

NAUKA NA MAZINGIRA ORGANIZATION



JOURNAL TITLE

To mitigate the effects of the emission due to the burning of fuel

Subtitle.

Reforestation and use of Alternative fuel

This journal is prepared and published for the fulfillment of environmental protection and preservation for our future generation.

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1. Abstract

experimental research design was opted for in this study and data were collected found that engine size, year of manufacture, and kilometers of travel affected vehicle experimental investigation to ascertain the emission status of used vehicles used for to obtain emission data for the study, where cluster sampling was preferred and 403 gasoline and diesel-powered vehicles were investigated for general inspection. The study controlling to mitigate the health and environmental hazards to communities. This was an

Exhaust gas emission is a by-product of air and fuel combustion in vehicle engines. It

2. Introduction

consists primarily of the technically known as particulate form such as soot or in gaseous development in developing countries like harm our health when inhaled while others form, Nitric Oxide (NO) and other forms of levels of emitted harmful gases. In Tanzania, Siskos&Moysoglou, 2019). The emission

combustion process, which is the primary

engine, the fuel results in heat energy. Some harm the environment. Cognizant of this, Dioxide (CO₂), Water Vapour, and other emit products as a result of the incomplete combustion byproducts react negatively and authorities worldwide impose emission Monoxide (CO), Hydrocarbons (HC) in the natural gases to power internal combustion oxides of Nitrogen (NO_x) and Sulphur (SO_x) fossil fuels, especially diesel, petrol, and source of Green House gases (GHG) that engines. The burned fuels release energy and the country. The transport sector utilizes Volatile Organic Compounds (VOC). When a ownership, thus increasing vehicle traffic in vehicle burns fuel in an internal combustion The rapid increase of socio-economic (Qin & Gao, 2022). These include Carbon testing standards for vehicles to ascertain the Tanzania has led to a rapid rise in vehicle pollute the atmosphere (Réquia et al., 2015; 'criteria air pollutants' such as Carbon **the** emission tests are compared with the

engines. 2022; Xu et al., 2023). Therefore, some measured from the vehicle tailpipe (Smmmt concept (Kontou et al., 2017). In developed emissions." In another study by (Wu 2022), it rebates tend to reduce an electric vehicle's Standard that describes vehicles that emit less customers who abide by the zero-emission al., 2003) (Franco et al., 2013; Zhong & capital cost and investments, resulting in "Road Vehicles-Code of Practice for + Nitrogen Oxides + Hydrocarbons + lower operating costs and driver savings. The Inspection and Testing of Used Motor (U.S.A) and U.K, authorities promote an countries such as the United Kingdom (U.K), environment and human health (Adeyanju et countries like the United States of America 2023). Of course, these are mostly either Particulate matters

Fuel + Air = Heat Energy + Carbon Dioxide vehicles are promoted by policymakers because of their potential to reduce tailpipe France, and others in European Union Block allowable emission levels should not exceed et al., 2017). The researchers quote, "Electric Ultra-Low Emission Vehicle (ULEV) example of this is given in a study by (Kontou 2.5 per meter of opacity (soot) for diesel + Carbon Monoxide + Water + Oxygen regulation No (TZS 698:2013) named the United Nations Emission Gap Report of 2022 Bushell, 2017; Du et al., 2019; Chen et al., limiting allowable levels of vehicle Vehicles for Road Worthiness" where the was reported that monetary

incentives such as 4.5% by volume CO, 1200 PPM of HC and have imposed harsh regulations aiming at electric or plug-in hybrid vehicles. An revised Tanzania Bureau of Standards (TBS) through tax credits and other incentives partly emissions. Other countries offer incentives to The emissions have severe effects on the than 75 grams of CO₂ per kilometer of travel stresses that the world is not on track to abideby the Paris Agreement goals and must cut of harmful environmental emissions. measures to help attenuate the harmful devices. The study, ultimately, proposes are still old vehicles on Tanzania roads. In developing countries like Tanzania, almost handled fuel can guarantee increasing levels most of these vehicles are imported as used Salaam City using data from vehicles all vehicles are powered by either diesel or tested using modern emission-detecting Regardless of the efforts made by the Centre to represent the various types of Vehicles with obsolete emission-limiting vehicles in the country. The vehicles were vehicles having significant depreciation rates. greenhouse gases (UNEP 2022). exhaust much more petroleum-based emissions due to partial combustion. Besides, of the tailpipe emission levels in Dar es technology and using contaminated or poorly government to curb the importation of cars gasoline internal combustion engines, which consequences of global warming caused by Therefore, this study investigated the extent emissions by 45% to avoid catastrophic more than ten years after manufacturing, there inspected at the National Institute's Vehicle emissions.

3. Research problem.

Air pollution caused by vehicular emissions contributes to the deterioration of human vehicles after identifying the emission status Salaam. It is against this backdrop that this and the environment from being at risk of limiting these harmful emissions from harmful emissions. One of the measures for respiratory and cardiovascular diseases. vehicles is through lessening their levels from health by being one of the causes of the existing vehicles in the city of Dar es less to improve air quality and prevent people Therefore, researchers should conduct studies on smart road transport equipment that pollute study investigated this phenomenon to make suggestions for policymakers on the matter at hand based on the outcome of the study.

