

Smallholder Farmer's Knowledge, Perception and Attitude on Occupational Hazard and Safety at Dumki Sub-District of Bangladesh

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Abstract Agriculture farmer have enormous occupational risk in rural area of Bangladesh. Dumki upazila is a coastal region of Bangladesh where about 85% population directly or indirectly is related to agriculture for livelihood. This study focuses on to identify the farmer's perception on occupational hazard and safety issue, their knowledge, attitude, perception on occupation hazard and safety with investigate whether or not significant differences exist based on selected personal and demographic variables. Both primary and secondary data has been collected from different sources to fulfill the objectives. The results of this study indicated that the occupational hazards includes noise, machinery, skin disease, animal bite, sting etc. but the farmers have no scope for hazard safety – only the indigenous technology are applied to save themselves like local hat, covering leg at rainy season by cloth or poly-thin etc. Farmers have very poor knowledge on occupational hazard and safety. The only focusing issues are their indigenous knowledge gained by inheritably but lack of modern techniques and health policy. Significant result shows on farmer's age, cultivation period, education level. Farmer's knowledge, perception and attitude differ on different demographic condition-age, sex, education, farm size, farming year. This study focuses on betterment of farmer's occupational health by taking proper policy and legislation both in local and national level.

Keywords: knowledge, perception, attitude, occupational health and safety, small-scale farmers, Dumki

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1. Introduction

Occupational health and safety (OHS) is termed as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could damage the health and well-being of workers, taking into account the possible effect on the surrounding environment [1,9]. It 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 [2,9]. As agricultural worker is very much exposed to occupational hazard and have little amount of measures, policy, legislation regarding safety issues, it is considered most hazardous occupation in the world. The job of a farmer is actually in labor intensive activities mostly in an unfavorable condition [2,3].

It has great evident that the lack of training on occupational

hazard and safety for farmer is existing in hole Bangladesh. Numerous risk factor-occupational hazards make the health of farmer vulnerable to those hazards [3].

In order to minimize the risk farmers knowledge level as well as perception and behavior towards those hazards should be maintained and checked overtime. By providing adequate assistance for up gradation of farmer's perception on occupational hazard and safety country can achieve sustainable development goal by reducing associated risk with maximum benefit [4].

Most of the farmers don't take the safety issue more prior than their benefit. Farmer's main thinking is like gaining better benefit from the farming practices but they are very low conscious about the health and safety issues. This type of result is also concluded by Naraendra et al. in 2014 at Trinidad. Due to organizational policy and national legislation farmer are not aware of health issues [12]. This is evident by research conducted in the Trinidad, which showed that farmers in general had unfavorable attitudes to safety, despite being aware of the potential risks associated with their jobs [7]. Farmer's perception about health issues is like that "all of hazards are driven by natural

process as it is common, if anyone want to cultivate anything then some problem he/she will face and it may be related to health. But there have no scope to recover from this.”

However occupational hazard and safety issues are better practiced in readymade garments industry in Bangladesh. They have scope for training and health policy to uplift their health problem. But agriculture farmer and health issues is not considered like garments sector [9,11].

1.1. Objectives

Therefore the aim of this study is as following:

- To identify the occupational hazard and safety issue of agriculture sector in the study area
- To determine the knowledge, attitudes, perceptions, and practices levels of small-scale farmers in Dumki, towards occupational health and safety issues in agriculture
- To investigate whether or not significant differences exist based on selected personal and demographic variables

2. Materials and Methods

2.1. Description of Study Area:

Dumki Upazila (patuakhali district) area of 92.46 sq km,

located in between 22°23' and 22°30' north latitudes and in between 90°17' and 90°27' east longitudes. It is bounded by bakerganj upazila on the north, patuakhali sadar and Bauphal upazilas on the south, bauphal upazila on the east, mirzaganj upazila on west. Population 70705; male 35209, female 35496; Muslim 64634, Hindu 5996, Buddhist 51 and others 24. Main rivers Lohalia, Rajaganj and Burishwar. Religious institutions Mosque 197, temple 38 [5].

