



AGRICULTURAL SAFETY AND HEALTH ASSESSMENT IN MODEL A2 FARMS OF ZIMBABWE

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ABSTRACT

A research was carried out to assess occupational safety and health in the Model A2 farms in the Mashonaland West Province of Zimbabwe. A questionnaire was developed, reviewed, revised and tested several times before the final instrument was ready. Fifty (50) farms were used in the survey. The results of the survey showed 74 % of the farms had specified working hours ranging between 8 and 9, and eight two percent provided protective clothing to full time workers only. Seventy eight percent (78%) of the farms carried out condition assessment for the equipment and 28 percent of the farms had written procedures for carrying out tasks. Eight two percent (82 %) of the farms had fenced off crop storage area and the least protected were dams and boreholes with 0 and 28% respectively. Sixty eight percent (68%) had NO SMOKING signs displayed near fuel storage or refuelling areas and a similar percentage had buildings free of accumulation of trash, litter, junk and other debris which could fuel fire and/or cause falls. The results of the survey showed that safety on the farms still have to be improved in order to create a safe and accident free working environment. Universities, colleges and institutions concerned with agricultural safety should develop short courses targeted at farmers and their workers in order to improve safety on the farms.

Keywords: occupational safety, hazards, risks, safe working environment

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INTRODUCTION

At independence in 1980, Zimbabwe inherited a highly skewed pattern of land distribution that had small minority of white large-scale commercial farmers owning and farming most of the better agricultural land (Chitsike, 2003). The majority of the national population, made up exclusively of black Zimbabweans, farmed in the lower rainfall and poorer soil areas. This dual structure of land ownership was protected by various pieces of legislation introduced during the colonial era, which resulted in mass expropriation of prime agricultural land by the colonial settlers and the subsequent marginalization of black people into marginal rainfall and infertile areas of the country (Moyo, 2001). Land redistribution was high on the list of priorities for the new Government in 1980 as a way of redressing the colonial imbalances in land holding at the same time serving as a barometer for empowering blacks to fight poverty and underdevelopment (Moyo, 2006). The first phase of the land redistribution started in 1980 and ended in 1999. This phase was slow but orderly and the mode of land acquisition was based on the principle of willing seller- willing buyer. The government viewed



this land reform process as having been slow to address development challenges that the majority of people of Zimbabwe were facing.

In the year 2000 the Government appointed a Commission to look into the drafting of a new Constitution. The draft constitution contained provisions relating to the acquisition of land for resettlement and it also placed the onus for providing compensation for the acquired farms on the former colonial power. The Government would no longer be obliged to pay compensation for the acquire land except for infrastructural improvements. A referendum was held in the same year to allow the people to either accept or reject the draft constitution. The verdict of the majority of Zimbabweans was to reject the draft constitution in its entirety for reasons that were more political than anything else. Shortly after the verdict of the referendum war veterans of the liberation struggle began invading white owned farms in a “spontaneous demonstration” which had the backing of Government (Moyo and Yeros, 2005). This new phenomenon soon spread throughout the country with ordinary peasant farmers joining in.

This forced the Government of Zimbabwe to adopt a Fast Track Land Reform Programme (FTLRP). Under this programme the government compulsorily acquired land for equitable distribution to the black majority. The FTLRP created empowerment opportunities for the blacks through increasing their chances to get and own land. Under the FTLRP, two resettlement models, the Model A1 and Model A2 were used (Moyo, 2006). Model A1 in which each household would be allocated at least 3 ha (maximum 5 ha) of arable land, but with shared grazing with the intention being to decongest communal lands. Model A2 was aimed at creating a cadre of black commercial farmers and was based on the concept of full cost recovery form the beneficiary. Thus, the Model A2 formulated under the FTLRP, was meant to give blacks access to land and infrastructure to enhance their participation in commercial farming.

However, it is worthy to note that the FTLRP in Zimbabwe has brought about a number of institutional and organisational changes (Marongwe, 2003). New institutions and organisations have merged while the old ones realigned or re-strategized to meet the changes that were posed by the massive and rapid influx of people into the commercial white farms. This is supported by Mujeyi (2010) who revealed that the land redistribution exercises have brought about significant shifts in agricultural production and the functioning of commodity markets and, hence, changes in Zimbabwe’s agrarian structure.

