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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

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**GREEN RESEARCH, INNOVATION &
SUSTAINABLE DEVELOPMENT: A MEANS TO
DIVERSIFICATION OF MONO-CULTURAL ECONOMIES**



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CONTENTS

Content	Page
Title page	i
Table of Content	ii
Forward	vi
Acknowledgement	vii
Sustainability context analysis of municipal solid waste management in Harare, Zimbabwe <i>Trust Nhubu, Edison Muzenda, Charles Mbohwa, & Emma Agbenyeku</i>	1 – 6
Characteristics of Sandcrete Blocks: A Review <i>Akanbi, T.Y, Abdullahi, M, & Adesiji, A.R.</i>	7- 10
Dimensional Compliance and Compressive Strength of Sandcrete Hollow Blocks Produced in Minna Metropolis <i>Yusuf, A., Aminulai, H. O, Abdullahi, A, Alhaji, B & Alalade, A. I</i>	11 – 16
Impact of Change in Oil Market Price on the Price of Selected Building Materials in Kaduna State <i>Shittu, A. A, Adamu, A, Issa, A. A & Shehu, M. A</i>	17 – 24
Assessment of Challenges of Sustainable Rural Water Supply in Makurdi Local Government Area of Benue State <i>Jijngi, H. E, Musa, A. Y & Sambo, A. D</i>	25 – 33
A Review on Factors Affecting Municipal Solid Waste Generation <i>Masebinu, S. O, Akinlabi, E. T, Muzenda, E, Aboyade, A. O, Mbohwa, C, Manyuchi, M. & Naidoo, P</i>	34 – 39
The Impact of Educational Technology Tools in Architectural Education in Nigeria <i>Ofide O.D & Muhammad, I. B</i>	40 – 44
Implementation of Sustainable Practices in American University of Nigeria, Yola: Challenges and Prospects <i>Lelle, H. S & Jimoh, R. A</i>	45 – 52
Comparison of Drying Shrinkage Models of IOT Concrete <i>Oritola, S. F, Saleh, A. L, Mohd Sam, A. R, Ahubakar, M & Alhaji, B</i>	53 – 59
Compression Index Prediction Models for Fine-grained Soil Deposits in Nigeria <i>Alhaji, M. M, Alhassan, M, Tsado, T. Y, Mohammed, Y. A & Tella, I</i>	60 – 65
Susceptibility and Defects from the Active Life of Landfill Geomembrane Liners <i>Agbenyeku Emem-Obong Emmanuel, Muzenda Edison, & Msibi Mandla Innocent</i>	66 – 75
Liner-Leachate Interaction Curve Models for Clayey Soils from Landfills around the City of Johannesburg <i>Agbenyeku Emem-Obong Emmanuel, Muzenda Edison, Msibi Mandla Innocent</i>	76 – 82
Assessment of Quality of Sand from Rivers Imo and Otamiri, Imo State for Construction Purposes <i>Adejumo, T. W. & Esau, I. F</i>	83 – 88
Assessment of Safety Provisions on Building Construction Sites in Abuja, Nigeria: Professionals and Workers Perspective <i>Kolo, D. N, Yitmen, I, Tsado, T. Y, Abdullahi, M, and Yakubu, D.M.</i>	89 – 94

Characterization of Groundwater Quality using Water Quality Index: A Case Study of Minna City	95 – 104
<i>Adesina, A.R., Odekinle, M., Gbadebo, A.O., Saidu, M., Malachy, B., Idowu, O., Elargun, M. & Mohammed, T.</i>	
Profiling Causes and Effects of Variation Order on the Performance of Civil Engineering Projects	105 – 111
<i>Ibrahim, M. O. & Idhake, J. E.</i>	
Assessment of River Asa Catchment Soil for Heavy Metal Pollution Using Indices Methods	112 – 119
<i>Animashaun, I. M., Karim, Kuti, I. A., Aroboinosen, H., Isa, R. O. & Salaudeen, O. H.</i>	
Development of an Artificial Neural Network Model For Daily Electrical Energy Management	120 – 125
<i>Abdullahi, J. M., Salawu, B. T., Maliki, D., Nuhu, B. K. & Aliyu, I.</i>	
A Review of Performance Characteristics of a Micro-strip Line	126 – 131
<i>Ghavan Bundega Martins, Michael David and Michael Stephen Otor</i>	
Comparative Analysis of the Accuracy of Forensic Result in Window and Android Phones	132 – 139
<i>John K. Alhassan, Bilikisu Abubakar, Morufu Olalere, Shafi'i Muhammad Abdulhamid and Suleiman Ahmad</i>	
Comparative Analysis of the Accuracy of Forensic Results obtained from Window and Android Platforms	140 – 147
<i>John K. Alhassan, Hassan T. Abdulazeez, Shafi'i Muhammad Abdulhamid, Suleiman Ahmad and Olanwale S. Adehayo</i>	
Iterative Parameter Selection Based Artificial Neural Network for Water Quality Prediction in Tank-Cultured Aquaculture System	148 – 154
<i>Folorunso, T. A., Aibinu, A. M., Kolo, J. G., Sa'iku, S. O. E. & Orire, A. M.</i>	
The Imperatives of Electrical Redundancy and Contingency Design for Critical Sections in a University Power Supply Network	155 – 161
<i>Isah, A. O., Alhassan, J. K., Subairu, S. O., Tola, O. J. & Ambafi, J. G.</i>	
Forensic Analysis of KIK Messenger on Android Devices	162 – 169
<i>Olanwale Surajudeen Adebayo, Salamatu Aliyu Sulaiman, Oluwafemi Osho, Shafi'i Muhammad Abdulhamid and John K. Alhassan</i>	
ICT in Urban Crime Prevention and Management in Minna Nigeria	170 – 177
<i>Mambo, A. D., Kurfi, S., Isa, H. Y. & Shehu, I. U.</i>	
Effect of Harmattan Dust in Kano Area on Cross Polarization of Microwave Radio Access Link Operating Between 15 GHz and 38 GHz	178 – 186
<i>Aikhunbare, H., San, S. M. & Tekanyi, A. M. S. Usman A. D. & Mohammed I.</i>	
Performance Evaluation of IGBT and MOSFET Solid-State Soft Starter for 3-Phase Induction Motor	187 – 194
<i>Yakubu, I., Rahimi, Lanre Olatomiwa, A. S. Mohammed, E. O. Aghachi</i>	
Adaptive Neuro-Fuzzy Based Optimal Routing Path Determination in Ad-Hoc Network	195 – 203
<i>Mohammed, I., Usman A. D. & Tekanyi A. M. S., Aikhunbare H.</i>	
Power Flow Solution for Voltage Stability Improvement using Static VAR Compensation and Genetic Algorithm Optimization (A case study of the Nigerian 330kV Power system Network)	204 – 215
<i>Lawal, O. A., Sule, T. K. & Alao, R. A.</i>	

