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Research Article

Assessing Factors Causing Traffic Accident in Kellem Wollega Zone, Oromia, Ethiopia

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ABSTRACT
This study set out to identify the driver related factors and management status in Kellem Wollega Zone. Both open ended and closed ended questionnaires, and structured interviews were designed to the selected sample population. These target population selected from five different sites of the zone, with 520 samples among this 300 are pedestrians, 170 are drivers and 50 are traffic polices and other related responsible bodies. The driver's factors include demographic variables, over speed, overloading, drunk driving, over taking without enough space and inexperienced driver. And no enough traffic police distribution, lack of road signs and symbols, lack of creating awareness to community, no joint work with institution (government and non-governmental), lack of commitments' of managing bodies, and corruption are traffic management status responded by participants. Finally, the researchers recommended to the researchers who are interested in this area to extend the study area and include recording the accident and examining of speed of vehicles using appropriate measures.

Keywords: Driver, Kellem Wollega Zone, Traffic Accident, Vehicles

INTRODUCTION

Road traffic accidents (RTAs) are great health, social and economic problems.Nearly 1.35 millions of people lose their life due to accident and more than 50million of peoples are injured (Sleet *et al*., 2011; WHO, 2020). In the same case 17 road accidents per 100,000 populations per annum are reported. Road traffic accident is the second leading cause of death in economically active population group of 15-44 years of age and more than 75% of RTA causes occur occurs in this age group (Abegaz *et al*., 2014; WHO, 2020). It affects the domestic growth rate of the country, which reduce nearly 3% of its annual growth as reported (WHO, 2020). The problem of RTA is disproportionally high in low and middle-income countries (LMIC) were over 85% fatalities and 90% of disability-adjusted life years lost is reported (Ameratunga *et al*., 2006). The fatalities of RTAs are more than double in LMIC than in high-income countries. Especially, Africa faces the highest annual rate of road fatalities in the world 27 per 100,000 populations (WHO, 2018). In the next few decades, the problem can even increases more due to the ongoing rapid economic growth and Increase in motorization in the continent (Bishai *et al*., 2006). It expected that RTA will be fifteenth leading cause to death in 2030 (WHO, 2009). According, Abegaz (2014) more than 70 peoples loss their life in every 100,000 vehicle accident. In many developing countries including Ethiopia there is lack of evidence regarding the incidence of RTA-related injuries and fatalities. This encourages us to assess the causes of traffic accident in the region. The aim of this study was to develop means of assessing the factors that cause traffic accident. The researchers grouped sample population to assess the driver-vehicle factors, pedestrian's related factor and management status that direct or indirectly cause road traffic accident in Kellem Wollega zone.

Cautiousness is emphasized in investigating accident causation and reconstruction. In the Causes and Prevention of Road Accidents (WHO, 2018) the writers stated "it is generally pointless to consider the 'cause' of an accident or even the 'causes,' because some of the important factors are still likely to be overlooked, but it is possible and useful to consider how accidents can be prevented." The task of accident and reconstruction simplified somewhat by division into three categories: the driver, vehicle and environment. The percentage of accident attributable to each of these factors varies from one report to another depending on the subset of accident population being investigated, purpose of investigation.

There are limited researches in road traffic accidents in Ethiopia, especially Kellem Wollega Zone. This study is conducted in Kellem Wollega Zone which is one of zone in Oromia Regional State. This zone is

located western Ethiopia and bounded west by Gambela regional state. According to population projection of 2017 statistical agency report of Ethiopia, the population of Kellem Wollega is 1,040,585 from this 522,482 are men and 518,103 are women. 123,077(11.82%) of population are live in urban area.Compared 2007 report of statistical agency the urban population increased about 2.3% .This increase in population needs more urbanization and more vehicles in the area. These includes determination of acquired capacity expansion, provision of additional infrastructure, improvement of existing roads, prioritization of different development which is possible up on collection of traffic data. The above points are amongst the basic requirements for a Nation to establish an institution which will manage the entire roads network in our country in general and in Kellem Wollega Zone in particular. The capital of Kellem Wollega Zone, Dambi Dollo, is one the typical towns, which is also in process of urbanization especially in the last decades. According to data from town finance economic development recently, the total number of the residents exceeds 50,000. However, the office says that the number of population is increasing in high level due to continue rural-urban migration to this end. As Dambi Dollo administration town located in strategic place of western Ethiopia it has two main outlets: West exit to Gambela and to east Gimbi-Nekemt exit. The annual growth rate of zone population is high with the process of urbanization, the size of urban area of Dambi Dollo is growing and the construction areas are expending to the nearest road routes. To this end researchers interested to assess the factors that cause the accident and try to forward the solution in order to take measures.

2. METHODOLOGY

3.1. Study Area

The research was conducted in four districts and one administrative town(DambiDollo town) of Kellem wollega Zone of Oromia Regional State.In this zone, there are eleven districts namely Gidami, Anfilo, Sayo, HawaGelan, YemalogiWalali, SadiChanka, DaleWabera, DaleSadi, LaloKile, GawoKebe, and Jima Horo. Four districts Zone and one city administration city were randomly selected .Dambi Dollo town is named after man Dollo who is popular man of the time around 1863 and in custom of Oromo of this locality to plant Dambi trees around the grave of deceased person. Therefore, theDambi Dollo was taken from those bunches of treas. Now it is the combined historical, scientific, and economic values of tree after which the town of Dambi Dollo, one of oldest town in KellemWollega, Oromia, was named. It is located midway between the towns of Gaba Robi(Hawen Gelan) in North and the commercial border town of Gambella in south, close to the border between south Sudan and Oromia, Ethiopia. Geographic coordinates 8º32’0’’ north, 34º48’0’’ and 1,701meter above sea level. The Zone is known for gold smith work, coffee production. And the town also possesses an airport. The town is far from the center of Addis Ababa (Fin fine) capital of Ethiopia about 664 Km.

