

Road Traffic Accidents in the Department of Irrigation: Empirical Evidence from The Midlands Regional Office, Zimbabwe

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Abstract

This study sought to examine the causes and impact of road traffic accidents in the Department of Irrigation Midlands Region. A sample of 25 out of 39 civil servants from the Department of Irrigation Midlands Region Gweru and its field centres were used as the research subjects. The methodology used was descriptive survey. Questionnaires and documentary evidence were used as research instruments. Of the 25 participants 20 responded to the study. Literature on both general accidents and road traffic accidents at local and international level was studied. The study (both secondary and primary findings) showed that accidents are mainly a result of human error and therefore can be prevented. This study recommends, among other things, continuous training of drivers in the Department, top management commitment to accidents prevention, avoiding driving under the influence of alcohol and grounding all unroadworthy vehicles.

Key words: traffic, accident, midlands, irrigation, Gweru, Zimbabwe

1. Orientation and Problem Statement

Since independence in 1980 road accidents have been a common sight in Zimbabwe. The Public Service has not been spared of these unwelcome events. An accident is defined as ‘an undesired event which causes physical harm to people, damages property and equipment and causes business interruptions or has the potential to cause the same’ (IPMZ, 1994: 11). The road carnage in Zimbabwe has destroyed life, sanity, property, technology, infrastructure, among other things. The IPMZ (1994) further argues that accidents are caused, they do not just happen. It therefore follows that if accidents are caused, they can be prevented.

The Department of Irrigation is a government department which was formerly under the Ministry of Water, Infrastructure and Engineering. In 2004 the Department was moved to the Ministry of Agricultural Mechanization and Infrastructure Development. The Department runs its own fleet of six vehicles; as such it is not spared of the road carnage. During busy schedules the department borrows more vehicles from either the CMED, other departments or sister ministries. The fleet is managed by a transport officer in the Administrative Office reporting to the Chief Engineer. Since 2004 when the department moved to the Ministry of Agricultural Mechanization, Infrastructure and Development the regional office experienced at least eight accidents with one of them killing one pedestrian. The accidents damaged the vehicles and equipment. All of them proved expensive for the department as they required repairs and replacement of damaged vehicles and equipment.

1.1 Research questions

- What are the causes of road accidents at the Department of Irrigation Midlands Region?
- What is the impact of these accidents on the operations of the Department of Irrigation Midlands Region?
- Which ways can be implemented to improve the situation in the Department of Irrigation Midlands Region?

2. Literature Review

Most of the available literature on accidents has its origins overseas. Very little information on local literature has been recorded. Blunt and Popoola (1985: xi), observe that “the existing literature has up to now been mostly British or American in origin, written by Western academics for a readership in the West, and taking as their starting point a Western business and management environment.” The literature is therefore limited in that locals cannot identify

with it. This study attempts to cover this gap.

2.1 Accident in general

The Oxford Advanced Learner's Dictionary (1995) defines an accident as 'an unpleasant event that happens unexpectedly and causes damage, injury, etc' and thus accidents are unplanned and unwelcome. For Beach (1985) an accident is an unexpected occurrence that interrupts the regular progress of an activity. The IPMZ (1994, 11) sees an accident as 'an undesired event which causes physical harm to people, damages property and equipment and causes business interruptions or has the potential to cause the same'. Thus an accident is something that cause or has the potential to cause harm to life, property and equipment. Yet as observed by Jubenkanda (2004) in most industrial practice attention tends to be focused primarily upon accidents that cause injuries as opposed to accidents that occur, but do not result in injuries. Characteristics of accidents thus can be summarised as follows: unplanned event, unpleasant event, causes or has potential to cause harm, and attention tends to be focused primarily upon accidents that cause injuries as opposed to accidents that occur, but do not result in injuries.

