NIGER DELTA UNIVERSITY
WILBERFORCE ISLAND, BAYELSA STATE.

48th Inaugural Lecture

MAN-MACHINE INTERACTION:

The Role of Chemical Engineers in Environmental Management

BY

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NIGER DELTA UNIVERSITY

Wilberforce Island, Bayelsa State, Nigeria

Motto

Creativity, Excellence, Service

Vision

To be a centre of excellence defined by well articulated programme that will produce creative and innovative minds

Mission

To strive to maintain an international reputation for high quality scholarship, research and academic excellence for the promotion of thesocio-cultural and economic well-being of mankind

NIGER DELTA UNIVERSITY ANTHEM (THE BRIGHTEST STAR)

Like the brightest star we are, to lead the way
To good education that is all our due,
The dream of our fathers like the seed has grown;
Niger Delta University if here to stay.

Let us build on this noble foundation
And with love, let our dedication increase,
To rise and uphold this noble vision
Ev'ry passing moment let our zeal never decrease.

In all that we do, let us bring to mind
Our duty as staff and students of N.D.U
Ev'rywhere to promote peace towards mankind.
Creativity, Excellence and Service

CHORUS
Rejoice, great people old and new, rejoice
For the good fruit through us is shown;
Be glad in our worthy contribution
To the growth of humanity (x2)

Dedication

This inaugural lecture is dedicated to the Almighty God for His loving kindness and tender mercies.

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Introduction

Creation of Man

The bible in Genesis Chapter 1 Verse 28 said that God, after He created man, blessed him and said among other things, that man should subdue the earth and also have dominion over everything that God created (King James Version). Since then, man has been fulfilling that mandate through Engineering. In order to subdue the earth and have dominion man had to develop various tools and technical abilities to fulfil that mandate. The development of these tools can be traced back to the primitive or stone age, which is about 3.3 million years ago (www.biotannica.com, 2022).

The Industrial Revolution

Mr. Vice-Chancellor, Sir, the need for a better life and improve standard of living brought about the first Industrial Revolution. Before that time, people travelled on foot or donkeys, on camels and horses, through bush paths and lived in small hamlets and villages. There were no good clothes and potable water. The sanitary conditions were relatively poor and there was shortage of food supply. People work all day from sunrise to sunset, using crude handmade tools, and most times fall sick easily with no good medications (Mohajan, 2019; Jacob, 1997; Clarke, 2010). The first Industrial Revolution (1760 – 1840) brought a significant shift from the

use of human and animal labour to the use of machines. This resulted in a lot of technological changes and improvement in productivity and in the lives of the people (Khan, 2008).

Industrial Revolution and the Environment

Despite the enormous benefits of the Industrial Revolutions which include increased urbanisation, improved productivity in agriculture, inventions of new machinery and technologies leading to improvement in the standard of living of the people and the creation of wealth for both individuals and nations. It has also created some serious environmental challenges globally.

The discovery and use of fossil fuel such as coal and petroleum has revolutionized the world, and are major driving forces of the Industrial Revolution. The use of fossil fuel has resulted to the increase in pollution of the environment, causing air, land and water pollution which has led to climate change, global warming and greenhouse gas emissions (Mohajan, 2020).

Urbanisation comes also with the issue of increase in the rate of generation of municipal solid waste and sewage. These are major environmental challenges the society is faced with today.

Technological developments like the steam engine, iron production, production of various chemicals, textile industries, and the use of coal, have transformed villages into towns (Ashton, 1948; Clarke, 2007).

Mr. Vice-Chancellor, Sir, the second Industrial Revolution took place between 1860 – 1924 with the invention of internal combustion engine, electricity, alloys and chemical industries. (Mohajan, 2020). The development of the petroleum refining industry and the steel industry brought a significant change that led to the development of sophisticated machinery (Chandler, 1993) like the diesel engine used for cars and locomotive (Cummins, 1993). The third Industrial Revolution, known also as the Digital Revolution started in 1950s with transition from analogue to digital electronics. This has brought tremendous wealth and prosperity to individuals and nations and have also improved the standard of living of the people (Mohaji, 2021). The fourth Industrial Revolution is here, we now have 3D printing, Artificial Intelligence, and human-machine interface (Xu *et al.*, 2018).

