**EFFECTS OF IMPORTATION OF USED MOTOR VEHICLES ON HUMAN HEALTH AND ENVIRONMENT IN LAGOS STATE**


**BY**


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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION, SCHOOL OF SCIENCE AND SCIENCE EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA NIGER STATE**


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# CERTIFICATION

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of the department of Industrial and Technology Education, certify that the work embodied in this

project is original and has not been submitted in part or full for any other diploma or degree of

this or any university.

 

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# APPROVAL PAGE

This project has been read and approved as meeting the requirement for the award of B.Tech. degree in Industrial and Technology Education of the department of Industrial and Technology Education, School of Science and Science Education, Federal University of Technology, Minna.

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## DEDICATION

This project is specially dedicated to God almighty and also to my father Mr Ojo Edegan, my mother Mrs Blessing Edegan, my brothers and sisters and my late friend Oladele Omojola Salami.

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# ABSTRACT

This study was designed to investigate the effects of importation of used motor vehicles on human health and environment in Lagos state. To carry out this study, three research questions and three hypotheses were formulated. A survey research design was employed for the study. The population for this study was 56 consisting of 40 health personnel and 16 Lagos state environmental protection agents. A questionnaire containing 30 items developed by the researcher and validated by the researcher's supervisor and other experts from the department of Industrial and Technology Education, FUT Minna was used for data collection. The mean statistics was used to analyze the data collected for the study. The three hypotheses were tested at .05 level of significance. The findings among others revealed that tiredness, headaches, lung diseases, eye irritation, coughing, drowsiness, shortness of breath, asthma, decreased lung function, choking, respiratory diseases are the health problem related to usage of imported used vehicles. While, traffic congestion, production of greenhouse gases that causes global warming, ground water pollution, production of scraps that pollute environment, acid rain fall, severe damage to aquatic life, and climate change were identified to be the environmental problems encountered from usage of these vehicles. Based on the findings, it was recommended that the it age and working conditions of every used vehicles should be inspected before importation, the public should be informed about the health and environmental problems associated with these vehicles, Government should place ban on importation of vehicles over 8 years of age, imported used vehicles should be properly maintained with regular tunes-ups after purchase and vehicle emission standard should be set and enforce by the Federal Environmental Protection Agency.

# CHAPTER I

# INTRODUCTION

**Background of the study**

It is an established fact, that Nigeria is politically independent and economically dependent. This portrays that, Nigeria is a developing or a third World Nation. Her industries especially motor vehicle industries are also developing side by side with the country to build up an egalitarian and self-reliant society. (Mathew 1996). In the 70's and late 80's, car manufacturing and assembly plants were in full operation. Volkswagen of Nigeria and Peugeot Automobile of Nigeria produced several affordable cars for Nigeria. During that period the country did not spend huge fortunes to import vehicles. (Shosanya, 2012)

Randle (2012) said, in those days, people did not have to save for years to buy cars neither did they have to replace their car engines shortly after purchase because most of the cars were what is colloquially referred to as Tear Rubber [brand new]. Popular brands then, like Peugeot 504 and 505 could be seen everywhere; Volkswagen beetle manufactured by Volkswagen of Nigeria, was also another small and affordable delight on Nigerian roads. Mercedes Benz trucks were also assembled by Anambra Motor Manufacturing Company (ANAMMCO). In the same vein, other vehicles like Toyota, Vesper, Suzuki etc.

Tyre manufacturing industries like Dunlop and Michelin were on ground to provide motorists affordable, quality, durable tyres. Motorists did not have to buy used tyres that could very well be the cause of their death. Like automobile industries, those factories no longer exist.

Dosunmu (2002) stated that during the period of economic depression in Nigeria, the purchasing power became low. Imported used vehicles became the norm because the costs of new ones were far above the income of most of the population. It will be realized that the locally

assembled or manufactured vehicles are costlier than those imported used vehicles, and probably serving the same purpose. On this consideration, there will be little or no customers to patronize the home industries.The craze for importation of cars into the country started in the 90's when the high cost of production became unbearable for indigenous manufacturing plants. Then production capacity was punctuated causing a massive job loss. (Shosanya, 2012)

The importation of used vehicles has affected the local assembly plants so much that most of them have now become parts manufacturers to others, for example, Steyr and National Truck Manufacturers of Bauchi and Kano respectively are now parts producers to Peugeot Automobile Nigeria Limited (PAN) Kaduna instead of performing the purpose for which they were established and this in turn has led to the massive importation of used vehicles into the country which on the long run have several effect on the health and environment of individuals in the country and also affected the country economically. (Uwah, 1995)

The mass importation of used vehicles into the country encompasses both positive and negative effects. On the positive side, job opportunities are created for a large number of Nigerians. The use of plastics, rubber, paints, industrial chemicals, glass, electronics, textiles from cottage industries for repairs and beautification, has created jobs for hundreds of Small and Medium Enterprises and industrial clusters that supplies parts and components for assembly.

There are many spare – parts dealers scattered everywhere in the country. Industries producing vehicle spare parts are also on the increase, motor mechanics, automobile electricians, vulcanizers, and many public transporters are also on the increase because the used vehicles are cheaper and people obtain and use them for public transport and private businesses. It will be noted that this sector of the population will be self-employed and menace of arm robbery and other criminal cases will be reduced as many people are engaged in one occupation or the other.

Furthermore, the low income earners will be opportune to at least have a vehicle in their life time. On this notion, many people will have vehicles because the imported used vehicles are at affordable prices.

On the contrary, the qualities of these used vehicles are not fully considered nor are experts involved in the protection of the buyers' interest. More still, most road accidents on our high ways are caused as a result of mechanical fault/failure which is common with the imported used vehicles. These used vehicles are always developing one fault or the other, non-road-worthy, but yet they are permitted to ply the roads due to one reason or the other. Environmental pollution and health hazards, are at alarming stage due to the waste/scraps dumped everywhere in the name of vehicles and the pollutant effects it has to the public on health ground. Pollution is the introduction of substances or energy into the air, water or soil environment, directly or indirectly by man, thereby having deleterious effects to such an extent that it will endanger human health, amenities or eco-system resources (Kummer, 2004).

These scraps found all over the country are brought about by the mass importation of different brands and models of vehicles, of which their spare-parts are not available in the market. For example common brake lining or contact set can render some of these imported used vehicles unserviceable, thus becoming scraps.

It is interesting to note that government is aware of the current problems in our assembly plants and many attempts have been made in the country's budget speech to find solution to these problems, yet, to no avail due to lack of policy implementation. This project delved into a large extent to find solutions to the health and environment effects of imported used cars.

**Statement of the problem**

Udeozor and Nzeako (2012) noted that thousands of used vehicles are imported into Nigeria each year and most of them are actually imported and purchased by Lagosians. Some of these are not supposed to be allowed into the country, having passed the age of serviceability. Many of these vehicles pack up after few years of use on Nigeria roads, thereby, turning the state into a scrap yard. Worst still, in the absence of appropriate recycling facilities, these vehicles degrade our environment. The imported used vehicles do not meet the climatic conditions of Nigeria and its roads. They pollute the air with harmful exhaust emissions caused by the wear of piston rings, valve seals, valve guides and cylinder bore. The pollutants include: CO, COx, NOx, Sox, Benzene, Chlorinated Organic Compounds, Ozonides and Peroxides. $CO_2$ has greenhouse effects, $NO_2$ (oxidizes to $HNO_3$) and $SO_2$ (oxidizes to $H_2SO_4$), which eventually fall as acid rain or mist or fog.

Majority of the imported used vehicles continue to give one problem or the other to their owners. Their mechanical conditions in the engine, gear box clutch, final drive, steering etc are not properly ascertained before they were brought in, to be sold to the public and as such they become problems.

Vehicles like any other machinery wear out. Thus the value of vehicle decreases with age, mileage and use. Also there will be need to have some money for unexpected repair which the vehicle may require after buying it because there is no guarantee.

Parts of vehicles over ten (10) years of age can be hard to obtain which usually renders most of these imported used vehicles unserviceable and leaving the owners in regret. Hardly can the sellers of these used vehicles provide records of maintenance done on the vehicles and nearly all

the used vehicles are painted or re-sprayed like a white-washed-grave to attract the masses into the problem of buying the beyond economic-repair-vehicles.

Most of the countries from which these used vehicles have actually been imported from use a different fuel type compared to that which we use here in Nigeria, so when these vehicles are actually imported and made to operate on our kind of fuel, the engine develops problems to the individuals and produce emissions that are dangerous to the environment and health of individuals.

The importation of these used vehicles saps the country foreign reserve that could have been used for important project like research and development for these home automobile industries to build vehicles that are affordable to the general public and suitable for the Nigerian roads and climatic conditions. But instead efforts are concentrated on these imported used vehicles which sooner become scraps. Therefore this study is aimed at finding the effect of the importation of these used vehicles into the country on the health of individuals and the environment.

