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COMBATING ENVIRONMENTAL CHALLENGES OF CLIMATE CHANGE THROUGH CLEANER ENERGY: FUEL-LESS GENERATOR AS SUSTAINABLE ALTERNATIVE

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Abstract
Sustainable energy generation is a key requirement for economic development for any nation. Since the discovery of crude oil, fossil fuel has been the major energy source for economic and industrial production all over the world. However, with the menace of climate change which has been largely blamed on combustion of fossil fuel, scholars, professionals, environmentalist and global leaders, are advocating for cleaner source of energy. Bearing in mind the need to preserve the environment from climate change caused by the emission of greenhouse gases, literature reports reveal that fuel generator is noiseless and does not emit greenhouse gases. The focus of this paper is to review the potential and benefits of fuel less generator as an alternative source of energy generation for mitigating climate change. Review of available literature revealed that fuel less generator has the capacity to recharge itself when operating and it does not emit greenhouse gases. Additionally, it does not generate heavy noise like the conventional fossil fuel generators. Some of the environmental benefits of fuel less generator are: Eliminate the need for combustible fuel, it does not emit greenhouse gas, it does not make loud noise that constitute noise pollution, it does not pollute the environment and it is also self-sustaining. Scientific discoveries revealed that the combustion of fossil fuel is a major emitter of greenhouse gases and by implication cause of Global Climate Change. Electromechanical energy has the potential of generating clean energy (without emission of greenhouse gases) for domestic uses and can also be scaled up for commercial business environment.

Keywords: Fuel less generator, energy source, climate change and alternative source of energy.

1.0 INTRODUCTION

1.1 Background

That the global climate is changing is no longer in doubt but a sad reality that humanity has got to contends with. This can be attested to by the visible signs manifesting all over the world. The National Aeronautics and space Administration (NASA, 2023) asserts that global climate change is not a future problem but a change that is already taking place right in our time.

Climate change is changes to earth's climate cause by increased human emission of heat trapping (greenhouse) gases (NASA, 2023). The heat trapping (greenhouse) gases include: Carbon dioxide, methane, nitrous oxide hydro fluorocarbon (HFCs) Perfluorocarbon (PFCs), Sulphur hexafluoride (SF6) Nitrogentrifluoride (NF3) and various synthetic chemicals, United Sates Energy Information Administration (USEIA, 2022). The global climate change is already having widespread effects on the environment: these effects include melting of glaciers and ice sheets, breaking of river and lake ice, shift in plant and animals geographical ranges, sooner bloom of plants and trees, heating up of the biosphere and extreme weather conditions that is adverse to agricultural and other human activities.

Scientists have long ago predicted effects that would result from global change such as loss of sea ice, accelerated rise in sea level, longer and more intense heat waves, droughts, wild fires, extreme rainfalls and unpredictable weather conditions. All these are already occurring at rate faster than scientists have earlier predicted. The Inter-governmental panel on climate Change, a United Nations body established to assess the science related to climate change has reported that humans have never experienced the observed changes in the global climate as much is happening today. It further reported that some of the changes are irreversible over the next hundreds to thousands of years to come.

In 2021, an assessment report published by the Inter government panel on Climate Change (IPCC) found that anthropogenic emissions of greenhouse (heat trapping) gases have already warmed the global climate by nearly 2 degrees Fahrenheit (1.1degree

Celsius) since 1850 – 1900 (IPCC, 2021). The report predicted that global average temperature will rise by 1.5degree C or more within the next decades and that these changes will affect all regions of the earth.

The effects of the human caused global warming are happening now and will worsen as human continue to add greenhouse gases to the atmosphere (NASA, 2023). The magnitude and rate of climate change and the associated risks depend strongly on near term mitigation and adaptation actions and projected adverse impacts and related losses and damages escalate with every increment of global warming (IPCC, 2013). It is against this background that it has become very pertinent for humanity to look for alternative source of energy to replace fossil fuel since the heat trapping (Greenhouse) gases are emitted from the burning of fossil fuel for energy generation. The focus of this paper is to highlight the potential and the environmental benefits of fuel-less generator and to emphasize the adoption as a sustainable energy source to combat climate change.

2.0 OVERVIEW OF CLIMATE CHANGE

Climate change is described by policy makers as the biggest challenge facing humanity in contemporary times. It is complex and dynamic and requires dimensional and multi-sectorial mitigation and adaptation initiatives within a dynamic policy framework to properly tackle it (Mohammad, 2021). Various studies have shown that annual and seasonal timescales indicate a significant positive increase in temperatures in the world including Nigeria. Literature records show that mean temperatures have been consistently increasing throughout the world in the last five decades and have been rising significantly since the 1980s, with a change of 1.01°C (0.52 to 1.5°C) in the linear warming for the period 1951 - 2005. The linear warming for the same period for 30-year averages on a decadal slice further revealed positive changes in temperature by an average of 0.2°C/decade (NPCC, 2021).

2.1 Causes of climate change

Climate change is caused mainly by anthropogenic activities. These activities cut across divers sectors of human endeavor. These are discussed below.

