BINDURA UNIVERSITY OF SCIENCE EDUCATION

DEPARTMENT OF ENVIRONMENTAL SCIENCE

Assessment on knowledge, attitudes and practices regarding littering legislation among motorists and passengers .A case study of BUSE FAES students and staff.

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENTS OF THE REQUIREMENTS OF BACHELOR OF SCIENCE HONOURS DEGREE IN SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT.

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DECLARATION FORM

***Title*: Assessment on knowledge, attitude and practice (KAP) on littering legislation .A case study of BUSE Astra Campus FAES students and staff.**

To be completed by the student

I Rumbidzai Jimu hereby declare that this work related learning project is my original work and has not been submitted before. Where information has been derived from other sources it is indicated in the project.

…… ……/……/……

Signature of student **Date**

To be completed by the supervisor

This dissertation is suitable for submission to the Faculty.

……. ……/……/……

Signature of supervisor **Date**

DEDICATION

I dedicate this research project to my family and friends. God bless you all.

ACKNOWLEDGEMENTS

I give all thanks to the all Mighty God for being with me through the whole program because with him all things are possible. Special thanks goes to my academic supervisor Mr T. Nyamugure for his patience and guidance throughout the dissertation. Would also like to express my sincere gratitude to my whole family for giving me wings to fly. A special gratitude goes to my classmates for the help during the study.

ABSTRACT

Background: Littering is considered a serious environmental problem. This study sought to determine the knowledge, attitudes and practices towards littering legislation among motorists and passengers at Bindura University Astra Campus, FAES department.

Methodology: Target population was stratified and individuals were randomly selected from each strata. It was conducted among 63 individuals. Piloted questionnaires were used for data collection. After data collection, the data was entered into SPSS version 20.0 for descriptive statistics and Chi Square test was then used to determine the association between socio-demographic characteristics with knowledge, attitude and practices towards littering legislation in Zimbabwe.

Results: Majority of respondents had knowledge that EMA governs littering in Zimbabwe .However, more than 80% of participants were not knowledgeable on the specific fine and years of imprisonment of failure to comply with littering legislation of Zimbabwe. Knowledge on specific fines and years of imprisonment dependant on age (χ^2= 8.676, p=0.19).At least 50% felt that it is unacceptable to throw litter anywhere. There was an association between age and attitude of responsibility to proper litter disposal, (χ^2 =5.63, p=0.03). Passengers littered more than motorists with a percentage of 32.6%. Littering on land surface was associated with age, (χ^2=8.09, p =0.018). There was a strong association between age and knowledge of passengers that throwing litter on land surface attracts a penalty (χ^2=14.182, p=0.001). Habit and unavailability of bins were the major cited reasons of littering through vehicle windows.

Conclusion and Recommendation: The results show that younger people litter more than older people. Knowledge and positive attitude towards littering may not imply one practice proper disposal of litter. .Strategies to combat littering among motorists and passengers should be directed towards behaviour change and provisions of vehicle bins.

Key words: littering legislation, littering, motorists and passengers.

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ABBREVIATIONS AND ACRONYMS

EMA	Environmental Management Agency
S.I	Statutory Instrument
KAB	Keep America Beautiful
KAP	Knowledge, Attitude, Practices
SMW	Solid Waste Management
FCSHWM	Florida Centre for Hazardous Waste Management
RSPCA	Royal Society for the Prevention of Cruelty to Animals
UNEP	United Nations Environmental Protection
FAES	Faculty of Agriculture and Environmental Science
BUSE	Bindura University of Science Education
NGOs	Non-Governmental Organisations

CHAPTER 1: INTRODUCTION

1.1 Background of study

Astra Campus was chosen for this study because that's where environmental legislation is taught .Littering is considered an important environmental problem. Legislation under the watchdog of the Environmental Management Act has been put in place but littering along highway roads are still at alarming rate (Chitotombe, 2014). Mukuka and Masiye (2010) argued that littering is a challenge facing any urban area in the world threatening both public and environmental health. Litter disposal should be practiced in harmony with various environmental considerations which are but not limited to public health, economics, engineering conservation and aesthetics, Makwara and Magudu, (2014). Ojedokun (2011) defines littering as the either intentional or unintentional act of throwing away waste on land surface.

Despite efforts by the Environmental Management Agency (EMA) and other environmental stakeholders to stop this unacceptable behaviour by introducing anti-litter campaigns and implementation of Statutory Instrument (S.I) 6 of 2007, the problem seems to be beyond control of law enforcers, Chitotombe, (2014). Litter begins with the individual and is triggered by human behaviour, Keep America Beautiful (2009). Littering is both a social and environmental problem. It negatively alters the health of humans and wildlife, creates health and safety hazards, increases anti-social behaviour, and has a negative economic impact, Schultz et a., (2011); Kingdom House, (2016).Accumulated litter and carelessly discarded cigarette residues pose to be fire hazards as evidenced by fires along roads. Thompson (2004) stresses that indiscriminate dumping and refuse overflow leads to drainage blockage which moreover require high finances to maintain .Its evidenced that littering leads to both soil and water contamination.

According to Keep America Beautiful, sources of litter can be classified into two major groups which are stationary and moving sources .Houses, offices, loading docks, and construction and demolition sites fall under stationary sources while uncovered trucks, vehicles and pedestrians fall under moving sources, KAB, (2009) .Due to the advancement in the public transport sector and high population growth coupled with decline in the country's economy, the roads are becoming very busy. This is evidenced by vast accumulated litter sites along roads by motorists and passengers. According to, ZimStat, (2015), the population of Zimbabwe is approximately 12.97 million with an annual growth rate of 1.1% and as a result litter rates increase .Progressively, the increasing public-supply/demand gap compelled the proliferation of informal kombis on the road. Up to 1983, public transport was solely provided by conventional buses which were strictly monitored on litter disposal as bins were available .Privately operated vehicles in the form of minibuses have mushroomed and now dominate the entire public transport resulting in the death of the conventional bus operator, Mbara, (2015). The reluctance of transport route operators in providing bins has contributed to passengers to throw litter through moving vehicle windows. To abate these problems , EMA implemented S.I 6 of 2007 which works in harmony with section 4 subsection (1) of the Environmental

Management Act (EMA) Chapter 20:27 of 2002 as well as section 73 of the Constitution of Zimbabwe (Amendment 20) .EMA can fine or imprison illegal dumping of refuse and the amounts range from US$1500 to US$5000.Littering legislation has been implemented since 2009 but despite enactment of the law ,litter accumulation on roads has become abysmal .This is evidenced by illegal solid waste dumpsites along roads as a result of accumulated litter because litter attracts litter.

Although there are many sources of litter, What is Littering, (2017), acknowledged that passengers and moving vehicles also contributed to littering and that large majority of litter is linked to individual behaviour, Schultz et al., (2011). Attitude towards littering is defined as the preference of someone to react either positively or negatively towards throwing away of wastes Ojedokun, (2011) and can be perceptive, emotional and normative. An individual can have a negative attitude and positive behaviour or a positive and a negative behaviour towards littering. Lack of knowledge on environmental legislation coupled with different beliefs which determined individual attitude and the corresponding practice towards littering hence this study will explore more on KAP on littering legislation, of Zimbabwe using a tertiary institution as a case study.

1.2 Problem statement

Environmental degradation is mostly being accelerated through littering, Chitotombe, (2014). Littering is one of the most ignored and visible forms of environmental degradation, Finnie, (1973). According to Keep America Beautiful (2009) and Schultz et al. (2011), about 85% of littering is caused by individuals. Despite the negative impacts associated with littering and the implementation of SI 6 of 2007 in Zimbabwe, people still litter. This is because dropping litter is a habit, an instinctive and repetitive behaviour ,Ojedokun and Adenkule, (2013).The extensive of the behaviour has made littering being considered as an environmental issue globally ,Keep Britain Tidy (2009) and (2013). In Zimbabwe , a lot of research has been geared towards solid waste management (SWM) yet even though litter is an aspect of SWM, it has received relatively low attention yet littering in Zimbabwe has become persistent .Locally there are city and municipal bylaws and still littering levels on roads are very high .Water ways are being harmed through pollution as being evidenced by drain blockages .Dumpsites pose health problems because of their attraction of mosquitoes, rats, cockroaches and flies leading to malaria and cholera outbreaks ,Masundire and Saunyanga, (1999). Accumulated litter reduce the aesthetic value of land .This could have a negative impact on the tourism industry which heavily depends on the natural environment for its success .No concrete study has been conducted to assess the knowledge, attitude and practice of littering legislation among motorists and passengers at tertiary institutions.

