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TRACTOR OPERATORS AND PASSENGERS' PERCEPTION ABOUT TRACTOR SAFETY IN KUMASI, GHANA

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Abstract

A survey of tractor operators and tractor passengers in Kumasi, Ghana, was conducted to assess their perceptions about tractor safety. A questionnaire was designed and administered to 150 tractor operators and tractor passengers including 60 tractor operators and 90 tractor passengers. Survey responses show that 96.7% of the tractors in use were bought as "second hand." Survey results indicate that 98.3% of the tractor operators' hour meter and speedometer were not in working order. The results also show that approximately, 98.3% of the tractor operators did not know the speed at which they operate the tractor. Survey responses indicate that 96.7% of the tractor operators do not keep tractor safety records. Survey results also show that none of the operators' tractors was fitted with roll over protective structure or slow moving emblem. Findings indicate that 96.7% of the power take–off of the tractor survey dwas unguarded. Survey responses indicate that none of the tractor operators used their tractor operator's manuals. Kumasi tractor operators refuel their tractors in open areas with 90% of them not shutting off their engine when re-fuelling, citing poor tractor starter condition for not shutting off their engines. Survey results also indicate that none of the tractor operator carelessness, and brake failures are perceived by tractor operators and passengers to be the major causes of tractor accidents. This study demonstrates the need to provide tractor safety training to tractor operators and passengers in Kumasi.

Keywords: Tractor Safety, Perception, Tractor Operators, Tractor Passengers, Kumasi, Ghana.

Introduction

Tractors have contributed immeasurably to farm productivity and helped make it possible for farmers to feed themselves and many others. But to continue doing so, an operator or farmer must operate tractors safely (Cyr and Johnson, 2009). In Kumasi, Ghana, many tractor operators carry passengers on the tractor or in the trailer without being aware of the effect of these operations on their own safety and the safety of the passengers. Accidents just do not happen. Accidents can be prevented because they are caused. It is important to prevent accident not just for human reasons. Accident cost money and resources in the form of loss of income, loss of production, damage of property and payment of liability to the injured party (Witney, 1996). Though tractors are useful and versatile machines, there are many dangers and risks associated with the use of the tractor. Regardless of how tractors are powered, a person who operates them faces an ever present danger. Tractor operators should be always thinking ahead and anticipate potential dangers. Tractors are quite safe when operated properly but can cause serious injury or death if used incorrectly.

Beginning from childhood, human beings gain knowledge, skill and understanding through education (Ambe *et al.*, 1994). Persons informed of risk will retain the information and take recommended action to reduce the risk. Persons skilled in a given hazardous endeavour are less likely to be injured than those less skilled (Robertson, 1983 cited by Ambe *et al.*, 1994). Perception is the process of organising and interpreting sensory impressions in order to give meaning to the environment (Robins and Coulter, 1999). Individual perceptions affect a person's actions, behaviour, and interest. Perception is developed through a complex assimilation of the everyday environment and the integration of thought processes. A person's perception of risk is continually updated to respond to the content and the form of risk-related information (Smith and Desvousges, 1988). In a work environment, common misperceptions may contribute to serious injuries or death. Tractors remain a leading contributor to this injury burden in many industrialized countries, accounting for 15% to 45% of work-related fatalities among those employed in agriculture (Myers *et al.*, 1998; Brison *et al.*, 1998; Langley *et al.*, 1997; Clarke and Coleman, 1995; Day, 1999 cited by Day *et al.*, 2005). Human factors play an important, but often overlooked, role in the management of safety (Mosher *et al.*, 2012). Most tractor accidents are caused directly or indirectly by operator error often involving carelessness, bad judgement or unnecessary hurry (WSU Tractor Safety, 2010).

Developing an effective tractor safety policy aimed at improving tractor safety require an understanding of the tractor operators and passengers' personal regard for tractor safety. Since it is increasingly important to involve the clientele group in the development of purposeful policy decisions, it is important that the perceptions of tractor operators and passengers about tractor safety are sought (Ambe *et al.*, 1994). Safe tractor operations guidelines include: proper servicing, fuel storage and refuelling practices; correct speeds; not carrying passengers; proper hitching of implements;

turning off engine and/or power take-off when not in use; and keeping all shields and guards in place (Ayers, 2005). The ways that tractor operators and passengers perceive potential hazards in tractor operations significantly affects the potential for behavioural change. People do not always perceive risk accurately. Perceptions are key to the development of effective educational programmes to reduce tractor accidents (Schwab *et al.*, 1995). Information on the perception of tractor operators and passengers in Kumasi is scanty. Thus, this study will provide information necessary for making policy decisions on tractor safety. The objectives of the study were to identify the personal profile of tractor owners and passengers, and to assess their perception about tractor safety in Kumasi.

