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OCCUPATIONAL DISORDERS IN GHANAIAN SUBSISTENCE FARMERS

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A survey of 100 (male) subsistence farmers in the Brong Ahafo region of Ghana was undertaken to identify the predominant causes of ill-health in this sector of the population. Injuries from cutlass accidents and back pain were found to be prevalent (79% and 76% respectively), with back pain being the more debilitating accounting for, on average, 19 days lost from work. A greater number of working days were lost from gunshot wounds (60), broken bones (38) and snakebites (29), but these were less prevalent. The use of handtools was heavily implicated in many of the activities associated with the onset of ill-health. It is concluded that improved designs of handtools could increase the farmers' productivity and quality of life.

Introduction

In Ghana agriculture accounts for 47.8% of GDP, employs about 60% of the total labour force and contributes 70% of total export earnings (GSS, 1994). The majority of this is small scale subsistence farming where manual labour contributes an estimated 90% of the energy used for crop production (FAO, 1987). The full potential of this energy is often not realised, with the workers physical capacity being reduced because of ill health from occupational disorders; diseases or injuries attributable to work practices, work demands or the work environment, (Rainbird and O'Neill, 1993).

A perception that occupational health is solely an industrial concern and that health and safety issues are less of a problem to the agricultural sector than the industrial sector seems to persist (Mohan 1987). Whilst some research has been conducted into occupational disorders in industrially developing countries, very little has focused upon agriculture. Rainbird and O'Neill (1993) in their review of occupational disorders affecting agricultural workers in tropical developing countries grouped agricultural occupational disorders into three broad categories: health problems associated with pesticides, musculoskeletal disorders, and occupational diseases such as zoonoses and

farmer's lung. They specifically excluded occupational accidents that may be a significant cause of lost productivity in agriculture. Nogueira (1987) described a survey of agricultural accidents carried out in Brazil where 9.22% of workers suffered accidents at work, of which 45.98% were caused by handtools. In Ghana where most farming activities are carried out using hand tools, the incidence of injuries from handtools may be expected to be greater.

A participatory rural appraisal (PRA), along the lines described by O'Neill (1997), conducted with farmers in the Brong Ahafo (BA) region of Ghana, suggested that accidents, injuries and illnesses as a result of agricultural activities are not uncommon. In particular, musculoskeletal disorders were identified as a problem with a majority of farmers complaining of lower back pain. Injuries from hand tools were common, farmers claiming that lacerations from slashing the bush with cutlasses or weeding with hoes were a regular hazard. Other occupational disorders that farmers claimed to suffer from included thorn pricks, from weeds such as *Acheampong* (*Chromolaena Odorata*) and *Speargrass* (*Imperata Cylindrica*), gunshot wounds and fever from working in the sun. Occupational disorders from post-harvest agro-processing activities, which are mostly carried out by women, were also found to be common. These usually involve much drudgery, with repetitive upper body motions (e.g., stirring, kneading, pounding) in unpleasant environments (e.g., smoke, dust). For a more detailed account of occupational health in agro-processing, refer to Fajemilehin and Jinadu (1995).

Discussions with medical personnel in clinics and hospitals in the Wenchi district of BA and with traditional herbalists supported the hypothesis that occupational disorders are a problem for farmers. Whilst malaria is by far the most common cause of morbidity and admission to hospital in Wenchi district it is by no means the only cause. In 1996, accidents (trauma and burns) were the sixth most common cause of morbidity (Antwi, 1997). Whilst there is no indication as to the causes of these, the medical personnel and herbalists suggested that agricultural accidents may be the most frequent cause. From the records at one hospital, morbidity amongst farmers that may be related to occupation (such as trauma, lower back pain and snake bites) accounted for approximately 11% of all cases seen. Given the apparently often hazardous nature of many of the activities with which they are involved, this study aimed to establish how Ghanaian subsistence farmers are affected by occupational disorders.

Methodology

From earlier PRA work with farmers and discussions with health personnel, a questionnaire was constructed covering the major occupational disorders that had been identified. It was piloted before being incorporated into a larger survey of farming practices in the Wenchi district. Whilst women are also farmers, (and indeed their burden of agricultural work may be greater, undertaking activities such as agro-processing, water and firewood collection along with tending to the farm), the logistics of this limited survey prevented them from being included. Hence the questionnaire was administered to farmers (predominantly male heads of household) in four villages in the Wenchi district. A total of 100 farmers from168 households were interviewed.

