International Scholars Journals

International Journal of Agricultural Economics and Extension ISSN: 2329-9797 Vol. 3 (1), pp. 091-097, January, 2015. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Farmers' knowledge, attitudes and perceptions of occupational health and safety hazards in Trinidad, West Indies and implications for the Agriculture sector

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Accepted 10 December, 2014

Studies have shown that Trinidad has an aged farming population. Young persons are not entering the sector. As such, older farmers will continue to be the backbone of Trinidad's agricultural sector. There is urgent need for focus to be placed on improving the state of occupational health and safety within this sector. This study sought to determine farmers' knowledge, attitudes and perceptions towards occupational health and safety issues in agriculture and recommend actions to reduce/prevent health and safety hazards in agriculture. A total of 100 small-scale commercial-oriented vegetable farmers from ten of the most populated agricultural pockets across Trinidad were surveyed as part of this study. The results of this study indicated that farmers had overall good knowledge, fairly positive attitudes but strong negative perceptions towards occupational health and safety issues in agriculture. Gender was not a significant factor on knowledge, attitude or perception levels. Additionally, attitude varied significantly based on characteristics of farmers (age and job type) and communication efforts by extension. This study validates the need for more emphasis to be placed on occupational health and safety within Trinidad's agricultural sector, which can be achieved through directed programs, policies and practices by government and its related agencies.

Key words: Occupational health and safety, Agriculture, knowledge, small-scale farmers, Trinidad.

INTRODUCTION

Occupational health and safety (OHS) is a set of guidelines that aims to: (a) maintain and promote the health of workers, as well as their working capacity; (b) improve the working environment and the job task so that it becomes conducive to health and safety; and (c) develop work organisations and working cultures in a direction which supports workplace health and safety (International Labour Organisation, 2014). Farming is considered to be amongst the most hazardous occupations since its workers are exposed to a wide range of occupational hazards on a daily basis. The job of a farmer usually entails performing labour-intensive

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physical activities, often in unfavourable conditions. Further, it has been postulated that occupational health and safety issues in agriculture exist not only because of the hazards present, but also because of ignorance, illiteracy, the lack of use or availability of personal protective equipment, inadequate information on occupational hazards, and/or non-existent or inadequate training (Ewete, 2011). Therefore, the knowledge level of farmers on occupational health and safety hazards and their perceived risks, as well as their attitudes and behaviours towards safety, play a crucial role in the safe operations of farming activities (Demirbas et al., 2009).

Farmers' knowledge and attitudes towards OHS and perceived risks

Most farms do not have a documented health and safety policy, including arrangements for managing safety effectively since they do not operate in an organisational context. Due to a lack of organisational structure, compliance with OHS is difficult to monitor in all farms, regardless of its operational span. Therefore, it can be argued that farmers do not take health and safety seriously. This is evident by research conducted in the United Kingdom, which showed that farmers in general had unfavourable attitudes to safety, despite being aware of the potential risks associated with their jobs (Cooper, 2012).

In addition, Cooper (2012) reported that the majority of farm owners never provided health and safety training for their hired labourers, nor did they ever discuss health and safety issues with them. Moreover, farmers have an informal perspective of health and safety, in particular, the role that their job plays on their health and safety (Amshoff and Reed, 2005). However, there is an agreement that agricultural practices and the industry as a whole is more likely to be unsafe if assessed under OHS guidelines (Cooper, 2012). With regards to knowledge, many farmers lack knowledge about health and safety issues and thus, fail to comply with health and safety legislation and standards (Elkind, 1993).

Studies have shown that farmers who were not provided with, or shown how to use, personal protective equipment, suffered from higher rates of occupational accidents, injuries and diseases (Lekei et al., 2014). Thus, farmers believe that if they are provided with more up-to-date information and advice regarding health and safety on farms, not only would it make their job less hazardous but also, it will also positively change their attitudes towards safety. However, Elkind (1993) disagrees and argues that the provision of information about farm hazards does not always correspond with changes in attitudes and behaviours and thus, do not ensure safer practices. Elkind (1993) went on to suggest that the presence of a multitude of farm hazards, as well as farmers' willingness to change their attitudes, behaviours and cognitive perceptions may be socially, politically or economically influenced. Furthermore, in terms of risk perception, farmers' attention to and processing of information relating to hazards in their work environment is influenced by scientific communications, farmers' peers or trusted figures in society, as well as the mass media. As such, Pidgeon and Beattie (1997) argues that, 'external information on hazards and their effects are selected for attention and interpreted on the basis of individual cognitive processes, which are shaped by external information sources'.