Since 2010 local people of Zimbabwe with different backgrounds are now the owners of Model A2 farms. However, the majority of these were not privileged enough to go through formal education and tend to engage in farm activities without full understanding of the hazards associated with these. Moreover, due to the economic hardships that both central and local governments have been experiencing, the settlers have been staying on the farms with rudimentary infrastructure that was left by the white commercial farmers and in some instances was vandalised by the new settlers (Marimira, 2010). This implies there will be greater chances of farm accidents, mishap, fatality, production loss time and other burdens on farmer’s well-being. Holistically, due to the modus operandi of agricultural work, the workers are exposed to hazard ranging from; chemical, physical, ergonomics, biological and psychosocial hazards thereby leading to disorders and diseases like carcinogenicity (cancer causing), mutagenicity (induce mutations), tetragenicity (affect the fetus), psychiatric disorder and delayed neuropathy (dysfunction of peripheral nerves), and the dusts have been known to cause diseases ranging from byssinosis (lung diseases), occupational asthma, pneumonitis (inflammation o the walls of alveoli) and non-specific chronic obstructive pulmonary disease (COPD) and agriculturally related musculoskeletal disorder (Olowogbon and Fakayode, 2013).

On a global scale, agricultural accidents place a great burden on the economy, resulting in reduced return on investment in agriculture; moreover, the burden of injuries/illness is on the increase with the quest of mechanization and commercialization of the sector (Olowogbon and Fakayode, 2013). The mergence of these accidents would impede workers’ efficiency, decreases agricultural output and weakens productivity. In African agriculture, hazards include injuries from handling livestock (Mandago, 1999), working in extreme



temperatures, sunlight, humidity, noise, vibration and many occurrences of slips, falls, sprains and fractures (Amweelo, 2001; Regoeng, 2001). Agricultural workers also experience musculoskeletal injuries from long work hours, repetitive motions, lifting and carrying heavy objects, and working in awkward positions for extended periods. Snake bites, insect bites and stings, exposure to poisonous plants and attacks by other forms of wildlife are other types of hazards (Amweelo, 2001; Maroni and Ferioli, 1998; Regoeng, 2001). In South Africa, London (1994) reported that low educational levels, chronic under nutrition, alcohol related trauma, domestic violence linked to alcohol abuse and pesticide poisonings associated with alcohol use are all problems among farmers in the Western Cape. However, most of these studies have been primarily observational and not analytic.

Although there is evidence that occupational health in agriculture is a major concern at a global scale (WorksafeNB, 2011), there is very little quantitative information on farm occupational health hazards in Zimbabwe upon which a control programme can be developed. Therefore this study is the first systematic survey on the health, safety and injury hazards of production agriculture in Model A2 farming system of Zimbabwe. It was undertaken to provide direction for the development of a model occupational health and safety programme and policy for the country. Moreover, the results of the survey can be used by universities, colleges and institutions concerned with occupational health and safety to develop objectives for short courses targeted at farmers and their workers in order to improve health and safety on the farms.

METHODOLOGY

Study site

The study was conducted in Mashonaland West Province of Zimbabwe between November and February of 2010 and 2011. The province has a high production potential and occupational accidents are most likely because of the scale of operation. The province is mainly a rural province with a few urban centres. Mashonaland West is popular for Model A2 commercial farms. Before the FTLRP, the province was the bread basket of Zimbabwe as most of the country's food requirements were produced therein. Commercial farms were acquired under the land reform programme, and the food security of the country has been precarious since then.

Methods

The study was conducted in two stages, namely; the walk-through survey using a hazard checklist and questionnaire based survey of Model A2 farmers. Informed consent of the farmers was sought by explaining the objectives of the study to the farmer in his/her local language and also assuring confidentiality of the responses. The walk-through survey comprised a field observation to scrutinize the nature and condition of farm tools and equipment, so as to identify occupational stressors, equipment hazards and the routes, frequency and duration of possible exposures. Farmers were questioned about performed tasks, personal protective equipment use, and their perceptions of the impact of farming on their health. The hazard checklist covered potential risks, injuries and illnesses in the various steps of the farming process, for each crop farmed, including draught animals, livestock and agrochemicals. All items on the checklist were recorded as yes/no alternatives. On average, the surveys took thirty (30) minutes to one hour to complete. There were a number of variables such as size of the farm, which influenced the amount of time required at each site.