1.3 Justification

The findings of this study will reflect the targeted population lifestyle of littering ,whether they litter or not outside school environment .Attitude towards littering can affect the amount of littering in an area , Zurbruegg, (2002).The results and findings of this study may help policy makers to be knowledgeable of KAP among motorists and passengers despite the presence of littering legislation in Zimbabwe .Policy makers may review the legislation concerning litter enacting the gaps which may have been left out .Research on littering proliferated after the cost of cleaning up litter became high and a solution was needed, Cooley, (2005). The researchers study may be used as reference for scientific research on littering or as literature to future studies. In developing countries like Zimbabwe, although there has been research done on environmental issues, there has been little research done on littering legislation. With littering becoming an issue of environmental concern, this study is important as understanding people's attitude and behaviour towards littering, thereby laying a solid foundation to finding effective and long-lasting solutions against the problem, Ongoro, (2012).

1.4 Aim

To determine motorists and passengers KAP towards Statutory Instrument 6 of 2007 on littering legislation.

1.4.1 Objectives

a) To determine the extent of knowledge of motorists and passengers with regards to littering legislation.

b) To assess motorists and passengers' attitudes towards littering legislation.

c) To determine motorists and passengers' practices with regards to complying with littering legislation.

1.4.1 Research questions

a) What knowledge do motorists and passengers have on littering legislation?

b) What is the general attitude of motorists and passengers have in complying littering legislation?

c) What do the practices of motorists and passengers reflect with regards in complying with littering legislation?

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter gives more literature related to the topic under study. It contains literature on littering, information on the Statutory Instrument 6 of 2007 section 23. It is necessary to understand how the public values, perceives, and behaves in relation to environmental legislation for sustainable behaviour change.

2.1 Provisions of Statutory Instrument 6 of 2007 section 23

1. It states that any person found throwing litter of any kind on the land (surface, street, and road) or in water or any other place except in a container provide for that specific reason will be punished.

2. Any operator of a public passenger conveyance shall put sufficient bins within the vehicle for use.

3. Any operator of a public passengers conveyance who fails to provide sufficient bins within the vehicle for use by passengers shall be guilty of an offence and liable to pay a fine not exceeding level fourteen or to imprisonment for a period not exceeding one year or to both such fine and such imprisonment (S.1 6 of 2007).

2.2 littering: An overview

Litter is a visible sign that society does not take pride in the spaces where it lives, works and plays, Florida Centre for Hazardous Waste Management, FCSHWM, (1999). According to H.A. Arafat et al., (2007), litter is defined as any piece of glass, plastic, paper, metal, cloth, rubber, food, or food by-product which is thrown away in public places outside waste collection containers .Littering can be intentional, unintentional or gross. Intentional littering is when someone deliberately throws trash while unintentional is when litter accidentally falls off a moving vehicle. Gross littering is when someone deposits a large amount of waste into a ditch or has an illegal dumpsite.

Moreover, littering is categorized as active and passive. Researchers argue that littering is a two-stage process. The first stage is placing litter in any location in the environment and then second stage is failing to remove that litter when leaving that location. This failure to remove litter is termed as passive littering. Active littering is whereby an individual takes a shorter amount of time to litter an object while leaving or passing an area, Sibley and Liu, (2003). Msezane, (2014**)** emphasised that passive littering is more resistant to change than active littering because of forgetfulness and the declining feeling of responsibility of picking up the litter are the reasons. There are many causes of littering but the main causes offered in various study findings are but not limited to laziness, the ozone layer, habituous behaviour , unavailability of bins and inadequate enforcements on littering, The NSW Office of Environment and Heritage, (2013).

As a result of the impacts of littering in the world, there has been existence of groups with targets to raise littering awareness and knowledge by conducting several anti-littering campaigns including clean up events. An icon found on packaged products to encourage proper binning of the packaging after use called

International Tidy man was introduced. Littering may be an individual's default disposal behaviour, so it is done with no thought given to the littering action. In Ghana, attitude towards littering was found to be exceedingly poor as almost all respondents acknowledged that they were in the habit of littering, Van et al., (2016), (2015).

In Zimbabwe litter is a problem everywhere both in communal or urban areas even along roads. Campaigns have been carried out to promote anti-littering for example the anti-litter campaign conducted every Friday of every month which was introduced by the President of Zimbabwe but most have been ineffective. EMA (2011) states that motorists are one of the major causes of littering in highways. Clean ups have been done in Zimbabwe for a very long time they only became popular when there was the Murambatsvina period which started in 2005. It was aimed at driving out garbage and dirt from the country, Mukuku and Masiye, (2002). However now the situation has been worsened by the increase in the fast food consumption which includes Chicken inn and Chicken slice and vendors situated along roads eaten by travellers and commuters as well as pet bottles, glass bottles, metal cans as well plastic bags that people get when they buy these things and receipts. Travellers often buy fruits in season and maize cobs and later dispose the residuals through the windows of their conveyances.

2.3 Impacts of littering

According to Keep Britain Tidy, (2013) littering is one of the first signs of social decay. H.A. Arafat et al. (2007) categorizes impacts of litter into three which are aesthetic blight, medical impact and financial impact which is associated with the cost of collection of litter and the losses caused by the occurrence of litter. Furthermore, Nilsen (2010) categorised the impacts of litter into biodiversity loss, aesthetic loss and human catastrophe.

High financial impacts of litter led to an increase in the development of littering legislation and research of littering behaviour, Cooley, (2005). In the United States, the direct cost of litter clean-up is almost 11 billion dollars annually, MSW Consultants, (2009) and Schultz et al., (2011). Moreover, in Florida, 180 businesses were surveyed and the total amount spent on litter annually was $2,434.73, FCSHWM, (1999). In South Africa, beach cleansing to remove litter was approximately R3.5 million in 1994-95, Balance et al., (2000). England spends one billion pounds annually on litter clean-ups. As litter is not stagnant, it is easily transported into the marine environment which consequently negatively affects the tourism sector for example facilities and recreation potential, Itai, (2015). Due to decrease in fish yield, livelihoods of people who rely on fishing are threatened, Tudor and William, (2000).

Torgler et al., (2008) found that items littered such as cigarettes, glass and plastic bottles, plastic bags, napkins, tissues, take-away food packages and snack wrappers seriously damage the environment as some are not degradable. The littered items cause the death of plants and animals (domestic and wildlife). For example, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) in the UK receives more than 7,000 calls per year regarding animals that have been injured by litter, RSPCA, (2015). It was also seen to lead to surface and ground water pollution, threat on biodiversity and aesthetic impact in Brazil, Raffoul, (2006). In Zimbabwe, litter was found to affect human beings as it causes health hazards This is evidenced by the cholera and typhoid outbreak in Harare (2011- 2012) as a result of uncontrolled littering. Chitotombe, (2014) further stressed that littering results in veld fires due to improper disposal of smoke cigarettes and litter accelerates intensity of veld fires

Keep Britain Tidy (2013) found that 80% of the litter found in seas and oceans originates from inland areas. Clean Up Australia and UNEP (2009) report that there are 46,000 pieces of plastic in every square mile of the sea. The litter is also a source of toxic substances which pollute the water for example cigarettes have the chemical lead which can leach into the water threatening the wellbeing of the marine life. While beach clean-ups are advocated for, cleaning up the debris disturbs the existing natural nests for animals such as turtles and so the ultimate solution if to prevent the litter in the first place by avoiding littering, UNEP, (2009).

2.4 Public perception on littering legislation

Knowledge

Awareness and education is very necessary about waste disposal for both passengers and commuters, Jatau, (2013). Lack of knowledge, irregular and unplanned dumping of waste are the main reasons of improper waste disposal along roads. Inadequate and inappropriate knowledge of solid waste handling may have serious health consequences and a significant impact on the environment as well, Shahzadi et al., (2018).In his study in Lahore community, there were conclusions that (72.0%) respondents were aware about adverse effects of improper waste disposal. If people have good knowledge of littering legislation, they can prevent themselves from infectious diseases and keep their environment clean, Jatau, (2013) .The infectious diseases include but not limited to cholera, small pox and plaque.