3.2. Study Design

This study employed mixed research approach (both qualitative and quantitative) the data were collected from five towns including Dambi Dollo administrative towns and rest four towns over past six months through questionnaire and interview. Hence, mixed approach and descriptive type study design wasfollowed to conduct the study. The descriptive type of research was found to be an appropriate method to assess the status, causes and control mechanism of traffic accidents and traffic management in the selected towns of the study area.

3.3. Source of Data and MethodofCollection

In order to achieve the objective of this study, both primary and secondary source of datawere used. The primary source of data obtained through interview and questionnaires of pedestrians, drivers and traffic police. And this primary data documented by (letters, memoranda, agendas, study reports and like), archival records (maps, charts). Interview with the help of open-ended and structured questions was conducted with key-informants coupled with non-participant observation. The secondary sources of data were also taken from statistical report of Zone road and transport traffic office.

3.4. Study Population

.In this regard the human populations of the study were 100 residents, 50 drivers and 10 traffic police were taken from Dambi Dollo town and 50 residents, 30 drivers and 10 traffic police and related bodies were taken from each of SadiChanka, HawaGelan, DaleWabera, and Anfillo.

3.5. Sampling Method

In this research, both probability sampling (simple random sampling, stratified Sampling) and non-probability sampling (purposive or judgmental sampling) techniques were applied. For the purpose of this research, the population is stratified in to two groups that the traffic police officers and the Pedestrians. Stratifying the population helps increase the accuracy of the research by taking the same sample for homogenous group. Among these two groups of Populations, heads of the officers (inspector) and some pedestrians were selected by judgmental sampling method and sample for traffic policeswere selected by simple random sampling method.

3.6. Sample Size

From the four towns and one administrative town the researchers randomly chose the participants according to their residents. The studyincluded 100 pedestrians, 10 traffic police and related bodies and also 50 drivers from Dambi Dollo town. And from Hawagelan, Sadi Chanka, Dale Wabera and Anfillo researchers chose 50 pedestrians, 30 drivers and 10 traffic police and related professionals. In order to strength the responses given by pedestrians, the researcher offered interview questions to different professionals.

3.7. Procedures of Data Collection

Structured questionnaire was prepared and used to conductthe study. The questionnaires were prepared based on the basic questions and review of related literature. To maximize the quality of the responses and the rate of return the time convenient for the respondents were arranged. A brief orientation about the whole purposes of the study was given for the respondents. Then the required data was collected.

3.8.Data Analysis

The data gathered from different sources was analyzed using mixed approach. The data gathered through interview, questionnaire, recorded data from traffic authorities and other institutions are translated into viable meanings and analyzed using Statistical Package for Social Sciences (SPSS) version 20. Tables, charts and figures were also used to clarify and substantiate explanations. The data obtained from different sources were placed together or compared for thepurpose of critical examination of the various claims.

3.9. Ethical Issues and Consideration

The researchers were in line with ethical guideline in the participation and respondent's identity wasconfidential. The participant were freed to participate or to miss participation as they wish. The responses were kept confidential and the respondents were not asked for their name or give their identification.

4. RESULTS AND DISCUSSION

4.1. General characteristics of Respondents

The information about respondents' who participated or involved in this study are presented in the table 1

Table 1: General Characteristic of Respondents

	Item	Number of Traffic polices and related bodies	Numbers Of Pedestrians	Numbers of Driver
Sex	Male	46	190	169
	Female	4	110	1
Age	Under 18 years	-	-	18
	18-22 years	-	70	78
	23-27	20	165	30

	27 and above	30	75	44
Education Level	Less than 12th	-	60	95
	College	-	100	20
	Diploma	35	80	40
	Degree	10	60	15
	Illiterate	5	-	-
Experience of service	Less than 2 years	30	45	100
	2-5 years	10	60	50
	More than 5 years	10	15	20
Occupations	Private	-	15	105
	Student	-	85	60
	Government officers	50	150	5
	Others	-	50	-

These populations were taken from the study sites. Unfortunately, there were no enough female drivers in the study area. The only one Bajaj driver was found in the Dambi Dollo town.

This survey was conducted for last six months in the Dambi Dollo town and other four selected tows. According to the zone road and transportation office, there were 21, 31, 25, 14 and 22 deaths were recorded in year 2015,2016,2017,2018 and 2019 respectively. Whereas, around 8 million ETB estimated property were damaged due to this uncontrolled traffic accident. Data obtained from zone transport was analyzed in the table below:

Death accident occurred in the 2015-2019G.C

As indicated above, around 113 deaths recorded within the zone in five consecutive years. As stated in the document the highest death accidents were recorded 2016 G.C. The main cause of the accident is due to high speed, drunk driving and under-age and without license.This study indicated that 47% of the accident was due to driver related factor specially, over speed and changing lane without warning.

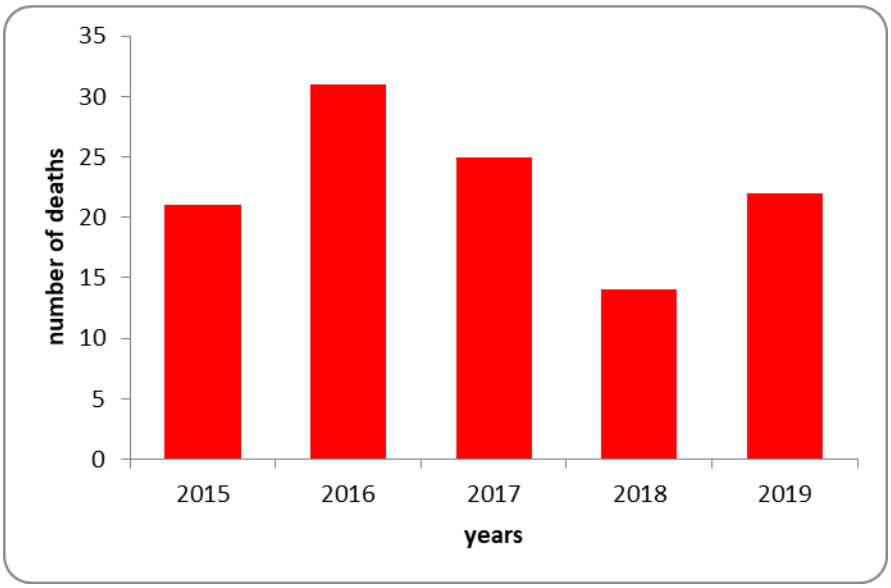

Figure 1: Deaths recorded from 2015-2019

Serious Injuries faced in the 2015-2019 G.C

Serious injuries faced in the year between2015-2019 G.Cwere 114. The highest serious injuries recorded were 32 in 2019 G.C.As shown in the graph below, the serious injuries eventually, increases from year to year in these five consecutive years.

