2	40.4
Back/waist pain	4	3	12	0.4	4.04	48.48	20.80	8	69.3
Harv. tool injury	6	1	6	2	4.04	24.24	5.78	2	30.0
Thorns/stumps	4	3	12	0.4	4.04	48.48	10.40	4	58.9

M.D.L/I =Mean days lost per injury. M.F.O =Mean Frequency of Occurrence. T.D.L =Total Days Lost. S.D =Standard deviation. M.L.C/D =Mean Labour Cost Per Day. T.C/D.L =Total Cost per Days Lost. M.C.T =Mean Cost of Treatment of injury. T.C.I. =Total Cost Incur for Days Lost and Treatment of injury. Unit of money is US dollars.

Source: Field data (2011)

CONCLUSIONS AND RECOMMENDATIONS

The results of the study show that occupational hazards and injuries are major problems affecting cocoa farmers in the Birim South District in the Eastern region of Ghana. Injuries from hand tools, musculoskeletal complaints (back and waist pains) and fever attributed to long working hours were prevalent among respondents. In addition the highest educational level attained by majority of the respondent was basic education. About 74% of the respondents were above the age of forty (40) years. For the various farm operations cutlass injury (88%) and stump/thorn injury (94%) were recorded as the greatest problem among respondents during pre-planting and planting operations. Post-planting and farm maintenance operation also had ant bite (98%) and cutlass injury (79%) as the most prevalent problem among respondents while severe fever (38%) and headache (60%) were found to be greatest among respondents during application of agro-chemicals. Harvesting of pods and post harvest operations had back pains (76%), bee/warp sting (58%) and waist pain (56%), headache (76%) as the problems respondents encounter. Approximately 60% of the respondents do not use personal protective equipment during application of agro-chemicals. Averagely, respondents lost forty-eight US dollars (\$48) as a result of hazards and injuries problem per cropping season. It is therefore recommended that Agricultural Extension Agents (AEAs) in consultation with Ministry of Health (MoH) and other health NGOs should collaborate to educate cocoa farmers on first aid operations at the farm. The training should also address the dangers in self-medication when injured. COCOBOD, Licensed Cocoa Buying Companies (LBCs) and Agricultural Extension Agents (AEAs) should collaborate to provide personal protective equipment to cocoa farmers. Finally, cocoa related NGOs and other stakeholders in the cocoa industry should sponsor mass media education on

the need to use personal protective equipment especially when applying agro-chemicals on the farm.

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