A study by Minnesota Report Card (2014) on Environment legislation literacy concluded that 68% of Minnesotan adults have at least an average knowledge about the environmental legislature. Manyanhire *et al*., (2009), reported that lack of knowledge and information about waste source reduction, recycling and waste management is a serious obstacle to the efforts of urban councils in developing countries like Zimbabwe, to reduce solid waste related problems. The level of awareness plays a paramount role at

household level in SWM. Saungweme (2016) found that most residents were not aware of regulatory policies on waste management hence it is of paramount importance that commuters and passengers be aware that illegal dumping of solid waste is a criminal offence which can attract a fine from the Environmental Management Authority. A study by Liwonde, (2018), concluded that lack of awareness, knowledge on littering penalties as stated in littering legislation is also contributing to littering in Empumalanga Township.

2.5 Attitude

Attitude towards littering is an individual preference to react positively or negatively towards throwing away of wastes, Ojedokun, (2011). People with lack of knowledge regarding littering legislation tend to have poor attitude towards littering. People who litter are referred to as litterbugs .Findings in the study by Liwonde, (2018) stressed that negative attitude is a high contributing factor to high levels of dumping. The attitudes of the public also contribute to challenges of solid waste management in Zimbabwe as they are contributing to littering. Minnesota Report Card (2014) reported that 58 percent of Minnesota residents believe that environmental laws have gone too far while forty percent of Minnesotans believe that regulations have not gone far enough to address issues of littering .

According to Tiera (1994), the throw away attitude, which is common in the western world has caught up with people in Zimbabwe. George (2011) suggests that the perceptions and attitudes are learned and can therefore be modified through education on littering legislation coupled with adequate enforcement .A good number of women who are highly involved in day to day management of wastes are illiterate or have adult education on littering legislations which is probably due to the community settings and believes. Hygiene starts from home. Hence the urgent need to streamline and sensitize young minds on the environmental problems and concerns. 97% respondents in Liwonde, (2018) study reflected that a negative attitude towards improper solid waste disposal leads many to see nothing wrong with littering hence the study concluded that attitude is another contributing factor to high levels of dumping.

2.6 Practice

Surveys by Keep America Beautiful report that to some extent everyone litters KAB, (2007). Good number of people do not participate in keeping the environment clean due to perceived perception that it is the duty of the local authority to maintain the road litter. This is witnessed by the fact that people just dispose litter wherever they feel it is convenient to them. Practice is determined by level of knowledge and corresponding attitude. Many studies in the past have attempted to predict environmental awareness and attitudes of people based on their socio-demographic characteristics. Raudsepp (2018) reports that age, education and gender have shown strong and consistent relationships with environmentalism. According to Okeoma (2009) the lack of bins is a major contributor to littering on Nigerian streets. Enforcement is seen a major deterrent against littering due to the embarrassment a litterer would face and the cost of the fine. However, studies in

Scotland found that it was considerable hard to enforce laws and fines (Keep Britain Tidy, 2011). A preliminary study done in South Africa revealed that there was an inadequate supply of bins leading to more practices of littering. In addition to this, where there were bins, a lack of regular litter removal caused litter to accumulate in the street encouraging littering (Poswa, 1997).

Certainly, education and income levels bring a variation in the disposal of waste by individuals. However, some researchers have given consistent attention on gender. Raudsepp, (2018) noted that gender significantly contributed to waste management disposal. He further concluded from his study that women were significantly more likely than men to litter .Study by Liwonde, (2018), reported that (77%) of the respondents showed that the knowledge that they have assists them in knowing the importance of proper litter disposal. The respondents in a study in Lahore community showed that in spite of good knowledge on environmental legislature people still litter.

Ramos *et al*. (2016), concluded that the knowledge, attitudes and practices of litter disposal was relatively moderate in secondary schools of division of Leyte. High level of awareness results consciously practicing proper litter disposal. Proper knowledge and practices can even be cultivated from adults to children down to grandchildren such that they will not practice improper litter disposal

2.7 Conceptual framework of littering

Figure 2.0 showing conceptual framework of littering

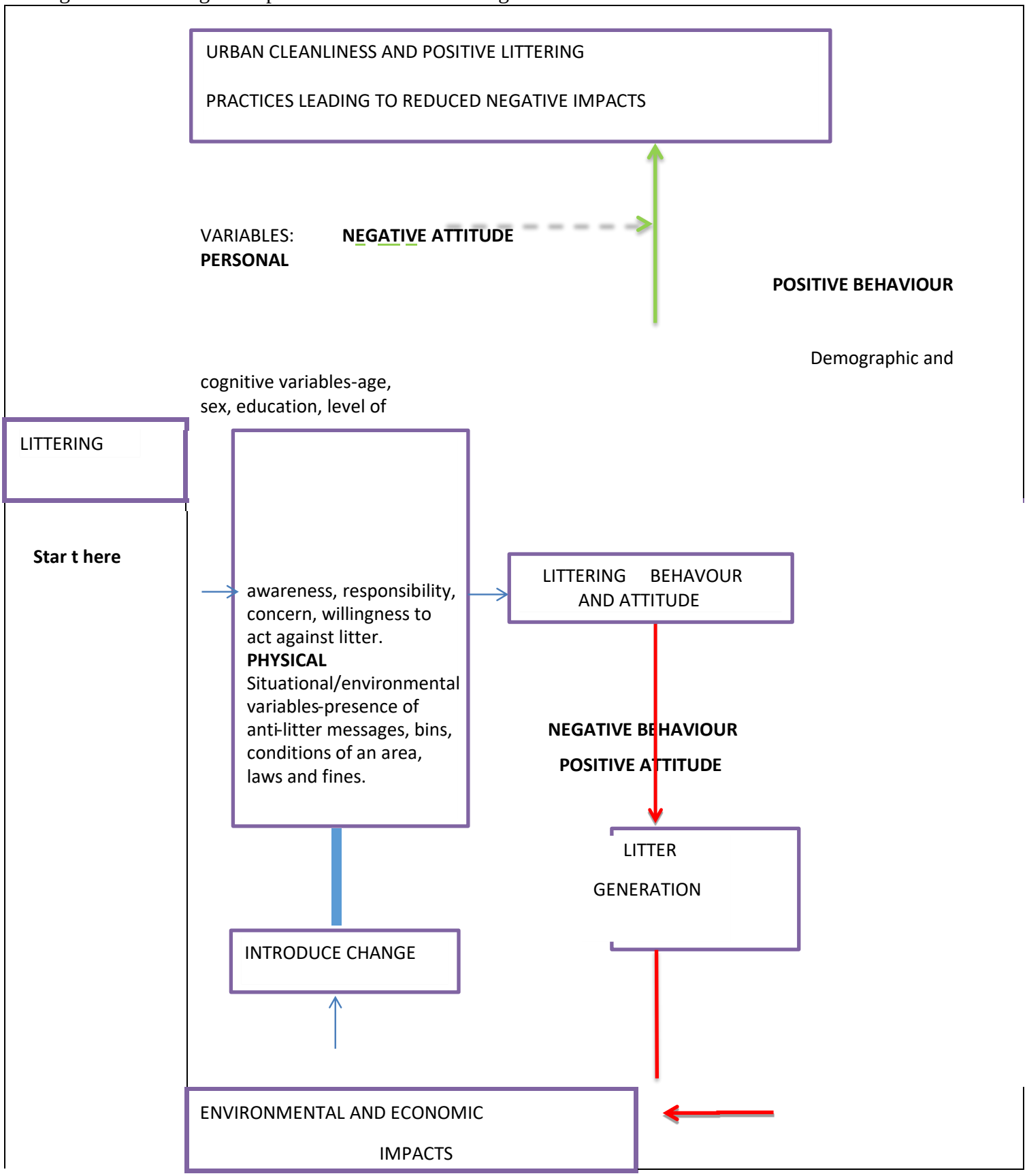


Figure 2.0 Conceptual framework of littering, Source: Wanjohi, (2015)

CHAPTER THREE: MATERIALS AND METHOD

3.0 Introduction

This chapter outlines the various methods that was employed by the researcher to collect and analyse raw data.

3.1 Description of study area

The study was carried out at Astra Campus of Bindura University of Science Education, Mashonaland central province. Annual temperatures on average range from 24^0c to 32^0c and average rainfall on balance is 847 mm per year. It is in the ecological region two where average annual temperatures of 19.8Ċ, with 27.2 0Ċ being recorded as the highest temperature and 12.4Ċ as the lowest. While precipitation amounts to 840mm per annum. Most of the rivers fond in this area are perennial with the highest discharge recorded during the summer and lowest during the winter.