OHS in Agriculture: Trinidad

In Trinidad, approximately 19,111 farmers (4% of the labour force) are involved in agricultural production (Jugmohan, 2013), and research conducted by the Economic Commission for Latin America and the Caribbean (2004), has indicated that Trinidad has an aged farming population, with the majority of farmers being older than fifty years of age. This is mainly attributed to the fact that young adults are opting not to pursue professions in agriculture. As such, the agricultural industry in Trinidad will continue to comprise of aged workers, making the issue of occupational health and safety within the sector an alarming concern. Further, studies have shown that the older farmers tend to suffer disproportionately high mortality and morbidity rates (Amshoff and Reed, 2005).

To add to this situation, in Trinidad, the farming sector has been traditionally neglected due to the high significance placed on industrial development. Most agricultural production activities are manually performed by small-scale, self-employed landowners. These farmers tend to produce crops to satisfy the demands of local markets, often with the help of family members. However, when specializing in cash crop production (such as tomatoes, cucumber, celery etc.), farmers tend to employ hired labourers. Additionally, research has indicated that there is a moderate prevalence of occupational hazards among small-scale, commercial-oriented vegetable farmers in Trinidad, with OHS outcomes differing based on each individual's job role (Baksh, 2014). Thus, this study seeks to fill the gaps in the literature not only as it relates to the knowledge, attitudes and perceptions of this farming group in Trinidad, but also by determining if these factors differ based on their individual job roles. Furthermore, if farmers are not aware of the occupational hazards that exist as a result of their job and due to their work environment, as well as the potential risks that these hazards pose to their health and safety, it can have negative impacts on national food security goals and the long-term sustainability of the sector.

Problems specific to the profession of vegetable farming in Trinidad which justifies an investigation include: (a) The extent of which up-to-date occupational

health and safety information is being made available to agricultural crop workers is unknown; (b) The attitudes and perceptions of vegetable farmers towards occupational health and safety issues is generally unknown; and (c) The provision of training for agricultural crop workers, if any, by the relevant authorities in occupational health and safety is not currently available.

In Trinidad, this area has attracted little research attention. No study has critically assessed farmers' knowledge, attitude and perception towards occupational health and safety issues in agriculture. Further, no attempts have been made to determine farmers' perspectives on the subject. Therefore, the aim of this study is to (i) determine the knowledge, attitudes, perceptions, and practices levels of small-scale commercial-oriented vegetable farmers in Trinidad, towards occupational health and safety issues in agriculture, (ii) investigate whether or not significant differences exist based on selected personal and demographic variables, and (iii) recommend actions to reduce/prevent the risk of occupational accidents, injuries and diseases among small-scale commercial-oriented vegetable farmers in Trinidad.

METHODOLOGY

Population and sample

The target population for this study was small-scale commercial-oriented vegetable farmers working on farms in ten of the most populated agricultural areas in north Trinidad. The sample population consisted of 100 small-scale commercial-oriented vegetable farmers from Aranguez (*n* = 10), Mt. Lambert (*n* = 10), Macoya (*n* = 10), Maloney (*n* = 10), Bon Air (*n* = 10), Arima (*n* = 10), Wallerfield (*n* = 10), Aripo (n = 10), heights of Guanapo (*n* = 10), and Valencia (*n* = 10).

Instrumentation

The questionnaire comprised of four (4) sections with questions related to: (i) demographics and job information; (ii) farmers' knowledge on the health and safety hazards in agriculture; (iii) farmers' attitudes towards safety; and (iv) farmers' perceptions of occupational health and safety. The questionnaire was examined for content validity by three subject matter experts, who made some recommendations for improvement. A pre-test was conducted among a small group of farmers (*n* = 5) in Aranguez to assess the practicality of the questionnaire and based on the feedback, adjustments were made to all sections of the questionnaire.