According to IPMZ (1994: 11) 'accidents are caused-they do not happen'. The cause thus can be identified and eliminated. IPMZ (1994) further classifies causes of accidents into personal, equipment and plant, environment, control activities, motivation and discipline factors. The factors are further categorized into either personal factors or job factors and unsafe acts or unsafe conditions. It is either the job incumbent or the environment that that causes accidents. It is either management or the incumbent that are to blame for the occurrence of accidents. For Armstrong (1999: 815) the blame for accidents is tilted towards management. He writes 'it is the system of work to which people are exposed that is the cause of accidents. The immediate cause may be carelessness, fatigue, inexperience, inadequate training or poor supervision, but all these factors are related to the system of work'. He thus sees causes of accidents in their broad context. Armstrong (1999) further outlined immediate factors leading to accidents as the following: using unsafe equipment, using equipment unsafely, operating without sufficient clearance, operating at an unsafe speed, making safety devices inoperative to reduce interference and speed up work, and distractions from other people or noise.

Jubenkanda (2004) classified the impact of accidents into two main costs which are insured (direct) costs and uninsured (indirect) costs. The insured costs are money paid to a medical practitioner and hospital bills, weekly benefits while the injured employees are away from work, scheduled payment due to death, accidental incapacitation or dismemberment and permanent disability. These costs are readily apparent and are met by the insurance premium. Uninsured costs include lost time of injured workers, lost time of fellow employees who render aid to the injured person, time spent by supervisors to assist the injured person and investigate the cause of the accident, lost production, possible damaged material or equipment, and administrative expenses to process paperwork connected with the accident. Accidents thus are undesirable and should be prevented. It is, however, important to note that concentration has largely been on direct costs instead of both direct and indirect costs.

2.2 Road traffic accidents

Road accidents can simply be seen as a result of a collision between two objects in a road and thus a threat to road traffic safety. Cloete (1990, 1991) observes that two main components of road traffic safety problems are traffic violations and traffic collisions. For him there is a close correlation between traffic violation and traffic collisions. There are several types of roads throughout the international community. For Jacobs (1999) the type and standard of roads depend on the level of development of a given community. Thus we have well developed highways in developed economies and dirty potholed duet roads in less developed economies. The type of road has a large bearing on the occurrence of accidents and thus Jacobs, *et al* (2000) believe there is high prevalence of road accidents in less developed economies. For Al-Haji (2007) it is a common perception that road accidents are a problem that results in death, injury or property damage. Unfortunately many people do not realize the size of the problem. While they have a general idea that driver error is the main cause of the problem, they have no idea that several causes and factors contribute to the problem as well (Al-Haji, 2007).

Jacobs and Aeron-Thomas (1999) observe that the problem of death and injury as a result of road accidents is now acknowledged to be a global phenomenon. Everyone is now concerned about the number of people killed and injured

on roads. Al-Haji (2007) reports that road accidents are the eighth leading cause of death in the world today. The World Health Organisation (2004) estimates that road accidents will become the world third leading cause of death by the year 2020 if no effective action and measures are taken. Al-Haji (2007) further observes that this information is just indicative and may not be reliable due to under-reporting of data. It is therefore concluded that road traffic accidents are one of the biggest causes of deaths and crippling injuries in the world. What then are the causes and impact of these road traffic accidents? Causes and impact are discussed in the next two sections respectively

2.2.1 Causes of road accidents at global level

Al-Haji (2007) grouped causes of road accidents into factors influencing exposure to traffic, factors influencing risk of accidents and factors influencing accident severity.

Factors influencing exposure to risk are categorised into economic factors and Gross National Product (GNP) per capita, urban population density and other demographic factors, and the type of travel choice. Economic factors and GNP come in as the richer you become the more you can afford to have better transport and the less exposed to the effects you are. Developed countries afford high standard highways, quick response to accidents, new and well functioning vehicles, advanced training facilities and equipment, among other things. Most developing economies do not afford all these things. All countries suffer from the road accidents problem, yet the size of the problem varies from one country to another as countries vary considerably in their development levels, road safety systems and experiences. The paradox is that the very same developed countries are highly motorised (have high rate of vehicles per person) as they afford this high rate. High motorisation is associated with high accident rate. This is, however, mitigated by quality and other factors and as such Jacobs, *et al* (2000) observe that highly motorised countries have 60% of the total vehicles but their contribution of the total global road accident deaths is only 14%. Also of importance here is population density. Urban centres are highly populated compared to rural areas and thus have both high personal risk (deaths per person) and traffic risk (deaths per vehicle). These are, however, mitigated by the standards of roads as compared to the rural communities' situation. Thus Al-Haji (2007) concludes developed nations have lowest risk records and high motorisation, and so forth; Africa which is underdeveloped has the opposite. Al-Haji (2007) summarises exposure risk thus: the more we travel on roads the higher the probability that an accident will occur. There is thus a correlation between high traffic volume and the total number of accidents. Population size, urban population, number of vehicles, length of road network and number of driving licenses are some of the available indicators of exposure risk.