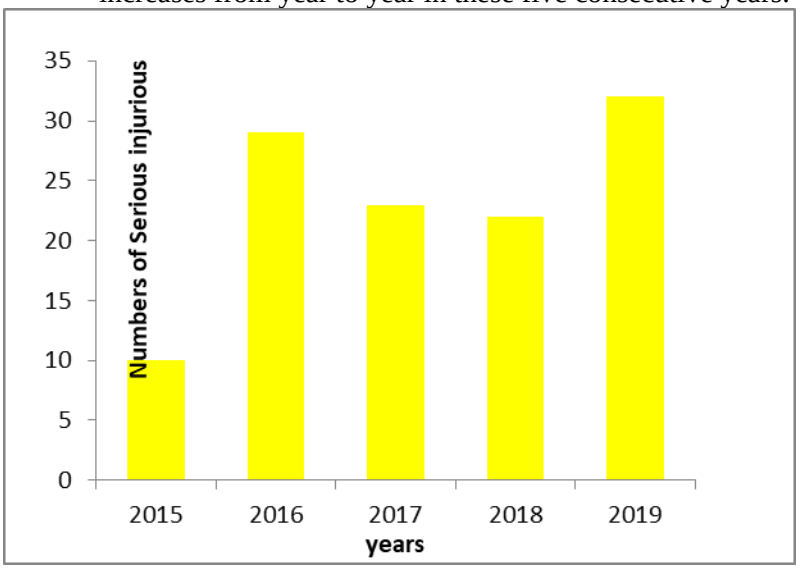

Figure 1: Number of Serious Accidents

Less serious injuries faced in 2015-2019 G.C

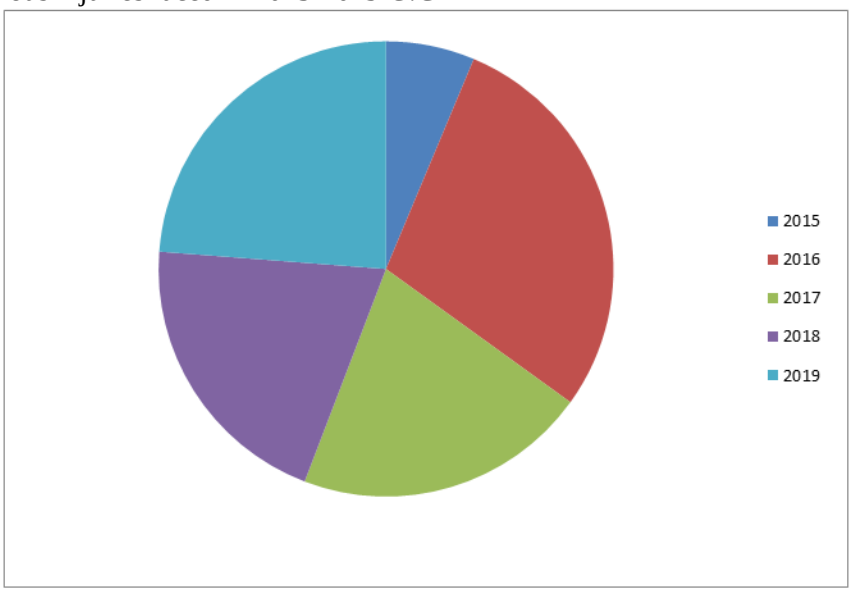

Figure 2: Number of Less Serious Accidents

The property damage occurred in 2015-2019 estimated in Ethiopia birr

Table 2: property Damage in Millions of birr

Year	Lost property in ETB
2015	0.5million
2016	3.6million
2017	2.8million
2018	1.5million
2019	2.6million

The document obtained from zone road and transport office shows that most the road traffic accidents caused by one of the following driver related causes and traffic mismanagement:

Speed has been identified as a key risk factor in road traffic injuries, influencing both the risk of a road crash as well as the severity of the injuries that result from crashes.Excess and inappropriate speeds are responsible for a high proportion of the mortality and morbidity that result from road crashes. In high-income countries, speed contributes to about 30% of deaths on the road, while in some low-income and middleincomecountries; speed is estimated to be the main contributory factor in about half of all road crashes (WHO,2020).Drivers' speed choice is influenced by a number of factors that can be considered as:

Driver related factors like: age of driver, alcohol level, the number of people in the vehicle.

Traffic and environment related factors like: traffic density, weather conditions, and prevailing speed and traffic police commitments.

In developing countries like Ethiopia, there is high demand in transportation. There are very few number cars are available for transportation, hence peoples are facing lack of transport to move from one place to another place. Due to this disproportion, the drivers take more population than expected in the vehicle for more demand of money and giving service for who are urgently in needy. However, with in this overloading vehicles' become damaged and cause accident. According to zone road and transport office, the high amount death accidents, injuries and property damage is due to this overloading population more than expected.Failing to give priority to pedestrians or other vehicles in combination with high speed

drive increases the odds road traffic accident fatality. This finding agrees with the finding of studies Abegaz(2014).