Sample

The list of farmers provided by Extension proved to be old (based on the 2000 agricultural census) and not updated. Consequently, it was decided to pursue a convenient sampling method. At the first selected location in each vegetable growing area selected for study, the researcher approached and asked the first farmer/farm worker found on the holding to assist with the survey. If the farmer/farm worker agreed to take part in the survey, an interview was done using the survey instrument. If the person declined to take part in the survey, the next farmer/farm worker found working on a farm was approached. This process was repeated until the target sample size (*n* = 10) was obtained for the first selected area and was repeated at all ten selected areas. Each survey was conducted in the form of face-to-face interviews and took approximately 15 min to complete.

Coding and data analysis

The data obtained from the questionnaires were numerically coded and statistically analysed using the Statistical Package for Social Sciences (SPSS v. 16). To determine the knowledge, attitude and perception of the sample population, total scores were obtained by summating the scores of all questions within each of the sections. The total scores for each section varied. For the section on knowledge, responses to statements (n=12) were scored as follows: *Yes* = 1 and *no* = 0, and the scores were combined to give a score range of 0-12. For the section on attitude, responses to statements (n=5) were scored as follows: *Strongly agree* = 5, *agree* = 4, *neutral* = 3, *disagree* = 2, and *strongly disagree* = 1, and the scores were combined to give a score range of 5-25. For the section on perception, responses to statements (n=7) were scored as follows: *Strongly agree* = 5, *agree* = 4, *neutral* = 3, *disagree* = 2, and *strongly disagree* = 1, and the scores were combined to give a score range of 7 to 35.

Next, overall scores in each area were tallied for descriptive purposes. For knowledge, low knowledge ranged from 0-4, fair knowledge ranged from 5-8, and high knowledge ranged from 9-12. For attitude level, very unfavourable or poor attitude ranged from 5-10, unfavourable attitude ranged from 11-15, favourable attitude ranged from 16-20, and highly favourable attitude ranged from 21-25. With respect to perception, statements were reversed (negatively stated) so that agreement with a negative statement showed unfavourable perceptions towards the OSH act. Accordingly, very favourable perception ranged from 0-5, favourable perception ranged from 6-15, and unfavourable perception ranged from 16-20.

Results regarding knowledge, attitude and perception were reported based on frequencies. One-way ANOVA tests with the associated post-hoc test (Tukey's b) were also performed to examine significant differences among means of knowledge, attitude and perception levels with the independent variables being age, gender, job role, whether or not farmers were visited by extension officers, the frequency of visits by extension officers, and farmers' familiarity with health and safety issues in agriculture. Cronbach's alpha (α) was used as a measure of internal consistency scales. With respect to the perception scale, α = 0.72, suggesting a fairly good level of reliability; for the attitude scale, α = 0.61, suggesting an acceptable level of reliability and; knowledge, α = 0.67, also an acceptable level of reliability.

RESULTS

Characteristics of farmers

The majority of farmers were males (82%) and some 32% of the sample was 46-60 years old, 31% were 31-45 years old, 19% were older than 61 years, and 18% were between 18-30 years old. Most farmers (58%) reported secondary level education, 35% completed primary education, 4% possessed a technical or vocational certificate level education, 2% attained tertiary education, and 1% had no formal level of education. Most respondent

Table 1. Knowledge, attitude, perception.