Al-Haji (2007) and Slim (1989) identified the driver; the vehicle; groups of road users; the road; the general environment; the number of vehicles on the road and animals as factors influencing risk of accidents. The driver is part of what Slim (1989) refers to as the human error and IPMZ (1994) refers to as personal factors. Human error is highly influenced by age of the driver, alcohol consumption, careless driving, overspeeding, use of seat belts, among others. For example the younger ones have less driving experience, high probability of taking alcohol to excess, high probability of overspeeding and so forth (Al-Haji, 2007). The driver must be sober, well adjusted, well trained and in good health to reduce accidents on the road. New and well maintained cars are less likely to cause accidents than old and poorly maintained cars. An old car is more likely to have easily burst tyres, brake failure, indicator failure, view mirror problems. Thus the type of vehicle and age of vehicle have a bearing on road accidents. Motorcycles, heavy trucks and non-motorised traffic are more prone to cause accidents than other modes. These problems are more prevalent in developing economies than in developed economies. Also risk of cars is said to be higher than buses or public modes. Groups of road users, especially unprotected road users are among the vulnerable groups like pedestrians, cyclists and motorcyclists who are mainly found in developing economies. Unpaved roads, defects in road design, poor road maintenance, slippery roads, potholes and curves have high probability of causing accidents on the road. These defects are most common in the developing countries road network as they have scarce developed resources to improve their roads. Darkness, fog, ice and many other related situations are more prone to accident occurrence. Congestions is more likely to cause accidents as there would be limited maneuvering space. Animals are also part of the problem especially in African countries where roads are neither fenced nor protected. Thus factors influencing the risk of road accidents are many, but as shown by Armstrong (1999) all of them are related to human negligence or failure of some sort. Accidents thus are not a natural phenomenon but caused or helped to occur by human elements (IPMZ, 1994). As such they can be prevented.

Factors influencing accident severity were identified by Al-Haji (2007) as human factors, vehicle, crush protective roadsides, rescue and pre-hospital emergence care and the health care system. Human factors have already been discussed above as alcohol influence, aped, wearing of protective clothes like helmets, seat belts, among others. Condition of the vehicle-what is the state of its seat belts, airbags, child safety seat, vehicle safety and protection standards? Again these problems are more prevalent in developing countries than in well to do nations

2.2.2 The impact of road accidents

Accidents have a horrible and highly negative impact on both life and development and therefore they are unwelcome. The World Health Organization (Peden, *et al*, 2004) shows that 1 260 000 people are killed in road accidents each year worldwide, and an additional 50 000 000 people are estimated injured. Nearly half of them are seriously injured or disabled. Due to the unreliability and under-reporting of data in most countries, these figures are still under-estimated (Al-Haji, 2007). Annually the national cost of road accidents is estimated between 1% and 3% of a country's GNP. This cost is a considerable waste of resources and has negative impact on roads and development. As we have already seen above the majority of these accidents occur in developing countries where there is greater need for development to ease poverty. Accidents thus exacerbate poverty, underdevelopment and pain among the vulnerable groups and its victims. These are serious setbacks to the desired goal of development and improvement of human life in the world. It follows that action has to be taken to prevent accidents' occurrence.