On questionnaire based survey, questionnaires were administered to assess the level of awareness of agricultural safety, illnesses and injuries among farmers. The survey population of farmers was selected in two stages. First district extension workers were asked to identify and provide the names of fifteen (15) to twenty (20) farmers in their districts who were willing to participate in the survey and whose operations were at a commercial scale. The names of the identified farmers were written individually on pieces of paper that were folded and put in a box. The folded papers were thoroughly mixed by vigorously shaking the box. Next, the district extension workers took turns drawing names out of the box, one at a time, until the required number of 50 participants was obtained. Each selected farmer was then conducted by telephone to set a date and time



for the data collection visits. A questionnaire was developed, reviewed and tested several times before final instrument was applied. The National Social Security Authority (NSSA) was consulted regarding liability that could be incurred through the survey. A lot of care was given in developing the instrument in order to make it non-threatening to the population being surveyed. For literate farmers, questionnaires were self-administered but each farmer was given a 2-hour training prior to response. Participants responded to the questionnaires individually but asked for clarifications were necessary. For illiterate farmers, the questionnaire was interpreted and administered by interview in the local language of the farmers by extension workers who were specially trained for it. The farmers' responses were recorded in English. Items for the questionnaires included closed- and open-ended questions on personal demographic data and farm characteristics; injuries and accidents; chemical handling, application and equipment; farm-related health and safety; and diseases.

RESULTS

The sizes of the surveyed farms ranged from 20 to 350 ha depending on the quality of the arable area. The summarised results on agricultural health and safety obtained from selected Model A2 farms in Mashonaland West Province of Zimbabwe are shown in Table 1. The majority of farmers expressed that their workers are trained to carry out specific agricultural tasks such as pesticide application (60 %), welding (64 %), tractor operation (68 %), and tractor maintenance. Seventy four (74 %) of the farms had specified working hours and most cases it was 8 to 9 hours for the permanent workers and casual workers. The remaining 26 % had no specific hours of work and the actual time ranged between 8 and 12 hours depending on the labour demand of the prevailing days. Most farmers (82 %) provided protective clothing such as overalls, helmets, gloves and safety shoes to full time workers only. It was only 18 % of the assessed farms where casual workers were provided with protective clothing, but the workers would surrender the clothing when the contract ends. A low number of farmers (42 %) are sending of workers for refresher courses in areas such as soil sampling and testing, machinery use, chemical application and irrigation scheduling and management since inception of business.

Most farmers indicated that there is communication with the outside world business through the use of fixed telephones (74 %), cell phones (82 %) and 56 % were using other means such as letters and messengers. Seventy eight percent of the farms carried out condition assessment for farm equipment. During condition assessment farmers are expected to check the state and condition of the farm machinery and its ability to be used for specific operations. The study found out that only a low number of farmers had agreed and well written safety procedures on maintenance of tractors (28 %), jacking of tractors (18 %), welding (14 %) and treating animals (32 %). However, the majority of farmers (74 %) had well written-down procedures of applying and mixing pesticides. Most farms were noted to be fencing off hazardous places such as animal area (68 %), crop storage places (82 %), fuel tanks (60 %), workshops (64 %) and electrical power points (54 %) from unauthorised entry. However, only a few farmers (28 %) were fencing the boreholes while none at all (0 %) were protecting the dams. The results showed that 40 % of the farms trained their workers or ensured that workers are somehow sent for training to operate new machinery. In most of these cases the workers accompanied the farmer to collect the new equipment so that they get training from the supplier. However, only 22 % of the farmers keep Material Safety Data Sheets (MSDS) in their files for future reference and only 40 % of the respondents are involved in safety discussions with the workers.

All the farmers involved in the study (100 %) stored chemicals in a lockable room and the chemicals were well arranged with labels facing the potential user. Only, ten percent (10 %) of the farms did either fire control rehearsals or had personnel trained in fire fighting. Fire guards around fields, grazing area, residential area were made in 82 % of the assessed farms. Induction of new workers was practiced in 72 % of the surveyed farms. However, the duration of the induction, differed from one hour (18 %), over a day (32 %) and over two weeks with review (22 %) amongst farmers. Forty percent (40 %) of the respondents had records of accidents at their farms. Few farmers (32 %) indicated that first aid can be conducted on the workplace as



them or a member of their workforce had received first aid training. The distances of the farms to the nearest health care were ranging from 1 to 3 km (42 %), 5 to 7 km (4 %), 7 to 10 km (4 %) and above 10 km (50 %). Sixty eight percent (68 %) of the farms had NO SMOKING signs displayed near fuel storage or refuelling areas. Moreover, sixty eight percent of the farms had buildings free of unnecessary accumulations of trash, litter, junk and other debris which could fuel fire, cause falls or get in the way.