Results and Discussion

Table 1 provides a summary of the days lost and the costs of disorders, for various activities from information collected over two cropping seasons (ie one year).

Table 1. Mean costs and days lost from occupational disorders

		Causal activity (%)					Days Lost		Cost[5] (¢)	
Activities	Incidence[1]	Clear.[2]	Prep.[3]	Cultiv.[4]	Harvest.	Other	Mean	SD	Mean	SD
Cutlass injury	79	23	9	47	21	-	9.9	8.09	13,086	8,335
Back pain	76	30	30	32	4	3	19.2	25.20	7,745	4,574
Fever from work	72	58	18	15	9	-	6.3	3.90	12,056	4,990
Acheampong injury	69	24	27	29	20	-	7.9	5.98	8,409	5,272
Hoe injury	57	9	35	52	4	-	7.2	4.91	-	-
Snake Bite	53	18	39	19	21	2	29.1	26.16	28,433	36,844
Burn	50	92	5	3	-	-	15.7	20.61	8,250	6,563
Speargrass injury	48	7	38	27	28	-	5.9	6.05	13,500	13,289
Chest pains	42	28	48	18	6	-	13.1	11.61	10,864	6,481
Sickness from chemical use	28	-	-	90	-	10	7.6	3.35	16,742	15,643
Broken bones	26	51	-	29	9	11	38.2	35.87	16,308	9,569
Gunshot wound	9	-	-	-	-	100	60.5	70.06	70,800	58,743
Bicycle accident	7	-	-	-	-	100	22.7	23.32	17,000	18,385
Other infections	33	9	4	23	62	2	9.7	7.31	10,100	10,394

[1]Number of farmers reporting having suffered from each occupational hazard (n=100)

[2]Clearing includes slashing, burning, tree felling and removing stumps
[3]Preparation includes mound making, bed making and planting
[4]Cultivation includes weeding, general tending to crops, and mixing and spraying chemicals
[5]Exchange rate at time of study was £1 = ¢ 3440

Musculoskeletal disorders

Back pain was suffered by 76% of the farmers. This may be related to extended periods of hard work in awkward postures that are observed during many agricultural activities. Indeed all the activities that were attributed to causing back pain (Figure 1) are traditionally undertaken using short handled hoes and cutlasses that necessitate a stooping posture. Several farmers claimed they were unable to work for long periods with chronic back pain. The mean number of days lost from back pain was 19 days.

Complaints of chest pain were made by 42% of the farmers in the last two cropping seasons. The most commonly cited cause of this was from making yam mounds; this activity involves the farmer bending over, using a short handled hoe to move soil between his legs creating a mound approximately 0.5m high.

An opportunity sample of 40 farmers from the original 100 were also asked whether they were suffering from lower back pain now and whether they had suffered lower back pain in the last year. The point prevalence was 48%, whilst 77% of farmers claimed they had suffered from lower back pain in the last year.

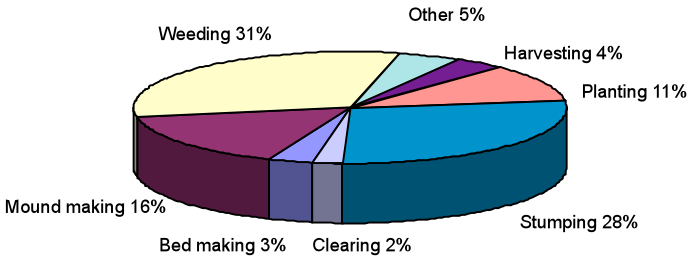

Figure 1. Activities attributed to causing back pain

Hand tools

The cutlass is a multi-purpose tool, being used in clearing the bush (slashing and cutting), planting (digging holes with the blade end), weeding (turning over the soil with the blade end) and harvesting (cutting and digging). Over the two cropping seasons the most common occupational disorder affecting farmers was cutlass injury. The weight of the cutlass and its handle design may be important factors in the incidence of accidents using cutlasses. Hoes are predominantly used during land preparation (i.e., making mounds) and during weeding. As well as being associated with musculoskeletal disorders, 42% of farmers claimed they had sustained an injury from hoeing.