2.2.3 Remedies to the road accidents problem

Al-Haji (2007) suggested the following remedies: reducing exposure risk; reducing risk factors; and reducing accident severity. Exposure risk can be reduced by reducing the amount of travel per person/vehicle and the total reduction in traffic volume. People can be encouraged to use public transport instead of private transport that tends to increase congestion and thus accident rate. This is most relevant to the developed world where there is an overpopulation of vehicles on the road. Reducing risk factors can be effected by improving driver skills, road user education, vehicle performance, road standards, legislation and enforcement. Though applicable to all situations, this is more required in developing countries which are replete with problems of illiteracy among a host of others. Reducing accident severity can be achieved through protecting people better in vehicles from injury severity, protecting vulnerable groups by vehicle design and use of helmets, and shifting travel from means of travel with high exposure risk (e.g. motorcycles) to public transport and so forth (Al-Haji, 2007).

2.3 Road accidents in Zimbabwe

Reporting on Zimbabwe and South Africa, Cloete (1991) observes that there is a close correlation between traffic violation and traffic collisions. In terms of the Zimbabwean Road Traffic Act (Chapter 13: 11) the following, among others constitute traffic violations and offences: exceeding the speed limit, driving without due care and attention or reasonable consideration for others, negligent or dangerous driving, reckless driving, driving with prohibited concentration of alcohol in blood and driving under the influence of alcohol or drug or both.

According to the Zimbabwe Republic Police Manual (2000), the following, among others, are traffic offences: overloading passengers, overtaking where it is prohibited, failing to signal turns, parking dangerously, failing to display reflectors, failing to stop at a stop sign, failing to give precedence at a give way sign, driving through a red traffic light, driving an unroadworthy vehicle and turning in front of oncoming traffic.

The above offences are a summary of causes of road accidents in Zimbabwe and have a lot in common with the general or international causes discussed above. The picture painted in daily newspapers in Zimbabwe shows that Zimbabwe has an extensive road safety problem. Table 2.1 below shows recorded traffic violations and convictions in Zimbabwe from 1997 to 2000.

Table 1 Traffic Violations and Convictions in Zimbabwe from 1997 to 2000.
 (Source: ZRP Manual, 2000)

Year	Total Number of Traffic Violations Committed	Total Number of Convictions Made
1997	148 000	90 571
1998	196 556	97 596
1999	212 614	120 139
2000	267 678	130 041

The table above shows that the annual traffic offence rate increases every year and hence something must be done to reduce this accident likelihood rate.

Table 2 below shows recorded traffic accidents and casualties for the period 1997-2000.

Table 2 Traffic Accidents and Casualties in Zimbabwe (1997 to 2000).
 (Source: ZRP Manual, 2000)

Year	Total Number of Accidents	Persons killed	Persons Injured
1997	43 357	1 331	18 095
1998	58 101	2 176	26 732
1999	48 737	1 762	22 232
2000	40 316	1 433	18 105

Although number of killed or injured persons from 1998 to 2000 seems to decline annually the picture is not encouraging. The figures are still too high for something which can be prevented.

3. Findings

3.1 Response rate and demographic characteristics of respondents

Twenty (80%) of the twenty five distributed questionnaires were collected. The high response rate was due to the fact that questionnaires were both hand-delivered and collected by the researchers. In some cases, at least three physical follow-ups were made before we could retrieve the questionnaire. In other cases we replaced the questionnaires that were misplaced three times.

Most workers at the Department of Irrigation Midlands Region had very little work experience. This scenario, as evidenced in the Department computerised human resources records, is largely because of the high staff turnover rate in the Department, or in the civil service as a whole. The turnover rate, also a result of the general brain drain in the country due to the poor economic environment, generally translates to poor implementation of organisational policies with fatal results. It disturbs continuity and smooth flow of planned activities and this affects the accident rate in the department as sometimes new personnel may be asked to operate machinery without adequate induction.