**Purpose of the study**

The main purpose of the study is to assess the effects of importation of used vehicles on human health and environment in Lagos state. The study will specifically determine:

1. The health effects and problems that individuals derive from the usage of imported used vehicles.

2. The environmental effects that individuals encounter from the usage of imported used vehicles.

3. The ways through which these effects could be abolished.

**Significance of the study**

This research work is of great significance to the general public as it will bring to the notice of the people, the health and environmental effects of imported used vehicles that have already spent their useful lives overseas before being imported into the country.

This study will also be of immense benefits to the Federal Environmental Protection Agency, by providing means by which the environmental pollution caused by vehicular usage can be controlled and if possibly abolished.

It is important to the government as it will produce ways by which the Government can control health and environmental effects caused by the usage of these imported used vehicles on Nigerian citizens and the atmosphere and by suggesting possible solutions to the problem of increased importation of used vehicles.


**Scope of the study**

This study is aimed at making a research in the used vehicles imported into the country affect the health of individuals and environment in Lagos state.

This research work will be carried out in Lagos state because higher number of vehicles and individuals exist there. Other states will not be covered due to financial, logistic and time constraints.

**Assumptions of the study**

The following assumptions are inherent in this study.

1. The general public is partially aware of the effect of vehicular usage on human health and the environment.

2. The respondents' personal interest will not affect their honest opinion on the questionnaire items.

3. The validated results of the study would be used to improve the awareness of the general public on the effects of imported used vehicles on human health and the environment.

**Research questions**

1. What are the health effects and problems that individuals derive from the usage of imported used vehicles?

2. What are the environmental effects that individuals encounter from the usage of imported used vehicles?

3. What are the ways through which these effects could be abolished?

**Hypotheses**

HO 1: There is no significant difference in the mean responses of the health personnel and environmental protection agents on the health effects and problems individuals derive from the usage of imported used vehicles.

HO 2: There is no significant difference in the mean responses of the health personnel and environmental protection agents on the environmental effects individuals encounter from the usage of imported used vehicles.

HO 3: There is no significant difference in the mean responses of the health personnel and environmental protection agents on the ways through which these effects could be abolished.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

The literature related to this study is reviewed under the following subheadings

1. History of the Automobile

2. Evolution of Automobile industry in Nigeria

3. The State Of Assembly Plants

4. Health and Environmental Effects of Vehicle Usage

5. Summary Of Related Literature

**History of Automobile**

The automobile has been around for more than 100 years. According to Wikipedia (2012), the history of the automobile begins as early as 1769, with the creation of steam powered automobiles capable of human transport. In 1806 the first cars powered by internal combustion engines running on fuels gas appeared, which led to the introduction in1885 of the ubiquitous gasoline or petrol fuel internal combustion engine and later diesel fueled engine in 1892. The automobile, motor car or car can be described as a wheeled motor vehicle which carried its own engine and is used for transporting or moving people and goods on the land. Cars powered by electricity briefly appeared at the turn of the 20$^{th}$ century but quickly disappeared from commonality until the turn of the 21$^{st}$ century, when interest in low and zero emissions transportation was reignited.

The first automobiles were basically horse-drawn buggies and carriages powered by gasoline and diesel fueled engines instead of horses. They were called gas buggies and horseless

carriages. The early engines had one cylinder that could produce only one or two horse power. A horse power is roughly the power of one horse. In 1885 and 1886, Karl Benz built the model automobile in Germany. It had three wheels, one in front and two in the rear. In 1886, a German, Gottlieb Daimler built a four wheel gas buggy (Wikipedia, 2012). Two brothers, Charles and Frank Duryea built the first automobile in the United States. The early cars were crude compared to today's cars. It was revealed that by 1900, several factories in Detroit and elsewhere were building cars that kept getting bigger and more expensive. Ford wanted to make cars as cheap as possible so that more people could buy them. By 1908, he had the car in production that put America on wheels. This was the model-T ford manufactured on the first modern assemble line and this marked the beginning of mass production of auto industry.

Presently the automobile is a commonly used product but it is an extremely complex and technologically sophisticated one. Today' automobile is a complex integrated product with more than 3,000 part that all need to work in harmony (Wikipedia, 2012). Automobile plays a major role in peoples live whether it is used for daily transportation or used for pleasure. In the regard, the development of the vehicle industry is instrumental to personal life. Today the automobile industry is one of the biggest in the world.

**Evolution of Automobile Industry in Nigeria**

The automobile industry is an industry that designs, develops, manufactures, markets and sells the worlds motor vehicles (Wikipedia, 2012). The automotive industry is a central agent of creating and managing patterns of technological change or innovation. In Nigeria, the 1970s was a turning point in the development of automobile industry. By this time, government had become aware of the importance of the industry as an engine of growth in economy. Given this strategic

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importance, government become involved in the sub sector essentially to aid their integrated developments that will stimulate the growth of the indigenous automobile know how. This led to establishment of Peugeot Automobile of Nigeria (PAN) which assembled cars like 204, 304, 305, 404, and 504, and the Volkswagen of Nigeria (VON) which assembled the Volkswagen beetle and Passat cars that are affordable to average Nigerians during General Gowon's administration. The third national development plan (1975-1980), provided further establishment of commercial truck plants such as Leyland Nigeria Ltd. Ibadan, Anambra Motor Manufacturing Co. Ltd (ANAMCO), National Truck Manufacturing Ltd. (NTM) Kano, and Steyr Nigeria Ltd. Bauchi. (Salami, 2007).

The establishment of these assembly plants in the country was mainly to meet the nation's demand for vehicles to counter our transportation problems for both human and goods. They also help the country to save foreign reserve that could be used for other projects instead of purchasing vehicles from abroad and also to earn us foreign currency by exporting to other countries if the local assembly plants could be able to meet our local demands. The establishments of these plants are also to facilitate technological transfer from the parent companies to Nigeria to help us develop our own automobile technology.
Consideration was also given to private individuals and organizations such as SCOA MOTORS, General Motors Nigeria Limited (GMNig) etc. to establish plants to assemble vehicles alongside those installed earlier to attain the stated objectives of the local assembly plants.

The assembly plants performed fairly well in the 1970s as Nigeria economy was relatively good. But due to unfavorable government policies all the automobile plants set up in the 1970s closed down except Peugeot Automobile of Nigeria (PAN). The formulation and adoption of the national policy in 1993, and subsequent establishment of the National Automotive Council

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(NAC) represented a landmark in the development of automobile industry in Nigeria. At this time, the automotive industry is regarded as an engine of growth whose establishment serves as an important stimulus to other types of manufacturing activities because the industry has capabilities to create many job opportunities and generate acquisition of technology. In realization of the need, the established National Automotive Council (NAC) has the following policy objectives:

1. To aid the early integrated development of the industry by exercising some measure of control over both the passenger car and commercial vehicles arms of the industry.

2. To accelerate the stagnant pace of local parts incorporation by halting the trend towards a proliferation of makes and models, thereby ensuring that parts for the few makes available can be locally manufactured in commercial quantities.

3. To stimulate the growth of indigenous automotive components manufacturing and auxiliary industries.

4. To ensure greater standardization of technology and a more efficient utilization of costly equipment in the industry. (FRN, 1993)

The inability of government to achieve these objectives discouraged and killed the growth of indigenous automotive industry.


**The State of the Assembly Plants**

When these assembly plants were established in the mid 70's, the demand for their products was high and business was favorable due to massive patronage. Distributors were located all over the country to sell their products. As time goes on business started depreciating as the demand for their products was not encouraging as the importation of used vehicles started, up to

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the late 80's it has nearly crippled the automobile plants. Business times Monday, August 7, 1995 page 23 also observed the state of the assembly plants as follows:

"Of the six (6) vehicles assembly plants set up by the government in the mid 70's, only three (3) are still carrying out their functions in the true sense of the word. Leyland stopped production in 1986 and went into receivership in 1987, while VON stopped production in November 1994. Although NTM was bailed out from receivership in 1992 by the then technical committee on privatization and commercialization (TCPC), which has now metamorphosed in to Bureau of Public Enterprise (BPE), the company is yet to find its feet. Last year it was to have built just about a dozen trucks apparently to settle staff and utility bills. The company now depends on the production of fibre glass, bumper and side lining for PAN. VON on its part now depends on after sales services, refurbishing and sale of handful of Jetta cars assembled in its dying days for survival. Even for the three (3) functional plants life is pretty difficult. With the price of an average car now above the one million naira mark, PAN now depends on the few buoyant corporate bodies that can still afford new vehicles for patronage. The massive drop in patronage could be ascertained from the company's current capacity utilization and reaction of its distribution network to recent events. PAN currently produces about 30 cars per day, given current trends; such level of capacity utilization at a time when private individuals can hardly afford new cars is commendable. But for a company that used to build close to three hundred (300) cars a day, the current capacity makes it a shadow of its old self. The effect of the plunge in patronage is felt everywhere. Of the Two hundred and forty (240) distributors that form the nucleus of the company's distribution network, only about forty (40) are known to have sold any number of cars in the first half of the

year. About one hundred (100) of them have not sold any car in the last two years. ANAMCO and Steyr are not finding it easier either. While a few highbrow transporters still manage to replenish their fleet with ANAMCO's multi-million naira luxury buses, the numbers of clients keep dwindling by the day as the cash crunch in the economy bits harder. Even with contracts for the supply of Mass Transit buses awarded by the Federal Urban Mass Transit Agency (FUMTA), capacity utilization remains just at a bearable minimum. Steyr is still battling  to sell its new blue bird mass transit bus to FUMTA, although its military wing may still be enjoying occasional contact largesse from the military, the company had to diversify into refurbishing and production of fibre glass bumpers and side liner for PAN as a life line".