Modeling and Analysis of a Permanent Magnet Synchronous Generator Dedicated to Wind Energy Conversion <i>Tolu D. I. Umeh, E. A.</i>	216 – 225
Survey of Techniques for Detecting Covert Members of Dark Networks <i>Ismail, A. I. Onwuka, E. N., Salihu, B. A., & Uhadike, O. C.</i>	226 – 233
Techno-Economic Evaluation of Standalone Hybrid Renewable Power System for a Remote Location in Nigeria <i>Chukwuke, Arlene, Lanre Olatoniba, Daniel Akinyele</i>	234 – 243
Technical Issues on Integrating Solar Photovoltaic Distribution Generation on Distribution Network <i>John Nweke & Lawal Muhammad Isah</i>	244 – 250
Analysis of Double Salient Reluctance Machine Using Total Surface Gap Area <i>Enesi, A. Y., Ejiofor, E. C., Anih, L. U.</i>	251 – 257
Ergodic Capacity of Underlay Cognitive Radio With Asymmetric Fading Channels Under Imperfect Channel State Information <i>Abba, A. M., Usman, A. D., Sanr, S. M & Ajagbonna, B. E.</i>	258 – 265
A Hybrid Scheme for Localizing Rogue Secondary User in a Mobile Cognitive Radio Network <i>S. A. Adebisi, E. N. Onwuka, A. U. Usman, A. J. Onumanyi</i>	266 – 270
An Improved Genetic Algorithm for Optimization of Mathematical Test Functions <i>Bello-Salau, H. Atibotu, A. M., Onwuka, E. N., Dukisa, J. J. & Onumanyi, A. J.</i>	271 – 277
Empirical Pathloss Models for the 802.11a/b/g Propagation Channel at the Bosso Campus of the Federal University of Technology, Minna <i>Bejide, O. V., Onumanyi, A. J. & Onwuka, E. N.</i>	278 – 283
Comparative Study of the Effect of Sensing Parameters on Ozone Gas Absorption-Cross-Section <i>Enenche Patrick, Michael David, C.O. Alenoghena, Salihu Alhaji Bala, Abolarinwa Joshua Adegboye, and Adeiza James Onumanyi</i>	284 – 290
Comparative Performance Analyses of Adaptive Threshold Techniques for Energy Detection in Cognitive Radio Network <i>Adedeyi, A. M., Onumanyi, A. J., Akinu, A. M.</i>	291 – 300
Conservation Voltage Reduction (CVR) Technique: A Review <i>Habibu, H., Abimbola, S. A., Athraf, A. A. & Nwazor, O. E.</i>	301- 306
Survey on Interference Mitigation on LTE-A FEMTO Cell Heterogeneous Network <i>Salihu A. B., Abolarinwa J. & Onu C.</i>	307 – 315
A Survey on Fractional Frequency Reuse in LTE-A FEMTO CELL <i>Salihu A. B., Abolarinwa J. & Onu C.</i>	316 – 321
Application of Renewable Energy Options - The Role of Solar Adsorption Cooling Technology <i>Abdulkadir, M. S., Kufu, A. M. & Bello, S.</i>	322 – 326
Energy Efficiency Estimation of a LTE Advanced HetNet Utilizing a Hybrid Channel-Gain Access-Aware Cell Selection Scheme <i>Ajagbonna, B. E., Tekanyi, A., Gadam, A. M. and Abba, A.</i>	327 – 335