4. Literature Review

association exists between ambient air

Particles (UFP) combined with Ozone (O₃)

investigated the effects of emissions on the deaths. cardiovascular diseases in Bangkok are likely caused by air pollution. A study by (Currie et Because vehicular emissions negatively affect pollutants and various health effects such as can cause cerebral and autonomic dysfunction. In another study by Heusser et inflammation, inducecough, worsen asthma, aspects. Some studies propose using electric matter, one of the vehicular emissions, has known to be hazardous to health. A report by WHO (2004) suggests an further reiterated that ultrafine particles, fuels. Other studies have extensively particles, where they found that ultrafine conducted to show their effects on various which among other ways, are dispersed been linked to causing severe healthproblems was found to increase sympathetic nervous our environment and health (Grahame & cardiopulmonary function, reduction of lung In a United Nations environmental report of and are retained longer in the lungs. The study vehicles for urban

transport and restricting ozone layer and global warming. In a study A recent study by Schraufnagel et al., (2020) respiratory symptoms or illness, impaired function, and premature mortality. Particulate investigated the health effects of ultrafine systems activity in healthy older individuals. atmospherically through vehicular emissions, al., (2019), exposure to Ultrafine Carbon means of transport that rely solely on fossil by (Kjellstrom et al., 2007), the researchers of shortening life expectancy and premature Schlesinger, 2010), studies have been al., 2005) found that criteria air pollution is found that as much as 29% of deaths from particles (PM_{0.1}) cause more pulmonary 2021 on emissions, however, it is reported emission tests conducted on 400 vehicles international standard. They also noted that standards that are hardly implemented and A study by Ayetor et al., (2021) investigated the test while almost all diesel cars failed the that about 70% of all greenhouse emissions in emissions have dropped by 5.4%.only five African countries have emission emission levels of some sampled vehicles in that, due to COVID19 Pandemic, global CO₂ indicated that even some new vehicles failed dwellings in Ghana and Rwanda, where countries. This study tried to investigate the Dar es Salaam and compare the data with Africa are contributed by only seven the state of road vehicle emission in African other studies conducted so far.

5. Discussion

different batches, this study has found that a anticipated poor emission records. However, the hypothesis was that most used vehicles emissions from used vehicles in the city of vehicle odometer reading does not necessarily thousand kilometers already, leading to their because most would have traveled several

Dar es Salaam-Tanzania. Before the study,

This study investigates the status of vehicular from the samples randomly picked for three would register a very poor emission record correlate to vehicle failure in emission test but rather to the emission-preventing engine capacity, age, and odometer reading. emission rates of 22.8%, 20%, and 1.6%, found that engines with a small capacity of rates of 26.7%, 40%, and 47.7% respectively. 2000 and those with kilometers of travel might be why the samples show more remarkable emission test pass rates than technology employed and the vehicle's maintenance programs for their fleet. This vehicles manufactured between 1991 and Therefore, vehicle age and kilometers of study were primarily large trucks owned by 25% and 6.7% of GHG respectively. exhaust pipe emissions. (petrol) visited the NIT-VIC to be ascertained maintenance.

large transportation companies in the country, vehicles at 3.2%. The assessment is based on higher failure rates of 9.8% than diesel and 1991 –2000 and for the vehicles which Unlike vehicle capacity, vehicle age and traveled 200,001 –300,000 km have emission Out of 403 vehicles, 250 (diesel) and 153 volume, the higher the emission, the study expected. Nevertheless, there is a vivid 3001-6000 cc diesel and 2001-3000 petrol petrol vehicles manufactured in 1980 –1990, have shown higher emission rates. Diesel for quality and roadworthiness issues for the most of which have well-scheduled emit more by 37% and 46.7% compared to (5.7%) failed the test. Petrol vehicles recorded 12001 –15000 and 40015000 which emit kilometer run/usage show different trends, in indication that individually owned vehicles which old vehicles with many years of travel travel have shown a direct correlation to

range of 300001 500,000 have higher
For the case of engine capacity, unlike the
entire period, 380 (94%) passed, whereas 23
phenomenon that the higher the engine
Diesel-powered vehicles sampled in this
respectively. The same trend is shown by
still fail in emission tests compared to those owned by transportation firms. The results of
maintained vehicles from well-established
yet for all vehicles in Tanzania. This leads to
such testing. Others only opt for general
there is no mandatory vehicle emission testing
transportation firms to send their vehicles for
inspection for roadworthiness to enable their
this study can never be conclusive because
the availability of only a small sample of well
vehicles to get registered.

6. Recommendations

roadworthiness should include emission
owners to regularly maintain catalytic
From the numerous studies conducted on
owner's discretion. The study suggests that
upkeep of a vehicle, countries should strongly
for every vehicle. Vehicles are brought for
the preregistration inspection for a vehicle's
testing as a compulsory inspection
good records of exhaust emission depend
vehicles like electric, hybrid, and Compressed
technology and well-planned and regular
have mandatory and periodic emission testing
health hazards of emission and the fact that
convertors and other parts of their vehicles
general roadworthiness testing but not for
prevent vehicular emissions in our
primarily on the installed emission
vehicles. This includes mandatory testing for
emissions after a certain period of running a
component. The study further urges vehicle
sense that, as of now, our country does not
country should encourage using clean energy
Natural Gas (CNG) powered vehicles to help
impose emission testing measures on all
that are vital for emission control. Finally, the
emission tests, which are only done at the

vehicle. This is such an essential aspect in the environment.