Presently, lamenting the near comatose state of the nation's automobile manufacturing sector, stake holder identify government's policy inconsistencies and low patronage among the factors stunting the growth of the sector, just as they proffer solutions on how to return to the glorious days of the automobile industry in the country.

The Guardian Nigeria News, Wednesday, May 16, 2012, also observed the state of the automobile plants currently as follows:

"Time was when cruising around in made-in Nigeria cars was the vogue. In those golden years of the nation's Automobile sector, companies such as Peugeot Automobiles Nigeria (PAN), Volkswagen or VON Automobiles Nigeria, NTM of Kano and host of others were manufacturing cars locally and vehicle brands such as Peugeot 404, 504, 505 Evolution, Volkswagen Beetle, Passat and others were the status conferrer- anyone who has not driven one was yet to join the club of the affluent. Today the reverse is the case as the multi-million naira investments of these companies have almost gone into extinction

and Nigerians have developed a penchant for driving imported brands. What is more, prices of locally made automobiles went out of reach of the average Nigerian with many now driving second-hand "Tokunbo" cars. And it is this ugly trend that local manufacturers want to reverse, to go back to the glorious days of the nation's automobile industry. Citing low patronage and policy inconsistencies in the past as bane of automotive manufacturing in the country, the Nigerian Automotive Manufacturers Association (NAMA) has repeatedly challenged all tiers of government to put measures in place to ensure sustainable growth in the sector.

Arthur, (2012) speaking on the none availability of components and parts to enable swift production of vehicles in the country, he said the number of component companies in the country has reduced from about 150 to 50, adding that the extinction of local tyre manufacturers like Michelin and Dunlop has equally contributed to the high cost of production in the sector as virtually all components needed are imported. In the same vein, he also noted that inadequacy in power supply and high cost of energy are equally responsible for the poor performance of existing auto plants in the country.

Ibrahim, (2012) explained that the desire of the Government at the time of setting up the company was to encourage the Nigerian vehicle industry. He said that due to lack of patronage and support, the company was privatized to Art Engineering and Construction Limited with 75 percent stakes in March 2003.

Created in December 1975 by the administration of late military head of state, Murtala Mohammed, NTM was a joint venture between the Federal Government and Fiat of Italy for the assembly of semi knocked down and completely knocked down trucks and agricultural tractors with an installed capacity for 7,000 trucks and 3,000 tractors. Between when it was created and

when it fully began operations in 1980 and the time it closed shop in 1986, it produced about 10,000 units of both products. It was basically designed as an assembly plant making trucks and agricultural tractors from imported components, not as a primary manufacturing plant. Due to lack of patronage and support, the company was non-operational for five (5) years before it was privatized to Art Engineering and Construction Limited in March 2003. As at the time it took over the running of the company, Art envisioned placing the company at the forefront of the Nigerian auto-manufacturing sector by producing passenger/commercial vehicles at competitive prices.

As at present, the new NTM has three assembly lines, fully stocked spare part store, finished goods warehouse, bonded warehouse, after sales service centre, utilities building and administration and support facilities.

Also recently, Volkswagen of Nigeria, (VON) Automobile limited formerly commenced local production of Ashok Leyland range of buses. The actual production of the buses commenced in December 2011 and the company said it has been able to churn out about 100 units since then from the 2,000 per annum capacity line. The new owners of the company, Stallion Group of Companies explained that over N1billion has so far been invested in the resuscitating of the production process. The money was actually used on rehabilitation, displacing of unwanted items, franchise right and vehicle production among other logistics. He also disclosed that the company is jointly owned by three investors; Stallion Group of Companies with 78 percent investment, Barbados Ventures Nigeria Limited, 17 percent and Lagos State Government through Ibile Holding with 4 percent. Going down memory lane, the auto plant which was jointly owned by the Federal Government and the German Company was left to waste away for over 20 years. If it had been allowed to operate, it would have by now improved the Nigeria's automobile

production capacity. He assured that in the next three (3) years, there would be 50 percent of the local content in the production of vehicles in the company, by producing 2000 city buses per annum, 15,000 commercial trucks and pick up vans annually, and sophisticated passenger vehicles. The plant is scheduled to commence production in the third quarter of 2012.

Jalal, (2012) revealed that the nation loses at least N550billion annually due to its inability to assemble or manufacture vehicles in the country, while a total of 80,000 new and 200,000 used vehicles valued at over N400billion are imported into the country annually. He explained that the annual installed capacity in the country in the assembling or manufacturing of vehicles stands at 150,000 units, adding that at full capacity, 70,000 skilled and semi-skilled staff would be directly employed while no fewer than 210,000 would be indirectly employed in the sector.

Chukwura, (2012) said "If we continue to import fully built up vehicles, we are creating jobs for those countries we are importing from. But the importation of completely or semi knocked down vehicles will create a lot of employment for small-scale businesses".

It is however important to know that the Government is actually trying to encourage local auto manufacturers through various measures being put in place. The Government had some time last year threatened to sanction agencies and parastatals that disobeyed its directive on locally assembled automotive products.

Our problem is indiscipline and unwillingness to do the right thing. We must get it right this time, Mr. President and all the MDAs intend to get it right and we are going to do exactly that, so sanctions must be included because that is what people will hear. (Ortom, 2012).

**Health and Environmental Effect of Vehicle Usage**

A number of human activities have the potential of inducing climatic changes. One of the most important of these activities is the increase in atmospheric carbon dioxide due to the burning of fossil fuels (global warming). This is closely followed by the depletion of the ozone layer. The consequences of the climatic changes, that we can foresee, if and when they occur, make it necessary to maintain a constant and careful surveillance on this regard. The combustion of coal, oil and gasoline accounts for the most of the airborne pollutants. For instance, more than 80% of the sulphur dioxide, 50% of the nitrogen oxides and 30 – 40% of the particulate matter emitted to the atmosphere in the US, are produced by fossil-fuel fired electric power plants, industrial boilers, and residential furnaces (Dosunmu, 1998). In addition 80% of carbon monoxide and 40% of the nitrogen oxides and hydrocarbons come from burning gasoline and diesel fuels in cars and trucks. (Dosunmu, 1998).

Emissions from an individual car are generally low, relative to the smokestack image many people associate with air pollution. But in numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from hundreds of thousands of vehicles on the road add up. Driving a private car is probably a typical citizen's most "polluting" daily activity. The economic difficulties that were consequent to the adoption IMF inspired economic program – Structural Adjustment Program (SAP) encouraged importation of used automobiles from Europe in a large scale. The low earning power of the middle classes made the used automobile the only solution, since there is no organized public transportation in most Nigerian cities. The age and the general absence of any quality enforcement make the used automobiles a great threat to the environment in Nigeria.

In Nigeria, pollutants emanate from different sources. According to the Environmental Protection Agency, vehicles account for 51% of carbon monoxide, 34% of nitrogen oxides and 10% of particulate matter released each year in the US. The common air pollutants in the chemical industries are sulphur dioxide, which are emitted from process and from fuel combustion, while the major pollutant from automobiles is carbon monoxide.

The air pollution associated with the emissions from automotive vehicles exhausts are mainly nitrogen oxides (NO and NO2), carbon monoxide (CO), unburned Hydrocarbons (HC), and particulates (lead, soot and sulphates). The engine exhaust is the source of nitrogen oxides (NO and NO2) and carbon monoxide (CO) emissions. The exhaust, the crankcase, the fuel tank and the carburetor are the sources of unburned hydrocarbon (HC). The processes responsible for the production of pollutants in the cylinder of a convectional SI engine (a reciprocating carbureted four-stroke) are: firstly, a spark ignites the compressed fuel-air mixture, and a flame form propagates across the chamber. As the flame approaches the walls, it is quenched, leaving behind an extremely thin layer of unburned gas, typically a few thousandth of an inch thick, unburned gas is also left in the crevice above the piston ring between the piston crown and the cylinder wall. At the same time nitric oxide (NO) is formed in the high temperature combustion products throughout the layer by non-equilibrium reactions involving nitrogen and oxygen. Carbon monoxide is also formed during this combustion process. In the end stage, the piston recedes, depositing the unburned hydrocarbons in the crevice above the piston ring along the sides of the cylinder and rapidly cooling the bulk combustion products by expansion. (Holdgate, 1979).