Wind Energy: The Future for Nigeria	336 – 346
<i>Atolagbe, G.A, Abdulrahman, A.S, Adedipe, O, Yaman, S.A, Alli, D.O & Oramalu, C.O</i>	
Towards a Comparative Review of Background Noise Interferences and Attenuation Techniques in Mobile Phone	347 – 356
<i>Abdulrazaq, A. A., Aboaba, A. A., Ngene C.U.</i>	
Mitigation of Sybil Attack on A Campus Network (Cunet) Using Inter-Arrival Time Threshold and Physical Address Comparison	357 – 362
<i>Onomza Victor Waziri, Balikis Bukola Jimoh, Marufu Olalere, Shafi'i Muhammad Abdulhamid and Ismaila Idris</i>	
Performance Analysis of Data Normalization Methods	363 – 368
<i>Ajiboye, J. A, Aibinu, M. A</i>	
Bacterial Foraging Algorithm Based Scheduling for Optimal Siting and Sizing of UPQC in Standard IEEE 33-Bus Test Network	369 – 374
<i>Musa, U, Mohammad, A, Umar, A, & Olaniyan, A. A</i>	
An Assessment of Renewable Energy Impact on Economic Development in Nigeria	375 – 381
<i>Egila, A. E & Diugwu, I.</i>	
Reviewing the Effects of Different Standardization Techniques on the Performance of the UCI Repository Hepatitis Dataset	382 – 385
<i>Aneh A.I. & Aibinu A.M.</i>	
Effects of Normalization on Diabetes Mellitus Determination: A Technical Review	386 – 394
<i>Dania, D. E, Abiodun, M.</i>	
Electronic circuit realization and Adaptive Control of a Chaotic Permanent Magnet Synchronous Motor	395 – 404
<i>Umoh, E. A, Tola, O. J.</i>	
Embedded System Based Internet of Things for Smart Home/Office Appliances Control using Wi-Fi Technology	405 – 412
<i>L. A. Ajao, J. Agajo, J. G. Kolo, A. Ahmed, O. C. Inalegwu, B. K. Nuhu</i>	
Evaluation of Speech Quality Based on Qos Key Performance Index (KPI): A Survey	413 – 420
<i>Gbadamasi, A. S, & Maliki, D.</i>	
Development of a Biometric Based Car Park Access Control and Billing System	421 – 425
<i>Ogbole Collins Inalegwu, Eustace M. Dogo, Jonathan Uama Kolo, Muhammad Enagi Bimo, Isikmon Adewale Ajao, & Joshua Inechioma</i>	
Development of a GSM Signal Booster for the 900 and 1800 MHz Bands Using BA-ANN	426 - 432
<i>S. Aliyu, E. N. Onwuka, M. Okwori, A. Victor & M. Suleiman</i>	
Characterization and Grading of some Potential Nigerian Timbers Species in Accordance to Eurocode EN 338(2009)	433 - 440
<i>Ibiolu, B. I & Jimoh A.A</i>	

FORWARD

The School of Engineering and Engineering Technology, Federal University of Technology, Minna, organized the 1st International Engineering Conference in 2015 with tremendous attendance and success. The huge success of the 1st IEC gave the committee the strength to organize this 2nd International Engineering Conference (IEC 2017) with the theme **Green Research, Innovation and Sustainable Development: A Means to Diversification of Mono-Cultural economies.**

The conference intends to provide opportunities for researchers, engineers, captains of industries, scientists, academics, security personnel and others who are interested in diversification of mono-cultural economies using green research and Innovation towards sustainable development to present and brainstorm on ideas and come out with a communique that will give the way forward in this respect. To arrive at this communique, the following sub-themes were carefully coined to guide the authors' submissions:

- ❖ Innovative Research, Development and Commercialization Policy.
- ❖ Electrical Power System and Electronic Engineering for National Economic Development
- ❖ Flood Disaster Management and Adaptation for Sustainable Development.
- ❖ Sustainable Water Supply, Sanitation and Water Quality Management. Sustainable Environmental Engineering and Management.
- ❖ Solid Minerals Potential Exploration for National Economic Development.
- ❖ Post-Harvest Technology and Food Security.
- ❖ Small and Medium Scale Enterprises for National Economic Development.
- ❖ Sustainable and Emerging Renewable Energy Technologies for Economic Development.
- ❖ Information and Communication Technology for Sustainable Economic and Security.
- ❖ Content Initiatives and Development.
- ❖ Structural Integrity and Geotechnical Survey for Sustainable Infrastructural Development.
- ❖ Sustainable Engineering Education and Curriculum Development.
- ❖ Engineering Entrepreneurship for National Economic Development.
- ❖ Green and Sustainable Built-Environment.
- ❖ Energy Economy, Planning and Management.

The conference editorial and Technical Board have members from the United Kingdom, Saudi Arabia, South Africa, Malaysia, Australia and Nigeria. The conference received submissions from 10 countries viz: United States of America, United Kingdom, Canada, the republic of Cyprus, Turkey, Malaysia, Botswana, South Africa, Netherlands and Nigeria. I am very happy to state that 142 papers were received and subjected to blind peer review process. Each of the paper was reviewed by two personalities who have in-depth knowledge of the subject discussed by the paper. At the end of the review process, 135 papers were accepted and recommended for presentation and publication in the conference proceedings. The conference proceedings will be indexed in Scopus.

Let me on behalf of the organizing committee seize this opportunity to thank you all for participating in the conference. Our sincere gratitude to the reviewers for finding time to do a thorough review. Thank you all and we hope to see you during the 3rd International Engineering Conference (IEC 2019).

Engr. Dr. A. Nasir
Chairman, Conference Organizing Committee

ACKNOWLEDGEMENT

The Chairman and members of the Conference Organizing Committee (COC) of the 2nd International Engineering Conference (IEC 2017) wish to express our gratitude to the Vice Chancellor and the management of the Federal University of Technology, Minna, the Dean and all staff of the School of Engineering and Engineering Technology (SPET) for the moral and financial support towards the successful hosting of this conference. We also thank the entire staff of the university who contributed in one way or the other. We are sincerely grateful to you all.