Table 3: Respondents' Educational Qualifications
 (Source: Questionnaire/Primary Data)

Sex	'O' Level	A' Level	Cert	A/Dip	Degree	Post- Degree	Total
Male	11	03	3	6	3	1	27
Female	09	02	1	9	2	0	23
Total	20	05	4	15	5	1	50

Table 3 shows that all respondents had a full Ordinary Levels certificate. Five (20%) of them had both 'O' Levels and 'A' Levels qualifications. All had some form of professional or University level academic qualifications. However, it is worth noting that the four with Certificates had nothing else above that and were not eager to further develop themselves. These included the two full time drivers who had 6-plus years work experience. The other two were development technical officers stationed at the field centres.

Ten (50%) of the twenty respondents had authority to drive government vehicles. All the two full time drivers at the regional offices in the City of Gweru, three field officers at the irrigation centres, three management and administrative staff at the regional offices in the City of Gweru, and two professional support staff at the regional offices in the City of Gweru had authority to drive government vehicles. Other than the two full time drivers the rest doubled as drivers during busy schedules. All the two full time drivers had a Defensive Driver's Certificate, but the professional/management drivers did not have a Defensive Driver's Certificate. This means the professional / management's probability of getting involved in an accident were likely to be higher than the two full time drivers who had both a Defensive Driver's License and more driving exposure.

3.2 Road traffic accidents in the Department of Irrigation, Midlands Region.

Below are some of respondents' unedited sample definitions of a road traffic accident.:

- An incident whereby a vehicle cause damage to other vehicles, property or injuries and loss of life to people.
- A mishap which involves motor vehicles, people and animals within a given area/road and eventually causes loss of life as well as damage to property.
- An unplanned, unfortunate incident involving at least one vehicle which results in loss of life, damage to property and the vehicle itself.
- An unintended interaction of vehicle with other vehicles and objects that is fatal.
- A clash of vehicles that causes death or damage to property.
- Hit or bump into anything is an accident

Thus most had an idea of what a traffic accident is all about though all their definitions were not complete. They touched on certain aspects of traffic accidents, especially the fact that accidents cause harm to either life or property. This is proof that they knew something about accidents. However, half definitions may mean that most road traffic accidents were not reported in the Department. The problem is with most of our local literature and curricula. The Oxford Advanced Learner's Dictionary (1995), Beach (1985), Armstrong (199), among others, all give half definitions of accidents. They talk of the harm leaving out the potential of causing harm as well defined by the IPMZ (1994). It is therefore concluded that workers at the Department of Irrigation Midlands Region partially understood what an accident is all about. This is in full agreement with Jubenkanda (2004)'s observation that attention is given to accidents that cause harm as opposed to accidents that occur, but do not result in any observable harm.

3.2.1 Reporting Road Traffic Accidents in the Department of Irrigation

Because of the above limited understanding of what road traffic accident is, the Department of Irrigation Midlands Region is likely to under-report the occurrence of road traffic accidents in the Department. From documentary evidence we determined that there were only five reported road traffic accidents in the Department since 2006. One of the accidents that occurred in Mkoba in August 2007 was fatal as it killed a pedestrian. The latest recorded accident in the Department occurred in November 2008. Though this accident killed no one it damaged the vehicle beyond repair. Table 4 below shows the number of recorded road traffic accidents in the Department since 2006 as per the departmental records.

Table 4 Road Traffic Accidents and Casualties in the Department of Irrigation Midlands Region

(Source: Irrigation Department Accident Reports-Midlands Region, Gweru Offices)

Year	Total Number of Accidents	Persons Killed	Persons Injured
2006	0	0	0
2007	3	1	2
2008	5	0	3
2009	0	0	0
Total	8	1	5

This information is not very reliable as there is high likelihood that some accidents involving senior personnel might not have been recorded. The fact that accidents are investigated and if the driver is found at fault, the driver is likely to be punished (charge, withdrawal of government vehicle driving authority, dismissal, etc) makes many accidents go unreported. Also the fact that accidents are defined as those that cause harm makes harmless accidents go unreported. As the Administrative Officer responsible for transport, the one of the researchers is highly mobile and liable to exposure risk of traffic accidents. She had been involved in many harmless accidents, like a car getting out of highway, crushing a small animal, and so forth. These incidents are never reported. This is in agreement with Al-Haji (2007) observations on international road accidents statistics as discussed above.