Many studies have documented adverse health effects associated with high concentrations of transport-related pollutants. Nitrogen oxides and sulfur oxides, for example,

are associated with immune system impairment, exacerbation of asthma and chronic respiratory diseases, reduced lung function, and cardiovascular disease (Schwela, 2000).

Exposure to carbon monoxide can result in fatigue, headaches, dizziness, loss of consciousness, and even death at very high concentrations (Schwela, 2000). Particulates are especially dangerous because they have been implicated in the development of lung cancer and higher rates of mortality (Schwela, 2000). Lead is similarly dangerous as poisoning causes irreversible neurobehavioral consequences, such as decreased IQ and attention deficits, and death at high levels of poisoning (Schwela, 2000). In addition to these pollutants, vehicle emissions contain volatile organic compounds (VOCs), a class of petroleum combustion by-products which includes many known and probable carcinogens and reproductive toxicants. VOCs are also hazardous because they can react with sunlight to form ozone, which exacerbates asthma and has other adverse respiratory effects (WHO, 2000).

A number of epidemiological studies have similarly linked exposure to vehicle emissions with adverse health outcomes. A comparison of the prevalence of chronic bronchitis and asthma among street cleaners, a high exposure group, and cemetery workers, who acted as controls, found that exposure to vehicle pollutants in concentrations lower than WHO-recommended guidelines resulted in a significant increase in respiratory effects (Raaschou, 1995). Moreover, a significant relationship between residence proximity to high traffic roads and prevalence of asthma and cardiovascular disease in children has been documented (Schwela, 2000), in addition to a strong relationship between proximity to congested roads and respiratory morbidity in infants. There is mixed evidence for a relationship between exposure and low birth weight, preterm birth and birth defects (Sram, 2005).

Clearly, the public health impacts of vehicular usage are serious and diverse.

With the importation of used vehicles into Nigeria, there are lots of hazardous effects including global implications of such action. The used vehicles pollute the air with the emission of incomplete combustion of the old engines. These pollutants include: COx, NOx, Sox, 3:4 benzpyrene, aldehydes, ketones, chlorinated organic compounds, ozonides and peroxides, carbon compounds containing nitrogen such as peracetyl nitrides. CO2 has greenhouse effects, NO2 will oxidize to HNO3, and SO2 will oxidize to H2SO4, which now falls as acid rain or mist or fog. In Nigeria, importation of used vehicles, known as "Tokunbo", are the aftermaths of the devaluation of Nigerian currency. It then became cheaper to buy these used vehicles to the detriment of the society at large (Ajayi and Dosunmu, 2002).

**Some of the gases emitted and their various health and environmental implications are:**

**Carbon Monoxide (CO):** Reduces the flow of oxygen in the blood stream and increases the likelihood of exercise-related heart pain in people with coronary heart disease. At low doses it can impair concentration and neurobehavioral function and Greenhouse gas contributing to global warming.

**Carbon Dioxide (CO2):** Major greenhouse gas contributing to global warming

**Nitrogen Oxides (NOx):** May exacerbate asthma and possible increase susceptibility to infections. It could also lead to coughing, shortness of breath and decreased lung function. Formation of ground-level ozone or "smog," which is highly corrosive and damages crops and forests. It contributes to acid rain and is a greenhouse gas that contributes to global warming.

**Unburned Hydrocarbons (HC):** Low molecular weight compounds cause eye irritation, coughing and drowsiness. High molecular weight compounds can be mutagenic or carcinogenic. And Ground level ozone precursor

**Sulfur Oxides:** It irritates the eyes and increases the frequency and severity of respiratory symptoms and lung disease. It is a major precursor of acid rain.


**Summary of Related Literature**

The automobile has been around for more than 100 years. According to (Wikipedia, 2012), the history of the automobile begins as early as 1769, with the creation of steam powered automobiles capable of human transport. In 1806 the first cars powered by internal combustion engines running on fuels gas appeared, which led to the introduction in1885 of the ubiquitous gasoline or petrol fuel internal combustion engine and later diesel fueled engine in 1892. . In 1885 and 1886, Karl Benz built the model automobile in Germany. It had three wheels, one in front and two in the rear. In 1886, a German, Gottlieb Daimler built a four wheel gas buggy (Wikipedia, 2012).   Presently the automobile is a commonly used product but it is an extremely complex and technologically sophisticated one. Today' automobile is a complex integrated product with more than 3,000 part that all need to work in harmony (Wikipedia, 2012). In Nigeria, the 1970s was a turning point in the development of automobile industry. By this time, government had become aware of the importance of the industry as an engine of growth in economy. Given this strategic importance, government become involved in the sub sector essentially to aid their integrated developments that will stimulate the growth of the indigenous automobile know how. . This led to establishment of Peugeot Automobile of Nigeria (PAN) which assembled cars like 204, 304, 305, 404, and 504, and the Volkswagen of Nigeria (VON)

which assembled the Volkswagen beetle and Passat cars that are affordable to average Nigerians during General Gowon's administration. Also Leyland Nigeria Ltd. Ibadan, Anambra Motor Manufacturing Co. Ltd (ANAMCO), National Truck Manufacturing Ltd. (NTM) Kano, and Steyr Nigeria Ltd. Bauchi, were also created to meet the nation's demand for vehicles to counter our transportation problems for both human and goods and also to save the foreign reserve of the country. (Salami, 2007). As time goes on business started depreciating as the demand for their products was not encouraging as the importation of used vehicles started, up to the late 80's it has nearly crippled the automobile plants. And since then, importation of used vehicles has been in practice in the country.

Jalal, (2012) revealed that the nation loses at least N550billion annually due to its inability to assemble or manufacture vehicles in the country, while a total of 80,000 new and 200,000 used vehicles valued at over N400billion are imported into the country annually.

The importation of vehicles into the country has somehow, satisfied the vehicular needs of the average Nigerians and also created job opportunities on the side of positivity, and crippled the operations of the created automobile plants and has endangered the health and environment of the individuals on the aspect of negativity. On the aspect of health and environmental effects of the importation of used vehicles due to the poor state of most of the vehicles as at the time of importation, has produced so many problems in the nation such as bad exhaust emission which contains harmful gases such as nitrogen oxides (NO and NO2), carbon monoxide (CO), unburned Hydrocarbons (HC), and particulates (lead, soot and sulphate). A number of epidemiological studies have similarly linked exposure to vehicle emissions with adverse health outcomes such decreased lung function, reduction of oxygen in the blood stream and increased likelihood of exercise-related heart pain in people with coronary heart disease caused by Carbon

Monoxide (CO), exacerbation of asthma and possible increase susceptibility to infections such as coughing, shortness of breath and decreased lung caused by Nitrogen Oxides (NOx), eye irritation, coughing and drowsiness  function  which are caused by unburned Hydrocarbons (HC) etc. and greenhouse gas contributing to global warming, formation of ground-level ozone or "smog," which is highly corrosive and damages crops and forests and ground level ozone precursor for some environmental problems caused by the various gases. It is however important to note that Government is actually putting measures in place to cub the problems caused by importation of used vehicles.

# CHAPTER III

# METHODOLOGY

This chapter describes the research design, area of the study, population, sample study, instrument for data collection, and validation of the instrument, administration of the instrument and method of data analysis.

## Research Design

The study was conducted using descriptive survey method. Olaitan and Ali (2000) defined a survey research design as a descriptive study in which the entire population or respective sample of the entire population is studied by collecting and analyzing data from the group through the use of questionnaire.The design is suitable since the study solicited information from the health personnel and Lagos state environmental protection agents using questionnaire.

## Area of Study

This study was carried out in Lagos state of Nigeria.  Lagos is located in the South-western part of Nigeria. It lies approximately on longitude 2º42'E and 3º22'E and Latitude 6º22'N and 6º52'N (Odumosu, 1999). It is the largest metropolitan area in Nigeria (Ayeni,1979). Along the Southern boundary of the study area in the west are Ojo and Ijanikin settlements. Lekki settlement forms the eastern boundary. It is bounded in the North by Ikorodu Local Government Area and Alagbado in Ifako-ijaye and Alimosho Local Government Area. The Study area is about 60km to Sagamu in Ogun State, about 80km to Abeokuta and 100km to

Ibadan. Lagos is endowed with many modern and socio-economic facilities. The city has airports, sea ports through which vehicles are actually imported into the country.

**Population**

The target population of this study comprises of 40 health personnel and 40 Lagos State Environmental Protection Agency staffs located in Ikeja area of Lagos state that actually drive imported used vehicles making it a total of 80.

**Instrument for Data Collection**

The instrument used for data collection for the study was a structured questionnaire. The questionnaire was designed for the health personneland environmental agents who have ideas on imported used vehicles. The questionnaire consisted of two parts. Part I which contained personal data of the respondents. Part II was further subdivided into three sections, A, B, and C. Section A centered on items designed to find out the health effects and problems that individuals derive from the usage of imported used vehicles. Section B contained items designed to find out the environmental effects that individuals encounter from the usage of imported used vehicles. Section C dwelled into items designed to find out the ways through which these effects could be abolished.