Impact of Change in Oil Market Price on the Price of Selected Building Materials in Kaduna State

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ABSTRACT

Past studies have discovered that high cost of construction is a major problem in the Nigerian construction industry. Therefore an increase in cost of construction projects is due to increase in price of petroleum products. This research therefore assessed the impact of oil market prices on the prices of building materials in Nigeria. Data were collected using questionnaire and checklist. Data obtained were analyzed using Relative Important Index, and simple linear regression. Data and results were presented using bar charts and tables. Findings from the study revealed that there was inconsistent annual increase in price of petrol from year 2000 to 2015. The descriptive analysis shows that change in petrol price lead to change in price of building materials. The result of the regression analysis shows that there exists a strong, positive and significant relationship between the price of petrol and prices of building materials. The null hypothesis was therefore rejected. Furthermore, it was stated that Exchange Value of Dollar was the major cause of changes in oil price and Promoting Competition was revealed as the major way of controlling oil price in Nigeria. It was concluded that change in oil market price has significant impact on the price of building materials. It was recommended that there should be a regulation on the price of petrol and building materials; that is minimum and maximum price legislation should be established in order to control the price of building materials.

Keywords: Building materials, oil market price, petroleum.

1 INTRODUCTION

The construction industry greatly contributes to the economy of any nation because it provides sources of livelihood and shelter for the citizens to be able to successfully carryout a project. Material, plant and labour are required for the successful execution of any project. Materials cover 50% - 60% of the cost of construction, labour takes 35% - 40% of the cost of construction while plant covers 5% of the cost of building projects.

Construction projects involve extensive use of materials. According to Obiegbo (2003), the construction industry is vulnerable to inflation in prices of materials. Materials needed for erecting and completing construction works could amount to about 35-45 percent of the total project cost while in some other projects, the materials cost may be as high as 60 percent. Inadi (2004) stated that building material is the largest input in the construction industry. Therefore, the cost of material is very important. Cost of material in construction industry is directly or indirectly influenced by the cost of petroleum product. This is because petroleum product is used as fuel during production of some materials as well as for transportation of material to where they are needed. Petroleum products like petrol and diesel are also used for operating or construction of equipment such as truck, Vibrator, Jack hammer and concrete mixer among others. Nigeria is the largest country in Africa and sixth in the world in the production of crude oil discovered in 1956 and started production in 1958. Nigeria joined the Organization of Petroleum Exporting Countries (OPEC)

in 1971. Prices of petroleum products have been increasing since 1977 until recently in 2012 when the Price of petroleum products became a bit stable. According to Isyaka (2014) Nigeria is one of the leading oil producing countries in the world, but despite the abundant natural resources in Nigeria, the country still suffers from massive shortage of Premium Motor Spirit (PMS) and its distribution to cater for the needs of the numerous users of its end product.

It was discovered that inflation in cost of construction is a major setback in Nigerian construction industry and the cost of construction projects have inflated due to persistent increase in price of petrol product (Shittu *et al.* 2013). Therefore all construction projects have increased in total cost of construction due to the persistent increase in the price of petroleum products resulting to variation and inconsistency of market price of material for building projects (Shittu *et al.* 2015a and b).

In the recent past and even up till now, the price of petrol has been inconsistently changing. The marketers who sell at the official price are few and unable to meet the demand of the population, while those who sell above the official price are the marketers that can meet the demand of the population. In the view of this, price of petrol has been inconsistent and increase of the price of petroleum is usually the case. This affects the prices of building materials and other commodities.

To this effect, Shittu *et al.* (2013), in a study to investigate the impact of petroleum price increase on the cost of building finishings during the period of unstable fuel price, discovered that the total cost of all construction



projects have increased due to increase in price of petroleum products. This variation and fluctuation of market price of material for construction projects has led to cost overrun and project abandonment. The change in price of building materials from 2000 to 2015 during the period of fuel stability therefore, leaves a gap which needs to be filled. As a result of this, this research studied the nature of cost of building materials when the price of fuel was unstable and when it became stable in order to fill this gap. This research is therefore important to help consultants and contractors execute construction projects in terms of effective management, planning and delivery. It will also assist policy maker to proffer everlasting solution to the changes in oil price. In the light of these, this study examined the impacts of oil market price on the price of building material in Nigeria.

In order to address the problem identified and to fill the research gap, this study set out to assess the impact of changes in oil market price on the price of selected building materials using regulated official and unregulated/unofficial oil prices from 2000 to 2015 using Kaduna State as the study area. Kaduna State was chosen because lots of buildings materials are manufactured and transported to the state. Kaduna State is also a center for the importation of these buildings material. The study considered 5 major materials used in construction industries which include the cement, coloured zinc, and paints.

To achieve the aim of the study, the research was targeted towards achieving the following objective:

- i. To identify the major causes of changes in oil prices
- ii. To present trend in the price of petrol between 2000 and 2015
- iii. To compare the trend in the prices of petrol and some selected building materials from 2000 to 2015
- iv. To establish the relationship between the price of petrol and prices of selected building materials
- v. To identify major ways to control the changes in oil prices

The findings from previous studies, the study's background and the fourth research objective led to the formulation of the following pair of hypothesis

- H. There is no significant relationship between price of oil and price of building materials
- H. There is significant relationship between price of oil and price of building materials

1.1 THE PETROLEUM INDUSTRY

Sina (2014) stated that oil was revealed in Nigeria in the southern part of the country at Oloibiri in Niger Delta area in 1956. It was found by Shell-BP, in the period of the sole concessionaire. Nigeria were among the oil

producers in 1958 when its earliest oil field came on stream producing 5 100 bpd. After 1960, investigation rights in on-shores and off-shores areas adjoining Niger Delta were extended to other foreign companies. In 1965 the EA field was revealed by Shell in shallows water southeast of Warri.