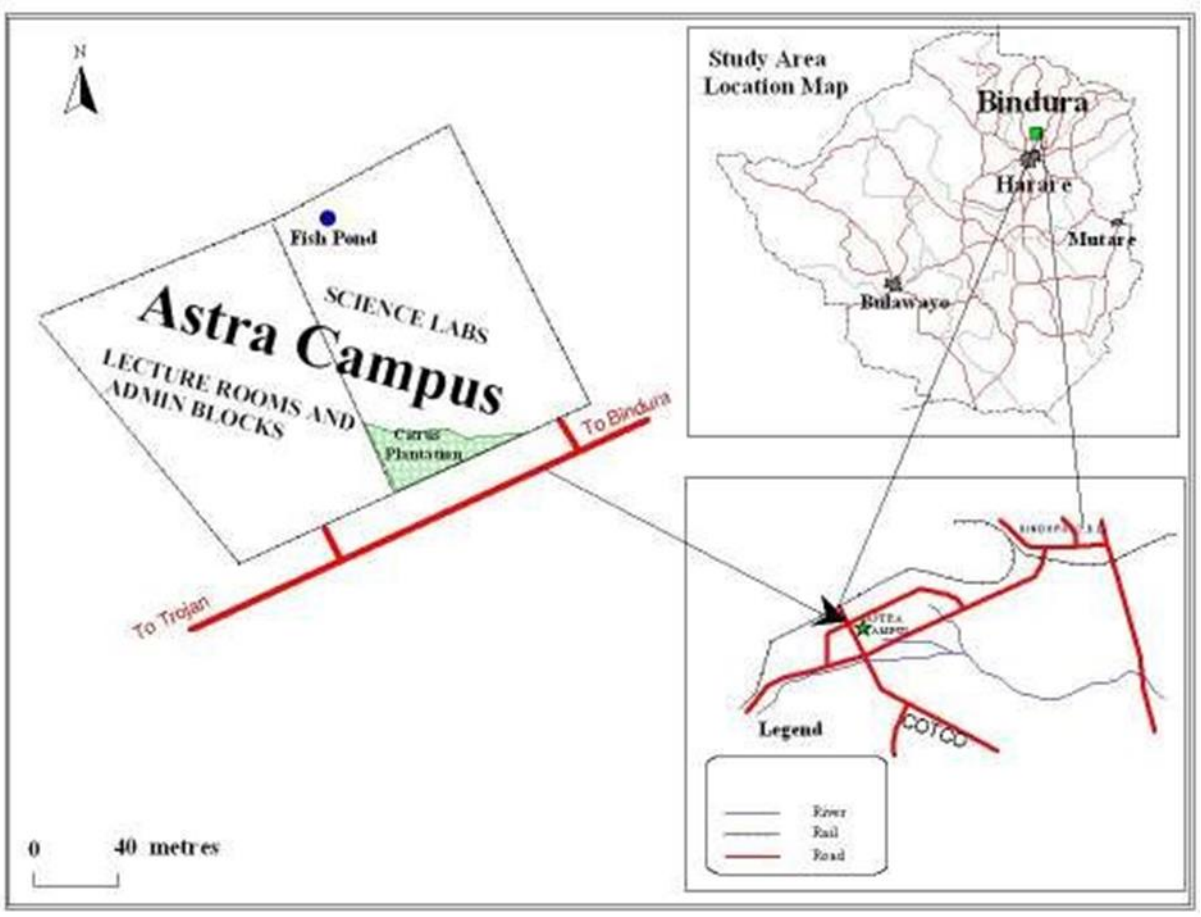


Figure 3.0 Map of study area

3.2 Research design

According to Creswell (2012), research design is a place of how to answer the research questions. Yin (2003) further explains that a research design basically refers to the strategy of the research that defines how,

when and where the data is to be collected and analysed. For the purpose of this study, descriptive cross-sectional survey was conducted. Respondents were stratified according to their position in the FAES Department at Astra Campus and then randomly selected. The sample size was 63 respondents .Before the questionnaire administration, all the participants were familiarized with the study and all the aspects of the study were explained to them such that the participants will actively participate.

3.3 Target population

Best and Khan, (2003) noted that population is a group of individuals that has one or more features in common that are of interest to the research. In this study the population comprised of FAES Department academics, non -academic and part four students.

3.4 Sample size

Target sample size was 63 respondents.

N (total population) =171

Stratified random sampling and random sampling will be used

Strata	Number of people in strata	Number of people in sample
Academic	34	63/171*34 =12
Non academic	21	70/171*21 =7
Part 4 Students	121	70/171*121 =44

Table 3.1 sample size

3.5 Methodology

For this study data collection was done using qualitative instruments that is the use of a structured questionnaire. A pilot survey was conducted for questionnaire validity and questionnaires were randomly administered to ten individuals. Once the survey pilot was complete, the questionnaire was finalized. The questionnaire was developed with four sections, (A, B, C, and D). Section A comprised of demographic data

whereas section B consisted of questions relating to knowledge, practices and attitudes (KAP) of the participants.

3.6 Statistical analysis

Data collected from 63 participants was coded and entered into a computer then analysed using SPSS version 20.0. Each respondent was entered as an individual study case .In descriptive statistics the means, frequencies, percentages and cross tabulations were calculated for quantitative information. Chi square was used to determine whether there was an association between demographic data and knowledge, attitude and practices

3.7 Strengths

The questionnaire was fully developed and pilot testing was done to ensure its suitability in the field. The testing was also to ensure the validity and reliability of the questionnaire. Random sampling of participants from each stratum was conducted to address systematic error and bias. Data collection was done using questionnaires which standardised the responses of participants.

3.8 Limitations

During the time of the study, majority of forth year students were away due to COVID-19 Lockdown period which resulted in some of them being excluded from the study sample, therefore the results cannot be generalised to represent all FAES forth year students. The majority of the questions on the questionnaire were closed-ended which limited the responses of the participants. The data collected by the questionnaires was self-reported, hence the probability of information bias. The researcher had to collect data through email addresses to avoid physical contact with participants as a precautionary measure against COVID-19 hence faced poor response rate.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.1 Socio-demographics

Table 4.1.below summarises the demographic characteristics of participants.

Variable	Motorist n (%)	Passenger n (%)
Age group		
18-25	5(20.8)	21(53.8)
26-35	3(12.5)	13(33.3)
36-50	12(50.0)	5(12.8)
>50	4(16.7)	0(0.0)
Gender		
Male	13(54.2)	19(48.7)
Female	11(45.8)	20(51.3)
Position in the faculty		
Academic	13(54.1)	6(14.0)
Academic support staff	4(16.7)	3(16.3)
Student	7(29.2)	30(69.8)
Educational level		
Secondary	1(4.5)	2(5.1)
Tertiary	23(95.5)	37(94.9)
Experience		
0-1	2(8.3)	N/A
1-5	9(37.5)	N/A
5-10	5(20.9)	N/A
10-15	8(33.3)	N/A

Table 4.1 Characteristics of study participants

n= (63

The majority of the students who participated in the study were between the ages of 18 to 25 years. Only 16.7% of the study sample were above the age of 50 years. Males dominated than females in the study.

4.2 Knowledge

Table 4.2 below shows knowledge of motorists and passengers towards littering legislation.

Statement/Question	Motorists			Passengers		
	Knowledgeable n(%)		Not knowledgeable n(%)	Knowledgeable n(%)		Not knowledgeable n (%)
Throwing litter on water surface attracts a penalty	22(91.7)		2(8.3)	33(76.7)		11(3.9)
Throwing litter on land surface attracts a penalty	24(100)		0(0.0)	33(76.7)		6(14.0)
Litter should be thrown at a designated place	24(100)		0(0.0)	36(83.7)		3(7.0)
Environmental Management Agency govern the disposal of litter	24(100)		0(0.0)	35(81.4)		4(9.3)
What is the penalty for failure to dispose litter at a designated place or bin according to legislation in Zimbabwe	1(4.2)		24(95.8)	2(13.9)		37(86.1)
What is the penalty for failure to provide sufficient bins within the vehicle by motorists according to the littering legislation in Zimbabwe	2(8.3)		22(91.7)	2(9.3)		37(90.7)
When litter inside the vehicle is not disposed on time ,it causes odours and diseases	24(100)		0(0.0)	39(100)		0(0.0)
	Yes	**No**	**don't know**	**Yes**	**No**	**don't know**
Waste separation is important	17(70.8)	2(8.3)	5(20.8)	33(76.7)	4(9.3)	2(14.0)

Table 4.2 Motorists and passengers knowledge towards littering legislation.