Materials and Methods

Study Area

The study was undertaken in Kumasi, the capital city of the Ashanti Region of Ghana. Kumasi is the second largest city in Ghana and is located between latitude 6° 40' 60"N and longitude 1° 37' 0"W at an altitude of 246 m above sea level. The study area falls within the semi-deciduous forest ecological zone of Ghana, and is distinguished by a bi-modal rainy season from March to July and from September to November, when most of the rain falls as heavy convectional storms, followed by a dry season from November to February. The average rainfall is about 1300 mm while the daily temperature averages about 26° C. Kumasi was chosen for the study because it is an important area where tractors are used.

Data Collection and Analysis

A questionnaire was developed to assess tractor operators and tractor passengers' perception about tractor safety in Kumasi. The questionnaire was administered to 60 tractor operators and 90 tractor passengers. The questionnaire focused on: personal data (such as sex, age group, educational level, and tractor operators' experience), profile of tractors, and tractor safety. Data was collected between 18th March, 2009 and 11th April, 2009. Frequencies and percentages were used to describe the composition of sample. Descriptive Statistics was used to summarize the data obtained from the administration of the questionnaires with the aid of the MINITAB Statistical Software Release 15 (MINITAB Inc., 2007).

Results and Discussion

Profile of Tractor Operators and Passengers

Sex, Age Group and Level of Education

All the 60 tractors operators as well as all the 90 tractor passengers (i.e. those travel on tractors or tractor trailers) interviewed were male. There were no female tractor operators or tractor passengers. Table 1 summarizes the age group distribution of the tractor operators and passengers. The mean age of the tractor operators was 38.5 years. Eighty-five percent of the tractor operators were aged between 30 and 49 years while 11.6 % of the tractor operators were aged between 20 and 29. Only 3.4% of the tractor operators were aged between 50 and 69. The mean age of the tractor passengers was 27.7 years. Approximately 93.4% of the tractor passengers were aged between 20 and 39 years. Only 6.6% of the tractor passengers were aged between 18 and 19 years.

Tuble 1. Inge Group Distribution of Respondents				
	Tractor O	Tractor Operators		ssengers
Age Group	Frequency	%	Frequency	%
18 - 19	0	0.0	6	6.6
20 - 29	7	11.6	52	57.8
30 - 39	25	41.7	32	35.6
40 - 49	26	43.3	0	0.0
50 - 59	1	1.7	0	0.0
60 - 69	1	1.7	0	0.0
Total	60	100	90	100

Table 1: Age Group Distribution of Respondents

Table 2 presents the educational level of the respondents. Forty-five percent of the tractor operators and 68% of the tractor passengers had no formal education. Approximately, 11.7% of the tractor operators and 12.2% of the tractor passengers had primary school level education (i.e. had between one and six years of basic school level education). About 44% of the tractor operators had formal education beyond the primary school level. This included tractors operators with Middle School (11.7%), Junior Secondary School (18.3%), Secondary School (1.7%), and "*Makaranta*" (11.7%) level of education. The remaining tractor passengers (20%) also had "Makaranta" level education. "Makaranta" is a word in Hausa which means "Madrasa" in Arabic. The "Makaranta" system of Islamic education involves only Arabic studies including arithmetic in Arabic excluding the study of English. Education is a key to success in the operation of tractors and also ensuring tractor safety. Tractor operators need to be able read tractor operation manuals and road signs to be able to reduce tractor related accidents.

Tuble 21 Educutonul Ecter of Tructor operators and Tubbengers					
	Tractor Operators		Tractor P	assengers	
Educational Level	Frequency	%	Frequency	%	
None	27	45.0	61	67.8	
Primary School	7	11.7	11	12.2	
Middle School (MSLC)	7	11.7	0	0.0	
Junior Secondary School	11	18.3	0	0.0	
Secondary School	1	1.7	0	0.0	
Makaranta	7	11.7	18	20.0	
Total	60	100.0	90	100.0	

 Table 2: Educational Level of Tractor Operators and Passengers

Table 3 summarizes the tractor operators' years' of working experience. Forty-five percent of the tractor operators had between 6 and 10 years of tractor operating experience while 26.7% of the tractor operators had between 11 and 15 years of tractor operating experience. Fifteen percent of the tractor operators had between one and five years of tractor operating experience. The remaining 13.3% of the tractor operators had more than 15 years of tractor operating experience.