Literacy rate and educational institutions Average literacy 66%; male 70.2%, female 62%. Educational institutions: university 1, college 5, secondary school 22, primary school 56, madrasa 22 [5].

Main sources of income Agriculture 43.10%, non-agricultural labourer 4.66%, industry 0.92%, commerce 14.62%, transport and communication 3.01%, service 18.17%, construction 3.20%, religious service 0.30%, rent and remittance 0.62% and others 11.40%. Main crops Rice, potato, pulse, chilli. Extinct or nearly extinct crops Kaun. Main fruits Banana, jackfruit, watermelon, papaya. Hats, bazars and fairs 50. Communication facilities Pucca road 7.30 km, mud road 298 km. Extinct or nearly extinct traditional transport Palanquin. Cottage industries Bamboo and cane work, weaving [5].

Access to electricity all the unions of the upazila are under rural electrification net-work. However 22.66% (urban 38.55% and rural 20.27%) of the dwelling households have access to electricity. Sources of drinking water Tube-well 92.16%, pond 4.62%, tap 0.08% and others 3.14% [5].

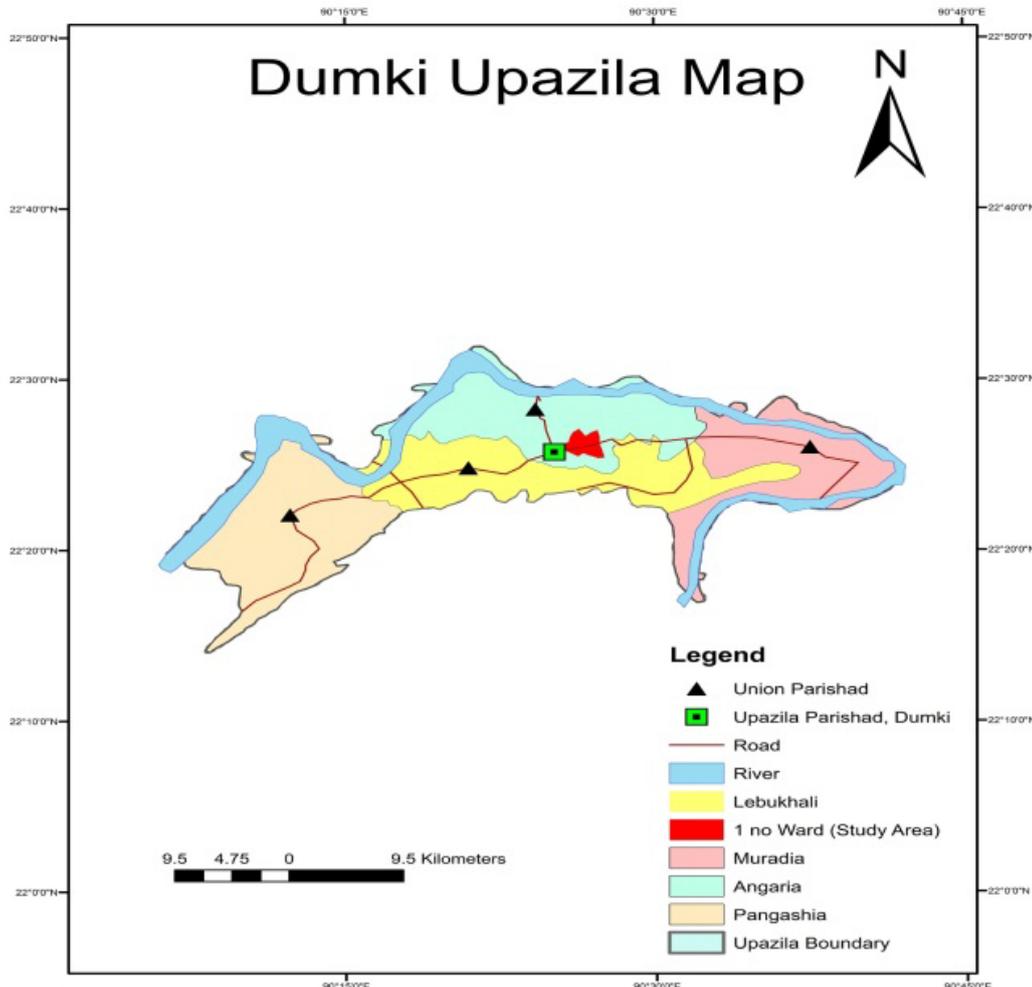


Figure 1. Map of the study area (Source: Prepared by Arc GIS 10)

2.2. Population and Sample

The target population for this study was small-scale farmers working on farms in ten of the most populated agricultural areas in Dumki. The sample population consisted of 30 small-scale farmers from five villages and each village occupying 6 farmers.

2.3. 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 Arranges to assess the practicality of the questionnaire and based on the feedback, adjustments were made to all sections of the questionnaire.

2.4. Coding and Data Analysis

The data obtained from the questionnaires were numerically coded and statistically analyzed 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 summing 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=7) were scored as follows: Yes = 1 and no = 0, and the scores were combined to give a score range of 0-7. 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.

Then the test are conducted as frequency distribution, cross tabulation, Chi square test at 0.05, One way ANOVA, Correlation at 5 % probability level by using SPSS 16 and Microsoft Office Excel 2010. Finally results are shown in tabular, textual, graphical form.

3. Results and Discussion

3.1. Demographic Profile of the Respondents:

The demographic profiles of the respondents are analyzed with help of frequency distribution, cross tabulation and chi-square test to determine the significance with actual population. Most of the respondents are male and its percentage is 76.7% while female respondents frequency n= 7 and 23.3 %. Maximum respondents are middle aged where in can be said that agriculture is an aged developed occupation. Younger people's engagement is less here. 13.33% respondent's age lies between 20-40 years, 56.67% respondents aged is between 41-60 years and 30% respondents age is between 61-80 years range. 96.7% respondent's education level is between 6 to 10 classes. About 86% respondent's farm size is about 80 decimals where 5% have no cultivation land. Maximum respondents said that they produce two seasonal crops in the field, Rabi crops are practicing in higher rate. Approximately 60% respondents said that their experience in farming lies between 40 to 60 years which indicates about aged old farming practice. 26.7% respondents said that they plough land with animal assistance, 53.3% said about Tractor assisted and rest 20 % said about manual ploughing by using handmade tools.

By analyzing the sample data it found that the sampling is quite good that among 7 parameters, 5 parameters show significant result (Table 1).

Table 1. Determining the variation of sampling from target population

	Age*	Gender**	Education**	Year of farming	Farm size**	Cultivation period**	Ploughing
Chi-Square	8.600	8.533	19.867	5.600	16.400	13.400	5.600
Asymp. Sig.	.014	.003	.000	.347	.001	.001	.061

Chi- Squire Test, $\alpha = 0.05$, * $p < 0.05$, ** $p < 0.01$.

The Table 1 shows that ages have significant result while gender, education, farm size and cultivation period shows grater significant result. So it can be concluded that the sampling techniques are significant with target population.

3.2. Most Frequent Hazards in Agriculture

Table 2. Most Frequent hazard faced by the farmer

Noise and vibration of different machine	Hazardous chemicals	Toxic agents	Communicable animal diseases	Ergonomic hazards	Contact with poisonous animals
Tractors Trucks and harvesters, Cutting and piercing tools	Pesticides Fertilizers Antibiotics Veterinarian products	Plants Flower Dusts Animal waste	Tuberculosis Tularaemia Rabies Brucellosis Bovine Listerioses	Use of inadequate instruments Unnatural body position Heavy work loads Boring work, Long time work	Insects Spiders Scorpions Snakes

Source: [11,13,14,15,16,17].