The questionnaire items were formulated based on four-point scale type. Items for section A, B, and C contained four responses category each. The responses categories were

Strongly Agree             = SA

Agree             = A

Disagree             = D

Strongly Disagree                = SD

These response categories were assigned numerical values of 4, 3, 2, and 1 respectively. The respondents were required to check and mark ( $\vee$ )    against the response category that best satisfies their opinion.

**Validation of the Instrument**

It is important to validate the instrument used for data collections so as to ensure that it measure what it is designed to measure. Therefore, the instrument used for this study was validated by the project supervisor and two experts in the Department of Industrial and Technology Education, Federal University of Technology, Minna.

**Administration of the Instrument**

The administration of the instrument to the respondents for collection of data was personally done by the researcher. A total number of 80 questionnaires were administered, but only 56 were responded to and returned, presenting 70% return rate.An interview was also conducted by the researcher to 10 health personnel and 10 environmental agents on the study.

**Method of Data Analysis**

The data generated from the use of the questionnaires were analyzed using mean, standard deviation and t-test. The mean and standard deviation were used to answer research question 1-3, while the t-test was used to test the null hypothesis.

Four points rating scale was developed using:

Strongly Agree         -        SA       =        4

| Agree | - | A | = | 3 |
| Disagree | - | D | = | 2 |
| Strongly disagree | - | SD | = | 1 |

Acceptance level for the four points rating items are:

$$\frac{4+3+2+1}{4} = \frac{10}{4} = 2.50 \text{ above}$$

Mean

$$= \frac{\sum FX}{N}$$

Where

$\sum$   =   Summation of values

X   =   Nominal values of option

$\overline{X}$   =   Mean of each item

N   =   Number of respondents of items

F   =   Frequency of respondents of each option

The standard deviation (SD) for each group of respondent was computed using the formula

$$\text{S. D} = \frac{\sqrt{\sum f(x-x)^2}}{N}$$

Where   SD  =  Standard Deviation

      $\overline{X}$  =  Mean of each item

      X  =  Grand mean of all the items

$\Sigma$    =    Sum of

N    =    Total number of items

t-test was used to compare the mean of the health personnel and that of the Lagos State Environmental Protection Agents to determine the relationship between their responses.

Formula for calculating t-test:

$$T = \frac{\overline{X1} - X2}{\sqrt{(N_1-1)S_1 + (N_2-1)S_2[1/N_1+1/N_2]}}$$

$$T = \frac{\overline{X_1} - \overline{X_2}}{\dfrac{\sqrt{(N_1-1)S_1 + (N_2-1)S_2[1/N_1+1/N_2]}}{(N1 + N2) - 2}}$$

Where   t   =    test of significance

$\overline{X_1}$ =    mean of the health personnel

$\overline{X_2}$ =    mean of the environmental agents

$N1$ =    number of the health personnel

$N2$ =    number of the environmental agents

$S1$ =    variation of the health personnel

$S2$ =    variation of the environmental agents

$(N1 + N2) - 2$ = Degree of freedom (D.F)

**Decision Rule**

To determine the acceptance, a mean of 2.50 was selected as a cutoff point, in other words any item with a mean response at 2.50 and above was considered accepted while items with less than 2.50 mean responses was considered unaccepted. The hypothesis was 0.05 level of confidence. The null hypothesis is rejected if the calculated values (t-test) is greater than critical value while not rejected (accepted) if the calculated value (t-test) is equal to or less than critical or table value.

# CHAPTER FOUR

## PRESENTATION AND ANALYSIS DATA

This chapter deals with the presentation and analysis of data with respect to the research questions and hypothesis formulated and also the findings of the study are discussed.

**Research Question 1**

What are the health effects and problems that individuals derive from the usage of imported used vehicles?

**Table 1: Mean Responses ofhealth personnel and environmental agents on the health effects and problems that individuals derive from the usage of imported used vehicles in Lagos state**

| S/No | ITEMS | X1 | X2 | Xt | REMARKS |
|------|-------|----|----|----|---------|
| 1 | The unavailability of airbag in most of the imported vehicles exposes the driver and its passengers lives to risk in occurrence of accident | 3.63 | 3.38 | 3.50 | Agree |
| 2 | Most of the vehicles are contaminated with radioactive materials which can affect the skin of the passengers | 3.63 | 3.50 | 3.56 | Agree |
| 3 | Lack of factory fitted A.Cs in most of the vehicles makes driving uncomfortable for the driver and its passengers | 3.63 | 2.94 | 3.28 | Agree |
| 4 | Overheating of the engine produces fumes that results to tiredness and headaches when inhaled | 3.70 | 3.31 | 3.51 | Agree |
| 5 | Some of the vehicles have passed their useful ages that driving them becomes problematic to | 3.53 | 3.06 | 3.29 | Agree |

the body due to difficulty in control of the parts

| | | | | | |
|---|---|---|---|---|---|
| 6 | The sulfur oxides produced by the vehicles causes severity of respiratory symptoms and lung disease | 3.70 | 2.75 | 3.23 | Agree |
| 7 | The unburned hydrocarbons produced by these vehicles causes eye irritation, coughing and drowsiness | 3.55 | 3.75 | 3.65 | Agree |
| 8 | Higher Nitrogen Oxides (NOx) produced by the exhaust of these vehicles causes asthma, shortness of breath and decreased lung function | 3.33 | 3.38 | 3.35 | Agree |
| 9 | Hydrocarbons, oxides of nitrogen formed by these vehicles when combines with sunlight form ozone that causes choking and aggravates respiratory diseases | 3.85 | 2.75 | 3.30 | Agree |
| 10 | Most of the vehicles before importation have been used to transport toxic waste, which when inhaled affects the lungs | 3.60 | 3.38 | 3.49 | Agree |

**$N_1=40$, $N_2=16$**

Key:

$N_1$ = Number of health personnel

$N_2$ = Number of environmental agents

$X_1$ = Mean score of the health personnel            where   $X_t = \dfrac{X_1+X_2}{2}$

$X_2$ = Mean score of the environmental agents

$X_t$ = Average mean score of both groups

Table 1 revealed that the groups agreed with items 1 to 10 with mean responses ranging from 3.23 to 3.65 and the average mean score of both the health personnel and environmental agents from 2.50 and above. Therefore, the listed health problems are actually experienced by the individuals who drive imported used vehicles.

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**Research question II**:

What are the environmental effects that individuals encounter from usage of imported used vehicles?

**Table 2: Mean responses of health personnel and environmental agents on environmental effects that individuals encounter from usage of imported used vehicles**

| S/N | ITEMS | X1 | X2 | Xt | REMARKS |
|---|---|---|---|---|---|
| 11 | They are major causes of road accidents due to engine parts failure | 3.78 | 3.69 | 3.73 | Agree |
| 12 | Most of them break down on roads and cause congestion of traffic | 3.88 | 3.50 | 3.69 | Agree |
| 13 | They produce greenhouse gases that causes global warming | 3.95 | 3.38 | 3.66 | Agree |
| 14 | The lead (Pb) produced by these cars causes ground water pollution and particulates in the air | 3.25 | 3.75 | 3.50 | Agree |
| 15 | The Ozone produced reduces the yield for commodity crops, fruits, vegetables and other plants | 3.73 | 2.44 | 3.08 | Agree |
| 16 | Many broken down used vehicles with time produce scraps that pollute the environment | 3.90 | 3.13 | 3.51 | Agree |
| 17 | The Nitrogen Oxide produced by the exhaust gases oxides to sulphuric acid which falls as acid rain or mist or fog | 3.65 | 3.44 | 3.54 | Agree |

| | | | | | |
|---|---|---|---|---|---|
| 18 | The Nitrogen Oxides produced contribute to acid deposition which increases the acidity of lakes and streams which results in severe damage to aquatic life | 3.75 | 2.81 | 3.28 | Agree |
| 19 | As these vehicles age, their parts begin to rust and fall off from the vehicles which are harmful to the environment | 3.83 | 3.69 | 3.76 | Agree |
| 20 | They are potential causes of climate change | 3.90 | 3.47 | 3.69 | Agree |

**$N_1=40$, $N_2=16$**

Key:

$N_1$= Number of health personnel

$N_2$= Number of environmental agents

$X_1$= Mean score of the health personnel      where   $X_t= \dfrac{X1+X_2}{2}$

$X_2$= Mean score of the environmental agents

$X_t$= Average mean score of both groups

Table 2 shows that respondents agreed with items 11 to 20 with mean response ranging from 3.08 to 3.76 and the average mean of the health personnel and environmental agents from 2.50 and above. Therefore, the result shows that the items agreed by respondents indicated that the individuals actually encounter the various environmental effects from the usage of imported used vehicles in Lagos state.

**Research question III**:

What are the ways through which these effects could be abolished?