Table 3: Tractor Operators' Experience				
Working Experience (Years)	Frequency	%		
1-5	9	15.0		
6-10	27	45.0		
11 – 15	16	26.7		
16 – 20	5	8.3		
21 – 25	2	3.3		
26-30	0	0.0		
31 – 35	1	1.7		
Total	60	100		

Profile of Tractors

Tractor Make

In Table 4, the Makes of tractors used by the tractor operators surveyed are summarized. The two main Makes of tractors used by the operators included Massey Ferguson and Ford, which represented 61.7% and 35% of the tractor Makes respectively. Both Makes of tractors were 4–wheel tractors. The remaining 3.3 % of the tractors were DAE DONG 2–wheel tractors. It can be seen that the most popular Make of tractor used in Kumasi was Massey Ferguson.

	Table 4: Tractor Make	
Make of Tractor	Frequency	%
Massey Ferguson	37	61.7
Ford	21	35.0
DAE DONG	2	3.3
Total	60	100

Uses of Tractors

Table 5 presents the uses of tractors in Kumasi as obtained from the survey. It can be seen that 70% of the tractors were used for the carting of logs, firewood, wood products (e.g. plywood, scantlings, door frames, panels), and furniture. Others uses of tractors in Kumasi included carting of spare parts, scrap metals, water, and sawdust (26.7%). The remaining 3.3% of the tractors were used for the carting of water, and sand. All the tractor operators indicated that they used one-axle trailers in carting the various items.

Table 5: Uses of Tractor		
Uses of Tractor	Frequency	%
Carting of logs, firewood, wood products, and furniture	42	70.0
Carting of spare parts, metals, water, and sawdust	16	26.7
Carting of water, and sand	3	3.3
Total	60	100

Nature of Tractor Purchase and Engine Capacity

Table 6 depicts the responses obtained regarding the nature of tractor purchase. About 96.7% of the tractors were purchased as "second hand". Only 3.3% of the tractors were purchased as brand new. When asked about the capacity of their tractor engine, 93.3% of the operators said they did not know their tractor engine capacity in kilowatts or horsepower. Only 6.7% of the operators could tell their tractor engine capacity (Table 5). While the purchaser of a new farm machine has the advantage of effective safety devices, many buyers of used farm equipment are at a disadvantage (West and May, 1998). Second hand tractors may not be safe. Anecdotal evidence from New York farmers suggests that many of the unsafe implements on New York farms were purchased at auction in that condition (West and May, 1998).

Table 6: Nature of Tractor Purchase and Engine Capacity

14	Tuble of Thutare of Tractor T archase and Engine Cupacity					
Tractor Purchase	Frequency	%	Engine Capacity	Frequency	%	
Brand New	2	3.3	Know	93.3	93.3	
Second Hand	58	96.7	Do not know	6.7	6.7	
Total	60	100	Total	60	100	

Tractor Hour meter and Speedometer Condition, and Speed of Operation

Tractor operators were asked about the condition of their tractor speedometer and hour meter. As shown in Table 7, about 98.3% of the operators reported that neither their speedometer nor hour meter was in working order. An hour meter operates whenever the tractor engine is running and shows the total hours of operation. It is important to record the hour meter reading and watch this meter to tell when services are required (Hathaway and Buckingham, 1980). A speedometer is a device used to measure the travelling speed of a vehicle, usually for the purpose of maintaining a sensible pace. The speedometer usually shares a housing with an hour meter, which is a mechanism used to record total distance travelled. When asked about the speeds at which they operate the tractors, about 98.3% of the tractor operators indicated that they did not know the speed at which they operate the tractor. The tractor operators further indicated that since the tractor is a slow moving vehicle, there was no need to worry about the speed at which they operate.