3.3. Farmers Knowledge, Perception and Attitude on Occupational Hazard and Safety

Table 3. Farmers Knowledge on OHS

Statements	Yes	No
1. Farmers knowledge on Occupational Safety and Health (OSH) standard?	0%	100%
2. Farmers knowledge of the ill effects that lifting heavy objects and working in uncomfortable positions can have on your body?	57%	43%
3. Farmers knowledge on how to reduce/prevent muscle pains/discomforts caused by your job?	76%	24%
4. Farmers knowledge on the ill effects that chemical use/exposure can have on your health?	20%	80%
5. Farmers knowledge on the consequences of reusing empty chemical containers for domestic purposes?	0%	100%
6. Farmers knowledge on how to reduce/prevent the harmful effects that chemicals can have on your health?	20%	80%
7. Farmers knowledge on the ill effects that working in the sun can have on your health?	100%	0%
8. Farmers knowledge on how to reduce/prevent the sun's harmful effects on your health?	50%	50%

Table 4. Farmers Attitude to OHS

Statements	SA 1	A 2	N 3	D 4	SD 5
1. Farmers personal safety is more important than anything else	10%	40%	50%	0%	0%
2. Because farmers have been doing job for many years, he believe he can skip some safety steps	40%	10%	50%	0%	0%
3. If farmer saw someone doing something unsafe, he would say something directly to him/her	50%	10%	40%	0%	0%
4. People should take personal responsibility for each other's safety	20%	10%	50%	20%	0%
5. Safety is a high priority when doing job	10%	80%	10%	0%	0%

Table 5. Farmers Perception to OHS

Statements	SA1	A2	N3	D4	SD5
1. Job is dangerous	20%	50%	30%	0%	0%
2. Easy way for getting hurt while doing job	16.7%	23.3%	26.7%	30%	3.3%
3. Health threatening during job	23.3%	46.7%	30%	0%	0%
4. Extension officer condition on information related to OHS	0%	3.3%	13.3%	50%	33.3%
5. OSH rules is applied in workplace	0%	10%	3.3%	87.3%	0%

Table 3 shows that 100% farmer is illiterate in case of occupational hazard and safety standards, that means they don't know about standards. About 57% respondents said that they have knowledge on handling negative consequences arrived from object/materials handling. About 80% respondents said that they have no knowledge that chemical reagent, fertilizer, pesticides have negative impact on their health while doing job in the field. Same result is driven from the research work in Trinidad where it is concluded that most of the farmer have respiratory problem due to pesticides spray but farmers are not aware and don't take any protection. 76% respondents have shown positive response in case of reducing muscle pain as they have gather knowledge inheritably. Most of the farmers agree that sun have very negative consequences for their life but about 50% take some measures to reduce the sun injury.

About 50% farmers said that their personal safety is main issues where 50% have no comments. 40% farmers strongly agreed that they have capacity to reduce the ill impact because they are practicing for many years. About 50% respondents positively stated that they should inform the others about their learning in the field because each and everyone have some scope for negative consequences. In aspects of personal safety rather than others safety mixed attitude is observed that about 50% said that they have no comments, while rest 20% disagree.

Table 5 indicated about farmer's perception on occupational hazard and safety, in aspects of job status

about 70% respondents said that farming is dangerous job, 23.3% said that they can be hurt while doing job, 30% disagree in this aspect. About 70% agreed that farming is a health threatening job and rest 30% disagree in this aspect. About 83.3% respondents said that extension officer don't give proper knowledge and take steps in the OHS issues. Farmers agree that occupational rules and regulation is not practiced readily and farmers are not aware about this.