According to zone road and transport office, the road conditions and environment factors that cause road traffic accident in the five consecutive years. According to South Africa department of transport (2004), the three factors contribute accident in the following proportions:Human factors (70-80%),Vehicle factors (10-15%)Road environment factors (5-10%) and Animals

In Ethiopia, Wollega Zones one suitable for grazing cattle's. Kellem Wollega zone is one four Wollega Zones which is suitable for animals because of suitable weather conditions, that is every green throughout year. The roads in this region cross through forests and grasses, hence animals grazed in this environment cross road here and there without any look of driver and cause accident. According to the Zone road and transport office crossing roads is one of uncontrollable problem in the area. According to **Vogel, L**., **& Bester, C. J. (2005)**who conducted survey from 1999-2003, 23 accident out of 404 accidents, that is, about 5.7% of accident caused due to animals on road.

Drunk drivers and under age drivers, physical depression of drivers and unlicensed drivers are other main factors in the region. These are also the factors that cause traffic accident in the study area. According to Zone report physical depression and fatigue of drivers, especially who drive long distance is the main factor that causes accident in the zone.

4.2.. Pedestrians number participated questionnaire*s*

Table 3: number of respondents' and respective towns

Pedestrians														
DambiDollo			HawaGelan			SadiChanqa			DalaWabera			Anfillo		
M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
75	25	100	33	17	50	34	16	50	40	10	50	45	5	50
75%	25%	100%	66%	34%	100%	68%	32%	100%	80%	20%	100%	90%	10%	100%

The required data collected through questionnaire distribution according to above in the five towns. The responses obtained through questionnaire are presented below;

Question1: ''Do you give priority to vehicles as required by law whenever you cross the road?''

Table 4: Whether Pedestrians Give Priority to vehicle or not

Item	Pedestrian			
	Number Male	Number of Female	Percentage (%)	
Always	50	10	20	
Some times	80	40	33.3	
Never	120	20	46.6	
			300	100

According to DambiDollo town the pedestrian response graphically represented as

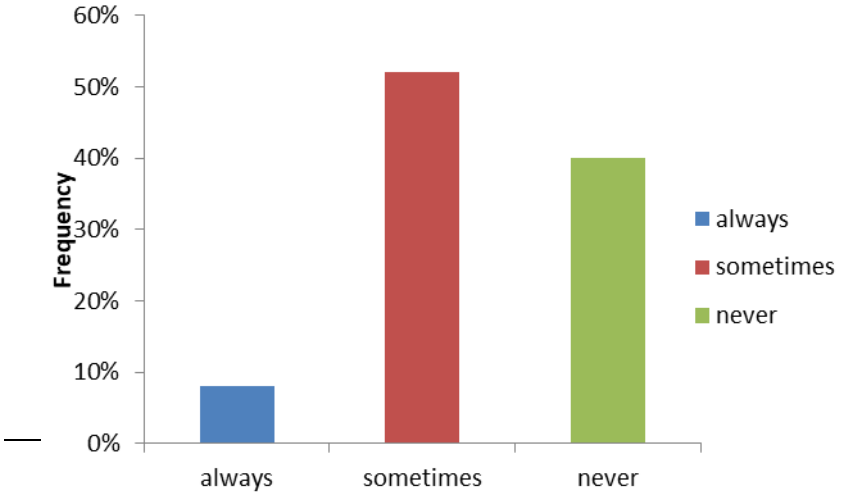

Figure 4: Pedestrian Responses on Giving Priority to Vehicle

As shown above, nearly half of respondents about 46% respond they never give priority to the law whenever they cross the road and about 33% responds that they are sometimes give priority to the roads and the rest 20%.

In this study it was also tried to collect information about the above questions from different traffic polices and most of them said they have highly criticized on pedestrians behavior when the cross road or when they walk on. They did not realize in which direction they have to walk or where they have to cross the road. These and the other weak behavior of pedestrian cause the traffic accidents. To address this challenge zone road and transport office incorporating with traffic police and any other responsible body launching agreement to work together to minimize these pedestrian behaviors.

Question2: ‘’where do you cross the main road?’’

Table 1: Pedestrians Crossing Point

Items	Number of Males	Number of Females	Percentage
At any point	120	62	60.6
At junction	35	15	15
At midblock	37	20	19
Other	10	6	5.3

About more than half of the pedestrian have no knowledge to them where to cross the road and they could not obey the law when they cross. That is why they crossany point without consideration. A small part of the pedestrian cross at mid-block and at junction. This indicates a lot of educationneeded to teach community how to use the road at any time and at anywhere. This shows the weakness of management in the area.As we see from the data most of respondents’ had no information on the way where they cross. Hence, these points to all responsible body regarding to this department should carry out such assignments.

Question 3.”How do you rate traffic police commitment to their duties?”

Table 5: Traffic Police Commitment

Items	Number of Males	Number of Females	Percentage
Strongly agree	2	-	0.6
Agree	73	30	34.3
Disagree	110	25	45
Strongly disagree	40	20	20

According to respondents’, their degree of difference can be described as follows:According to table 5, more than 60% of respondents’ disagree on the traffic commitments and less than 35% agree on the traffic police commitments. This implies that most of respondents disagree on the commitments of traffic police, this give direction to the responsible bodies to make action on this gap. Hence, this forwards to the transportation office to overcome this assignments on their behalf.