The Petroleum Industry, the Chemical Engineer and the Economy

The Petroleum Industry is a global industry with operations going on in different parts of the world where oil and gas is

found including Nigeria, where it started in the 1950's (Akpofure *et al.*, 2000). It involves exploration, exploitation, production, transportation, refining and storage.

This industry has a very enormous impact on the economy because of the role the Chemical Engineer plays in transforming the crude oil into various useful products that benefit mankind. Chemical Engineers produce useful products from crude oil for our daily consumption.These products include:

- Pharmaceuticals and Healthcare – Disposable syringes, capsules, pills, hearing aids, artificial hips, crutches, prosthetic limbs, soaps, disinfectants, etc.
- Agriculture – Inorganic fertilisers and pesticides.
- Solvents and Detergents – Mist solvents and detergents contain chemicals derived from petroleum because it easily dissolves greases and other substances.
- Artificial Scents and Perfumes
- Lubricants like greases, oil, etc.
- Asphalt and Tar – for road and roofs.
- Petroleum Jelly
- Plastics

Study shows that over 6000 products are made from the oil industry and the effect on the economy can only be imagined, thanks to the Chemical Engineer (https://iprb.org; US Energy Information Administration, 2022).

Figure 1:Artificial hip (Source: CaryOrthopaedics, 2023)

Figure 2: Itchy ears hearing aid
(Source: Debra Sillivan/MedicalNewsToday, 2019)

Figure 3: Prosthetic limb (Source: Psychology Today, 2020)

Figure 4: Prosthetic hand (Source: Eric Niller/Wired, 2018)

The Petroleum Industry and Our Environment

Mr. Vice-Chancellor sir, the Man-machine interactions in the course of oil exploration and production have led to environmental issues in the society, Nigeria inclusive. These environmental issues include crude oil spill, gas flaring, production of toxic waste etc.

Crude Oil Spills

The release of crude oil into the environment either by accident or deliberately by human sabotage (which is known as vandalism) is called crude oil spill. Technical or design errors, storage or transportation problems, corrosion, or pipeline rupture are all different causes of oil spills (Awobajo, 1982; Beller, 1996). There have been various cases of crude oil spill reported all over the world, including Nigeria.

Oil Spill Incidents in Nigeria

Various oil spill cases have been reported over the years in the Niger Delta region of Nigeria. The first that comes to mind is the Bomu field oil spill in Rivers State that occurred in 1970 as a result of blowout, where crude oil spill destroyed crops and making about 607 hectares of agricultural land desolate. Another blowout occurred again in 1972, this time at Obagi in Rivers State, in Safram (now Elf). In Escravos, we had the GOCON's spill in 1978 in which about 300,000 barrels of crude oil was released into the environment. Still in 1978

there was, the tank failure at Forcados SPDC terminal, about 580,000 barrels was lost.

Figure 5: Oil spill on land (Source: Osodi/Bloomberg, 2021)

Figure 6:Crude oil polluted land in the Niger Delta.
(Source: Uwemedimo/Amnesty International, 2019)

Figure 7:Crude oil polluted farmland

Figure 8:Crude oil polluted water body in Nembe
(Source: This Nigeria, 2023)

Figure 9: Oil spill resulting from operational failure/accident (Source: Guyuse/Mongabay, 2022)

Figure 10: Gas flaring in the Niger Delta (Source: Arise News, 2021)

Figure 11: Flaring at Port-Harcourt Refinery and Petrochemicals (Source:Roy Luck/NS Energy, 2022)

A corroded manifold caused an oil spill where about 3000 barrels of crude oil was lost in Ebubu in Rivers State in 1997. In 1980, a blowout occurred at Texaco Funiwa-5 and about 400,000 barrels of crude oil was spilled. In 2015, an incident happened at the Qua Iboe Terminal, then Bonga oil field spill occurred with about 40,000 barrels of oil reported to have leaked into the environment (Olujobi, Oyewunmi & Oyewunmi, 2018). One of the most recent if not the latest spill incident occurred in Nov 2021 in Bayelsa, Nembe Local Government Area, at the Santa Barbara Oilfield thereby causing people to relocate from their communities to neighbouring communities for safety because of the magnitude of the spill.