Also 15 of the respondents said they did not report some of the accidents they were involved in because they were afraid of writing cumbersome reports, being found in the wrong side, the punishment involved, among other things.

3.2.2 Causes of Road Traffic Accidents in the Department of Irrigation

All respondents were able to give at least three causes of road accidents. Some of the causes enumerated were using faulty vehicles, unworthy roads, driving under the influence of alcohol, poor weather conditions, disregard of road regulations, overspeeding, negligence, fatigue and stress. Thus all respondents were fully aware that accidents do not just happen, they are caused.

However, none of them talked of the role of management especially when it comes to orientation and administering rules and regulations in the management of organisational vehicles. Also they were very far from the advanced analysis given by Al-Haji (2007) as discussed above. They said nothing on the exposure, risk and severity of accident issues. Thus they were not even aware that lack of resources, demographic factors (age and sex) and the type of travel choice (on foot, motorcycle, private car, lorry, etc), population density (rural areas versus busy towns and industrial areas), exposure risk (the more you travel on road the more you are likely to get involved in an accident), and so forth are among the most serious causes of accidents. Of course they were aware that accidents are largely a result of human error, but comparing their understanding with Al-Haji's analysis as given in this paper leaves a lot to be desired. The implication is that there is lack of proper and holistic training on road traffic accidents in the Department of Irrigation Midlands Region.

3.2.3 The Impact of Road Traffic Accidents in the Department of Irrigation

Loss of life, injury, disablement, medical expenses to both the organisation and the injured, burial and funeral expenses, repairs and insurance expenses, disruption of business, loss of working hours, loss of property, and many others were some of the identified costs or negative impact of road traffic accidents on organizations. Thus for all the eight recorded accidents, the Department incurred most of these direct costs to its operations. Even the unrecorded road traffic accidents had high costs on the organization, some of which are paid unknowingly or indirectly through dubious absenteeism, vehicle maintenance charges, poor performance, and so forth. Sometimes the Department goes with out a vehicle when all the vehicles went for unexplained repairs. Thus the efficiency of the Department is affected as a result of these traffic accidents.

According to the Departmental records the 2007 fatal accident that killed a person dragged the driver to court. For almost a year the driver was up and down to and from court, on and off duty and his concentration was affected. Though he was cleared as it was determined that he was not at fault, he lay idle for the whole year as the government suspended his authority to drive. Reporting for duty was just formality; otherwise he was as good as someone away from duty. Nonetheless he got all his monthly salary throughout the year.

Traffic road accidents are thus very expensive for organisations and should be prevented at all costs. At the Department of Irrigation Midlands Region they have affected the efficiency of the Department by affecting the performance of those involved in the accident, paying idle workers, and so forth.

3.2.4 Measures to Prevent Road Traffic Accidents in the Department of Irrigation

The following were some of the respondents' unedited suggestions on measures to prevent or reduce road traffic accidents in the Department of Irrigation Midlands Region:

- Following a proper maintenance schedule of vehicles.
- Adhering to proper standards of servicing vehicles at reputable service providers.
- Grounding all unroadworthy vehicles.
- Adhering to the correct procedures of certifying departmental drivers.
- Encouraging drivers to be open about their personal problems so that they share them with others before they get on the steering.
- Ensuring that every driver in the Department has a Defensive Drivers' License.
- Refresher courses in driving to deal with bad habits that easily creep in when one is an experienced driver.
- Avoid night traveling.
- Proper vehicle check/inspection before embarking on a journey.
- Boards of enquiry into the causes of accidents so that such causes are dealt with.
- Avoid overworking drivers.
- Following rules and regulations like avoiding drinking and driving

The suggestions show that respondents were fully aware that traffic road accidents can be avoided through correcting human behaviour. Thus workers are aware that traffic road accidents are unwelcome and should be avoided. What is lacking in the Department of Irrigation Midlands Region is supervision.