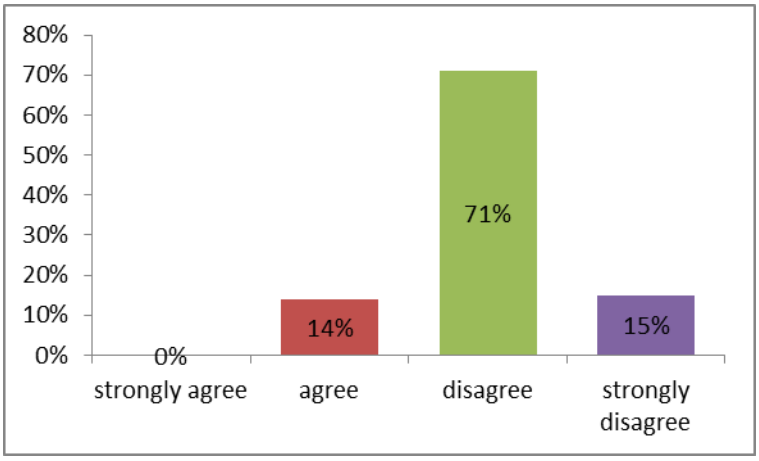

Figure 5: Traffic Police Commitment

The response of the pedestrian respect to above question is that more than half of the respondent doesn't agree with the commitment of traffic police in the area. When responding this questionnaire, most of respondents told that there is weak management, especially in buses and Bajaj's, especially those vehicles serve as transport. They raise two maim things: the first one is unfairness of tariff and the second one is the number of people carried by these vehicles. The tariff given to kilometer per hour is not enrolled properly the area, this is due to the traffic police commitment weakness. As respondents, they were suffered both in tariff as well as over loading of vehicle.

Questions4: 'Do vehicles take more population than expected?"As presented in(Fig, 6), respondents' responds that 70% drivers take more population than expected and less than 20% responds that they obey and about 10% responds no idea on the issue. Hence the responsible bodies have to take measurements on such problem. For more clarification we introduced bar graph to describe the percentage of respondents on the questionnaire.

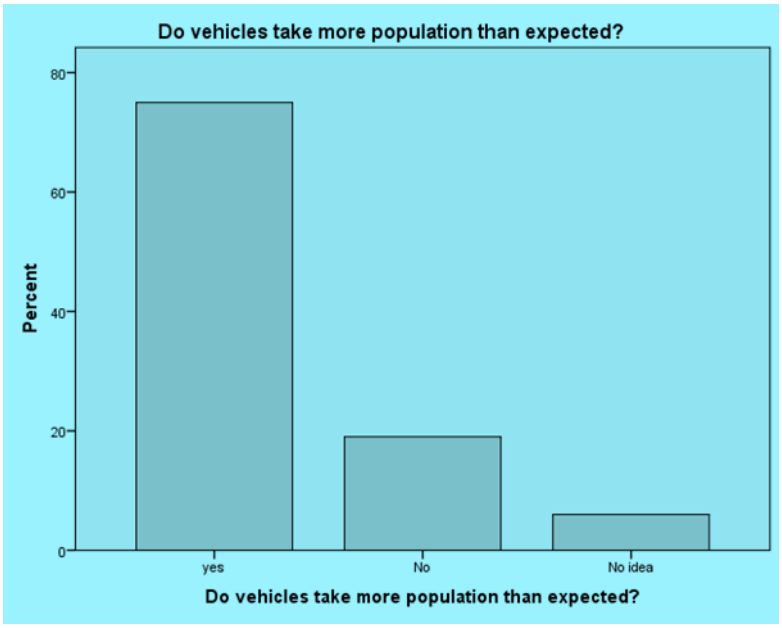

Figure 6: Pedestrian's Responses' on Overloading

Table 6: Pedestrian's Response on Checking and Follow up of License of Drivers

Do you believe follow up and checking the license of driver works properly?				
Options		Frequency	Percentage	Cumulative percentage
	strongly agree	15	5.0	5.0
	Agree	45	15.0	20.0
	Disagree	192	63.8	84.0
	strongly disagree	48	15.9	100.0

According to table 6, the respondents' gave their response according to their environment. Most of pedestrians, about 80%, disagree on follow up and checking the license of responsible bodies. A bout 20% the respondents' agree on the checking and follow up of the license of drivers.

Questions6:"Do road conditions cause traffic accident in your community?"

Table 7: Pedestrians Response on Road Condition as Factor

	Frequency	percentage	Cumulative percentage
Yes	180	59.8	60.0
No	72	23.9	84.0
No idea	48	15.9	100.0
Total	300	100	

From table 7,about 60% of respondents' responds that road conditions road accidents in their community. And about 15% of respondents have no idea on if there is accident due to road conditions or not. Standing from this information that road condition is a major cause of traffic accident in the area.

Questions7:"Do you think lack of signs and symbols of road in your community causing traffic accident?"

Table 8: Responses on Lack of Road Signs and Symbols

	Frequency	percentage	Cumulative percentage
Yes	102	33.9	47.0
No	39	13.0	13.0
No idea	159	52.8	100.0
Total	300	100	

As presented in table 8, about 53 %(159 out of 300) a respondent responds that they have no idea on the road signs and symbols. About 33% respondents' mention that lackof signs and symbols are the problem of town that causes traffic accident.

Questions8:" Do traffic office and other related bodies work with other institution like: NGO's, colleges, University or other voluntary organizations?"

Table 9: Responses of Pedestrians on Cooperative Work of Traffic office and Other Institution

	Frequency	Percentage	Cumulative Percentage

	Yes	90	29.9	30.0
	No	138	45.8	76.0
	No idea	72	23.9	100.0
	Total	300	100	

According to the corporation with another institution such as churches, schools and NGO'S , the respondents' raised their response in the table 9: most of respondents' about 46% responds there is no cooperative or joint with such institution and around 24% of respondents have no awareness on the issue. This implies that traffic bureau should work cooperatively with different institution because the pain of traffic accident touches each and every body.

Question9:"Do you think traffic bureau and other related bodies create awareness to your society?'

Table 10: Pedestrian's Responses on Creation of Awareness Responsible Bodies

		Frequency	Percentage	Cumulative Percentage
Valid	Yes	12	4.0	4.0
	No	213	70.8	75.0
	Different	75	24.9	100.0
	Total	300	100	

Creating awareness to society respondents' mostly answered there is no more awareness creating tasks are done. About 71% of respondents responded no awareness is createdon traffic accident as well as traffic management in the towns.

Questions10: "Do traffic police take measure according law?''