Nigeria became part of the Organization of Petroleum Exporting Countries (OPEC) in 1971 and successfully established the Nigerian National Petroleum Company (NNPC) in 1977 with branches in state like Kaduna, Warri, Abuja and so on. It is a state owned and controlled company which is a major player in both the upstream and downstream sectors. Petroleum production and export play a dominant role in Nigeria's economy and account for about 90% of her gross earnings. This dominant role has pushed agriculture, the traditional mainstay of the economy. Therefore, petroleum is one of the Nigeria's most valuable endowment from which it's derive revenue to run the country's and on which livelihood of a social political life substantially depends on.

The activities in oil and gas industry are usually divided into upstream and downstream sector. The upstream cover all activities related to the exploration, production of crude oil or natural gas from underground, discovery and extraction of oil and their treatment, transportation and delivery to designed export terminals or otherwise to processing plants such as refineries. The downstream segment comprises all other activities following delivery to processing plants. These include refining and subsequent conversion to petrochemical product, transportation and marketing of the finished products.

1.2 EFFECTS OF FLUCTUATION OF CRUDE OIL PRICE ON PRICE OF PETROL

Ocheni (2015) stated that majority of the citizen believe that when there is change in price of petroleum product there will be sharp fall in economic growth of a given nation and therefore affect small businesses which led to high price of commodity. The worldwide economy and especially the Nigerian economy are backward in their business in the past previous years, even the banking sector faces setback in Nigeria which is yet to be resolved up till today. The central bank struggle throughout the period to control the price inflation and therefore spending much money to defend the value naira in the foreign exchange market. It is also a guide for the general health of any given economy. Nigeria economic structure at this time is not able to give an answer to price shocks for over 100 percent increase today.

1.3 CAUSES OF CHANGE IN OIL PRICES

Shittu *et al.* (2015a and b) attributed the causes of inconsistencies in price of petrol as highlighted below



1.3.1 Production by OPEC: OPEC is said to be the main body that has more influences to the changes in the price of fuel in the country, is an association made up of thirteen countries which Nigeria and Saudi Arabia are all part of it. OPEC controls almost 40% of the world supply of oil. The group sets the level of production to convene the world demand and also monitor the fuel price by inflating or deflating the production. The prices of fuel begin to fall. It fell and a hit the highest point of above \$100 per barrel to below \$50 a barrel. In addition it has been observed that OPEC was also main cause of low-price of oil.

1.3.2 Law of demand and supply: When supply is more than the demand, possibly there would be downfall in the prices of commodity and vice-versa. When there is downfall in the price of commodity it give negative impact in the demand for fuel in Europe and other countries and it lead to low demand.

1.3.3 Natural disaster: This is an act of God which causes so much damage to building and equipments for which no man can stop it.

1.3.4 Production cost: Fall and rise in price of fuel is cause by cost of production. To extract oil in the Middle East region is comparatively cheap while in other part of is more costly. When the oil is supply at a cheaper rate it will be exhausted.

1.3.5 Political instability: In the Middle East Political instability makes price of fuel to change, as the province accounts for the bigger portions of the global oil market supply. For instance, in the middle year of 2008, the oil price per barrel has reach \$135, based on the disorderliness and fear of the consumer on war.

1.3.6 Speculation: speculation is another contributor in oil price fluctuations. Oil producers and consumers store up crude oil for urgent upcoming purposes. They conjecture on the price expectations and arbitrage opportunities base on any irregular changes in supply and demand balances.

1.3.7 Restrictive Legislation: It is said to be that world oil assets are handled by government-run companies. The worldwide petrol market is deeply govern and its functionality is very competitive and its far away from the competitive market. Banning of exploration by government in a place where there is verified and confirmed reserves can cause too much lose in a commodity market.

1.3.8 Political Unrest: If an oil-rich area becomes politically unbalanced, supplier markets react by ordering the price of oil so that supplies are still available to the uppermost bidder.

1.3.9 Financial Markets: The equality of Oil marketer's that is the buyers and the sellers of crude oil, and the trader contractor for prospect delivery of oil also known to be the future. Clients pay for futures to evade against oil price hike that could unfavorably affect their productivity. Oil producers sell oil futures contracts for the purpose of locking up in a price for a specific period of time and oil

marketers purchase oil futures to promise future delivery of oil at a certain price.

1.3.10 Weather: Unlike other commodities when there is change in weather it really affects the demand for petrol for instance oil is more consumed in the winter period as a result of too much of heats.

1.3.11 Exchange Value of the Dollar: In international market Petrol is marketed in dollars. When there is fall in Dollar generally there will be raise in demand of petrol and also corresponding increase in the price petrol. on the contrary the rise of the dollar reduce the income coming into countries, and therefore falls in the demand for oil and lowering prices.