From the table, both motorists and passengers cited that Environmental Management Agency governs littering in Zimbabwe and that throwing litter attracts a penalty. Moreover, all motorists had knowledge that litter should be disposed of properly. Results from table 4.2 show that 100% motorists felt that litter inside

vehicles causes odours and diseases if not disposed of in time. However, more than 80% motorists and passengers were not knowledgeable on the specific fine and years of imprisonment of improper litter disposal and failure of provision of vehicle bin according to Statutory Instrument 6 of 2007.

4.2.1 Association between socio-demographic characteristics and knowledge.

There was a strong association between age and knowledge of passengers that throwing litter on land surface attracts a penalty (χ^2=14.182, df=2, p=0.001).In addition, knowledge on specific fines and years of imprisonment dependant on age (χ^2= 8.676, df=6, p=0.19).

4.3 Attitudes

Table 4.3 below shows attitude of motorists and passengers towards littering legislation.

Statement	**Motorists**		**Passengers**	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Littering legislation has been effective in Zimbabwe	6(25)	18(75.0)	3(9.3)	36(90.7)
It is acceptable to throw litter anywhere	3(12.5)	21(87.5)	3(7.69)	36(92.3)
Presence of a bin inside a vehicle causes odours and is uncomfortable	24(95.8)	1(4.2)	38(97.4)	1(2.6)
Litter that decomposes should be thrown in the environment	13(54.2)	11(45.8)	20(51.2)	19(48.6)
In highway , you can throw litter on the environment	1(4.2)	23(95.8)	10(25.6)	29(74.3)
Litter should be placed in a bin to avoid arrest	20(83.3)	3(12.5)	34(87.2)	5(12.8)
Litter should be placed in a bin to avoid damaging the environment	22(91.7)	2(8.3)	38(97.4)	1(2.6)
I litter because there is no waste separation in vehicle bins	14(58.3)	10(41.7)	14(35.9)	25(64.1)
It is everyone's' responsibility to practice proper litter disposal	24(100.0)	0(0.0)	36(92.3)	3(7.7)

Table 4.3 attitude of motorists and passengers towards littering legislation

According to 75% motorists, littering legislation has not been effective in Zimbabwe. Majority of motorists and passengers felt that it was not acceptable to throw litter anywhere. Almost all passengers and motorists had positive attitude by feeling that it was their responsibility to dispose of litter properly. At least 50% of participants believed that litter that decomposes should be thrown in the environment .However, majority of respondents were of opinion that presence of a bin inside vehicle cause odors.83.3% motorists believed that proper disposal of litter should not only be done to avoid arrest but for environmental sustainability.

4.3.1The association between socio- demographic characteristics and attitudes of passengers.

There was an association between age and responsibility of proper disposal of litter ($\chi 2$ =5.63, df=2, p=0.03).

4.3.2 Perception of responsibility towards proper disposal of litter by age group.

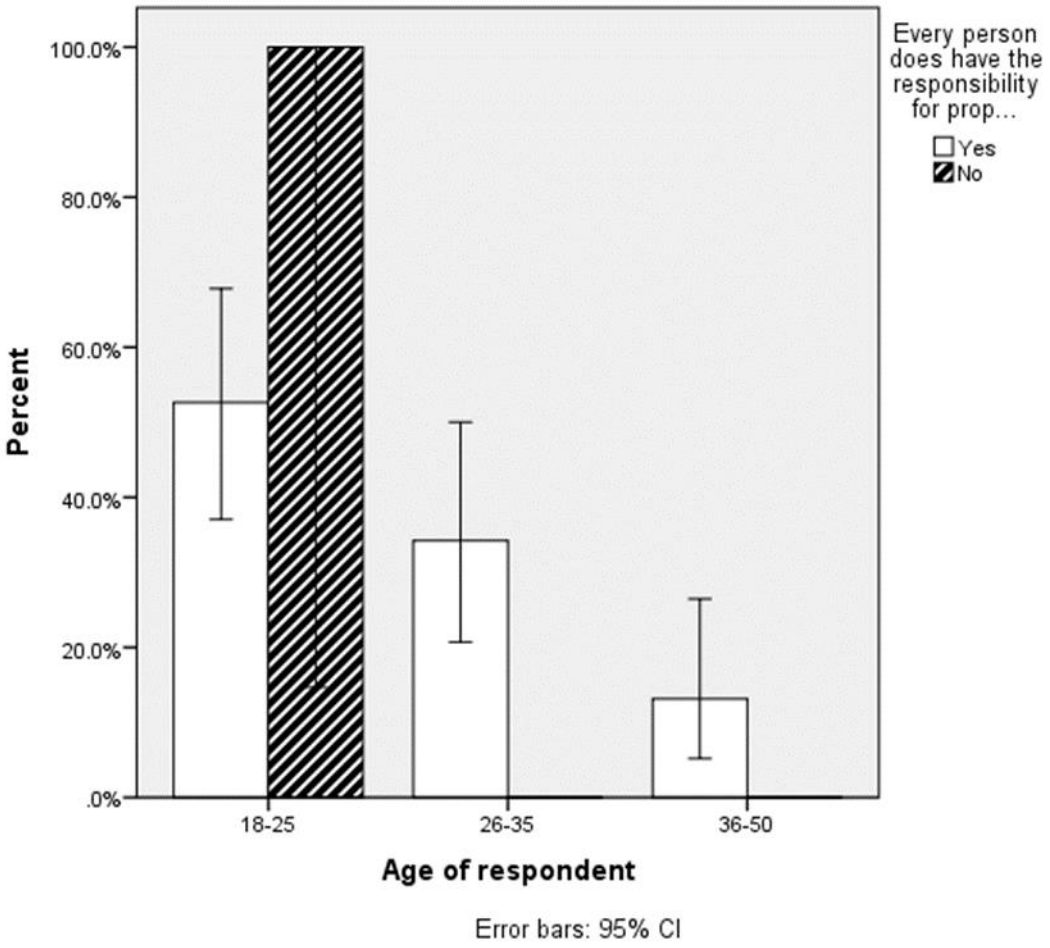


Figure 4.1Perception of responsibility towards proper disposal of litter

Majority of respondents between 18 and 25 believed that it is not their responsibility to dispose of litter properly. However, those above 25 years felt that it is their responsibility to discard litter properly.

4.3.3 The association between socio-demographic data and attitudes of motorists.

There was an association between age and attitudes towards proper litter disposal to avoid arrest, ($\chi 2$ =5.81, df =2, p=0.025).

4.3.4 Dependence of attitude by age.

Fig 4.2 below shows the dependence of motorists 'attitude towards proper litter disposal to avoid arrest.

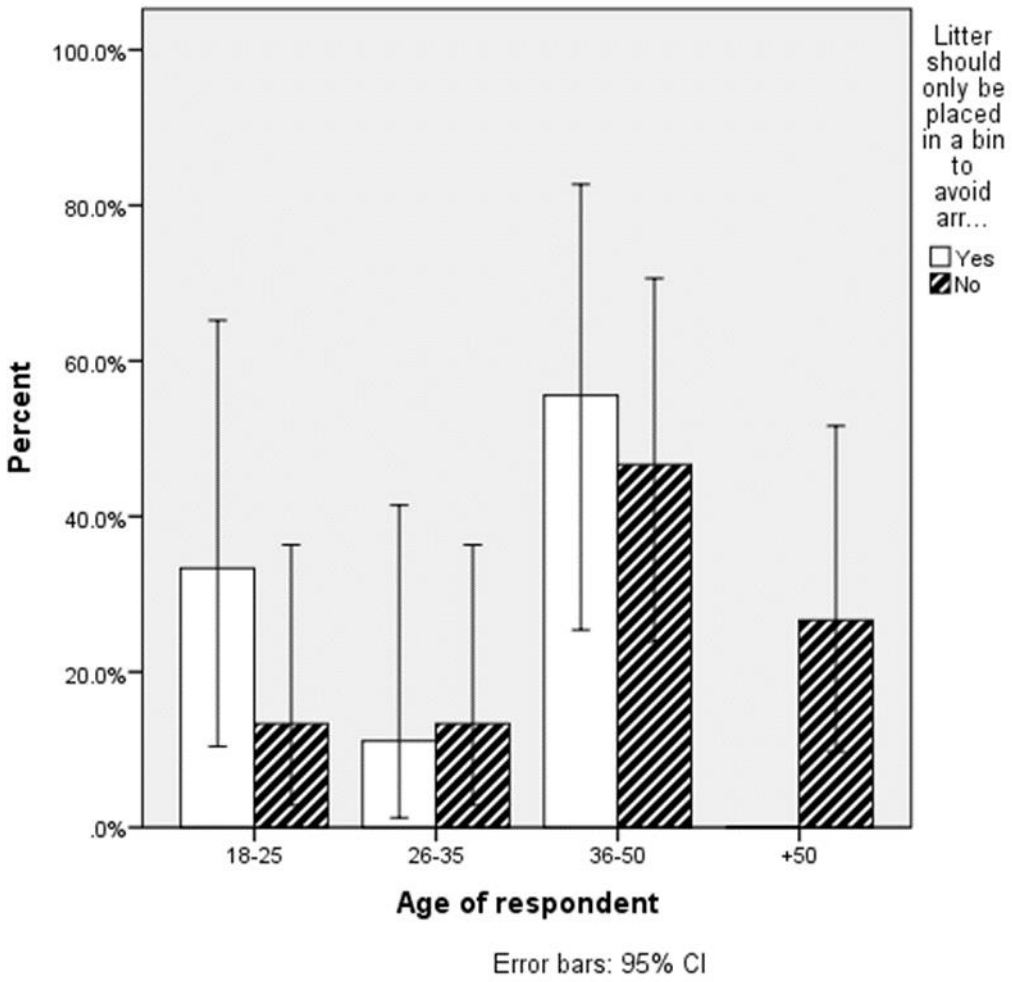


Fig 4.2 Dependence of proper disposal of litter to avoid arrest.