Statements							Yes (%)	No (%)
Knowledge	Do you know of the Occupational Safety and Health (OSH) Act?						72	28
	Do you know of the ill effects that lifting heavy objects and working in uncomfortable positions can have on your body?						67	33
	Do you know how to reduce/prevent muscle pains/discomforts caused by your job?						38	62
	Do you know the ill effects that chemical use/exposure can have on your health?						89	11
	Do you know the consequences of re-using empty chemical containers for domestic purposes?						83	17
	Do you know how to reduce/prevent the harmful effects that chemicals can have on your health?						89	11
	Do you know the ill effects that working in the sun can have on your health?						67	33
	Do you know how to reduce/prevent the sun's harmful effects on your heath?						51	49
	Do you know how to reduce/prevent stress and depression?						37	63
	Do you know how to reduce/prevent workplace violence/harassment?						41	59
	Do you know what can cause you to slip, trip or fall on your farm?						86	14
	Do you know what to do in case of accidents/emergencies?						86	14
	Summary (mean) knowledge						67	33
		SA[1]	**A[2]**	**N[3]**	**D[4]**	**SD[5]**		
Attitude	My personal safety is more important than anything else	56	39	0	4	1		
	Because I have been doing my job for many years, I believe I can skip some safety steps	19	21	8	33	19		
	If I saw someone doing something unsafe, I would say something directly to him/her	40	37	2	21	0		
	People should take personal responsibility for each other's safety	28	40	0	28	4		
	Safety is a high priority for me when I am doing my job	53	41	0	5	1		
	Mean attitude	**39**	**36**	**2**	**18**	**5**		
Perception	My job is dangerous	29	20	1	40	10		
	I could get easily hurt while doing my job	27	25	1	35	12		
	My health can be threatened while doing my job	26	30	2	32	10		
	My extension officer is well informed about health and safety on farms	3	5	4	21	36		
	The OSH Act is not useful	31	34	0	7	2		
	The OSH Act is not effective at reducing injuries and illnesses	31	34	0	5	4		
	The OSH Act does not apply to my workplace or job	33	32	1	4	4		
	Mean perception	**31**	**28**	**1**	**18**	**6**		

[1]Strongly Agree; [2]Agree; [3]Neutral; [4]Disagree; [5]Strongly Disagree.

(65%) were farm owners, while 28% were hired labourers and the remaining 7% were family workers. Some 47% of the sample had more than 15 years of farming experience, 28% had 1-5 years of experience, 16% had 10-15 years of experience and 9% had 5-10 years of experience farming.

The majority of the farmers (72%) did not reside on the farm premises. In terms of hours worked per day on the farm, the majority of farmers (48%) worked 6-8 h day^{-1}, while 35% worked 4-6 h day^{-1}, 13% worked 2-4 h day^{-1}, and the minority (4%) worked 1-2 h day^{-1}.

With regards to extension visits, 67% reported that they were visited by extension officers, of which 39% reported monthly visits, 16% experienced annual visits, 7% of farmers were visited irregularly, and 6% were visited weekly by extension officers.

Finally, 53% of the farmers stated that they were not familiar with the health and safety issues in agriculture, while 47% expressed some familiarity.

Farmers' knowledge

Table 1 shows that with respect to overall level of knowledge; mean frequencies suggested that 67% of farmers knew of the health and safety hazards in agriculture, while 33% did not. Farmers had highest knowledge with respect to "*the ill effects that chemical use/exposure can have on your health"*, *"how to reduce/prevent the harmful effects that chemicals can have on your health", "what can cause you to slip, trip or fall on your farm"* and *"what to do in case of accidents/emergencies"* Lowest knowledge was with respect to knowledge of "*how to reduce/prevent stress and depression",* and *"how to reduce/prevent muscle pains/discomforts caused by your job".*

There were moderate levels of knowledge with respect to knowledge of "*how to reduce/prevent the sun's harmful effects on your health"* and *"how to reduce/prevent workplace violence/harassment?"*

Farmers' attitudes

With respect to overall attitude towards safety, mean frequencies showed that the majority (75%) of farmers had fairly positive attitudes towards safety (39% of farmers strongly agreed with the statements and 36% agreed with the statements). Some (25% of farmers) did not have a positive attitude towards safety (18% disagreed with the statements, 5% strongly disagreed, and 2% were neutral). Farmers agreed most with the statement, *"My personal safety is more important than anything else"* and *"Safety is a high priority for me when I am doing my job".* Similarly, farmers agreed with the statements, *"If I saw someone doing something unsafe, I would say something directly to him/her" "People should take personal responsibility for each other's safety"*. There was varied of agreement with the statement, *"Because I have been doing my job for many years, I believe I can skip some safety steps"*.

Farmers' perceptions

Table 1 provides the responses to statements aimed at determining farmers' perceptions of occupational health and safety. Sample frequencies showed that 59% of farmers agreed on some level with the negatively worded statements, suggesting that farmers had a fairly strong negative perception of occupational health and safety issues.