1.4 WAYS OF CONTROLLING PRICE HIKE OF PETROL PRODUCTS

Higher oil price have obvious costs such as steeper energy bills for households and companies, more inflations, and large trade deficit. The most effective response to oil price volatility is simply to allow markets to work. Government restrictions and regulations impede the market effectiveness in responding to changes in oil price, further attempts to reduce our dependence on oil by subsidizing alternative fuels or creating fuel efficiency standards waste taxpayer dollars and do little to reduce dependence on oil. In view of this, Gupta (2015) put an attempt to identify various means to control the hike in prices of petrol as highlighted below.

- i. **Marketing of Petrol.** The petrol is largely an item of final consumption. An analysis of the trend of petrol consumption by the automobile owners reveals that increase in prices of petrol can be borne by motorized vehicle owners.
- ii. **Promoting Competition:** A market-determined pricing system for petrol and diesel can be sustained in the long run by providing level playing field and promoting competition among all players, public and private, in the oil and gas sector.
- iii. **Transparent and Effective Distribution.** A transparent and effective distribution system for Public Distribution System kerosene and domestic LPG can be ensured through UID Smartcards framework.
- iv. **A Viable Long-Term Strategy for Pricing Major Petroleum Products.** This has to be workable over a wide range of international oil prices and has to meet the various objectives of the government.
- v. **Promote the Usage of Solar Energy.** Some attempts should be made to promote the usage of solar energy as it will last forever.
- vi. **The Use of APC (Automated petro cards):** An APC model has also been framed which describes the impact of fixing of quota on different sectors like general people, petrol pump dealers, retailers, society, government, economy, OPEC and the whole world. This quota helps us to implement the



smart card system to every vehicle owner in the country.

- vii. **Promoting Other Source of Energy:** Nuclear energy, sea energy (generated by waves) and wind energy should be promoted extensible for the generation of electricity which can be used for the usage of electric cars and their promotion.
- viii. **Regulating Excise Duties:** Petrol and diesel used in cars, including SUVs, are for final consumption. The higher excise duty on petrol compared to diesel encourages use of diesel cars. An additional excise duty should be levied on diesel car owners.

2 METHODOLOGY

The study employed the used a quantitative research approach. Data was obtained from both primary and secondary sources. Semi-structured questionnaires and data collection checklist were used to collect data. The use of both descriptive and inferential methods was employed to analyse data collected for the study.

The population for the study comprised the number of official PPMC and the unofficial PPMC (black marketers) and registered sellers of building materials in Kaduna. For the purpose of this research and its viability, only one number of official PPMC and 10 numbers of unofficial PPMC was visited, and also a total number of 50 questionnaires were distributed among the various sellers of these building materials. The sampling frame of this research is restricted to professionals in the marketing of petrol and building materials located within Kaduna State. The data was collected for the study was presented with the use of tables and graphs. Bar chart was employed to present the trend in the price of petrol from 2000 to 2015. Bar and line graph was also used to compare the trend in the petrol price and some selected building materials from 2000 - 2015. The use of regression analyses was employed to determine the relationship between two variables which are petrol price and building materials prices. The identified causes of change in oil market prices were ranked in order of occurrences using relative importance index (RII). The identified ways of controlling increase in oil prices was also ranked in order of importance using RII.

3 RESULTS AND DISCUSSION

For the purpose of this study data collected are represented and analyzed in Table 1

TABLE 1: Research Data on Price of Petrol and Selected Building Materials

YEAR	PRICE OF PETROL (₦/N=)	PRICE OF CEMENT (₦/50kg)	PRICE OF PAINT (₦/50kg)	PRICE OF CEMENT ZINC (₦/50kg)
2000	22.00	640.00	700.00	5500.00
2001	22.00	640.00	700.00	5500.00
2002	26.00	650.00	750.00	5700.00
2003	34.00	700.00	800.00	5900.00
2004	46.00	700.00	800.00	6000.00
2005	57.00	750.00	900.00	6500.00
2006	73.00	750.00	1000.00	6500.00
2007	81.00	780.00	1000.00	6500.00
2008	88.00	790.00	1175.00	6425.00
2009	74.00	1550.00	1175.00	7900.00
2010	83.00	1750.00	1238.00	9000.00
2011	90.00	1850.00	1500.00	9950.00
2012	121.00	2000.00	1700.00	11273.00
2013	97.00	2000.00	2100.00	14125.00
2014	97.00	1875.00	2360.00	15400.00
2015	87.00	1575.00	2500.00	13440.00

Source: i. Researchers' Field Work (2016)
ii. Market Survey (2016)

3.1 PRESENTATIONS AND DISCUSSIONS OF RESULT FOR DESCRIPTIVE ANALYSIS

3.2.1 Trends in Price of Petrol and Selected Building Materials

The trend analysis for the petrol price and price of each building material was employed with the aid of bar and line graph are presented and discussed in Figure 1.

