

Road Accident and its Impact on the Environment: The Case of Oil Tanker Accident in the South-East Nigeria

Chukwurah Gladys O.¹, Ogboi K. C.², Akanwa Angela. O.³

Lecturer^{1,3}, Faculty²

Department of Urban and Regional Planning^{1,2}, Department of Environmental Sciences³

University of Nigeria, Nsukka, Nigeria,

Odimegbu Ojukwu University, Anambra State, Nigeria

Corresponding Author's Email id: gladys.chukwurah@unn.edu.ng

Abstract

The study focused on revealing the impact of road accident on the environment. A study of oil tanker accident, which is common in the country, is carried out in the south east Nigeria. The recorded available data on oil tanker accident were sourced from Department of Petroleum Resources (DPR) and Federal Road Safety Corp. The data was subjected to descriptive statistics and qualitatively analyzed. Oil tanker accident record for nine incidences in the south east Nigeria shows that 533 people were burn died, 317 people injured, total area spillage of 12250m², and about #807.81 Million of property damaged. The researcher discovered the impact of oil tanker accidents as; air pollution, climate change, soil quality and destroyed vegetation, noise, distortion of urban landscape and agricultural land, health hazard. The researcher summarized that oil tanker accidents have caused enormous environmental, human and material losses. The study therefore suggests traffic management. In this case, oil tanker should not be allowed to ply on the road during peak periods with other kinds of vehicles. There should be a time frame preferably from 9pm to 6am when the road is less congested from pedestrian and other kinds of vehicular movement. This could serve as a temporary measure while the country should carry out the implementation plan of reviving railway transportation in the country so that petroleum products could be convey by train services as it was in the early days. This

will drastically reduce oil tanker accident and its impact on the environment.

Keywords: *Road, Oil Tanker, Accident, Impact, and Environment.*

INTRODUCTION

Traffic accidents particularly oil tanker accidents are considered modern problems which are causing enormous environmental human and material losses to many people and resulting of them many temporary and permanent injuries and they cause enormous damages to the public and private properties. According to Ghoneem (2014) road accidents victims are more in number than the victims of wars and terrorist operations in the world.

The deplorable and unsafe state of road traffic environment, the use of oil tanker and all kind of vehicles such as trucks, trailers, bus, cars and pedestrian on the same road in Nigeria affect the environment negatively. It renders pedestrians the most endangered class of road users in the country. Everyday hundreds of our fellow human beings are injured, paralyzed, disfigured for life and many are killed outrightly or die a slow painful death. Just in four years 1985 – 1988, 5,324 accidents occurred with 89,006 injured and 33, 09 dead as officially reported by the Nigerian police (2005).

Losses of life and properties from 1990 to 1995 with a total of 294 accident cases were recorded and 5,283 deaths in the country. A lot of investment has been lost as a result of road accident in Nigeria.

Accident reduces the number and quality of vehicles plying the roads thereby causing inadequacy in meeting the national transport requirements. Accidents drain foreign exchanges to an estimated 10% of total foreign reserves per annum and over 1% of export earnings (Odedokun 1991). Accidents adversely affect those performance indices that are of direct concern to the management of transport business. In this regard accidents retard the growth of those variables that are of managerial concern like volume of business output, revenue and proceeds realized, and the assets base or vehicles available.

The issue of transportation and the environment is paradoxical in nature since transportation conveys substantial socioeconomic benefits, but at the same time road accident particularly oil tanker accident is impacting environmental

systems. Transportation activities support increasing mobility demands for passengers and freight, while on the other, transport activities are associated with growing levels of environmental externalities. This has reached a point where road tanker accident is a dominant source of emission of most pollutants and their multiple impacts on the environment (Jean-Paul Rodrigue, 1998-2016). This arose the need to examine road accident and its impacts on the environment with reference to oil tanker accident in the south-east Nigeria.