Majority of respondents between age group 36-50 believed that litter should be disposed of properly to avoid arrest .However, older people above 50 years felt that litter should be discarded properly not only to avoid arrest but for the benefit of the environment.

4.5 Practices

Table 4.4 shows the practices of motorists and passengers to requirements of littering legislation.

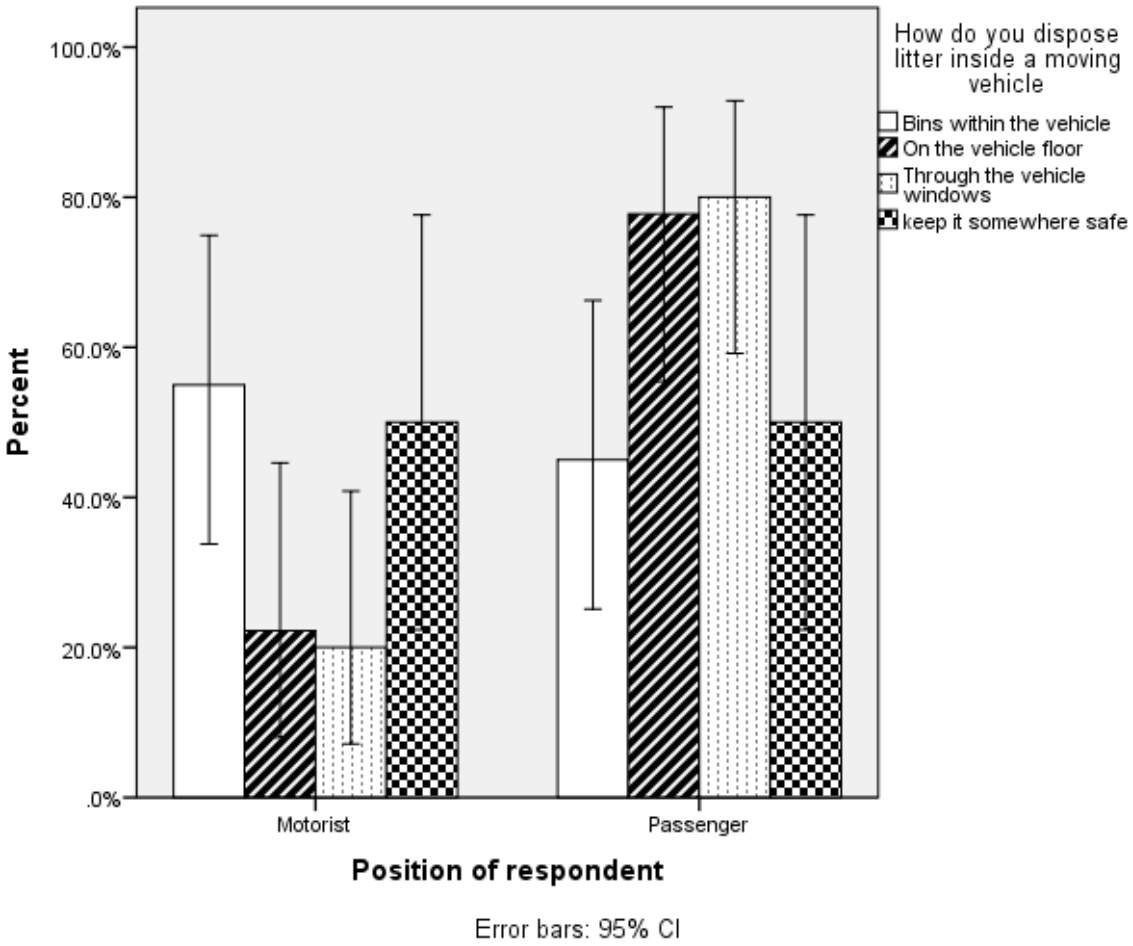
Statement/Question	**Motorist**		**Passenger**	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
I litter on land surface.	3(12.5)	21(87.5)	10(25.6)	29(74.4)
I litter on water surface.	3(12.5)	21(87.5)	10(25.6)	29(74.4)
I litter because there are no vehicle bins.	14(58.3)	10(41.7)	14(35.9)	25(64.1)
Do you have vehicle bin?	3(12.5)	21(87.5)	N/A	N/A
Do you have a bin cover?	1(33.3)	2(66.6)	N/A	N/A
Motorists	6(25.0)	18(75.0)	2(4.7)	37(95.3)
Do you tell passengers to throw litter in a bin				
Passenger				
Do drivers tell you to throw litter in a bin				
Would you caution a litterer?	15(62.5)	9(37.5)	17(43.6)	22(56.4)

Table 4.4 practices of motorists and passengers to requirements of littering legislation

87.5% motorists and 74.4% passengers reported that they do not litter on land surface. However, 37.5% motorists and 56.4% passengers reported that they would not caution a litterer. Majority of motorists said they do not have vehicle bins and do not tell passengers to throw litter in a bin. Few passengers reported that motorists do not tell them to throw litter in a bin.

4. 6 Association of litter disposal from vehicle by status of rider.

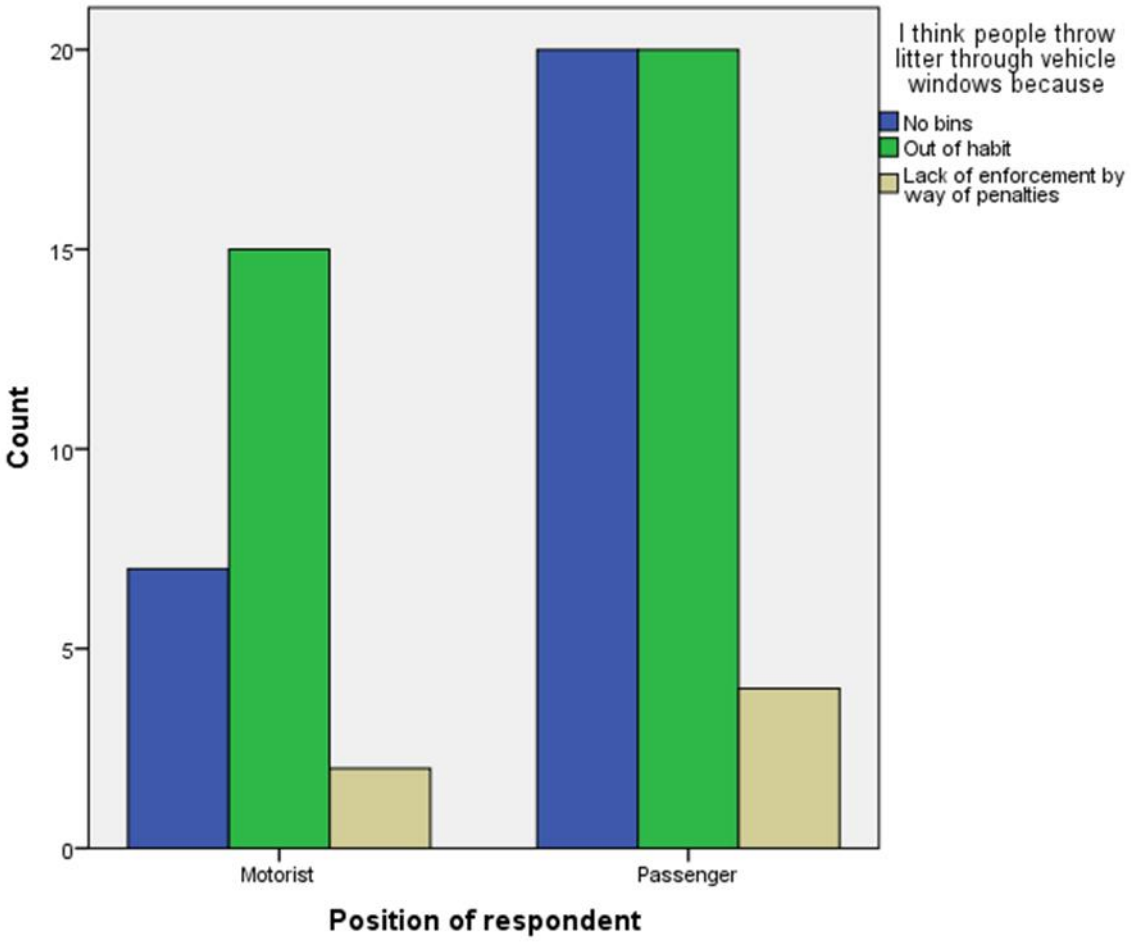
Fig 4.3 Below shows the association of litter disposal from vehicle by status of rider.