Transport

The major modes of transportation in Nigeria are road, water, air, rail and pipelines. Among these modes of transportation, the road is the most developed form of transport with Federal highways covering 34,340 km and the railway spanning 4000 km. The transport sector is a major source of heat trapping (Greenhouse) gas emissions. Nigerian vehicles are reported to have emitted 1.49 trillion tons of CO2 from 2000 to 2016. Under a business-as-usual (BAU) scenario, with an almost universal reliance on the road network for transport of passengers and freight in the country, Greenhouse gas (GHG) emissions from the transport sector could increase by up to 50% by 2035 and almost double by 2050. The BAU scenario would not only increase emissions, it would also put an even greater stress on infrastructure and services that are already struggling with demand and would, therefore, severely restrict socio-economic development. In addition, a lack of investment in climate resilient infrastructure would put current and new transport infrastructure at risk from the impact of climate change with the potential to disrupt, damage and destroy transport networks.

Agriculture, forestry and other land uses

Agriculture and related issues have been identified as contributors to climate change. For instance, in Nigeria, agriculture and forest which form part of the country's natural capital that provides direct source of income and employment is vulnerable to climate change and also contributes to climate change. The Nigeria National Policy on Climate Change reported that in the year 2015, agriculture was responsible for about 67% of the national greenhouse gas emissions. A breakdown statistics showed that emissions from the livestock sector alone in Nigeria increased significantly from 21877 Gg CO2-eq in 2000 to 29375 Gg CO2-eq in 2015 which represented an increase of about 34%. (NCCP, 2021)

Energy generation

Sufficient energy is required to achieve high socio-economic growth in every nation in order to meet the needs of households, businesses and industrial process. In Nigeria, the energy sector is identified as the second major contributor of heat trapping (Greenhouse) gases. Producing adequate energy for the country's development needs and minimizing GHG emissions in the process remain critical challenges to achieving high socio-economic growth in Nigeria. These will require improved investment, regulatory control and critical review of existing approaches, as well as the adoption of low-cost but

efficient energy generation technologies according to the Nigeria National Policy for Climate Change (NPCC, 2021). Therefore, the overall objective of the National Policy for Climate Change is to reduce greenhouse gas emissions principally from the power sector.

2.2 Global evidence of climate change

There are numerous documented evidences of climate change. The intergovernmental panel on Climate Change (IPCC) reported that "Scientific evidence for warming of the Climate system is unequivocal" The report further stressed that ice cores drawn from Greenland, Antartica and tropical mountain glaciers show that Earth's climate responds to changes in greenhouse gas levels.

Report by the National Aeronautics and Space Agency (NASA) states that the current warming of the globe is clearly the result of human activities since the mid-1800s and it is proceeding at a rate not seen over many recent millennia. It is undeniable that human activities have produced the atmospheric gases that have trapped more of the sun's energy in the Earth system (NASA, 2024).

Britain Britannica report has that the ongoing climate changes are being monitored by networks of sensors in space, on the land surface and on the surface and below the world's ocean. Documentary records from the monitoring instruments provide information about climate change in various locations for the past few hundred years. (Britannica, 2024). Scientific evidences of global climate change are:

Thermometer measurements

Evidences of from thermometer readings of Earth's temperature show that there has been a 1degree Celsius rise in average surface temperature of the Earth since the year 1900. There are recorded data that show that 2016 and 2022 have been the warmest years on record (studysmarter, 2024). Graphical representation of the earth's temperature pattern over the years is presented in Fig. 2.1

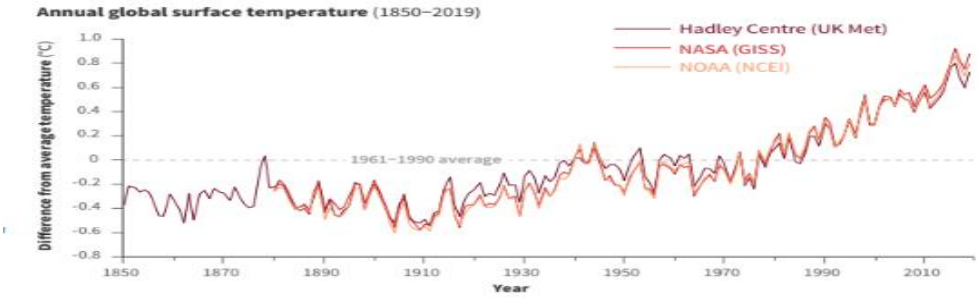


Fig. 2.1: Rise in Earth's temperature over the years (Source National Research Council)

Shift in Seasons

There are also signs of shifts in seasons where springs arrives earlier and winter is less cold than it used to be. This has largely affected nesting migration and hibernating wildlife.

Glacier retreat

There is significant melting or retreating of glaciers which is caused by rising temperature. There is also rise in sea ice melting in the Artics. This has been recorded through photography in the past 50 to 100 years. Images show an evidence of melted glacier. Satellite measurements also show a steady decline in the amount of Arctic sea ice from 1979 to 2009 (expressed as a percentage difference from 1979-2000 average sea ice extent, which was 7.0 million square miles). The data show substantial year-to-year variability, but a long-term decline in sea ice of more than 10% per decade is clearly evident, highlighted by the dashed line. Source: National Research Council, 2010a.