**Table 3: Mean responses of health personnel and environmental agents on the ways**

| S/No | ITEMS | X1 | X2 | Xt | REMARKS |
|------|-------|----|----|----|---------|

**through which these effects could be abolished**

| | | | | | |
|---|---|---|---|---|---|
| 21 | The age and working conditions of every used vehicle should be inspected before they are imported | 3.95 | 3.75 | 3.85 | Agree |
| 22 | Used vehicles entering into the country must pass an approved emission test to demonstrate that their emission control equipment is functioning as intended | 3.88 | 3.75 | 3.81 | Agree |
| 23 | Public and consumer awareness campaigns should be created on the hazard of used vehicles on human health and the environment | 3.78 | 3.50 | 3.64 | Agree |
| 24 | The Government should establish plants that will assemble and even manufacture vehicles that fit the country's road and environment | 3.75 | 3.88 | 3.81 | Agree |
| 25 | Federal Government should place a ban on importation of used vehicles over 8 years of age | 3.73 | 3.38 | 3.55 | Agree |
| 26 | Federal Government should create inspection centres where imported used vehicles would be checked for compliance with safety standards and decontamination | 3.60 | 3.44 | 3.52 | Agree |
| 27 | Government should set a high standard for importation of used vehicles | 3.73 | 3.38 | 3.55 | Agree |
| 28 | The imported used vehicles should be properly maintained with regular tune-ups after purchase to prolong its efficiency and emission control system | 3.53 | 3.75 | 3.64 | Agree |
| 29 | Only registered auto-dealers with the state Motor Vehicle Administration Agency should be given the right to import and sell used vehicles | 3.55 | 3.69 | 3.62 | Agree |
| 30 | Exhaust emission standards should be set by the Federal Environmental Protection Agency and should enforce these standards to ensure strict compliance | 3.35 | 3.88 | 3.61 | Agree |

**$N_1$=40, $N_2$=16**

Key:

$N_1$= Number of health personnel

$N_2$= Number of environmental agents

$X_1$= Mean score of the health personnel            where   $X_t = \dfrac{X1+X_2}{2}$

$X_2$= Mean score of the environmental agent

$X_t$= Average mean score of both groups

Table 3 shows that respondents agreed with items 21 to 30 with mean responses ranging from 3.52 to 3.85 and the average mean score of both the health personnel and environmental agents to be 2.50 and above. Therefore, the result indicated that there is the need to abolish both the human health and environmental effects derived from the usage of imported used vehicles. And with the suggested measures in practice, the effects will surely be reduced, if at all not completely abolished.

**Hypothesis 1**:

There is no significant difference in the mean responses of the health personnel and environmental agents on the health effects and problems individuals derive from the usage of imported used vehicles in Lagos state.

**Table 4: t-test analysis of the mean responses of health personnel and environmental agents on the health effects and problems that individuals derive from the usage of imported used vehicles in Lagos state**

| S/No | ITEMS | X1 | X2 | SD1 | SD2 | t Cal | REMARK |
|------|-------|----|----|-----|-----|-------|--------|
| 1 | The unavailability of airbag in most of the imported vehicles exposes the driver and its passengers lives to risk in occurrence of accident | 3.63 | 3.38 | 0.59 | 0.84 | 0.91 | NS |
| 2 | Most of the vehicles are contaminated with radioactive materials which can affect the skin of the passengers | 3.63 | 3.50 | 0.59 | 0.88 | 0.45 | NS |
| 3 | Lack of factory fitted A.Cs in most of the | 3.63 | 2.94 | 0.59 | 0.79 | 2.51 | S |

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| No | Statement | $X_1$ | $X_2$ | $SD_1$ | $SD_2$ | T-t | |
|---|---|---|---|---|---|---|---|
| | vehicles makes driving uncomfortable for the driver and its passengers | | | | | | |
| 4 | Overheating of the engine produces fumes that results to tiredness and headaches when inhaled | 3.70 | 3.31 | 0.61 | 0.83 | 1.39 | NS |
| 5 | Some of the vehicles have passed their useful ages that driving them becomes problematic to the body due to difficulty in control of the parts | 3.53 | 3.06 | 0.56 | 0.79 | 1.72 | NS |
| 6 | The sulfur oxides produced by the vehicles causes severity of respiratory symptoms and lung disease | 3.70 | 2.75 | 0.61 | 0.81 | 3.42 | S |
| 7 | The unburned hydrocarbons produced by these vehicles causes eye irritation, coughing and drowsiness | 3.55 | 3.75 | 0.57 | 0.99 | -0.72 | NS |
| 8 | Higher Nitrogen Oxides (NOx) produced by the exhaust of these vehicles causes asthma, shortness of breath and decreased lung function | 3.33 | 3.38 | 0.53 | 0.84 | -0.19 | NS |
| 9 | Hydrocarbons, oxides of nitrogen formed by these vehicles when combines with sunlight form ozone that causes choking and aggravates respiratory diseases | 3.85 | 2.75 | 0.66 | 0.81 | 3.84 | S |
| 10 | Most of the vehicles before importation have been used to transport toxic waste, which when inhaled affects the lungs | 3.60 | 3.38 | 0.58 | 0.84 | 0.82 | NS |

Key:

$X_1$ = Mean score of health personnel,

$X_2$ = Mean score of the environmental agents

$SD_1$ = Standard deviation of health workers

$SD_2$ = Standard deviation of environmental agents

T-t = Calculated t-value for each items.

Table 4 shows the calculated t-value for each item which do not exceed t-critical value of 2.00 necessary for rejection/acceptance of null hypothesis at 0.05 level of significance. This implies that there was no significant mean difference between the responses of the health personnel and the environmental agents for the items in table 4.

**Hypothesis 2**:

There is no significant difference in the mean responses of health personnel and environmental agents on environmental effects that individuals encounter from usage of imported used vehicles.

**Table 5: t-test analysis of themean responses of Health personnel and Environmental agents on environmental effects that individuals encounter from usage of imported used vehicles.**

| S/No | | X1 | X2 | SD1 | SD2 | t Cal | REMARK |
|------|----|-----|-----|-----|-----|-------|--------|
| 11 | They are major causes of road accidents due to engine parts failure | 3.78 | 3.69 | 0.63 | 0.96 | 0.30 | NS |
| 12 | Most of them break down on roads and cause congestion of traffic | 3.88 | 3.50 | 0.66 | 0.88 | 1.29 | NS |
| 13 | They produce greenhouse gases that causes global warming | 3.95 | 3.38 | 0.69 | 0.84 | 1.96 | NS |
| 14 | The lead (Pb) produced by these cars causes ground water pollution and particulates in the air | 3.25 | 3.75 | 0.52 | 0.99 | -1.87 | NS |
| 15 | The Ozone produced reduces the yield for commodity crops, fruits, vegetables and other | 3.73 | 2.44 | 0.62 | 0.91 | 4.55 | S |

| | | $X_1$ | $X_2$ | $SD_1$ | $SD_2$ | T-t | |
|---|---|---|---|---|---|---|---|
| | plants | | | | | | |
| 16 | Many broken down used vehicles with time produce scraps that pollute the environment | 3.90 | 3.13 | 0.67 | 0.80 | 2.69 | S |
| 17 | The Nitrogen Oxidesproduced by the exhaust gases oxides to Sulphuric acid which falls as acid rain or mist or fog | 3.65 | 3.44 | 0.60 | 0.86 | 0.77 | NS |
| 18 | The Nitrogen Oxides produced contribute to acid deposition which increases the acidity of lakes and streams which results in severe damage to aquatic life | 3.75 | 2.81 | 0.63 | 0.80 | 3.34 | S |
| 19 | As these vehicles age, their parts begin to rust and fall off from the vehicles which are harmful to the environment | 3.83 | 3.69 | 0.65 | 0.96 | 0.47 | NS |
| 20 | They are potential causes of climate change | 3.90 | 3.47 | 0.67 | 0.87 | 1.48 | NS |

Key:

$X_1$  =  Mean score of health personnel

$X_2$  =  Mean score of the environmental agents

$SD_1$  =  Standard deviation of health personnel

$SD_2$  =  Standard deviation of the environmental agents

T-t  =  Calculated t-value for each items.

Table 5 shows that calculated t-value for each item which does not exceed t-critical value of ±2.00 necessary for rejection/acceptance of null hypothesis at 0.05 level of significance. This implies that there was no significant mean difference between the responses of the health

personnel and environmental agents for the items in table 5. With this result, the null hypothesis (HO$_2$) of no significant means difference between the responses of the health personnel and environmental agentson the environmental effects that individuals encounter from the usage of imported used vehicles in Lagos state was upheld at a level of significance of 0.05. The calculated t-value which exceeds the critical value of ±2.00 are said to be rejected.