Effects of Crude Oil Pollution on the Environment

The effect of crude oil pollution on the environment depends on where the pollution occurred, the most vulnerable being the marine environment (Cairns and Buikema, 1984). It also causes a lot of damage to the vegetation, retarding growth and causing death of crops, and even outright destruction of those crops. Available data shows that mangroves are disappearing and fishermen are making little or no catches. Farmlands are continuously destroyed leading to food insecurity and restiveness as environmental degradation occurs.All these evidences we see in the Niger Delta region of Nigeria (Nwilo and Badejo, 2005; Jobson*et al.*, 1974; Krebs, 1982; Dunnet, 1982; Ekekwe, 1981; Anozie, 2001).

Crude oil pollution has also been linked to be a major factor/cause of many sicknesses today. These sicknesses result from gaseous emissions as most people drink from the polluted water (including acute renal failure, itchy skin, infertility, carcinogenesis, etc.) (Ordinioha & Brisibe, 2013; Kaladumo, 1996; Barron*et al.*, 2003).

Figure 12:Oil spill impacted farmland in Bomu
(Source: Digha, Ambah and Jacob, 2017)

Figure 13:Oil spill in mangrove
(Source:Akinyomi/Face of Gbaramatu Int'l, 2019)

Figure 14:Effects of oil spill on marine life
(Source: Adeyinka/Punch, 2022)

5.3 Clean Up of Crude Oil Spills

Various treatment technologies have been developed for the remediation of crude oil spills. They include:

(I) **Natural Breakdown** – This is the oldest remediation method, and is still in use today. This process uses the fact that crude oil, if left alone will by natural means breakdown and evaporate under the influence of several environmental conditions like sun, wind and wave action. However, this method works better on light crude oil than the heavier crude oil type.

(ii) **Booms and Skimmers**

Booms are devices used to stop the spread of crude oil on water when oil spills. They are floating physical

barriers usually plastics or other materials used to either isolate an oil spill or to stop the spread to other locations.

Skimmers on the other hand are devices used to remove the spilled oil from the surface of the water by sucking or siphoning the oil into storage tanks or vessels. Skimmers are of different types, including vacuum machines. They are very advantageous as they do not affect or change the chemical or physical properties of the crude oil. However, there are several factors that determine the success of skimming operations and these include, the type of crude oil, the thickness of the oil spill, the amount of debris present in the water, the location where the spill occurred and the prevailing weather condition.

Figure 15:Manual skimming of spilled crude oil
(Source: Sukhada Tatke/TheIndu, 2016)

Figure 16:Manual skimming at sea shore
(Souce: TheJapanTimes, 2015)

Figure 17:Booming of spilled oil (Source: Akuna Services, 2017)

Figure 18:The use of mechanical skimmers for spilled oil recovery
(Source: Markleen, 2020)

(i) Chemical Dispersant

The use of dispersants is another common method of effectively cleaning up oil spills when used appropriately. They can be used on both surface and subsurface in the marine environment. Dispersants are chemicals that breakup oil into tiny easy to degrade droplets.

(ii) Incineration (In-Situ Burning)

Incineration or in-situ burning is another method used in the cleanup of crude oil spill. It is used most times after skimming process have been carried out. The residual oil is

then burnt. It efficiently removes oil from water surface as quickly as possible. Nevertheless, it causes additional pollution by releasing nitrogen, sulphur and other gases into the atmosphere.

Figure 19:In situ burning of spilled crude
(Source: Greenland. Summer, 2017)

(i) Sorbents

These are materials that are insoluble and are used to recover liquids in this case crude oil through absorption or adsorption or both, for any material to be used as sorbents and be useful for cleanup of crude oil spills, it needs to be both water-repellent (hydrophobic) and oil-attracting (Oleophillic). They are mostly used after skimming operations have been carried out, to remove residual traces of oil, or in places where skimmers cannot be used, or in situations where we

have very small spills (USEPA, 2016).