Some farmers (25%) had a fairly positive perception of occupational health and safety. Response showed that the majority (65%) of farmers negatively perceived the OSH Act as "*not useful"*, *"not effective at reducing injuries and illnesses"*, and *"it does not apply to my workplace or job".* Most farmers (57%) held the view that extension officer "*is not well informed about health and safety on farms".* There were mixed perceptions of their job as being dangerous, that they could get hurt while doing their job and that their health can be threatened while doing their job.

Relationships with farmers' knowledge scores

Table 2 presents the results of the ANOVA tests. Farmers' mean knowledge scores were significantly different based on their familiarity with health and safety issues in agriculture ($F_{(1, 98)} = 14.39$, $p < 0.01$). Tukey's b post hoc test indicated that farmers who were familiar with health and safety in issues in agriculture were significantly more knowledgeable on health and safety hazards in agriculture ($FK_L = 9.3$) than farmers who were not familiar with the health and safety issues in agriculture ($FK_L = 7.0$). Farmers' mean knowledge scores did not significantly differ with age, gender, job role, whether or not they were visited by extension officers, and the frequency of visits by extension officers.

Relationships with farmers' attitude levels

ANOVA tests indicated that farmers' mean attitude scores were significantly different based on age, on-farm job role, whether or not farmers were visited by extension officers and the frequency of visits by extension officers. With respect to age, there is a significant difference in farmers' mean attitude scores ($F_{(3, 96)} = 3.59$, $p < 0.05$). Tukey's b post hoc test indicated that farmers between the ages of 46-60 ($FA_L = 15.7$), farmers 31-45 years old ($FA_L = 13.5$), and farmers more than 61 years of age ($FA_L = 14.3$), had a significantly more favourable attitude towards safety than farmers 18-30 years of age ($FA_L = 13.2$).

Results also suggested that there was a significant difference in farmers' mean attitude scores based on job-role on farm ($F_{(2, 97)} = 4.15$, $p < 0.05$). Tukey's b post hoc test confirmed that farm owners ($FA_L = 14.9$) had a significantly more favourable attitude towards safety than hired labourers ($FA_L = 13.0$) and family workers ($FA_L = 13.2$). With respect to whether or not farmers received extension visits, there was a significant difference in farmers' mean attitude scores ($F_{(3, 64)} = 3.35$, $p < 0.10$). Tukey's b post hoc test confirmed that farmers who were not visited by extension officers ($FA_L = 14.7$) had a significantly more favourable attitude towards safety than farmers who were visited by extension officers ($FA_L = 13.5$).

There was also a significant difference in farmers' mean attitude scores based the frequency of visits by extension officers ($F_{(3, 64)} = 7.06$, $p < 0.01$). Tukey's b post hoc test confirmed that farmers who were visited annually by extension officers ($FA_L = 12.5$), farmers visited irregularly ($FA_L = 12.9$), and farmers visited monthly by extension officers ($FA_L = 15.2$) had a significantly less favourable attitude towards safety than farmers visited on a weekly basis ($FA_L = 18.8$). Farmers' mean attitude scores did not significantly differ with gender and farmers' familiarity with health and safety issues in agriculture.

Relationships with farmers' perception scores

ANOVA tests indicated that farmers' mean perception scores were significantly different based on whether or not farmers' were visited by extension officers ($F_{(1, 98)} = 8.22$, $p < 0.01$). Tukey's b post hoc test confirmed that farmers who were visited by extension officers ($FP_L =$

Table 2. ANOVA model of several independent variables on farmers' knowledge levels (FK_L), attitude levels (FA_L) and perception levels (FP_L).