**Hypothesis 3**:

There is no significant difference in the mean responses of health personnel and environmental agents on the ways through which these effects could be abolished

**Table 6: t-test analysis of the Mean Responses ofHealth personnel and environmental agents on the Ways through Which These Effects Could Be abolished.**

| S/No | ITEMS | X1 | X2 | SD1 | SD2 | T-test | REMARK |
|------|-------|----|----|-----|-----|--------|--------|
| 21 | The age and working conditions of every used vehicle should be inspected before they are imported | 3.95 | 3.75 | 0.69 | 0.99 | 0.67 | NS |
| 22 | Used vehicles entering into the country must pass an approved emission test to demonstrate that their emission control equipment is functioning as intended | 3.88 | 3.75 | 0.66 | 0.99 | 0.43 | NS |
| 23 | Public and consumer awareness campaigns should be created on the hazard of used vehicles on human health and the environment | 3.78 | 3.50 | 0.63 | 0.88 | 0.97 | NS |

| 24 | The Government should establish plants that will assemble and even manufacture vehicles that fit the country's road and environment | 3.75 | 3.88 | 0.63 | 1.05 | -0.43 | NS |
|----|---|---|---|---|---|---|---|
| 25 | Federal Government should place a ban on importation of used vehicles over 8 years of age | 3.73 | 3.38 | 0.62 | 0.84 | 1.25 | NS |
| 26 | Federal Government should create inspection centres where imported used vehicles would be checked for compliance with safety standards and decontamination | 3.60 | 3.44 | 0.58 | 0.86 | 0.59 | NS |
| 27 | Government should set a high standard for importation of used vehicles | 3.73 | 3.38 | 0.62 | 0.84 | 1.25 | NS |
| 28 | The imported used vehicles should be properly maintained with regular tune-ups after purchase to prolong its efficiency and emission control system | 3.53 | 3.75 | 0.56 | 0.99 | -0.81 | NS |
| 29 | Only registered auto-dealers with the state Motor Vehicle Administration Agency should be given the right to import and sell used vehicles | 3.55 | 3.69 | 0.57 | 0.96 | -0.50 | NS |
| 30 | Exhaust emission standards should be set by the Federal Environmental Protection Agency and should enforce these standards to ensure strict compliance | 3.35 | 3.88 | 0.53 | 1.05 | -1.93 | NS |

Key:

$X_1$ = Mean score of health personnel

$X_2$ = Mean score of the environmental agents

$SD_1$ = Standard deviation of health personnel

$SD_2$ = Standard deviation of the environmental agents

T-t = Calculated t-value for each items.

Table 6 shows that the calculated t-value for each item does not equal or exceed t-critical value of 2.00 necessary for rejection/acceptance of null hypothesis of 0.05 of significance and 54 degree of freedom, therefore, the hypothesis was therefore accepted.

Hence, there is no significant difference in the mean responses of the health personnel and environmental agents on the ways through which these effects could be abolished.

N1= Number of respondents of health personnel

N2= Number of respondents of environmental agents

X1= Mean score of health personnel

X2= Mean score of environmental agents

SD1= Standard deviation of health personnel

SD2= Standard deviation of environmental agents

T-test= Test of significance for items in QI, II, III.

**Findings:**

Based on the data collected, the following major findings were reviewed under each research question:

1. What are the health effects and problems that individuals derive from the usage of imported used vehicles?

   Both respondents generally agreed that:

   a. The usage of these imported used vehicles actually affects the health of individuals.

   b. Most eye irritations, coughing and drowsiness, encountered by drivers and passengers on the road are actually caused by the gases emitted by these imported used vehicles.

   c. Body pains after driving are as a result of the faulty nature of imported used vehicles.

   d. The Nitrogen Oxides produced by these vehicles are higher and causes asthma, shortness of breath and decreased lung function.

   e. The sulfur oxides produced by the vehicles causes severity of respiratory symptoms and lung disease

2. What are the environmental effects that individuals encounter from the usage of imported used vehicles?

   Both respondents generally agreed that:

   a. The imported used vehicles are major causes of road accidents due to parts failure.

   b. They are causes of traffic congestion when they break down easily on the road.

   c. They produce greenhouse gases that cause global warming.

d.  The hydrogen sulphide which falls as acid rain or mist is caused by the nitrogen oxides produced by the usage of imported used vehicles.

e.  They contribute to the acidity of lakes and streams which results in damage to aquatic lives.

f.  The imported used vehicles are potential causes of climate change.

3.  What are the ways through which these effects could be abolished?

Both respondents generally agreed that:

a.  There is need for government to interfere in the vehicle importation business of the nation.

b.  The emission control equipment of every used vehicle entering into the country must be tested to ascertain its working capability.

c.  The Federal Government should create inspection centres where imported used vehicles would be checked for safety compliance before allowed into the country.

d.  The federal government should establish plants that will assemble or manufacture cars that are suitable for Nigerian roads.

e.  The Federal Environmental Protection Agency need to set an exhaust emission standard that would be strictly adhered to by vehicle owners.

**Discussion on findings:**

The discussion of the findings were organized and presented in line with the research question and the hypothesis.

The purpose of this study is to identify the various human health and environment problems associated with the usage of imported used vehicles and device means through which the identified problems can be abolished. The results in table 1 showed that the mean responses of the respondents with 3.23 and above. Items 1 to 10 all where agreed which shows that the individuals are actually experiencing severe health effects and problems from the usage of these imported used vehicles and are actually aware of them. (Schwela, 2000) stated that nitrogen oxides and sulfur oxides, for example, are associated with immune system impairment, exacerbation of asthma and chronic respiratory diseases, reduced lung function, and cardiovascular disease, exposure to carbon monoxide can result in fatigue, headaches, dizziness, loss of consciousness, and even death at very high concentrations, lead is similarly dangerous as poisoning causes irreversible neurobehavioral consequences, such as decreased IQ and attention deficits, and death at high levels of poisoning. It is therefore, necessary that the importation of used vehicles should be controlled in order to reduce or abolish these dangerous health effects in lives of the individuals.

From table 4 of hypothesis, it revealed that there is no statistical analysis of the mean responses of the health personnel and environmental agents on the health effects and problems that individuals derive from the usage of these imported used vehicles. This is as a result of the calculated t-value for each item which does not equal or exceed the t-critical value of ±2.00 therefore, the hypothesis is accepted.

Based on the environmental problems associated with the usageof these vehicles on the individuals who have in one way or the other suffered from these effects, the result from table 2 showed by mean responses of the respondents with 3.08 and above. Items 11 to 20 were all agreed which means that the various environmental problems are associated with the usage of imported used vehicles and the individuals are actually encountering the problems directly or indirectly.

From table 5 of hypothesis 2, it reveals that there is no statistical analysis of the mean responses of the health personnel and environmental agents on the environmental effects that individuals encounter from the usage of imported used vehicles. This is as a result of the calculated t-value for each item which does not equal or exceed the t-critical value of $\pm 2.00$ therefore the hypothesis was accepted.

The result from table 3 showed by mean responses of the respondents. Items 21 to 30 were agreed with the statements which showed that the various suggested measures have the potential of solving the human health and environmental problems encountered from the usage of these imported used vehicles. Most of these imported used vehicles have passed their useful states and the conditions in which they are imported into the country makes them unfriendly to the health of the individuals and the environment in which they are operated. (Shabi, 2011) stated that banning over-aged vehicles from Lagos roads will prolong lives by reducing the amount of pollutants in the environment. He also disclosed that arrangements to commence emission tests on vehicles operating in the state have been concluded and awaiting final approval from relevant authorities.

(Badejo, 2010) stated that all automobile dealers in the country should take into cognizance the year of manufacture of a vehicle in order to determine the life span and status of the vehicle imported into the country so as not to make Nigeria a dumping ground of used vehicles popularly

called "Tokunbo".It is therefore necessary for the Federal Government to place a ban on importation of vehicles over 8 years of age, create centres where imported vehicles would be inspected and checked for good working conditions and compliance with safety standards and decontamination. It is also the responsibility of the Federal Environmental Protection Agency to set exhaust emission standard and enforce them in order to control the emission rates of these vehicles and protect the environment from being polluted.

From table 6 of hypothesis 3 it revealed that there is no statistical analysis of the mean responses of the health personnel and environmental protection agents on the ways through which these effects could be abolished, this is as a result of the calculated t-value for each item which does not equal exceed the t-critical value ±2.00, therefore, the hypothesis was accepted.

# CHAPTER FIVE

# SUMMARY, CONCLUSION, RECOMMENDATION AND SUGGESTIONS FOR

# FURTHER STUDIES

**Summary of the Study**

The purpose of this study is to assess the effects of importation of used vehicles on human health and environment in Lagos state, related literature were reviewed in the study under the following sub-headings: history of the automobile, evolution of automobile industry in Nigeria, the state of assembly plants, health and environmental effects of vehicle usage. Statistical tools such as mean, standard deviation and t-test were used to analyze the data by using both health personnel and environmental protection agents as respondents. A 30 items questionnaire was used as instrument for data collection and was analyzed according to each of the research questions.