There are three basic categories of sorbents:

(a) Natural organic sorbents – They includesawdust, feathers, ground corncobs or other carbon-based products. The major advantage of using natural organic sorbents is that they can adsorb up to 15 times their weight in oil. However, there are some disadvantages in using them. First, some of them adsorbboth oil and water and so sink, hence difficult to collect after spreading them on water,but they can be used on land easily. To overcome these challenges, a floating device is used while a mesh is used to aid the collection of loose particles in water (Tan *et al.*, 2021; USEPA, 2016).

(b) Natural Inorganic Sorbents – Examples include clay, sand, glass wool, etc. They are inexpensive and can adsorb a large quantity of oil.

(c) Synthetic Sorbents – These are man-made materials, example polyethylene and polypropylene. They also include cross-linked polymers and rubber materials (USEPA, 2016).

(ii) Bioremediation – This the use of microorganisms to breakdown pollutants (in this case hydrocarbon) into non

harmful substances. Bioremediation process is accelerated by the use of nutrients to enhance the growth of microbes (Vidali, 2001; Mukred*et al.*, 2008).

There are two basic types of bioremediation namely:

(a) In-situ bioremediation – This is a process of treating the contaminated or polluted soil and/or water in its original place or site. Whereas

(b) Ex-situ bioremediation involves removing the soil from the subsurface and taking it to somewhere else for treatment.

(a) In-situ Bioremediation Types

There are basically three types of in-situ bioremediation namely:

- Bioventing – This is a process of stimulating/ enhancing bioremediation process with the supply of air or oxygen to the existing soil microbes in the unsaturated zone (Lee, 1988).

- **Biosparging** – This also follows the same process but uses the supply of air into the saturated soil surface for use by the micro-organisms to enhance the bioremediation process (Lee, 1988).

- Phytoremediation – This is a remediation process whereby living plants are used to remove pollutants from the soil, water and air. There are certain plants

and algae that have been identified to have the ability to extract, transfer and/or destroy these pollutants especially at low concentrations. There are various types of phytoremediations, some of which are:

- Rhizosphere biodegradation – This is a process whereby nutrients are released by the plants through their roots to the micro-organisms in the soil and this in turn enhances the process of degradation.
- Phyto-accumulation (also called phyto-extraction) – The pollutants are absorbed by the plants through its roots to the leaves and shoots, which are harvested and disposed as hazardous wastes.
- Phyto-degradation – In this case, plants metabolise and destroy these pollutants within the plant tissues.
- Phyto-volatilisation – A process whereby plants take upthese pollutants and release them through their leaves into the atmosphere (USEPA, 2012; Siciliano, 2000; Farrel, 2000); El-Nemr, 1995).

(b) Ex-situ Bioremediation types

This is the removal of a polluted material from its original/natural environment and taking it to a different location for treatment. There are three types of ex-situ bioremediation:

- **Land Farming** – Which involves the excavation and spreading of the polluted soil over a prepared bed and tilling from time to time to extract and collect liquids (leachates) that may seep out from the polluted soil as biodegradation proceeds.
- **Biopiles** – This is placing the contaminated soil in well aerated piles with nutrients added to increase the rate of bioremediation.
- **Composting** – In this process, microbes are used for the degradation but at high temperaturesof $55^{o}C - 65^{o}C$.

Bioremediation Strategies

For bioremediation rates to be enhanced, favourable conditions must be created for the microbes doing the work to thrive. These can be either through biostimulation or bioaugmentation.

- **Biostimulation** is the addition of required nutrients (such as nitrogen and phosphorus) that will stimulate the process into the soil, so that the existing or indigenous micro-organisms can feed on the pollutants. Yelebe *et al.*(2015) carried out a bioremediation work on crude oil polluted soil by using Palm Bunch and Wood Ash as bio-stimulants and obtained very good results.