Table 7: Tractor Hour meter and Speedometer Condition				
	Tractor Hour Meter Tractor Speedometer			ometer
Hour Meter and Speedometer Condition	Frequency	%	Frequency	%
In working order	1	1.7	1	1.7
Not in working order	59	98.3	59	98.3
Total	60	100.0	60	100.0

Slow Moving Emblem and Use of Hand Signals

Tractor operators were asked to indicate if their tractors were fitted with slow moving emblems. Table 8 depicts the responses obtained. About 96.7% of the operators reported that their tractor was not fitted with a slow moving emblem. Only 3.3% of the operators said their tractors were fitted with slow moving emblems. Tractors are slow moving vehicles and as such slow moving emblems should be fitted on them as such. When asked about the use of hand signals, all the tractor operators reported that they use hand signals, explaining that they do so because their tractor trafficator was not in working order.

-	Table 8: Slow Moving Emblem on Tractor		
Slow Moving Emblem on Tractor	Frequency	Percentage	
Yes	2	3.3	
No	58	96.7	
Trailers	60	100	

Tractor Operator's Manual

Participating tractor operators were asked if they had access to their tractor operator's manual. All the 60 tractor operators indicated that they did not have access to their tractor operators' manuals. Tractor and tractor implement operator's manuals are the "oracle" on proper tractor operation and maintenance. Where the manuals are not available, they should be looked up for (WSU Tractor Safety, 2010). The most important safety job for an operator is frequently reading the operator's manual. It contains safety tips and procedures for checking and servicing the equipment. Following these instructions will increase operating life, reduce major breakdowns, and prevent serious accidents (Grisso *et al.*, 2009; The Workers Compensation Board of Prince Edward Island, 2006). A safe tractor operator performs proper maintenance according to the operator's manual (Bittner *et al.*, 1983).

Tractor Safety Records, and Health and Safety Training

Tractor operators were asked if they kept tractor safety records. Table 9 presents the responses to the question. Approximately 96.7% of the tractor operators reported that they did not keep safety records of their tractors. Only 3.3% of the tractor operators said that they kept tractor safety records. When asked about their training background on health and safety guidelines, all the 81.7% of the responding tractor operators claimed they had received training in health and safety guidelines while the remaining 18.3% said they had not received any such training. All the operators who reported having received training in health and safety guidelines reported having received their training from their "Master".

Table 9: Witten Records of Tractor Safety			
Do you keep written records of your tractor safety?	Frequency	Percentage	
Yes	2	3.3	
No	58	96.7	
Total	60	100	

Roll Over Protective Structure (ROPS) and Safety Guards

Survey tractor operators were asked if their tractors were fitted with roll-over protective structures (ROPS). All the tractor operators interviewed indicated that their tractors were not fitted with roll-over protective structures. Roll–over protective structures or cabs are fitted on tractors to provide safety to the operators. The mounting of a protective frame

or crushproof cab (known as rollover protective structures or ROPS) can prevent personal injuries to the driver of a tractor (Springfeldt *et al.*, 1998). Roll-over protective structures work by limiting a rollover to 90° and preventing the operator from being crushed under the weight of the tractor. Roll-over protective structures work only if the operator is wearing a seatbelt to keep them in the operator station as the tractor is rolling (WSU Tractor Safety, 2010). Tractor operators were also asked if their tractor power take–off (PTO) was guarded. Out of the 60 tractor operators, 96.7% reported that their tractor power take–off was not guarded. Only 3.3% of the operators reported that their tractors are associated with fatal and nonfatal injuries, especially when tractors roll over and drivers are trapped underneath the vehicles.

Use of Seat Belts

Participating tractor operators were asked to report if they wear seat belts when operating their tractors. All the 60 tractor operators indicated that they do not wear seat belts when operating their tractors stating that their tractors were not fitted with seat belts. Given the effectiveness of seat belts in preventing injuries and deaths (Beck and Shults, 2009), it is important that tractors without roll-over protective structures should be retrofitted with roll-over protective structures, and seat belts, while seat belts use by tractor operators enforced by the law enforcement agencies.

Tractor Operators' Protective Clothing and Footwear

Safety clothing and equipment provide extra protection in the event of an accident situation (Grisso *et al.*, 2009). Survey tractor operators were asked to indicate the type of clothing they wear when operating tractors. Table 10 presents the summary of their responses. About 91.7% of the operators said that they wear loose fitted clothing while 5% of the respondents indicated that they wear close fitted clothing. The remaining 3.3% of the tractor operators said they wear either loose or close fitted clothing when operating tractors. Tractor operators should wear close-fitted, sturdy clothing and avoid clothing with tears, bulging pockets, frayed edges, and heavy cuffs that may tangle in revolving equipment parts. Cut-off trousers or shorts offer no protection from flying debris. (Grisso *et al.*, 2009).