Factor/levels	Knowledge levels			Attitude levels			Perception levels		
	FK_L (SD)	*F*	b	FA_L (SD)	*F*	B	FP_L (SD)	*F*	b
Age									
18-30	8.4 (0.7)	1.9		13.2 (0.7)	3.6**	A	12.4 (1.2)	0.2	
31-45	7.7 (0.6)			13.5 (0.5)		B	11.6 (0.9)		
46-60	8.9 (0.6)			15.7 (0.5)		B	12.0 (0.9)		
> 61	6.9 (0.7)			14.3 (0.7)		B	11.2 (1.2)		
Gender									
Male	8.1 (0.4)	0.3		14.2 (0.3)	0.2		11.7 (0.6)	0.1	
Female	7.7 (0.8)			14.6 (0.7)			12.1 (1.2)		
Job									
Farm owner	8.2 (0.4)	0.57		14.9 (0.3)	4.2**	A	11.8 (0.6)	1.6	
Hired labourer	7.6 (0.6)			13.0 (0.5)		B	12.5 (1.0)		
Family worker	8.8 (1.3)			13.2 (1.2)		B	8.5 (2.1)		
Extension visit									
Yes	8.0 (0.4)	0.1		13.5 (0.5)	3.4***		12.8 (0.6)	8.2*	a
No	8.2 (0.6)			14.7 (0.3)			9.7 (0.9)		b
Frequency of visit									
Annually	7.5 (0.7)	0.8		12.5 (0.7)	7.1*		11.6 (1.2)	1.0	
Monthly	7.9 (0.5)			15.2 (0.5)			13.5 (0.7)		
Weekly	9.0 (1.2)			18.8 (1.2)			11.8 (1.9)		
Irregularly	9.3 (1.1)			12.9 (1.2)			14.9 (1.8)		
Familiar HSE									
Yes	9.3 (0.4)	14.4*	a	14.2 (0.4)	0.1		11.4 (0.7)	0. 6	
No	7.0 (0.4)		b	14.4 (0.4)			12.2 (0.7)		

*p < 0.01, **p < 0.05, ***p < 0.10.

12.8) had a significantly less favourable perception towards occupational health and safety than farmers who were never visited by extension officers (FP_L = 9.7) (Table 2). Farmers' mean perception scores did not significantly differ with age, gender, job role, frequency of visits by extension officers and farmers' familiarity with health and safety issues in agriculture.

DISCUSSION

Farmers had good knowledge levels of the health and safety hazards in agriculture. Results indicated that farmers were very knowledgeable on chemical and accident hazards and less knowledgeable on physical (heat) hazards. It was found that farmers' knowledge levels significantly differed based on their familiarity with health and safety issues in agriculture.

Additionally, studies showed that farmers who had completed higher levels of education had greater awareness of issues, such as pesticide toxicity (Lekei et al., 2014; Osewa et al., 2013).

In contrast, Ogunjimi and Farinde (2012) observed that cacao farmers in Nigeria had poor knowledge levels with regards to precautionary measures in agrochemical usage and concluded that this shortcoming in knowledge was attributed to the lack of contact with extension officers. Thus, according to Pidgeon and Beattie (1997), the term knowledge has different meanings based on who is doing the interpretation and for the purpose for which it is being done, since farmers rely on their own experiences as a source of knowledge.

However, knowing about health and safety hazards may not necessarily lead to the adoption of practices to mitigate its effects, especially when farmers do not consider it relevant to their situation. Pidgeon and Beattie (1997) argue that it is the farmers' perceptions of the risks associated with the hazards that are more relevant in determining what precautionary practices farmers may adopt.

The attitude levels of farmers towards safety were fairly positive. It was found that most farmers felt some level

of responsibility to ensure their personal safety and the safety of others in the farming environment.

These findings correlate with BOMEL (2009) who found that farmers in England had an overall positive attitude towards safety. Further, Knowles (2002) found that in England and Wales there were interrelationships between farmers' background and experiences and their behaviours regarding attitudes to health and safety.

Farmers' attitudes towards safety are argued to be greatly influenced by pressures to produce crops commercially, their past experiences, their supervisor or the farm owners, and the existence of regulations (BOMEL, 2009).

It is evident that with regards to attitude, there is adequate room for improvement. However, it is recommended that in order to achieve a much more favourable attitude there is much need for further studies to be conducted, specifically, studies that seek to: (a) Determine why farmers take risks despite being aware of the potential hazards; and (b) Determine what can be done to change farmers' perceptions of risks. Further, the relevant authorities should undertake activities to promote a safety culture among farmers in the areas of health support/guidance, training/retraining and legislation.

Farmers' perception levels of occupational health and safety were not favourable. They expressed strong negative perceptions of the OSH act and the extension officers who should be their source of information. This can be attributed to the fact that in Trinidad, extension officers are not currently trained on occupational health and safety issues in agriculture, and are therefore unable to provide farmers with the information that they require. Similarly, studies conducted by Agbarevo and Obinne (2009) indicated that farmers in Nigeria found extension services to be ineffective and thus, were perceived negatively.