Majority of motorists reported that they either place litter in a vehicle bin or keep it safe if bins are unavailable .At least 50% of passengers discard litter through vehicle windows and on vehicle floors.

5.0 Reasons of littering.

Fig 4.4 below show the reasons motorists and passengers litter through vehicle windows.



Habit and unavailability of bins were the major identified reasons of littering through vehicle windows.

4.6 Association between socio-demographic characteristics and practices.

No association was found between gender and littering on land surface, $p>0.05$ .Littering on land surface by passengers dependent on age ($\chi 2=8.09$, df=2, p =0.018).

4.6.1 Dependence of littering on land surface by age.

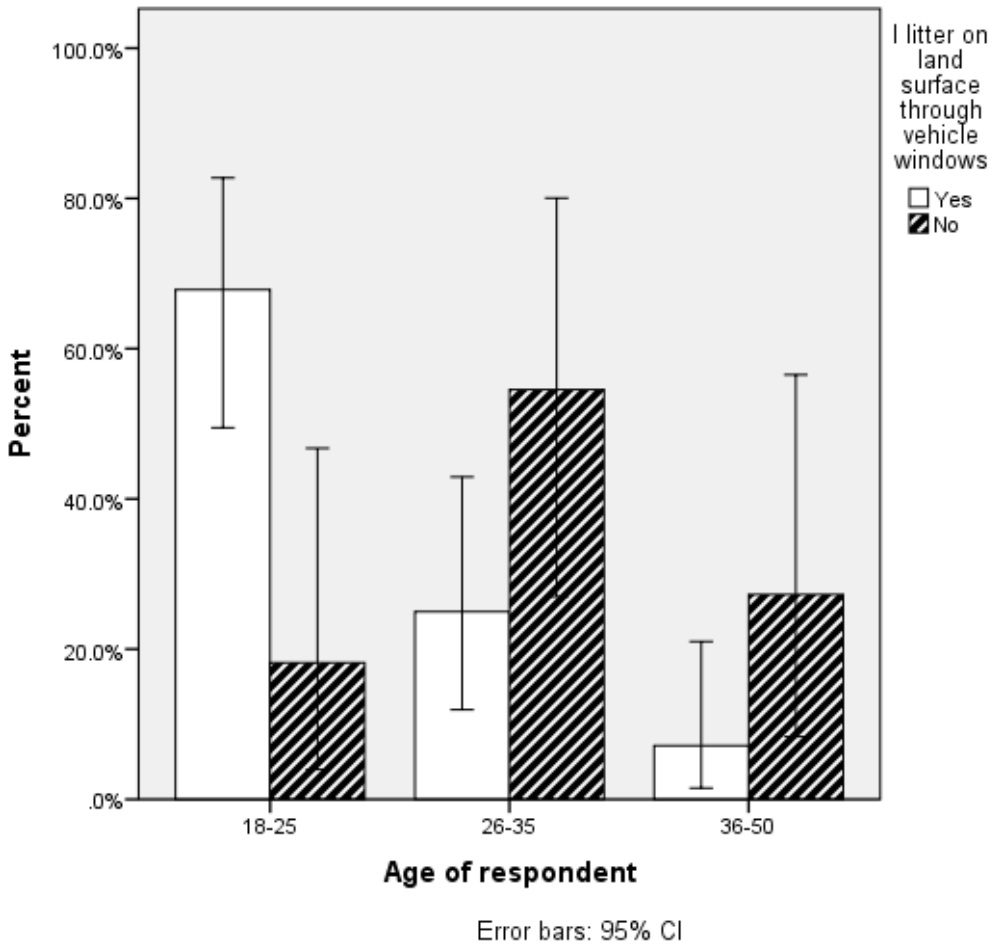


Fig 4.5 Dependence of littering on land surface by passengers by age.

Highest percentage of respondents who littered were between 18 -25 years .Lowest percentage of passengers who littered were between 36-50 years.

CHAPTER FIVE: DISCUSSION

5.0 Discussion of results

5.1 Knowledge on littering legislation

Generally both motorists and passengers had good knowledge on littering legislation .Both motorists and passengers had knowledge on the board which govern the disposal of litter, Environmental Management Agency (EMA) .This is because academics and part four students under FAES Department might have studied environmental legislation .A study done by Takaedza, (2013) reported that 67% of respondents had knowledge on environmental legislation. However, only 2(8.3) motorists and 2(9.3) passengers under FAES Department had knowledge on the specific fine and years of imprisonment of improper litter disposal according to S.I 6 of 2007.

From the findings, lack of knowledge on the legal consequences of littering leads to individuals to litter hence the need to educate passengers and motorist that not only is littering prohibited but one can be fined and imprisoned. A study by Armiage and Rooseboom, (1999) reported that knowledge on the impacts of littering makes people to litter less. However the Environmental Management Agency has to increase fines and penalties so littering issues may be taken seriously by both motorists and passengers. The knowhow of such legislations will have a bearing on the passengers and motorist's attitude towards littering as it may reduce illegal practices of littering just for the fear of being prosecuted. The public needs to be educated and made aware of the law so as to try and cultivate a new attitude towards littering general public Chitotombe, (2014). Therefore, there is need for proper publication of environmental management legislations laws and bylaw so that motorists and passengers may be aware of them.70.8% motorists and 79.1% passengers under FAES Department reported that littering legislation in Zimbabwe has not been effective .This may be true for example Statutory Instrument 6 of 2007 lacks enforcement by way of penalties Chitotombe (2014), the law is silent.

5.2 Attitudes

87.5% motorists and 92.3% passengers under FAES Department reported that its not acceptable to throw litter anywhere which shows they are concerned about littering .The level of concern usually influences littering behaviour as it makes people to be more environmentally conscious. Findings from the study by Wanjohi, (2013) showed that 58% of the respondents were very concerned about littering. However, he asserted that level of

concern did not have a bearing on littering behaviour. Therefore, to come up with effective ways of dealing with litter, the mental attitude and behaviour must be examined so that motorists and passengers thoughts match their actions. However, most respondents agreed that presence of a bin inside vehicle cause odour and is uncomfortable .This may be the reason motorists and passengers do not perceive the importance of vehicle bins. However, the respondents noted that litter that decomposes should be thrown in the environment .They believed that litter that decomposes aid soil fertility. In support of this view, Njeru (2006) asserted that 65% participants did not view organic items as litter. Most motorists viewed proper disposal of litter as their responsibility. In a study by Beck, (2007), 47% of the residents were of the opinion that government is responsible for picking up litter. Feeling responsible makes people less likely to litter. This kind of attitude actually progresses efforts by law enforcers to manage littering.