	Table 10: Type of Clothing	
Type of Clothing	Frequency	Percentage
Loose fitted clothing	55	91.7
Close fitted clothing	3	5.0
Either loose or close fitted clothing	2	3.3
Total	60	100

In Table 11, the type of footwear worn by the tractor operators surveyed are presented. Fifty percent of the operators claimed that they wear heavy duty boots while 36.7% of the operators reported they wear ordinary shoes when operating tractors. The remaining 13.3% indicated that they wear slippers (5%) or sandals (8.3%). None of the operators reported operating the tractor with their bare foot. Sure footing is essential to tractor operators' safety. Heels help prevent slipping and good soles reduce dangers of tripping and falling (Grisso *et al.*, 2009).

	Table 11: Type of Footwear	
Type of Footwear	Frequency	Percentage
Slippers	3	5.0
Sandals	5	8.3
Ordinary shoes	22	36.7
Heavy duty boots	30	50.0
Total	60	100

Earplugs/ Earmuffs and Safety Glasses

Tractor operators were asked if they were wear earplugs or earmuffs to minimize load noise from the tractor. All the 60 tractor operators reported that they do not wear earplugs or earmuffs when operating tractors. In addition, all the 60 tractor operators indicated that they do not wear any safety glasses (goggles) to protect their eyes when operating tractors. Tractor operators should wear ear muffs in excessively noisy conditions (more than 85 decibels) to prevent hearing damage and reduce operator tension and fatigue (Grisso *et al.*, 2009).

Travelling on Tractors

Tractor operators were asked if they allow passengers to travel on their tractor or trailer. All the 60 tractor operators said that they allow passengers to travel on their tractor or trailer. Tractor passengers were also asked if they believe it is safe to travel on the tractor or the trailer. All the 90 tractor passengers indicated that they believe it is safe to travel on the tractor or the trailer because the tractor is a slow moving vehicle. The classic agricultural tractor is a simple open vehicle with two very large driving wheels on an axle below and slightly behind a single seat (the seat and steering wheel consequently are in the centre) and the engine in front of the driver with two steerable wheels below the engine compartment (Bell, 1996). Tractors are meant to be used by the operator, not passengers. For safety reasons, tractors should be used as intended. Tractor operators should not carry passengers.

Tractor passengers were asked to indicate which part of the tractor they travel on. Table 12 summarizes the responses to the question. Fifty percent of the tractor passengers stated that they travel in the trailer while about 43% of the tractor passengers reported that they travel on the tractor itself. The remaining 6.6% indicated that they travel on the

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tractor drawbar. The tractor drawbar is a bar across the rear of a tractor for hitching trailers or implements. The tractor delivers power of its motor through a drawbar. A common type consists of a quadrant that is rigidly attached to the transmission housing, and a swinging member which is easily detachable and can be adjusted in height, often by bolting an extra short member to the rear end to form a clevis (Culpin, 1981). Tractor operators were asked if they allow tractor passengers to travel on the drawbar. About 13.3% of the tractor operators said that they allow passengers to travel on the drawbar while 86.7% indicated that they do not allow passengers to travel on the drawbar.

2		1 1	0	
Table 1	2: Trav	elling	on Tractors	/ Trailers

What part of the tractor do you travel on?	Frequency	Percentage			
Tractor itself	39	43.3			
Drawbar	6	6.6			
Trailers	45	50.0			
Total	90	100.0			

Mounting and Dismounting Tractors

Tractor operators and passengers were asked if they had mounted or dismounted a moving tractor, an unsafe practice. Table 13 sums up the responses to the question. Approximately 73.3% of the tractor operators indicated that they had mounted or dismounted a moving tractor while the remaining 26.7% of the tractor operators said that they had not mounted or dismounted a moving tractor. All the tractor passengers indicated that they had mounted or dismounted a moving tractor operators should never mount or dismount from a moving tractor (The Workers Compensation Board of Prince Edward Island, 2006).

Table 13: Mounting or Dismounting a Moving Tractor							
	Tractor C	Operators	Passengers				
Mounted or Dismounted a moving Tractor	Frequency	Percentage	Frequency	Percentage			
Yes	44	73.3	90	100.0			
No	16	26.7	0	0.0			
Total	60	100.0	90	100.0			

Shutting off the Engine and setting the Parking Brake

Tractor operators were asked if it is always advisable to shutoff the engine and set the parking brake when dismounting the tractor. Eighty–five percent of the tractor operators said that it is advisable to shut off the engine and set the parking brake when dismounting the tractor. The remaining 15% of the operators said that it does not make any difference between shutting off the engine and setting the parking brake and not shutting off the engine and setting the parking brake when dismounting the tractor.