There are several environmental impacts associated with oil tanker accident. Some of the environmental problems associated with oil tanker accident include oil spills, discharges of petroleum-derived chemical wastes, contamination of controlled water sources, contamination of soil and sediments, the destruction of the farmland and the marine environment. The major environmental issues arose primarily from the improper disposal of large volumes of petroleum-derived hazardous waste streams, such as oily and toxic sludge, equipment failure, and oil spillage pose serious environmental threat to affected communities and makes the people vulnerable to environmental and health hazards (Ordinioha and Brisibe, 2013).

The quantities of oil tanker spillage determine the presence of total petroleum hydrocarbon (TPH) in the environment; it determined the environmental impacts on land, water and it also identified the health implications of oil spill on the residents. It fashioned a remarkable economic landscape for the country. It has adverse effects on farming, socio-economic life and the environment of the immediate affected communities; it has left a balance sheet of ecological and socio-physical disaster. Tanker accident also has a major impact on the ecosystem as a result of oil spillage from tanker accident.

Study Area

Oil tanker accident is a common occurrence in Nigeria with lots of environmental consequences. The south East Nigeria consisting of the following states; Abia, Anambra, Ebonyi, Enugu, and Imo; have experience frequent occurrences of oil tanker accidents and this have resulted to lots of environmental disaster.

Data Presentation and Analyses

The study focused on demonstrating the impact of road accident on the environment. A study of oil tanker accident, which is common in the country, is carried out in the south east Nigeria. The recorded available data were used. The data

were sourced from Department of Petroleum Resources (DPR) and Federal Road Safety Commission. The data was subjected to descriptive statistics and qualitatively analyzed.

Table: 1. Some recorded Oil Tanker Accidents in the South-East Nigeria from 2012-2016

Date	Location/ Site	Area Spilled	No. killed /Burnt	No. Injured	Property Destroyed	Estimated Financial Value of Damage
12th March 2012	Okobie (near Port Harcourt Army check point)	1450m ²	75	13	2 big buses, 15 mini buses, 2 trucks, 13 tri cycles, farm lands.	117.6m
18th April 2012	Okobie town	1800m ²	84	32	1 big bus, 8 mini buses, 13 motor cycles, 8 low cost buildings	81.09m
1st June 2015	Okogbe (near Port Harcourt)	2500m ²	136	78	8 big buses, 14 mini buses, 22 motor cycle, farm lands, 11 shops, 18 low cost houses 3 cars, 1 truck	186.16m
18 Nov. 2015	Anambra (Eze-uzu junction)	350m ²	5	8	1 truck, 1 mini bus, 1 car, 2 shops	14.7m
31 st May 2015	Onitsha Upper Iweka (Asaba Park)	1500m ²	108	121	12 big buses, 31 min buses 35 tricycles, 22 cars, 1 truck.	191m
8 Dec. 2015	Enugu-Onitsha Road Exp. (Ugwuonyema)	1350m ²	32	16	8 mini buses 5 cars, High tension wire	14.42m
24 Dec. 2015	Nnewi (Intercoops gas plant)	2000m ²	75	33	9 big buses, 12min buses 16cars, 34 motorcycle, 1 truck, 55NPG cylinder, 2 floor blocks of flats, High tension wire	145.32m
4 Jan. 2016	Nnewi (organizing filling station)	850m ²	3	9	2 floor block of flats, EDDC High tension wire	44.12m
8th Jan. 2016	Enugu-Onitsha Road (Ugwu Onyeama)	450m ²	15	7	1 truck, 1 bus, 2 cars	13.4 m

Source: Department of Petroleum Resources (DPR), and Federal Road Safety Corp (FRSC).

The table above reveals the recorded incidence of oil tanker accidents in the South East Nigeria and the level of environmental disaster. It shows the number of people burnt and injured at various incidences as well as the property destroyed including the urban infrastructures. Records from DPR shows the year, location, number of life burnt and injured, and area spilled of oil tanker accidents in the south East Nigeria.