5.4 Practices

Results show that both motorists and passengers litter in accordance with literature that asserts anyone can litter .A study be, Wanjohi (2013) reported males littered more than females. This is in contradiction with findings from this study which showed that 75.0% of females do not litter and 84.2% males litter. This could be because of the social constructs of society or gender stereotyping which views certain chores like waste management to be for women .This kind of attitude is not helpful especially where litter is expected to be everyone ' s responsibility to ensure a clean and healthy environment, Alice Ferguson Foundation (2011). From the findings, 87.5% motorists do not have vehicle bins .Despite having 100% concern on littering, this is contradicted by their practices as majority of them do not have vehicle bins. Whilst results from this study indicated that lack of litter bins and habituous behaviour was the reason for littering, research by Broadway, (2008) is in contrast with this view as he reported that people littered because they did not care about the environment.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

Findings from this study show that both motorists and passengers had knowledge about the need to avoid littering. They also knew that Environmental Management Agency governs littering in Zimbabwe and that throwing litter attracts a penalty. Moreover, all motorists had knowledge that litter should be disposed of properly. Age had effect on littering attitudes and practice with older motorists and passengers had positive attitudes and littered lesser than younger ones. Moreover, males litter more than females .This study's results shows that motorists and passengers under BUSE FAES department have good knowledge, positive perceptions and positive attitude towards littering legislation .However, their positive attitude and adequate knowledge on littering legislation does not reflect their behaviours to the requirements of littering legislation due to unavailability of bins and habituous behaviour to dispose litter improperly. The majority of people do not know the legal consequences of littering in Zimbabwe.

6.2 Recommendations to:

Government and environmental agencies

- From the research and the results obtained the researcher recommends that the local authorities must educate passengers and motorists on littering legislation. The Environmental Management Agency and the local authority should embark on intensive environmental education so as to concretise the motorists and passengers on the existing legislation clarifying the provisions sand consequences of violating these pieces of legislation and explaining why littering is not appropriate through highlighting its negative effect may make the messages more acceptable.
- There must be provision of bins for vehicles and make it illegal for any car to be without a bin hence introduce inspection along roads by EMA police.
- Education on littering legislation provisions and legal consequences should be directed more to young people through the internet where they spent most of their time.
- The EMA agencies must place disposal bins along the road at particular intervals for example after every 10km so that motorists can empty their small portable bins into the large ones in order to prevent odours that may come from the bins.
- Grocery shops and food outlets must not provide unnecessary packaging

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Appendix One: Questionnaire

QUESTIONNAIRE

INTRODUCTION /CONFIDENTIALITY.

My name is Rumbidzai Jimu, a final year BSc SHEM (Safety, Health and Environmental Management) student at Bindura University. Iam conducting a study on the above mentioned topic. The study is for learning purposes and as such, I would appreciate your voluntary cooperation to allow me to interview you based on this questionnaire .There are no risks involved and you are under no obligation to participate and you should feel free to decline at any time. All the information collected will be kept in the strictest confidence.

Instructions to respondents

- Indicate your answer by highlighting it in red/ticking.
- Fill in the spaces where applicable.
- Do not write your name on any part of the paper.

A. Demographic details of participants

1. Sex: Male ☐ Female ☐

2. Age: <18 ☐ 18-25 ☐ 26-35 ☐ 36-50 ☐ 50+ ☐

3. Educational level: Primary ☐ Secondary ☐ Tertiary ☐

4. Position of respondent

Motorist ☐ Passenger ☐ Both ☐

5. Experience in years (**If motorist)**

0-1 ☐ 1-5 ☐

5-10 ☐ 10-15 ☐

B.KNOWLEDGE

Number	**Knowledge**	**Response**	**Indicate by numbers**
6	Throwing litter on water surface attracts a penalty.	1.Yes 2. No 3.Do not know	
7.	Throwing litter on land surface attracts a penalty.	1.Yes 2. No 3.Do not know	
8.	Litter should be thrown at a designated place.	1.Yes 2. No 3.Do not know	
9.	Roads in Zimbabwe are generally littered.	1.Yes 2. No 3.Do not know	
10.	If no, why do you think roads in Zimbabwe are generally littered?	1. There are enough bins to facilitate anti-littering behavior 2. People are aware of the importance of not littering and therefore do not litter 3. The laws and enforcements in place deter people from littering	
11.	If yes, how littered?	1. Slightly littered 2. moderately 3. heavily littered 4.Not sure	

12.	Which legislation in Zimbabwe govern the disposal of litter?	1.EMA Act 2. Forest Act 3.I don't know	
13.	What is the penalty for failure to dispose litter at a designated place or bin according to legislation in Zimbabwe?	1. Fine not exceeding level seven, imprisonment not exceeding two months 2. Fine not exceeding level three, imprisonment not exceeding six months 3. Do not know	
14	It is important to dispose litter properly.	1.Yes 2.No 3.Do not know	
15	Littering causes soil contamination	1.Yes 2.No Do not know	
16.	Littering cause drain blockages	1.Yes 2.No Do not know	
17.	Littering cause water contamination	1.Yes 2.No Do not know	
18.	Littering reduce the aesthetic value of land	1.Yes 2.No 3.Do not know	
19	Sufficient bins should be provided in vehicles by motorists.	1.Yes 2.No 3.Do not know	
20.	What is the penalty for failure to provide sufficient bins within the vehicle by motorists according to the littering legislation in Zimbabwe?	1. Fine not exceeding level seven, imprisonment not exceeding two months 2. Fine not exceeding level fourteen, imprisonment not exceeding one year 3. Do not know	
21	Legislation on littering in Zimbabwe has been effective in reducing litter reduction.	1.Very effective 2.little effective 3.Not at all effective	
22	What is the major cause when litter is not disposed on time inside the vehicle?	1.Odours 2.cause diseases 3.Do not know *Please specify other* ……	

23	Waste separation is important	1.Yes 2.No Do not know	
24.	I have heard littering messages on	1.Television 2.signposts 3.Radio 4.Hearsay 5.Dont remember	

SECTION C: ATTITUDE

25.	**Attitude**	**Response**	**Indicate by number**
a	It is acceptable to throw litter anywhere	1.yes 2.No 3.do not know	
b.	Presence of a bin inside the vehicle causes odors and is uncomfortable.	1.yes 2.No 3.do not know	
c.	I think covering vehicle bin minimizes odors.	1.yes 2.No 3.do not know	
d.	Presence of a bin inside the vehicle causes rodent nuisance.	1.yes 2.No 3.do not know	
e.	Litter that decomposes should be thrown in the environment.	1.yes 2.No 3.do not know	
f.	In highway outside town, you can throw litter on the environment.	1.yes 2.No 3.do not know	
g.	Litter should be placed in a bin to avoid arrest.	1.yes 2.No 3.do not know	
h.	Litter should be placed in a bin to avoid to damaging the environment.	1.yes 2.No 3.do not know	
i.	I think throwing litter outside the vehicle windows poses a serious health and safety hazard.	1.yes 2.No 3.do not know	
j	It is in my opinion that waste characterization should be practiced to avoid accidents e.g.	1.yes 2.No	

	cuts.	3.do not know	
k	I litter because there are no specific bins in vehicles (waste characterization).	1.yes 2.No 3.do not know	
l	It is in my opinion that vehicle bins should be accessible to every passenger inside the vehicle.	1.yes 2.No 3.do not know	
m	Every person does have the responsibility for proper litter disposal.	1.yes 2.No 3.do not know	
n	It is in my opinion that full bins in the vehicle should be emptied.	1.yes 2.No 3.do not know	
o	Are you concerned about littering?	1.yes 2.No 3.do not know	

SECTION D: PRACTICE

Question	**Practice**	**Response**	**Indicate by number**
27	I litter on land surface through vehicle windows	1.Yes 2.No 3.Sometimes	
28	I litter on water surface through vehicle windows	1.Yes 2.No 3.Sometimes	
29	**Motorist** I keep a bin inside my vehicle **Passenger** Vehicles I board always have bins	1.Yes 2.No 1.Yes 2.No 3.Sometimes	
30	**Motorist** My bin has a cover **Passenger** Vehicles I board have bin covers	1.Yes 2.No 3.N/A 1.Yes 2.No 3.Sometimes	
31	How do you dispose litter inside a moving vehicle?	1.Bins within the vehicle 2.On the vehicle floor 3.Through the vehicle windows 4.keep it somewhere safe	
32	I think people throw litter through vehicle windows because:	1.No bins 2.Bins in the car not easily accessible inside the car 3.Out of habit	

		4. It is easy 5. Inadequate information on waste disposal 6.Lack of enforcement by way of penalties 7.Everybody does it	
33.	**Motorist** Do you tell passengers to throw litter in a bin **Passenger** Drivers tell us to throw litter in a bin	1.Yes 2.No 3.Sometimes 1.Yes 2.No 3.Sometimes	
34	**Motorist** How often do you empty your vehicle bin? **Passenger** Have you ever seen motorist emptying bins when full?	1.Daily 2.When full 1.Yes 2.No 3.Sometimes	
35	Would you caution a litterer?	1.Yes 2.No 3.Sometimes	
36	Do you practice waste separation?	1.Yes 2.No 3.Sometimes	

Thank you for your participation