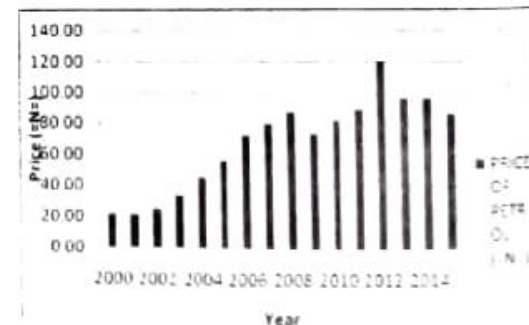
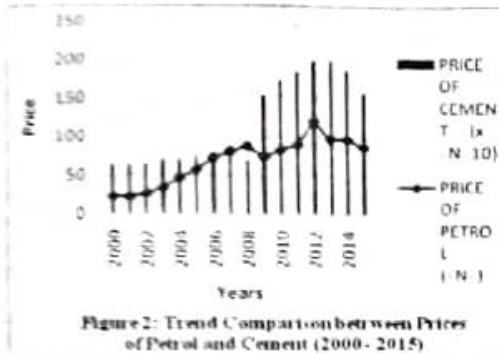
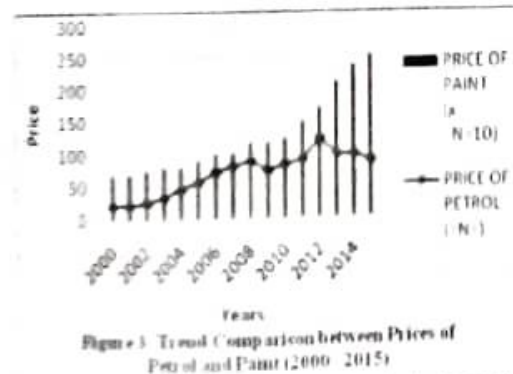


Figure 1: Trend in the Price of Petrol between 2000 and 2015

Figure 1 shows the trend in the price of petrol between 2000 and 2015. It was observed from the chart above that the price of petrol increases every year and it was inconsistent. It was also observed that the highest price of petrol was witnessed in 2012, while the lowest price was certified in 2000 and 2001. There was consistent increase in the price of petrol between year 2002 and 2008 and slight decrease in 2009. After then it maintain its previous trend, that is inconsistent increase in the price.

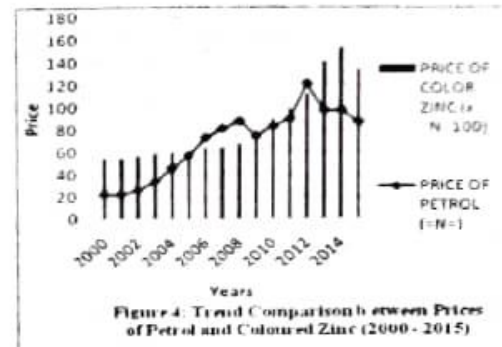


From Figure 2 above, it was clearly observed that the highest price of cement was revealed in 2012 and 2013 as a result of high price of petrol during the period. And the lowest price was obtained between 2000 and 2001. From 2002 to 2007 there was a slow boost in the price of cement in proportion with the petrol price, but in 2008 the price decreases. It was also observed that from 2009 to 2012 there was rapid increase in the price of cement which almost double the price in 2008. But from 2012 to 2015 there was steady increase in the price of cement. From the fig above it shows that between 2004 and 2015 there was decrease in the price of cement. In the same figure we can observed that whenever there is change in the petrol price it really affect the price of cement on the other hand it can be assume that when the price of petrol is stable likely the price of cement will not be affected. This shows that there is dependency between the prices of petrol and the prices of cements.



It can also be seen from Figure 3 that highest price of cement was witnessed in 2015. And the lowest price was obtained between 2000 and 2001. It was observed from the chart above that the price of paint increases slowly from 2002 to 2012 but it increases rapidly from 2013 to 2015. In this chart there wasn't any decrease in the price of petrol in respective of the changes in the price of petrol.

The price of paint is not affected by the price of petrol compare to the other material paint inflate with only small amount. Which can also be seen from the chart above.



From Figure 4 it was clearly observed that highest price of coloured zinc was observed in 2014. And the lowest price was obtained between 2000 and 2001. It was clearly shown from the chart above that from 2000 to 2008 the price of coloured zinc increases with only N200. But in 2013 and 2014 the price increased rapidly and also decreases in 2015. From the first 8 years there was consistent increase in the price of zinc in relation with the petrol price but in the last 8 years the prices was not consistences therefore the chart was zig zag in shape.

3.2.2 Examination of Causes in Changes in Oil Price

The use of RII was employed to rank the factors causing oil price inflation in order of their occurrence. The result is presented in Table 2.

S/NO	CAUSES OF CHANGES IN OIL PRICE	MEAN SCORE	RII	RANK
1	Exchange Value of Dollar	3.87	0.77	1 st
2	Law of Demand and Supply	3.57	0.71	2 nd
3	Political Instability	3.53	0.71	3 rd
4	Production by OPEC	3.43	0.69	4 th
5	Speculation	3.37	0.67	5 th
6	Demand and Supply Imbalances	3.33	0.67	6 th
7	Restrictive Legislation	3.27	0.65	7 th
8	Production Cost	3.23	0.65	8 th
9	Political Unrest	3.13	0.63	9 th
10	Financial Markets	3.10	0.62	10 th
11	Natural Disasters	2.87	0.57	11 th
12	Weather	2.17	0.43	12 th

Source: Researchers' Field Work (2016)

It was revealed that Exchange Value of Dollar was ranked 1st, which had the highest relative importance index of (0.77), followed by Law of Demand and Supply and Political Instability, both having relative importance of 0.71. Then follow by Production by OPEC, which also had RII of 0.69. Also Speculation, Demand and Supply



Imbalances both had RII of 0.67 Restrictive Legislation and Production Cost was also having RII of 0.65 making it the seventh and eighth in the rank. Next in the ranking is Political Unrest and Financial Markets both having RII of 0.63 and 0.62 respectively. It was also observed from the table above that Natural Disasters was the next factor with relative importance index of 0.57. On the other hand Weather factor was discovered to be the least and last factor among the factors causing oil price inflation in Nigeria, having relative importance index of 0.43.