Table 11: Responses on Traffic Police Measure According Law or not?

		Frequency	Percentage	Cumulative Percentage
Valid	Yes	33	11.0	11.0
	No	150	49.8	61.0
	no idea	117	38.9	100.0
	Total	300	100	

According to the table 11,about 50% of respondents responded traffic polices do not take measure according law and about 40% of participants responded they have no idea whether they take measure according law or not. Depending on the responses' of participants the researchers inform that there is weakness on the measurement as well as the shortage of information of how traffic police works

This study includes the factors like: experience, speed, age, changing lane, obeying signs and symbols, number of population inside vehicles which directly related with drivers. In this section we will discuss these factors cooperating with the responses of participants and to identify the degree of their prevalence and the way the participants understands these variables and their influence on the drivers to cause traffic accident, traffic crashes and traffic injures.

Question1: Do speed of vehicle problem in your town (community)?

Options	Frequency	Percentage	Cumulative Percentage
Disagree	60	20.0	20.0
strongly agree	108	36.0	56.0
Agree	126	42.0	98.0
strongly disagree	6	2.0	100.0
Total	300	100.0	

Table 17: Responses on speed as problem

As shown table 17, most respondents agree that speed is the main problem in the community that is about 78% of respondents agree and about 22% disagree. This implies the high speed is the problem of the towns that more respondents agree on (236 out of 300). Thus any responsible bodies and drivers itself should do great assignments on the speed controlling. Specially,in freeways and following too closely as well as mimicking to overtake without enough space and adequate warning.

Question2:" Do drivers obey road signs and symbols? ''

Options	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	18	6.0	6.0	6.0
No	228	76.0	76.0	82.0
No idea	54	18.0	18.0	100.0
Total	300	100.0	100.0	

Table 18: Pedestrians Response on Drivers Obey Road Signs and Symbol

As shown in table 18, 76% of responses that drivers do not obey the rule and regulation of the traffic sign and symbols. This implies that most of traffic accidents are related neglecting of the rules of the signs and symbols of the road. This shows that there is great gap in the obeying the rule and regulation of traffic in the study area. So, any responsible bodies should give measurement on this part. Also 18% of respondents have no awareness regarding to this signs and symbols of roads.

Question3: Do drivers change lane without adequate warning?

	Frequency	Percentage	Cumulative Percentage
Yes	22	7.3	7.3
No	219	73.0	80.3
no idea	59	19.7	100.0
Total	300	100.0	

Table19: Response on Drivers Change Lane with Adequate Space or not

In table 19,73% of respondants responded that drivers do not change lane without adiquate warning. This implies tha drivers should take care when they change lane.

Question:Taking more population than expected cause traffic accident in your community?

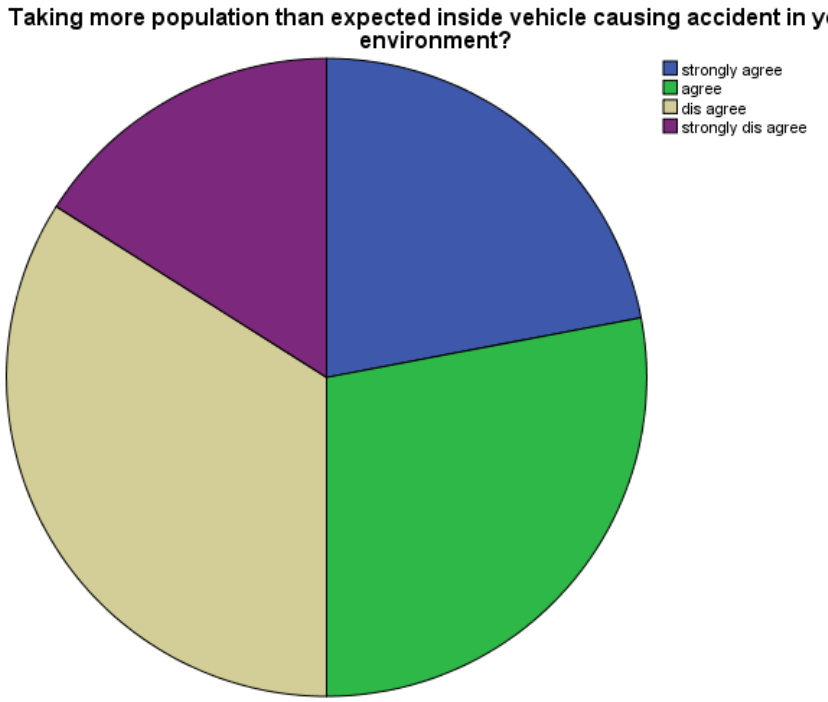

Figure 7: Responses on Overloading of Drivers

As the pie chart indicates most of participants agree that drivers are taking more population than expected and this cause the traffic accident. For sake more benefit drivers although vehicles owners are overloading people or other things that cause the traffic accident. Thus, checking and follow up of vehicles and giving awareness and give appropriate measures according law is needed in the area. This is one of driver factor that expose and increase traffic accident, hence all responsible bodies should take measures to reduce such factors as much as possible.

Question5:"Do you think inexperienced drivers case traffic accident in your area?"

Table 20: Inexperienced Drivers as Factor

Options	Frequency	Percentage	Cumulative Percentage
No	25	8.3	8.3
Yes	220	73.3	81.7
no idea	55	18.3	100.0
Total	300	100.0	

According to table 20, 73% of respondents agree that in experienced driver's cause's traffic accident. And about 18% have no idea on experience of drivers and that they cause traffic accident in their community.