Result

The researcher discovered that Oil tanker accidents have caused enormous environmental, human and material losses. Oil tanker record for nine incidences in the south east Nigeria shows that 533 people were burn died, 317 people injured, Total area spillage of 12250m², and about #807.81 Million of property damaged. The researcher summarized his findings by

illustrating the negative impact of oil tanker accidents on the environment as:

Air Pollution

One of the major environmental impacts of oil tanker accident is air pollution. Oil tanker accident results to oil spillage which causes fire outbreak and release of hazardous substances. It may be regional or global in scale. The gaseous and particulate matters emissions from oil tanker accidents affect air quality. Toxic air pollutants from oil tanker accidents has resulted to the loss of lives and damaged the health of few surviving victims of oil tanker accident. Studies by Ordinioha and Brisibe (2013) also show that Toxic air pollutants are associated with cancer, cardiovascular, respiratory and neurological diseases. Carbon monoxide (CO) inhale affects bloodstream, reduces the availability of oxygen and is extremely harmful to public health.



Fig: 1. Air Pollution: A runaway oil tanker truck crashed and exploded at a bus station in southern Nigeria

Source: Federal Road Safety Corp (2015)

Climate change

In any Oil tanker accidents occurrences several million tons of gases are release into the atmosphere. This can also be seen in fig. 1 above. These include lead (Pb), carbon monoxide (CO), carbon dioxide (CO₂; not a pollutant), methane (CH₄), nitrogen oxides (NO_x), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), perfluorocarbons (PFCs), silicon tetrafluoride (SF₆), benzene and volatile components (BTX), heavy metals (zinc, chrome, copper and cadmium) and particulate matters (ash, dust).

Although there is an ongoing debate to what extent these emissions are linked to climate change and the role of anthropogenic factors. But some of these gases, particularly nitrous oxide, participate in depleting the stratospheric ozone (O₃) layer which naturally screens the earth's surface from ultraviolet radiation. Some of these gases such as SO₂, NO₂, H₂S, NH₃, and CO produce organic acids resulting in acid rain.

This Acid precipitation has detrimental effects on the built environment, reduces agricultural crop yields and forest decline. It is also relevant to underline that climate change also has a significant impact on

transportation systems, particularly infrastructure.

Soil Quality and Destroyed Vegetation

The environmental impact of oil tanker accident on soil consists of soil erosion and soil contamination. It influences natural vegetation and result to deforestation in the area of occurrences. Many times oil tanker falls into the ditch, farm lands, and natural vegetation resulting too many environmental consequences. Many animal species are becoming extinct due to burn from oil tanker spillage. Petroleum released to the soil move through the soil to the ground water.

Individual compounds separate from the original mixture, depending on the chemical properties of the compound. Some of these compounds evaporate into the air and others dissolve into the ground water and move away from the release area. Other compounds attach to particles in the soil and stay in the soil for a very long time, altering the soil properties and composition of microorganisms like nitrifying bacteria present in the soil that helps in enhancing soil fertility.

It therefore reduces soil fertility, smothered economic trees and food crops, reducing

their yield. Spillages from oil tanker accident also contribute to increased biodiversity loss and the destruction of vegetation including farmland.

Noise

Transport noise emanating from the movement of oil tanker affects not just human health and psychological wellbeing but have negative impact on the urban environment. Oil tanker trucks generate high level of noise then other vehicles. Increasing level of noise from oil tanker have negative impact on the environment reflected in falling land values and loss of productive land uses.

Distortion of Urban Landscape and Agricultural Land

Oil tanker accident affects the urban landscape. Houses, farm lands and vehicles burnt as a result of oil tanker accident occurrences causes' significant environmental degradation and nuisance. The burnt properties especially vehicles are left on the road or along the road for a long time thereby causing environmental nuisance. These burnt properties affect the quality of urban life by creating physical barriers, generating odour, reducing urban aesthetic and affecting the built heritage. It also destroys urban infrastructure such as high tension wire, and economic trees which also serves as shade.



Fig: 2. Distortion of Urban landscape and property.



Fig: 3. Oil Tanker rammed into a bus park (Asaba- Onitsha Park) at Onitsha in the South-East, Nigeria.

Source: Gruesome images BBC News (2015).



Fig: 4. Damage Vehicles

Source: Gruesome images BBC News (2015).