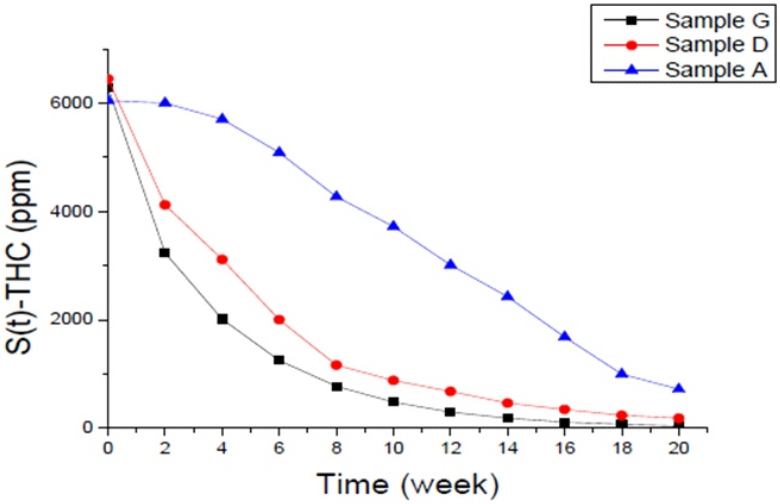

Figure 20: A plot of Total Hydrocarbon Content versus Time (fitted with experimental growth equation) (Source: Yelebe *et al.*, 2015)

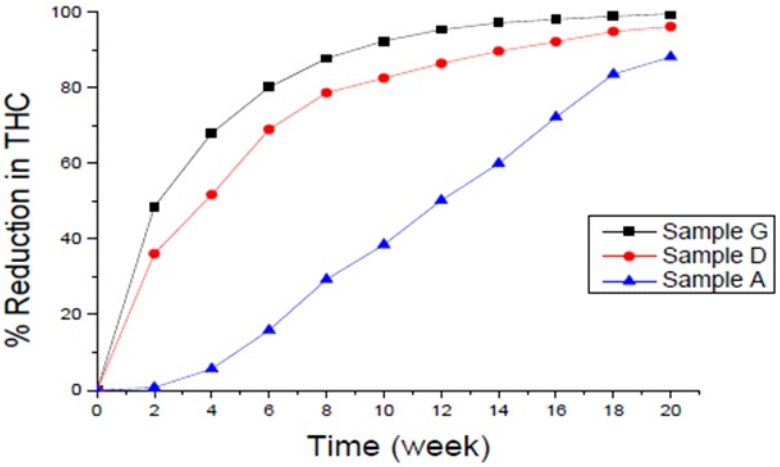

Figure 21: Percentage reduction in Total Hydrocarbon Contentversus Time for various samples (Source: Yelebe *et al.*, 2015)

- **Bioaugmentation** on the other hand is a process whereby, micro-organisms with the capacity (ability) to degrade pollutants are identified, cultured and introduced into the bioremediation process to help in accelerating the process(Yelebe and Puyate, 2012; Puyate and Yelebe, 2012; Puyate and Yelebe, 2010).

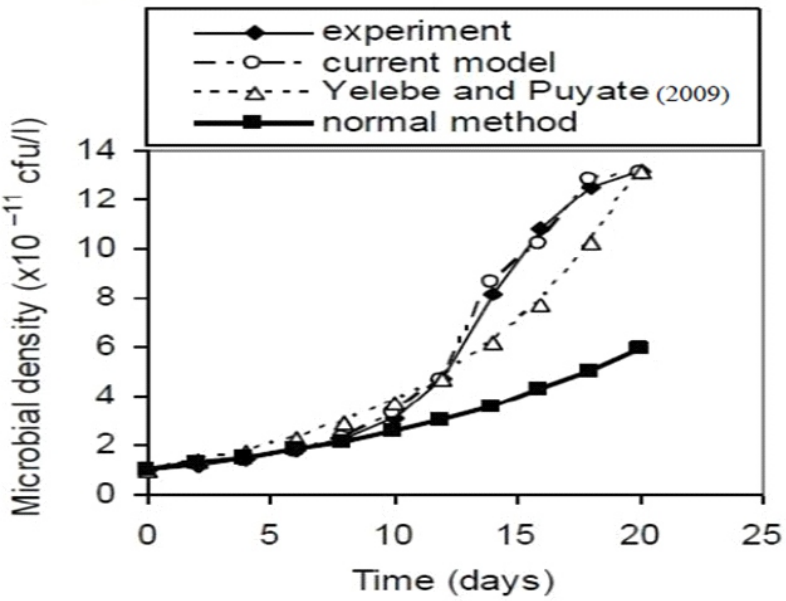

Figure 22: Experimental and predicted microbial density in control bioreactor (Source: Puyate and Yelebe, 2012)