Question 6: Ranking factors according to their prevalence

Table 21: Ranking Driver Factor in Area

Select the most known problem causing traffic accident

Options	Frequency	Percent	Valid Percent	Cumulative Percent
high speed	91	30.3	30.3	30.3
Addicted driver	15	5.0	5.0	35.3
Taking more population than expected	52	17.3	17.3	52.7
inexperienced and under aged driver	46	15.3	15.3	68.0

Other	96	32.0	32.0	100.0
Total	300	100.0	100.0	

This question is very important to identify the degree of driver factor more related traffic accident. Here participants put the factors according to ranks of that they have high prevalence. As we see above high speed take first rank that is 30% agreed on over speed and the second one is taking more population than expected is more practiced driver related problem. Third factor is related with driver factor is inexperienced and under aged drivers who are not that much awareness as well as training on traffic accident and service giving to community in free from any harsh conditions. Addicted drivers (drunk driver and chat chewing) counts 15% and other driver factors like: not giving priority to pedestrians, not driving in right track, too close driving, calling while driving and others counts 32%. Thus any responsible bodies take care on the factors and give solution to these factors accordingly.

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	170.000	35	4.857	14920654.315	.000
Residual	.000	134	.000		
Total	170.000	169			

Dependent Variable: accident severity

Predictors: gender, age ,year of experience, educational level ,giving priority to pedestrians, obeying the road symbols, over loading , taking measure according law, lack of signs and symbols, creating awareness.

DISCUSSION

This study was carried out in Kellem Wollega Zone in five selected towns. In this study 170 drivers, 300 pedestrians and 50 traffic police and related bodies participated to give relevant information's. Fortunately, researchers got all the sample population that designed in the methodology, hence researches thinks that they got enough data from the site as much as possible.

This study tried to meet three research objectives thatwere identifying driver factor, pedestrians' attitude and the management status in the study sites. Unfortunately, there has been a single female driver among 170 drivers, so gender as factor is not considered as driver factors. But this finding shows that ages of driver is one factor that more expose to accident in the site. 42(18%) of drivers are under 18 years, most of them are business bus and Bajaj drivers. This finding is similar with study found in (Mc Donald, 2015),

which identified poor hazard anticipation skills as factors determining young drivers car crash risk. Speed is the most and crucial driver factor which increase exposure to accident. In this finding most respondents strongly agree that speed is great problems in their towns 108(36%) and 126(42%) agree with the statement, where less than 6% disagree. This finding is consistent with Addis Ababa transport police annual report of 2004.Here the report indicate that driving beyond speed limit is the first and highest driver factor. The second most highest factor next to speed is that drunk driver, in this study 58% of respondents show that drunk drivers are causing traffic accident more than other factors. This finding is coincide with the study in the Addis Ababa transport police annual report of 2004 and also with drugs and fatal accidents by Eland*et al*.(2011). Overloading of population the area is again the main problem causing traffic accidents. As stated above more of the vehicles in the sites are business vehicles, thus drivers are search for money to get in their daily business. This study is consistent with finding (Fikadu, 2015). The other factor more responded in questionnaire are: not giving priority to pedestrians, changing lane without enough space, psychological depression, mobile phone use and lack of experience. Use of mobile phone has associated with positive outcomes (Gezer,2004).

The second objective considered in this study is that the attitude of pedestrians when crossing the main roads. The main factors related with pedestrian in the study are: pedestrians walking direction, not giving priority to vehicles when crossing roads and not choosing points when crossing roads. In this study more than 60% of pedestrian do not give attention to the direction of traffic. Only few numbers of pedestrians almost less than 15% walk against traffic direction. According to respondents', most of them have awareness that in which side do they walk, but they do not apply such traffic rule in the ground. This finding is consistent with Yilma (2014) and Luoma J and peltola H.(2012).

The third factor that described was the management status of the Kellem, Wollege Zone in the area of traffic. The most factors related with management status are: lack of trained traffic distribution, lack traffic police commitment to ensure the traffic rule, lack of road side signs and symbols, lack of giving training to drivers and societies as whole and lack of joint work with governmental and non-governmental organizations. According to the zone road and transport office, only one trained traffic police in a town except zone administrative town Dambi Dollo, which has three traffic police, one female and to male traffic police. There are different routes of roads which connect the Worde town with other Keble towns; hence, it is difficult to monitor all these routes with this single traffic police. Due to this zone road and transport office trained some volunteer to solve these problems. But the rapid increase of vehicles in zone and great expansion of urbanization in the zone needs more human power who trained in this area of specialization. Due to this and the other problem drivers over load peoples more than expected amount and causing traffic injuries in the zone. The rest of factors like lack of traffic sign and symbols are the main factor in the area of curves and in more steeped areas. There is also lack of renewal of road signs like zebra problem to pedestrians to cross in any point and some mid-block areas. According to respondents' 90% responded that there was no training or awareness creation is done in the zone road and transport office. This finding is similar with Yilma (2014), Yonatan (2001), Chijioke and Ugwuanyi(2014).

5. CONCLUSION

Kellem Wollega Zone is a host for many residents, and many vehicles, is experiencing a rapid growth of population. This condition creates an alarming traffic situation especially crashing and over taking occurs. With the increase in the horizontal expansion of the tows and lack of parallel alternative roads, lack of appropriate short cuts and/or absence of linkages between radiating or parallel roads; poor surfacing and narrow carriage ways; inadequate sidewalks and traffic control facilities; together with the existing narrow streets and junctions create serious traffic accident in the towns. However, it is expected that the ring road and towns different vehicles, whose construction is underway, would not only divert traffic but also save time and resource. It would be a shortcut to move from any corner of the city relative to the prevailing condition. Ingeneral, the mixed traffic flow in narrow and heavily pedestrians movements,mismanagement urban of public transport provision, poor standard of

vehicle(most of vehicles were old), poor maintenance and development of roads, the negligence of drivers due to lack of adequately training and driver testing, negligence of pedestrians due to lack of stringent laws, poor traffic control and enforcement which combine increased risk of accidents on roads of KellemWollega Zone. Low institutional and public awareness of the extent of an immense destruction of traffic accidents aggravated the situation.