Some of the environmental implications of oil tanker accident as shown in above also include environmental nuisance. Damages such as urban infrastructure and vehicles constitute environmental nuisance and

obstruction on the road. This obstruction often times result to more accident.

Health Hazard

Oil tanker accidents have caused lots of health disaster. Many lives were roasted as

a result of fire outbreak from oil tanker accident while the very few surviving one's health was damaged for life. Children, young and old were affected in this incidence. Many of the victims of oil tanker accident were burnt in the act of scooping up spilled petroleum after the oil tanker crashed when it caught fire. In Onitsha oil tanker ran into the Bus Park roasted lots of lives and properties. This is as result of brake failure and loss control by the driver. Collision of moving oil tanker

with bus and smaller vehicle on the highway has also resulted to the loss of many lives. Indiscriminate and improper parking of oil tanker along the road especially at night, the use of hand set in the filling station during the discharge of fuel and the use of phones while driving when the oil tanker is close has also led to accident and fire outbreak and this also has burn and damage the life of many victims. The fig. 5 and 6 below shows the level of health disaster caused by oil tanker accident.



Fig: 5. Health Hazard

Source: AFP Getty Images 2012 about 136 lives burn by oil tanker accident at Okogbe in the South – East



Fig: 6. Health Hazard: Tragedy: The victims had been scooping up spilled petrol after the tanker crashed when it caught on fire

Source: Reuter Images 2012.

Oil tanker accident has caused adverse environmental impact on the affected areas and communities as shown in the fig 5 and 6 above. It deny human right to a healthy environment and makes the people vulnerable to environmental and health hazards.

CONCLUSION

The study demonstrated the impact of oil tanker accident and the level of environmental disaster in the south east Nigeria. An estimated 90% of passengers and freight in Nigeria rely on the road network with the attendant challenge of increased number and incidences of road accident (F.R.C 2012). The use of oil

tanker and other kinds of vehicle on the road is a big risk and environmentally unhealthy. petroleum products was transported by train services in the early 1960's Robinson et al (1961) and Chukwurah et.al (2017) revealed that poor performance of railway transportation has contributed immensely to the high rate of road accidents in the country. The study therefore suggests traffic management. In this case oil tanker should not be allowed to ply on the road during peak periods with other kinds of vehicles. There should be a time frame preferably from 8pm to 6am when the road is free from pedestrian and other kinds of vehicular movement. This could serve as a temporary measure while the country should carry out the

implementation plan of reviving railway transportation in the country as this will drastically reduce oil tanker accident and its impact in the country.

REFERENCES

- I. Ghoneem (2014) Ghoneem, K. (2012), The Effects of Traffic Accidents on the Emergence of Psychological Disorders among Drivers of "3Rd' Category": Private License in Jordan "A Field Research" Academic journal Studies in Sociology of Science.
- II. Jean Paul Rodrigue (1998-2016): The Environmental Impact of Transportation. The Geography of Transport System. Hofstra University New York, USA.
- III. Odedokun (1991), Accident and Productivity Level in the Transport Industry in Accident Control and Safety Measures in Mass Transit Operations. Causes of Accidents.
- IV. Ordinioha B. and Brisibe S. (2013): The human health implication of crude oil spill in the Niger delta, Nigeria: An interpretation of published studies. Nigeria Medical Journal, 54(1): 10-16.
- V. Robinson, H., Smith, S.R., and Clare, K.G. (1961). The Economic Coordination of Transport Development in Nigeria, Stanford Research Institute, California, Feb.
- VI. Chukwurah et.al, (2017), "Assessment of Railway Performance and Road Accidents Rate in Nigeria. International Journal of Environmental Sciences. Vol.6 No.4.pp.134-139.
- VII. Department of petroleum and Natural Resources: Unpublished Report on Oil tanker Accident in south East Zone. Office of the PRO Enugu.
- VIII. Federal Road Safety Commission (2012): Road Traffic Crashes Leading Causes of Death among Youth People. News Bulletin [http://FRSC Abuja](http://FRSCAbuja).