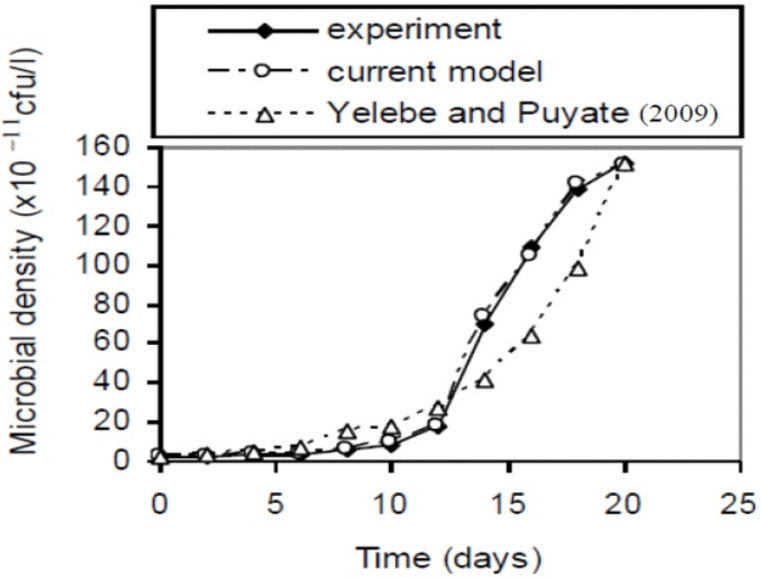

Figure 23: Experimental and predicted microbial density in bioaugmented bioreactor (Source: Puyate and Yelebe, 2012)

Advantages of Bioremediation

- It is environmentally friendly, with no adverse effect on the environment.
- The rate of degradation using bioremediation technique is very high.
- It is far cheaper than other treatment technologies used for the treatment process.

Disadvantages of Bioremediation

- It cannot be used for non-biodegradable pollutants.

- It takes a longer time when compared to other techniques.
- There are not acceptable and defined end points for the process (Kiel, 1997; Maletic *et al*., 2009; Vidali, 2001; Sublette, 2001).

Factors Affecting Bioremediation Process

For bioremediation to be very effective, certain factors must be put into consideration, and they include:

- **The structure of the soil**: This is a very important factor in determining the rate of bioremediation process. The characteristics of the soil must be considered during the remediation process (Skladany, 1994).
- **Oxygen**: Most bioremediation processes are aerobic in nature hence, oxygen is essential and a limiting factor for successful bioremediation process. The supply of oxygen enhances microbial activities (Hinchee, 1992; Dinee, 1990).
- **pH**: For microbial survival and growth, a pH of near neutrality is recommended as optimum even though a number of species can survive in other environments that may be considered hostile (Richardson and Peacock, 2006).
- **Moisture Content**: Even for micro-organisms,

water is life and is essential for transportation of nutrients and by-products (JRB and Associates, 1984; Winegardner, 1991).

- **Temperature**: Temperature is a major factor that affects the rate of chemical reaction and is also true for biochemical reactions (Kiely, 1997).
- **Nutrient Availability**: For any biodegradation process to be successful, nutrients must be available as microbes need nutrients to grow and also to degrade pollutants (Odu, 1972).
- **Having the Right Micro-organisms**: Not all organisms have the ability to feed on or degrade petroleum hydrocarbon hence, the need to identify the right microbes needed and where necessary bio-augment for effective remediation process (Bossert, 1995; Mesharch, 1997).

Municipal Solid Waste, Sewage and the Environment

Mr. Vice-Chancellor, Sir, as previously discussed, with urbanization comes the problems of sewage and municipal solid waste handling as a result of increase in population density. The indiscriminate dumping of waste generated by man into the environment without proper handling and treatment is a major source of environmental pollution. The need for engineers to design superior systems for waste treatment is necessitated by the exponential growth of the waste (Oyinlola, 2001).