4 Conclusions

Although respondents knew what a traffic road accident is, it was established that they had partial understanding of what a road traffic accident is and therefore most road traffic accidents go unreported further increasing the probability of more road traffic accidents.

It was also established that very few respondents admitted to the fact that they were once involved in a road accident. This is mainly due to their partial understanding of what an accident is. Some accidents are not considered accidents. Some accidents are not reported because of fear of the repercussions. It is therefore established that a number of accidents are not reported at the Department of Irrigation Midlands Region. This has serious repercussions as no corrective measures are taken for the unknown/unreported accidents.

Major causes of road traffic accidents were found to be linked to the human element and therefore not natural. It follows that if road traffic accidents are artificial / caused by either human negligence or fault mechanical work, then they can be prevented by attending to these artificial problems. Thus the system that causes accidents can be restructured for better performance.

The impact of road traffic accidents was found to be negative as traffic road accidents affect the Department's performance negatively. People are killed, disabled or injured. This means disruption in organizational activities, uncalled for expenses and unnecessary pain. Thus the impact of road traffic accidents on the Department of Irrigation Midlands Region was found to be far from encouraging.

Respondents believed it was possible to prevent accidents by adhering to set rules, avoiding risk behaviour or driving unroadworthy vehicles, training and orienting new drivers, among other suggestions.

We therefore conclude that road traffic accidents is a human problem and can be prevented through human interventions in the Department of Irrigation Midlands Region. Since this was a case study to determine what the situation is like in the Zimbabwean civil service, it is also generalized that road traffic accidents in the civil service are a result of human error. Through proper interventions the problem can be rectified.

5. Recommendations

Based on the discussions in Chapter two, and the findings and conclusions in this study, the following recommendations are suggested:

- Training: Management should ensure that all drivers are continuously trained and reminded of the importance of safe driving. Such training should not be haphazard, but should be a well-planned and implemented formal training programme. Drivers should be exposed to such training at least once every year, especially at the beginning of the year when all workers come up with their performance targets. Refresher courses in driving to deal with bad habits that easily creep in when one is an experienced driver are also very important.
- Defensive Driver's Certificate: All drivers in the Department must have a Defensive Drivers' License, and frequently go for tests to ensure safe driving. People with poor records of driving should not be allowed to drive the Department's vehicles. Also all drivers should only be allowed to drive after getting proper approval from the authorities. There should not be any shortcut. Thus top management should also abide by the dictates of the rules and procedures governing authority to drive
- Top Management Commitment: Top management should actively support safe driving before other workers take them seriously. Thus some serious senior management training and motivation programmes have to be embarked on before any form of strategy implementation is even thought of.
- Walking the Talk: Top management should abide by the dictates of the rules and procedures governing authority to drive government vehicles for the rules and procedures to be taken seriously. In this study it was established that top management were not reporting cases of accidents that involved them but required all juniors to report any accidents for assessment.
- Avoiding Driving Under the Influence of Alcohol: Most respondents suggested that drivers should not drive when drunk. This implies some accidents must have occurred when the driver was drunk. Generally alcohol impairs one's judgement. As such drivers are encouraged to be sober when driving.
- Avoiding Overworking Drivers: Drivers should not be overworked. Respondents said some of the accidents on the road were due to fatigue, stress and tiredness. Also drivers should be encouraged to be open about their personal problems so that they share them with others before they get on the steering. Such problems, if not attended to may end up impairing the driver's judgement when driving.
- Avoiding Night Driving: Night traveling is dangerous since vision is not as clear as during the day. Also most drivers are likely to be tired and sleepy at night. The 2008 accident reported above occurred during the night.
- Grounding all Unroadworthy Vehicles: All unroadworthy vehicles should be taken away from the road. There should also be proper vehicle check/inspection before embarking on a journey
- Following a Proper Maintenance Schedule of Vehicles: Vehicles due for service/check up should be taken to the garage for service. Such service should adhere to proper standards of servicing vehicles at reputable service providers.
- Accident Boards of Enquiry: After each and every accident a proper board of enquiry into the causes of the accident should be established so that such causes are dealt with.

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