REFERENCES

1. **WorldHealthOrganization**.Roadtrafficinjuries:Keyfacts,2018.Accessedfrom:http://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries.Cited01July2018.
2. **WorldHealthOrganization**.Globalstatusreportonroadsafety2015:Summary. Geneva:WHO;2018
3. **OderoW,KhayesiM,HedaP.**Road traffic injuries in Kenya: Magnitude cause and status of intervention.InjControlSafPromot.2003;10:5361.https://doi.org/10.1076/icsp.10.1.53.14103PMID:12772486
4. **MohanD**.Roadsafetyinlessmotorizedenvironments:Futureconcerns.IntJEpidemiol.2002;31:527–532.PMID:12055145
5. **SleetD,BaldwinG,DellingerA,DinhZarrB**.Thedecadeofactionforglobalroadsafety.JSafetyRes.2011;42:147148.https://doi.org/10.1016/j.jsr.2011.02.001PMID:21569898
6. **BishaiD,QureshA,JamesP,GhaffarA**. Nationalroadcasualtiesandeconomicdevelopment.Health economics.2006;15:6581.https://doi.org/10.1002/hec.1020PMID:16145717
7. **AmeratungaS,HijarM,NortonR**.Lancet.2006;367:153315.https://doi.org/10.1016/S0140-6736(06)68654-6 PMID:16679167
8. **A.Persson, 2008** Road Traffic Accidents in Ethiopia: Magnitude, Causes and Possible Interventions‖, Sweden, Lund University
9. **Baker, J.Stannard 1960**. Limitations on accident reconstruction.Traffic Institute, Northwestern University,
10. **Cohen, John and Preston, Barbara.**Causes and prevention of Road Accidents. Faber and F'abzr. London. 1968.
11. **Cook, David I march 1967**. Models and accident reconstruction and analysis. Traffic engineering, 37, pp. 34-36,
12. **Clayton, A.B July 1971**. Road-user errors and accident causation. Seven-tenth International Congress of applied psychology. Liege, Belgium, 25-30,
13. **Chijioke, and Ugwuanyi(2014)** Towards Efficient And Effective Traffic Management System.(A Case Study Of Abakpa Nike Enugu State Nigeria)
14. **DONALD, R. DREW. (1986**) "Traffic flow Theory and Control", McGraw – Hill, NewYork.
15. **Elsande PV, Jaffard M, Fournier J-Y, Fouquet K.(2011)** Stupéfiants et Accidents Mortels (Projet SAM): AnalyseAccidentologiquedesDéfaillances de Conduite sous Influence de l'Alcool et/ou du Cannabis. ObservatoireFrançais des Drogues et desToxicomanies.
16. **AbegazT,BerhaneY,WorkuA,AssratA,AssefaA**.Roadtrafficdeathsandinjuriesareunder-reported inEthiopia:Acapture recapturemethod.PLoSONE.2014;9(7):e103001. https://doi.org/10.1371/journal.pone .0103001 PMID :25054440
17. **GetachewEpherem (Thesis), June 2008**," Road Traffic Accident in Addis Ababa and the Solution to Mitigate,Addis Ababa University, Ethiopia.
18. **GetuSegni, April 2007**, "Causes of Road Traffic Accident and Possible Counter Measures on Addis Ababa - Shashemene Road ―,Addis Ababa, Ethiopia.
19. **KebedeTenaw, 2000 E.C,** "Capability of Driving Preventing Accident 10th Edition, Elam printing, EthiopiaHighway Safety foundation.Vehicle factors and traffic accident causation.InternationalReport. Mansfield, Ohio, December 1971.
20. **YilmaH. (2014),**Challenges and Prospects of Traffic Management Practices of Addis Ababa City Administration
21. **HUTCHINSON, B. (1974**). Principles of Urban Transport Systems Planning; Script Book Company, Washington D.C

22. **King, Barry Griffith**. Human Factors in accident causation.National Safety Congress Transactions,Vol.6, pp. 44-50, 1960.
23. http://www.losangelespersonalinjurylawyers.co/top-10-causes-of-car accidents accessed on Oct 04, 20149.32pm
24. **McDonald CC, Goodwin AH, Pradhan AK, Romoser MR, Williams AF(2015).**A review of hazard anticipation training programs foryoung drivers. J Adolescence Health
25. **PAUL, N. (2003**) Road Transport in Africa
26. **SAYER, I. and PALMER, C. (1997)**Pedestrian Accidents and Road Safety Education in Selected Developing Countries; Transport Research Laboratory, UK.
27. **The World Health Organization (WHO)** World Summary Reports on Road Traffic Injury and Prevention, Geneva, 2004
28. **YAYEH, A. (2003)** the Extent, Variations and Causes of Road Traffic Accidents inBahir Dar Addis Ababa University
29. **Yonatan J.(2001),** why people obey the law:compliance with Addis Ababa city traffic regulations
30. Addis Ababa Transport and communication traffic police annual report (2004).
31. **WHO, 2020**. World health organization: Road traffic injuries. Geneva.
32. **Vogel, L**., **& Bester, C. J. (2005).** A relationship between accident types and causes . *SATC 2005*
33. **Fikadu (2015**). Road Traffic Accident: Causes And Control Mechanisms: The Case Of Addis Ababa City
34. **Departments of transport ,South Africa,** arrive alive campaign.[online] Available: www.arrivealive.co.za. [2004, july]
35. **Elsande PV, Jaffard M, Fournier J-Y, Fouquet K.** Stupéfiants et Accidents Mortels (Projet SAM): Analyse Accidentologique des Défaillances de Conduite sous Influence de l'Alcool et/ou du Cannabis. Observatoire Français des Drogues et des Toxicomanies. OFDT (2011). p. 1–65.
36. **Geser H**. Toward a Sociological Theory of the Mobile Phone. Soziologisches Institut der Universitat Zurich (2004). Available from: http://socio.Ch/mobile/index_mobile.htm
37. **Luoma J, peltola H**. Does facing traffic improve pedestrian safety? Accid. Anal. Prev, 2013;50;1207-10