The design, development and application of superior engineering systems for proper handling and treatment of waste instead of just releasing them into the environment is very important to protecting surface and groundwater and air quality standard.

The dumping of wastes into landfills over the past years have brought about abandoned dump sites, contaminated ground waters, poisoned streams, toxic disposal sites, etc. in most environment (Kiely, 1997). A typical example is the dump site along Amassoma road, in Yenagoa Local Government Area of Bayelsa State.

According to Ogunbiyi (2001), over 65% of our household wastes are biodegradable while the remaining 35% is made up of plastics, metals, etc. This means that over 65% of the waste are biodegradable and can be used as a major source of raw material for biogas production (Yelebe and Gumus, 2012) and the remaining 35% can be recycled.

The indiscriminate dumping of sewage into receiving waters is another major source of concern as this usually leads to outbreak of various waterborne diseases. Yelebe and Gumus (2012) designed an anaerobic digester that was used to treat sewage and produce biogas.

Figure 24:Municipal solid waste dumping site in Bayelsa State (Source: Stanley *et al.*, 2018)

Figure 25:Municipal solid waste dumping site (Source: Smukste, 2015)

Figure 26:Indiscriminate/illegal disposal of sewage into Opolo Creek, Bayelsa State (Source: Oyadongha, 2016)

Conclusion

My Vice-Chancellor Sir, I have come to the conclusion after all my years of research that, environmental pollution is as a result of Man-Machine Interaction to create a better life for humanity even as the United Nations is talking about achieving these seventeen sustainable development goals.

In Genesis Chapter 2, Verse 15, the commandment of God to Man as He took him to the Garden of Eden was simple. He said, dress it and keep it. Environmental Managementis about taking care of the environment and that is the role the Chemical Engineers are carrying out to ensure that while

products are produced from fossil fuels for human development, the environment is kept safe.However, this can only be achieved if we all join hands together to make the world a better place.

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First, I want to appreciate the Almighty God for a day like this and for what he has done for me. If it has not been the Lord who was and still on my side where would I have been, how would I have gotten to this place? Uptill now, when I remember my Ph.D programme and how I finished on record time, I can still say, thank you Jesus.

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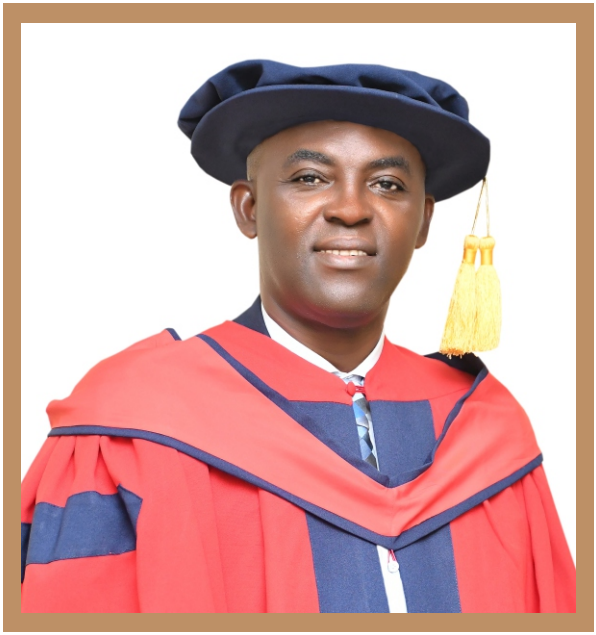

Zekieni Robert Yelebe, PhD

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ABOUT THE INAUGURAL LECTURER

Engr. Prof.Zekieni Robert Yelebe was born into the family of late Elder Balius Robert Yelebe and Elder Mrs Florence BaliusYelebe of Ovom town in Yenagoa Local Government Area of Bayelsa State. He attended Banham Memorial State School, Aggrey Road, Port Harcourt for his primary education and obtained his First School Leaving Certificate in 1984. He then proceeded to Enitonna High School, Borikiri, Port-Harcourt for his secondary school education and got his Senior School Certificate in 1990 and General Certificate of Education (GCE) in 1991. In his quest to further his education, Engr. Prof.Yelebe then proceeded to Rivers-State University of Science and Technology, now Rivers-State University, where he obtained his Bachelor of Technology degree in Chemical/Petrochemical Engineering in the year 2000.