Additionally, Aphunu and Otoikhian (2008) found that there was a significant association between the effectiveness of extension services and farmers' adoption of best practices and technologies. Further, most farmers perceived their neighbouring farmers and agricultural suppliers as much more effective sources of valuable information (Mirani, 2013). Thus, this stance indicates that farmers obtain their information from peers in their social groups and therefore, it can be argued that these 'external' sources of information also influence farmers' perceptions of the OSH act.

To add to this, at present in Trinidad, there is no legislation specific to health and safety in agriculture. As a result, there is insufficient awareness among farmers regarding occupational health and safety issues in agriculture, which may arguably be another why reason farmers negatively perceived the OSH act.

Therefore, the development of any new agricultural health and safety programs must include the input of farmers in order to ensure the programs' practicality and applicability, as well as farmers' acceptance.

Conclusion

Farmers appeared to have good knowledge and (based on the mean scores) moderately favourable attitudes on health and safety hazards in agriculture. Also, attitude seemed to be the variable, which showed the most differentiation based on the characteristics of the farmers examined in this study.

Additionally, farmers also have negative perceptions about selected issues related to health and safety on farm. Thus, it can be argued that extension officers play a vital role in the farmers' knowledge, attitude and perception of health and safety issues in agriculture. Extension officers are key to providing farmers with awareness-knowledge (information that hazards exists), how-to knowledge (information needed to properly adopt precautionary measures) and principles knowledge (information regarding how agricultural health and safety benefits them). Only when farmers are provided with knowledge, can positive attitudes and perceptions towards agricultural health and safety be fostered, which would then in turn encourage the adoption of precautionary measures to mitigate the effects of hazards thereby reducing the prevalence of those hazards.

Recommendations

The findings of this study indicate that there is considerable room for improvement in the three key areas of policy development, government actions, and future research and training.

Policy development

It is recommended that a national framework be established for occupational health and safety in agriculture to promote a preventive occupational health and safety culture and the effective management of occupational health and safety. This national framework should be comprehensive and afford protection for all workers within the agricultural sector, regardless of their gender or job role. Additionally, this national framework should identify the specific rights and duties of self-employed farmers with respect to occupational health and safety in agriculture.

Government actions

Firstly, establish a competent body to ensure that measures are taken so that self-employed farmers can benefit from the health and safety protection afforded by the national framework. These measures include:
(a) Ensuring compliance with regulations;

(b) Disseminating information about hazards and risks in agriculture; (c) Addressing hazards and risks in agriculture; (d) Developing appropriate educational programmes and materials, and providing occupational health and safety training for farmers concerning work-related hazards; (e) Collaborating with insurance companies to develop special insurance schemes; and (f) Providing training to extension officers or competent individuals in agricultural occupational health and safety. Secondly, provide subsidies for ergonomically designed tools and personal protective equipment such as, goggles, safety boots, gloves, and respirators.

Further research and training

There are many gaps in the knowledge of exposures and the magnitude of specific health risks among farmers in Trinidad. Therefore, further individual quantitative studies on each category of occupational hazards must be conducted to determine these levels of exposure and also take into consideration farmers' health status. In addition, qualitative studies are also needed to obtain information regarding farmers' beliefs and experiences of occupational health, as well as the factors hindering or facilitating farm safety.

With regards to training, health and safety courses should be introduced into the curriculum of tertiary level agricultural institutions such as UWI's ECIAF curriculum, which would facilitate capacity building among extension workers. Together with in-service training and farmer training courses, farmers could be educated.

Implications

The majority of farmers are over the age of 50, and younger farmers are not opting to pursue a profession in farming. Therefore, older farmers will continue to be the backbone of Trinidad's agricultural sector. If actions are not taken the health of farmers could decline and food security objectives and agricultural sustainability goals in Trinidad could be jeopardised. Therefore, there is need for urgent action to improve the state of occupational health and safety within Trinidad's agricultural sector. If appropriate actions are taken in a timely manner then the well-being of Trinidad's aged farming population would be positively impacted and food security goals are not compromised.

Conflict of Interest

The authors have not declared any conflict of interest.

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