Refuelling of Tractors

Tractor operators were asked if they always shut off their engine when refuelling. Ninety percent of the operators indicated that they do not shut off their tractor engine when refuelling while the remaining 10% pointed out they did. When asked for the reason for not shutting off the engine before refuelling, all the operators who do not shut off their tractor engine when refuelling said that their tractor engine starter was not in working order and so shutting down the engine when refuelling was bound to create tractor staring problems. Tractor operators should never refuel while the engine is running or hot (Utah State University Cooperative Extension, 1995). The safe tractor operator removes risk of fire or explosion when refuelling (Bittner *et al.*, 1983). All the tractor operators reported that they re-fuel their tractor in open areas.

Perception of Tractor Accidents

Tractor operators and passengers were asked to indicate their perception of common types of tractor accidents. Table 14 summarizes the responses. The common types of tractor accidents were indicated as crash (60% of tractor operators and 71.1% of tractor passengers), overturn (23.3% of tractor operators and 10% of tractor passengers), and fall (16.7% of tractor operators and 18.9% of tractor passengers).

Tuble I in Types of Thuesof Heerachies					
	Tractor Operators		Passengers		
Type of Tractor Accident	Frequency	Percentage	Frequency	Percentage	
Fall	10	16.7	17	18.9	
Crash	36	60.0	64	71.1	
Overturn	14	23.3	9	10.0	
Total	60	100	90	100	

Table 14: Types of Tractor Accidents

Causes for Tractor Accidents

Respondents were also asked to state causes of tractor accidents. Table 15 presents the reasons given for the causes of tractor accidents. About 41.7% of tractor operators and 52.2% of tractor passengers' perceived tractor brake failure as the leading cause of tractor accidents. Thirty-five percent of tractor operators and 23.3% of tractor passengers attributed the causes of tractor accidents to be carelessness on the part of the operator. The next cause of tractor accident was overloading of trailer (16.7% of tractor operators and 16.7% of tractor passengers). Other reported causes of tractor

accidents were tractor operator tiredness (3.3% of tractor operators and 5.6% of tractor passengers), and improper hitching of trailers (3.3% of tractor operators and 2.2% of tractor passengers).

Table 15: Causes of Tractor Accidents							
	Tractor Operators		Passengers				
Causes of Tractor Accidents	Frequency	%	Frequency	%			
Trailer Overloading	10	16.7	15	16.7			
Tiredness	2	3.3	5	5.6			
Improper Hitching of Implements	2	3.3	2	2.2			
Carelessness	21	35.0	15	23.3			
Brake Failure	25	41.7	47	52.2			
Total	60	100	90	100			

Conclusions and Recommendation

This study provides a profile of Kumasi tractor operators and passengers, and their perceptions about tractor safety. Based on this study, the following conclusions were drawn: The typical tractor operator or passenger in this study was male. The mean age of the tractor operators was about 39 years while that of the tractor passengers was approximately 28 years. The educational background of the tractor operators and passengers was low. In this study, Massey Ferguson tractors represented 62% while Ford tractors represented 35% of the tractor make in Kumasi. About 96.7% of the tractors in use were bought as "second hand". Also about 98.3% of the tractor operators' speedometer and hour meter were out of order. Approximately 96.7% of the tractor operators did not keep tractor safety records. None of the operators' tractors was fitted with roll over protective structure or slow moving emblem. Approximately, 96.7% of the power take-off of the tractors was not guarded. None of the tractor operators used tractor operator's manuals. About 73.3% of the tractor operators and all the tractor passengers in this study had mounted or dismounted a moving tractor. Tractor passengers in this study perceived travelling on tractors or trailers as safe. All the tractor operators refuelled their tractors in the open. Ninety percent of the tractor operators did not shut off their engine when refuelling. None of the tractor operators wore seat belts when operating tractors. Tractor operators and passengers perceived tractor brake failures, and tractor operator carelessness to be the major causes of tractor accidents. This study demonstrates the need to provide tractor safety training to tractor operators and passengers in Kumasi. Additional research will be needed to identify tractor operators and passengers' perception about tractor safety in other parts of Ghana.

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