Thereafter, he took up a teaching appointment with the Bayelsa-State Post Primary Schools Board as a class room teacher in November 2000 and was posted to Government Technical College Ekowe, in Southern Ijaw Local Government Area of Bayelsa-State. In May 2002, he resigned his appointment at the Government

Technical College Ekowe, having been appointed as a Graduate Assistant in the Department of Chemical/Petrochemical Engineering, at the then Rivers State University of Science and Technology, Port-Harcourt. In 2004, he obtained his Master's degree from the same University and was upgraded to the rank of Assistant Lecturer, and then to Lecturer II in 2005. In August 2005, he transferred his service from the Rivers-State University to Niger Delta University, Bayelsa-State.

In the year 2010, he obtained his Doctor of Philosophy Ph.D. from the same Rivers-State University and was upgraded to Lecturer I. He was promoted to Senior Lecturer in 2013, Associate Professor in 2016 and a full Professor in 2019.

Engr. Prof.Zekieni Robert Yelebe have held several positions in the University, and these include, Departmental Student Adviser, Chairman, Department Research Committee, Faculty Exam Officer, Sub-Dean of the Faculty, and Acting Head of Department, Chemical/Petroleum Engineering (2015 – 2017). He has been one time faculty postgraduate coordinator.

In 2017, he was appointed Deputy Rector Federal Polytechnic Ekowe, In January 2018 he returned to the University and was appointed pioneer Acting Head of Department, Petroleum Engineering in 2019. He is a member of the Postgraduate School Quality Assurance Committee. In 2020, he became the Acting Dean, Faculty of Engineering and was elected substantive Dean of the faculty in 2021, Niger Delta University, Bayelsa State.

In addition to being the Dean of the Faculty, he was appointed as the Pioneer Centre Director, for the NCDMB Centre of Excellence in Engineering Studies in 2021.

Engr. Prof. Zekieni RobertYelebe is an adjunct professor in the Department of Chemical Engineering, Federal University, Otuoke.

He is an external examiner to the Rivers State University, Port Harcourt.

He is an external examiner to the NLNG Centre for Gas, Refining and Petrochemical, University of Port Harcourt.

He is an external examiner to the World Bank Centre of Excellence (Centre for Oil Field Chemical Research), University of Port Harcourt.

He a facilitator for the training of the One Thousand Youths engaged by NCDMB on the Remediation of Crude Oil Polluted Environments.

Prof.Zekieni Robert Yelebe was appointed by NUC to review the BMAS and produce the new CCMAS for Natural Gas Engineering for Nigerian universities.

In February 2021, he was elected as the P.R.O of Committee of Deans of Engineering and Technology of Nigerian Universities (CODET).

In February 2022, he was appointed as a Member of the BayelsaState Science and Technology Board, by the Executive Governor of Bayelsa State, His Excellency, Senator Douye Diri.

Later in the same year 2022, Engr. Prof.Zekieni Robert Yelebe was appointed as a Council Member of Council for the Regulation of Engineering in Nigeria (COREN) by the President of the Federal Republic of Nigeria, President MohammaduBuhari (GCFR).

Engr. Prof. Zekieni Robert Yelebe is a versatile scholar and a distinguished academician that have published extensively, both locally and internationally and has attended several seminars, workshops and conferences.

Engr. Prof. Zekieni Robert Yelebe is a Zonal Pastor in The Redeemed Christian Church of God, a Commander in The Redeem Chaplaincy International and a Special Marshal in the Federal Road Safety Corps.

Engr. Prof. Zekieni Robert Yelebe is happily and blissfully married to one wife, his adorable and beautiful soulmate Engr. (Mrs) Blessing Zekieni Yelebe, a Member of The Governing Council of Niger Delta University and they are blessed with Deborah Boizibe Zekieni and many other spiritual children.

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