3.2.3 Assessment of Ways of Controlling Changes in Oil Prices

The control measures of oil price inflation were ranked in order of their effectiveness using RII and the result is presented in Table 3.

TABLE 3 Control Measures of Oil Price Inflation

S/NO.	CONTROL MEASURES OF OIL PRICE INFLATION	MEAN SCORE	RII	RANK
1	Promoting Competition	4.30	0.86	1 st
2	Transparent and Effective Distribution	3.76	0.73	2 nd
3	Marketing of Petrol price	3.53	0.71	3 rd
4	Regulating the Excise Duty	3.33	0.67	4 th
5	Strategic plans for Pricing Major Petrol Product	3.23	0.65	5 th
6	Promote usage of Solar Energy	3.03	0.61	6 th
7	Use of Automate Petrol Card Model	2.57	0.51	7 th

Source: Researchers' Field Work (2016)

Table 3 revealed Promoting Competition was ranked highest among the ways of controlling oil price having the highest RII of 0.86, which was then followed by Transparent and Effective Distribution which was the second on the rank with RII of 0.73, also Marketing of Petrol price also followed with RII of 0.71. Regulating the Excise Duty with relative important index of 0.67 was the next on the list of the ranking. Viable Long Terms Strategic plan for pricing most Petrol Product tend to be the fifth on the list with RII of 0.65, then Promote usage of Solar Energy was also rank sixth with RII of 0.61. Then the least among the ranking was the Use of Automate Petrol Card Model with the least relative importance index of 0.51.

3.3 Results of Regression Analysis

It was revealed from the first regression analysis in Table 4 that there exists strong and significant relationship between the prices of petrol and cement. Coefficients of determination also known as the (R^2) value was revealed to be 64% which implies that there is strong relationship and the correlation coefficient also known as the (R) was observed to be 80% which also indicate strong degree association of the two variables. To the positives correlation observes the variable indicating a whenever there is raised in the petrol price it will then follow by a corresponding increase in the cement prices and reverse also be the case. The value of calculated F of 24.945 observed was more than the values of tabulated F of 4.60 and the P value of 0.000 was not up to 0.05. Therefore it leads to the rejection of null hypothesis and accepting the alternative hypothesis.

It was also discovered from Table 4 that there exists a strong, positive and significant relationships between prices of petrol and price of paint in the second analysis. The coefficients of determinations also known as the R^2 was revealed to be 56% which implies strong relationships and the correlation coefficient also known as the R and was observed to be 75% also signifying strong degrees of associations between two variables. The observable positive correlations between two variables shows the tendencies that rise in the petrol price will follow by corresponding rise in the paint prices and with the order reversed. The value of calculated F 18.004 indicate to be more than the value of tabulated F of 4.60 whereas the P value of 0.001 revealed to be less than 0.05. Therefore it was observed that null hypothesis was rejected.

A strong and significant relationship was also realized between prices of petrol and coloured zinc in the third analysis as shown in Table 4. The R^2 also known as coefficient of determination revealed was 55% implied a strong relationship and the correlations coefficients revealed was 74% signifying strong degree of associations of the two variable. The positive correlations observed between variable showed the tendencies that rise in petrol price will follow by a resultant rise in the prices of coloured zinc and the opposite way. The calculated F value of 16.773 was more than the tabulated F of 4.60 whereas the P value of 0.001 observes was not up to 0.05. Therefore the H_0 was rejected. The summary of the results of regression analysis are shown in Table 4.



TABLE 4: Results Summary for Regression Analysis

Anal ysis No	Variables		Type of Model	Observations					Inferences			
	X	Y		Regression Equation	R/R ² r ²	F _{cal}	F _{tab}	P _{value}	Strengt h of Relatio nship	Rem ark	Action On Hypothesi s	
1	Price of Petrol	Price of Cement	Linear (Simpl e)	Y = 160.451 + 14.972x	80/64		24.945	4.60	0.000	Strong	SS	Reject H ₀
2	Price of Petrol	Price of Paint	Linear (Simpl e)	Y = 272.154 + 14.612x	75/56		18.004	4.60	0.001	Strong	SS	Reject H ₀
3	Price of Petrol	Price of Coloured Zinc	Linear (Simpl e)	Y = 2917.537 + 81.179x	74/55		16.773	4.60	0.001	Strong	SS	Reject H ₀

Source: Researchers' Analysis of Data (2016)

Key:

SS= Statistically Significant

4 CONCLUSIONS ANDS RECOMMENDATIONS

The findings of this research led to the following conclusions:

- There is inconsistent annual increase in price of petrol from year 2000 to 2015.
- The major causes of petrol price inflation were discovered to be exchange value of dollar, law of demand and supply and political instability.
- Promoting competition, transparent and effective distribution, and marketing of petrol price are the most effective control measures of petrol price inflation.
- Changes in the price of petrol affect the price of building materials; therefore change in oil market price has significant impact on the price of building materials.

The following recommendations were made from the conclusions of the study:

- Government should provide a lasting solution to the problem of petrol price inflation by regulating the price of petrol and building materials.
- Government should make petroleum products abundant and distribute it freely and openly to everyone.
- Government should provide a regulation that will make the importation of building materials less attractive and provides incentives for local producers.
- Government should promote competition among marketers.

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