Table 1: Summarised results from safety and health assessment of MODEL A2 farms

	ITEM/ DESCRIPTION	Number	Yes %age
	Are workers trained to carry out the following tasks		
1.	i. Welding	32	64
	ii. Pesticide application	30	60
	iii. Tillage	39	78
	iv. Tractor operation	34	68
	v. Tractor maintenance	37	74
2.	Are number of working hours per day specified on the farm.	37	74
3.	Does the farmer provide protective clothing for the workers		
	i. Full time workers	41	82
	ii. Casual workers	9	18
4.	Are workers sent for refresher courses for the different farm tasks	21	42
5.	Is there any way of communicating with the outside world		
	i. Phone	37	74
	ii. Cell	41	82
	iii. Other	28	56
6.	Does the farmer carry out condition assessment for farm machinery	39	78
7.	Are there any written or agreed procedures for carrying out:		
	i. Pesticide application	37	74
	ii. Maintenance of tractors	14	28
	iii. Jacking of tractors	09	18
	iv. Welding	07	14
	v. Treating animals	16	32
	vi. other	-	-
8.	Are hazardous places fenced off from unauthorised people:		
	i. Animal area	34	28
	ii. Crop storage places	41	82
	iii. Fuel tanks	30	60
	iv. Boreholes	14	28
	v. Electricity power points	27	54
	vi. Dams	0	0
	vii. Workshops	32	64
9.	Are workers trained on safe practice/ operation of new items or machinery?	20	40
10.	Are there any files with MSDS for all equipment for future reference	11	22
11.	Are workers involved in safety discussions	20	40
12.	How are working days managed during:		
	i. Hot days	0	0
	ii. Cold days	0	0
13.	Are chemicals stored in a lockable room and if yes are chemicals well arranged	50	100



	with labels facing the potential user.		
14.	Are some workers trained in fire fighting?	05	10
15.	Do you make fire guards around fields, grazing area, residential area?	41	82
16.	Do you do induction for new workers when they com, if yes what is the period of induction?	36	72
	i. 1 hour	09	18
	ii. Over a day	16	32
	iii. Over two weeks with review	11	22
17.	Do you have a record of:		
	i. Accidents	20	40
	ii. Near misses	0	0
18.	Is there an active first aid committee on the farm?	16	32
19.	The nearest health centre is placed between:		
	i. 1-3 km	21	42
	ii. 3-5 km	0	0
	iii. 5-7 km	02	4
	iv. 7-10 km	02	4
	v. 10+ km	25	50
20.	Are NO SMOKING signs displayed near fuel storage or refuelling areas?	34	68
21.	Are buildings free of unnecessary accumulations of trash, litter, junk and other debris which could fuel a fire, cause falls or get in the way?	34	68

DISCUSSION

The study showed that the majority of farmers train their workers to carry out different agricultural tasks. This is important as training equip workers with appropriate knowledge of carrying out the given tasks, hence minimisation of risks to hazards and injuries. This is supported by ILO (2000) which noted that training in agricultural health and safety is important as it plays a crucial role in promoting workers' health, cutting the social and health costs of sickness and accidents, increasing productivity, contributing towards the social stability of the country concerned and protecting the environment. However, training in health and safety in agriculture requires a pragmatic approach in order to achieve a sound understanding of the sector and dispel any misconceptions about the inevitability of accidents. This means training in Model A2 farms in Zimbabwe must be on-going for farm workers to reflect the multiplicity of skills required as workers are expected to do different tasks within and between seasons.

The study highlighted that 26 % of farms had no specific working hours as time of work was determined by labour demand of the prevailing days. This should be a concern as time of work and concentration on agricultural activities should be specified so that workers are not made to work for long hours. This should be so because long working hours is a known risk factor for injury amongst those working in agriculture (Hwang et al., 2001). Long working hours may result in body straining. This is supported by Gou (2002) who found a prevalence of back pain of 7.4 % to be associated with straining activities in the farming industry of the United States. Moreover, with long working hours, the hazard rate and the probability of injury is high. This is so as tired workers are likely to take shortcuts in carrying out tasks, as they want to quickly finish the job and get an early rest (Swaen et al., 2003)



The study also showed that most Model A2 farmers (82 %) in Mashonaland West Province of Zimbabwe provided protective clothing such as overalls, helmets, gloves and safety shoes to full time workers only whilst limited farmers (18 %) provided for temporary workers. This could be a risk to the casual workers who are not provided the protective clothing. Personal protective equipment is necessary in protecting employees against health and safety hazards, hence, should be provided to all employees. Therefore farmers are urged to provide protective clothing to all their workers and the resultant safe working environment can improve labour efficiency and overall profitability of the farming business (Rohan, 1998). Amweelo (2001) also noted that appropriate equipment should be worn by all workers regardless of grade throughout the period of potential exposure. After work, it should be washed to remove all traces of pesticides or any other agricultural chemicals and then stored in a well-ventilated space, separate from cloakrooms for personal clothing, until next required.