Burns and fever

Farmers burn their land during the dry season to clear the soil for planting and to rid the land of weed seeds and pests. Fires are also lit by hunters to drive out animals. With intensified cultivation, longer dry seasons and increasing spread of grasses the fires can easily get out of hand. Thus, burns are common, with 50% of farmers claiming to have been injured, predominantly during the dry season. Burns may not be the only health hazard from bush fires: almost 74% of fevers during the dry season were attributed to burning. Whilst many of these fevers may be malarial (farmers do not discern between malaria and any other fever) it is suggested that they may be the symptoms of upper respiratory problems from smoke and dust inhalation, or heat stress and heat related illnesses.

Pesticide problems

The results from this survey indicate that 28% of farmers had suffered from sickness following chemical use. This is an indication of acute pesticide poisoning rather than the effects of long-term exposure to pesticides that would require objective, or clinical, analysis such as inhibition of cholinesterase activity to reveal (Rainbird and O'Neill, 1993). Several reasons for the incidence of pesticide poisonings are suggested in Table 2.

Table 2. Suggested reasons for incidence of pesticide poisonings

1.	Ignorance of the dangers. Anecdotal evidence suggests that some farmers taste the chemical before buying it to check or evaluate its strength.
2.	Application. Where farmers do not have access to knapsack sprayers the 'Hosanna Method' is adopted. The farmer dips a palm branch into a bucket and flicks the pesticide over the crops.
3.	Lack of protective clothing. PPC is expensive, often unavailable and inappropriate to a tropical climate. In the villages surveyed the nearest town selling gloves and face masks was approximately 70km away. Farmers are encouraged by agricultural extension officers to improvise using plastic bags for gloves, and handkerchiefs for face masks but there is little evidence to support the effectiveness of such methods.
4.	Packaging. The pesticides are often repackaged in small plastic bags or bottles so they are more affordable to the farmer. Consequently there is no labelling or pictorial advice as to safe handling. This however will be of little value to the illiterate farmer or where pictograms designed in industrially developed countries are not recognisable to a different culture.

Snake bites and injuries from plants

Acheampong is a common weed that is claimed to have medicinal properties and is used in the preservation of corpses. When it is dried, however, the sharp ends are thought to be poisonous and present a significant hazard of injury and infection: injuries from *Acheampong* were reported by 69% of the farmers. *Speargrass* is also a hazard with the risk of lacerations and puncture wounds. Discussions with farmers suggested that these injuries occur mainly around the feet and ankles. Snake bites, which are universally feared, also occur around the lower legs. Many farmers wear wellington boots to protect themselves from these hazards, however they are expensive and inappropriate for the tropical environment. There is, therefore, an apparent need for comfortable, low cost leg protection.

Conclusions

The results of this survey have indicated that occupational disorders are a major problem in Ghanaian subsistence agriculture. Injuries from hand tools, musculoskeletal complaints (back pain) and fever that is attributed to work are the most common. The immediate to the cost to the farmers both in terms of lost work and the financial burden of treatment, be it traditional or allopathic can be considerable. When farmers only have a limited window, dictated by climatic changes, in which to undertake certain activities, an injury or illness that is sustained at these times can have serious consequences in the success of the crop.

Many of the occupational disorders identified in this study could benefit from improvements following a participatory ergonomics approach. For example whilst the cutlass and hoe are the traditional tools used by subsistence farmers it is apparent that they cause many injuries, and the posture required to use them may be a contributing factor in the high incidence of back pain. Nwuba and Kaul (1986) investigated the biomechanical and physiological aspects of using short and long handled hoes. They found the short-handled hoe exerted considerable spinal muscle force and associated this with the "sharp pains low in the back when hoeing". It also had a 64% greater demand in terms of work rate and 51% greater energy expenditure per unit of volume soil moved when compared with the long-handled hoe. Yet, whilst such improvements as long-handled hoes may appear to be beneficial to farmers, there may be cultural or traditional reasons why an ergonomics intervention may be resisted. Freivalds (1987) suggested that a lack of impetus for

changing tool design is a resigned view arising from the belief that that no further improvement is possible to a tool which has been used by many people for many years. Johnson and O'Neill (1979) noted that many attempts have been made to introduce improved tools, such as scythes into Africa, but have mostly failed. They suggested that the main reason, in broad terms, was that a participatory approach had not been taken. By introducing a participatory, multi-disciplinary ergonomics approach to the causal factors of the occupational disorders identified in this paper, it is considered that accidents, injuries and ill-health can be reduced. This will result in raised work capacity, improved health and higher productivity (Elgstrand, 1985).

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