3.4. Relationship with Farmers' Knowledge, Attitude and Perception Score on OHS:

3.4.1. Relationships with Farmers' Knowledge Scores

Table 6 presents the results of the ANOVA tests. Farmers' mean knowledge scores were significantly different based on their Education ($F_{(1, 30)} = 4.747$, $p < 0.01$). Mean test indicated that farmers who were aged between 20-40 yrs. Were significantly more knowledgeable on health and safety hazards in agriculture (FKL = 0.27) than farmers who were between 41-60 yrs. (FKL = 0.24). Farmers' mean knowledge scores did not significantly differ with age, whether or not they were visited by extension officers, and the frequency of visits by extension officers. Very significant result (**) is found in case of education score with knowledge level as the $p < 0.01$.

Table 6. ANOVA model of several independent variables on farmers' knowledge levels (FKL), attitude levels (FAL) and perception levels (FPL)

	Knowledge Level		Attitude Level		Perception Level	
	Mean (SD)	F	Mean (SD)	F	Mean (SD)	F
Age:						
20 -40 yrs.	0.27 (.12)	0.161	3.6 (.16)	1.81*	3.25 (.34)	1.12*
41-60 yrs.	0.24 (.07)		3.7 (.34)		3.62 (.53)	
60-80 yrs.	0.24 (.08)		3.9 (.28)		3.53 (.26)	
Education:						
No education	0.12 (.06)	4.747**	3.9 (.14)	0.263	3.3 (.34)	0.364
< class 5	0.22 (.06)		3.7 (.36)		3.63 (.53)	
Class 6 to 10	0.27 (.08)		3.7 (.31)		3.50 (.26)	

**p < 0.01, *p < 0.05.

Table 7. Correlation between combined score with different independent parameter

	Age & Combined Score	Education & Combined score	Year of farming & Combined score	Farm size & Combined score
Pearson Correlation (r)	0.272	0.053	0.681	0.004
P value	0.006**	0.390	0.027*	0.491

**P<0.01, *P<0.05.

3.4.2. Relationships with Farmers' Attitude Levels

ANOVA tests indicated that farmers' mean attitude scores were significantly different based on age as well as education. In case of age the difference are more significant than education, in case of age the p value is less than 0.05 which indicates about significant difference between age and knowledge score (Table 6).

3.4.3. Relationships with Farmers' Perception Scores

ANOVA test result indicates that there have no difference farmers' education levels. Maximum attitude differ in age level, where mean value 41-60 aged group have greater value than 20 – 40 yrs. group. In case of perception the aged class shows significant difference between different group as the p < 0.05.

In Table 7 it shows that in case of year of farming*Combined score shows significant relationship with r value is 0.681 that means there have strong positive linear relationship between those two factors. The p value for age*Score indicates about very significant relationship between those factors (Table 7).

4. Conclusion

Occupational hazard and safety is a vital issue for farming practices in global world. Due to unconsciousness and lack of knowledge each and every time the average age of the farmer is decreasing. But in order to reduce the ill health and negative consequences raised from the farming practices farmers' knowledge, attitude, perception regarding these issues can take better option in future. Dumki sub district is a remote region in Bangladesh where about 84% people directly or indirectly depend on agriculture for their livelihood but there have very few OHS standards in Bangladesh. About 85% farmer is male and aged between 45-60 years. Aged farmers have greater knowledge and perception regarding the OHS. Ages have significant result while gender, education, farm size and cultivation period shows grater significant result. Most of the farmers about 80% is not aware about OHS they

perform their task indigenous knowledge based and think that they have capacity to recover from any kind of disturbance. Respondent's positive attitude indicates that people are aware about their thinking and have opportunities to recover themselves by the help of the others. In case of attitude level age shows significant result, while in case of education level farmer's knowledge shows significant result that means literate farmer have greater knowledge than illiterate. By setting standards for occupational hazard and safety in case of small scale farming country can reduce negative impact from the farming activities.

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