The study noted that 50 % of the farms were located more than 10 km from health facilities. This is divergent to the expectation that no person should be more than 8 kilometres of walking distance of a Rural Health Centre (Ministry of Health and Child Welfare, 2012). This should be a concern as resource constrained farm workers cannot access basic medical attention near their workplaces. Therefore, farmers concerned should advocate for establishment of health facilities near their farms. This is so because poor access to health services and a medical profession raises agricultural health and safety concerns to the workers. Forastieri (2001) also noted that specialised health services and big hospitals are in urban areas, and by the time injured or ill persons from remote areas get treatment, they would have either suffered severe pain or lost life. However, the introduction of cell phones has somehow improved communication and if this is combined with improved maintenance of roads, accessibility of health facilities by farm workers can improve on their safety.

The low availability of well written procedures for carrying out different hazardous tasks such as jacking of tractors and welding amongst Model A2 farmers is a concern. This is so because activities like tractor maintenance and welding need well written down procedures as they are linked to several deaths and injuries in Zimbabwe (Blair et al., 2005). Tractors for example were found to account for 69 % of agricultural related deaths in the United States, with half of these due to roll over (Etherton et al., 2001). Therefore, farmers are encouraged to have well written procedures for hazardous tasks in order to minimise risk and hence increase farm profitability. It was however; impressive to note that majority of farmers (74 %) had well written-down procedures of applying and mixing pesticides. Adoption of a written policy and procedures for pesticide application provides the farmer with an effective way to minimise pesticide hazards and at the same time improves the farmer's internal decision-making process, resulting in more efficient, more effective, and safer resolution of pest problems (Flint, 2003).

The study showed that only 40 % of the respondents are involved in safety discussions with the workers. This is worrisome as the involvement of workers in safety discussions is important in all efforts to create a safe working environment on the farm (Bodeker, 1999). Discussion groups which involve workers are useful for identifying hazards and recommending solutions. It is recommended that farms form safety and health committees and elect safety and health representatives. This is because employees have a right to get involved in workplace health and safety. From the study, it is encouraging to note that all the surveyed farms stored chemicals correctly in a lockable room, with labels facing the potential user. This shows the importance farmers put on their chemicals which are expensive and need protection from unauthorised people. However farmers should avoid use of chemical storage places for other purposes as this tends to provide access to unauthorised people, resulting in unforeseen and avoidable health hazards.

The study also revealed that most farmers (72 %) are conducting induction of new workers. However, the quality of the programme is not satisfactory in terms of time spent with new recruit. More time is needed for orientation to the business and health and safety issues. Health and safety orientation is a vital component of any company's health and safety management system. It is the process of introducing new, inexperienced,



transferred and returning employees to a safe and healthy workplace. Orientation provides employees with necessary safety information about their job and tasks, informs them of specific details about workplace hazards and provides an opportunity to learn about the company and their colleagues, ask questions and to clarify new or confusing information. Moreover, an induction of new workers is important to instil a sense of belonging to the organisation, confidence and even attitude towards goals of the organisation (Booth, 1998).

CONCLUSIONS

Level of safety in the commercial farms in Zimbabwe has to be improved. The level of training of most farm workers is so low that both farmers and their workers could benefit from training programmes that are properly designed to make them conscious of the need to create a safe working environment. Not all farmers are checking the condition of their machinery on the farms, and even those who are checking are not replacing some worn out parts in time. Potentially hazardous areas on the farms are not isolated from unauthorised people. Farmers should involve everyone dwelling on the farm in safety discussions so that hazards are identified and solutions suggested in time. Fire risk must be reduced on farms by making fire guards and writing warning signs near fuel and chemical storage areas.

Farmers should be concerned with creating a safe working environment because the direct and indirect costs associated with accidents can endanger their competitiveness. Financial losses due to increased insurance premiums, lost production or disruption to production schedules, damage to equipment and crops and animals, loss of time for other employees during the accident investigation, training of replacement workers and the possibility of fines and adverse publicity are all issues to consider. Whilst it is possible to insure against some of the expenses associated with injury, ill health and damage to property, the hidden uninsurable costs could well exceed the insurable costs. It is now becoming common for the foreign markets to request companies to provide safety records as part of tender analysis processes.

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