A survey approach was taken to develop the instruments for the study. Three research questions were formulated for the specific purpose of guiding the study, three hypothesis was formulated to guide the study and were tested at 0.05 level of significance. The questionnaires was validated by the researcher's supervisor and refined by here lecturers in the Industrial and Technology Education Department of the Federal University of Technology, Minna. The data was analyzed using mean and standard deviation. The study among others revealed that, tiredness, headaches, lung diseases, eye irritation, coughing, drowsiness, shortness of breath, asthma, decreased lung function, choking, respiratory diseases and even lower chances of surviving in the occurrence of accidents are health related problems associated with the usage of imported used vehicles. While traffic congestion, production of greenhouse gases that causes global warming, ground water pollution, production of scraps that pollute environment, acid rain

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fall, severe damage to aquatic life, and climate change are the environmental effects associated with the usage of imported used vehicles.

However, certain measures have been found to be effective in reducing and abolishing the human health and environmental problems associated with the usage of imported used vehicles in Lagos state among of which includes: age and working conditions of every used vehicles should be inspected before importation, the public should be informed about the health and environmental problems associated with these vehicles, Government should place ban on importation of vehicles over 8 years of age and imported used vehicles should be properly maintained with regular tunes-ups after purchase.

**Implication of the Study**

The findings from this study revealed that the massive over aged and poor working conditioned vehicles imported into the country have the various health and environmental effects on the individuals who drive such vehicles and the environment at large in which such vehicles exists. Among such health effects includes tiredness after driving, coughing, drowsiness, lung related diseases, asthma, headaches, eye irritation, choking and environmental effects include climate change, traffic congestion, global warming, ground water pollution, and death to crops and aquatic lives etc. however, without the strategies which includes inspection of vehicles before and after importation for emission control, ban on importation of vehicles over 8 years of working age, establishment of vehicle assembling and manufacturing plants, setting and enforcement of vehicle emission standards by the Federal Environmental Protection Agency to suit the Country's atmosphere and enlightenment of vehicle users on health and environmental

problems associated with usage imported vehicles etc., it will be difficult to achieve and sustain a good health and clean environment while using imported used vehicles.

**Conclusions**

From the findings of this study, it is clear that tiredness after driving, coughing, drowsiness, lung related diseases, asthma, headaches, eye irritation and choking amongst others are the various health related problems associated with the usage of imported used vehicles and climate change, traffic congestion, global warming, ground water pollution, and death to crops and aquatic lives amongst others are the environmental effects associated with the usage of imported used vehicles and these effects are not good to both the human health and the environment in which humans exist. However, certain measures have been identified to help abolish these ugly effects among which are the inspection of vehicles before and after importation into the country for emission control, ban on importation of vehicles over 8 years of working age, establishment of vehicle assembling and manufacturing plants, setting and enforcement of vehicle emission standards by the Federal Environmental Protection Agency to suit the Country's atmosphere and enlightenment of vehicle users on health and environmental problems associated with usage imported vehicles amongst others. Furthermore, if these measures are well implemented, it is obvious that there will a reduction or even complete eradication of the various health and environmental effects and problems associated with the usage of imported used vehicles in Lagos state.

**Recommendation**

Based on the findings of the study, the following were recommended;

1. The age and working conditions of every used vehicle should be checked before they are imported into the country

2. Used vehicles entering the country must pass an emission test to test the functionality of their emission control equipment,

3. The public should be notified on the health and environmental problems associated with the usage of imported used vehicles.

4. The Federal Government should establish vehicle assembling and manufacturing plants to help make vehicles that would suit the Nigerian road and atmosphere.

5. The Federal Government should place a ban on importation of vehicles over 8 years of age.

6. Inspection centres should be created by the Government to check imported vehicles for compliance with safety standards and decontamination.

7. Only registered auto-dealers with the state Motor Vehicle Administration Agency should be given the license to import and sell used vehicles.

**Suggestion for Further Study**

1. Economic implication of mass importation of used motor vehicle on the automobile industries and general public.

2. Strategies for improving emission control systems in Motor vehicles.

3. Replica of this study should be carried out in all states in Nigeria.

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QUESTIONAIRE ON EFFECTS OF IMPORTATION OF USED MOTOR VEHICLES ON HUMAN HEALTH AND ENVIRONMENT IN LAGOS STATE

**FEDERAL UNIVERSITY OF TECHNOLOGY MINNA**

**SCHOOL OF SCIENCE AND SCIENCE EDUCATION**

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION**

**INSTRUCTIONS**

Please sincerely respond by filling or ticking [√] the appropriate space provided. The information shall be treated with confidentiality.

PART 1

Personal data

Status: Health personnel [  ]

      Environmental Protection Agent [  ]

PART II

Section A, B and C below are research questions and their items. Kindly indicate by a tick i.e. [√] against each statement in the appropriate column which describe the extent to which you agree with the following statement by using the following keys:

SA—Strongly Agree

A—Agree

D—Disagree

SD—strongly disagree

## SECTION A

What are the health effects and problems that individuals encounter from the usage of imported used vehicles?

| ITEM | STATEMENTS | RESPONSES | | | |
|------|-----------|:---:|:---:|:---:|:---:|
| | | SA | A | D | SD |
| 1 | The unavailability of airbag in most of the imported vehicles exposes the driver and its passengers' lives to risk in occurrence of accident | | | | |
| 2 | Most of the vehicles are contaminated with radioactive materials which can affect the skin of the passengers | | | | |
| 3 | Lack of factory fitted A.Cs in most of the vehicles makes driving uncomfortable for the driver and its passengers | | | | |
| 4 | Overheating of the engine produces fumes that results to tiredness and headaches when inhaled | | | | |
| 5 | Some of the vehicles have passed their useful ages that driving them becomes problematic to the body due to difficulty in control of the parts | | | | |
| 6 | The sulfur oxides produced by the vehicles causes severity of respiratory symptoms and lung disease | | | | |
| 7 | The unburned hydrocarbons produced by these vehicles causes eye irritation, coughing and drowsiness | | | | |
| 8 | Higher Nitrogen Oxides (NOx) produced by the exhaust of these vehicles causes asthma, shortness of breath and decreased lung function | | | | |
| 9 | Hydrocarbons, oxides of nitrogen formed by these vehicles when combines with sunlight form ozone that | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | causes choking and aggravates respiratory diseases | | | | |
| 10 | Most of the vehicles before importation have been used to transport toxic waste, which when inhaled affects the lungs | | | | |

## SECTION B:

What are the environmental effects that individuals encounter from the usage of imported used vehicles?

| ITEM | STATEMENTS | RESPONSES | | | |
|---|---|---|---|---|---|
| | | SA | A | D | SD |
| 11 | They are major causes of road accidents due to engine parts failure | | | | |
| 12 | Most of them break down on roads and cause congestion of traffic | | | | |
| 13 | They produce greenhouse gases that causes global warming | | | | |
| 14 | The lead (Pb) produced by these cars causes ground water pollution and particulates in the air | | | | |
| 15 | The Ozone produced reduces the yield for commodity crops, fruits, vegetables and other plants | | | | |
| 16 | Many broken down used vehicles with time produce scraps that pollute the environment | | | | |
| 17 | The nitrogen oxides produced by the exhaust gases oxidizes to sulphuric acid which falls as acid rain or mist or fog | | | | |

| ITEM | STATEMENTS | | | | |
|------|-----------|---|---|---|---|
| 18 | The Nitrogen Oxides produced contribute to acid deposition which increases the acidity of lakes and streams which results in severe damage to aquatic life | | | | |
| 19 | As these vehicles age, their parts begin to rust and fall off from the vehicles which are harmful to the environment | | | | |
| 20 | They are potential causes of climate change | | | | |

## SECTION C:

What are the ways through which these effects could be abolished?

| ITEM | STATEMENTS | RESPONSES | | | |
|------|-----------|-----|----|----|----|
|      |           | SA  | A  | D  | SD |
| 21 | The age and working conditions of every used vehicle should be inspected before they are imported | | | | |
| 22 | Used vehicles entering into the country must pass an approved emission test to demonstrate that their emission control equipment is functioning as intended | | | | |
| 23 | Public and consumer awareness campaigns should be created on the hazard of used vehicles on human health and the environment | | | | |
| 24 | The Government should establish plants that will assemble and even manufacture vehicles that fit the country's road and environment | | | | |
| 25 | Federal Government should place a ban on importation of used vehicles over 8 years of age | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 26 | Federal Government should create inspection centres where imported used vehicles would be checked for compliance with safety standards and decontamination | | | | |
| 27 | Government should set a high standard for importation of used vehicles | | | | |
| 28 | The imported used vehicles should be properly maintained with regular tune-ups after purchase to prolong its efficiency and emission control system | | | | |
| 29 | Only registered auto-dealers with the state Motor Vehicle Administration Agency should be given the right to import and sell used vehicles | | | | |
| 30 | Exhaust emission standards should be set by the Federal Environmental Protection Agency and should enforce these standards to ensure strict compliance | | | | |