Rise in sea level

Sea level has risen steadily over the past few decades due to various contributors: thermal expansion in the upper 700 meters of ocean (red) and deeper ocean layers (orange), melt water from Antarctic and Greenland ice sheets (blue), melt water from glaciers and ice caps (purple), and water storage on land (green) (National Research Council, 2011a).

Fig, 2.2 is a graphical demonstration of the rise in sea level with years

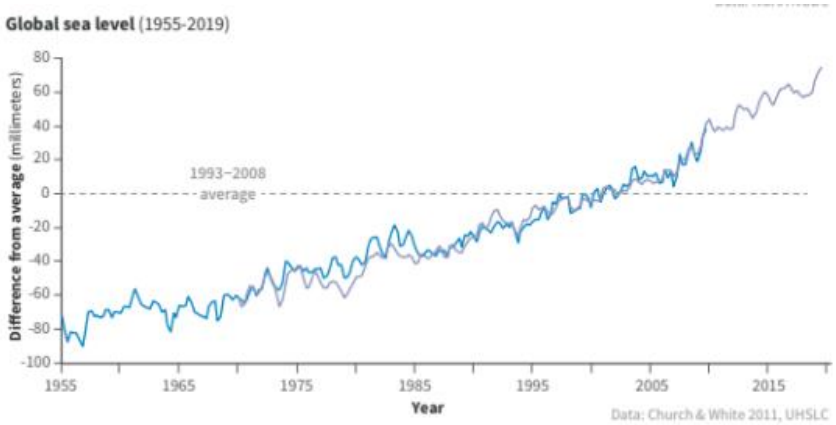


Fig. 2.2: Graph of rise in sea level over the years (Source National Research Council)

Ocean getting warmer

The temperature of the top 100 meters of the ocean has risen by 0.033 degree Celsius since 1969 according to report by studysmarter (2024). The ocean absorbs a lot of increased heat with 90% of the Earth's extra energy being stored in the ocean. This can affect marine ecosystems such as coral reefs and fisheries.

Air temperature over the ocean rising

The temperature of the air above the ocean has also been observed to be rising just like the Earth and the ocean surface. This eventually leads to more vapourization. As the mass of warmer water vapour in the air above the ocean increases, the water vapour warms the air and causes heavy precipitations. Fig. 2.3 is a graphical demonstration of the temperature rise in the air above the ocean over the years

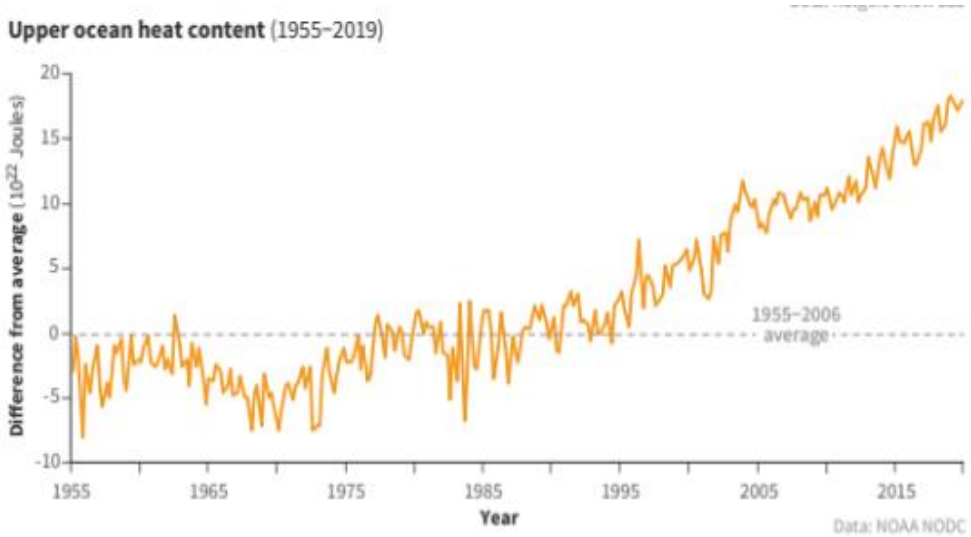


Fig. 2.3: Graph of rise in over ocean air temperature over the years. (Source National Research Council)

Ocean acidification

There has been an observed increase in ocean acidity. The increase in acidity in the ocean has risen by 30% since the industrial evolution according to available literature. This is due to increase in atmospheric carbon dioxide concentration. The increase in Carbon dioxide from human activities is being absorbed by the oceans which subsequently lead to rise in acidification. This is because Carbon dioxide reacts in seawater to form carbonic acid. The acidification of the world's oceans is another certain outcome of elevated CO2 concentrations in the atmosphere.

Charles David Keeling began collecting in 1958. The data show a steady annual increase in CO2 (National Research Council, 2011)

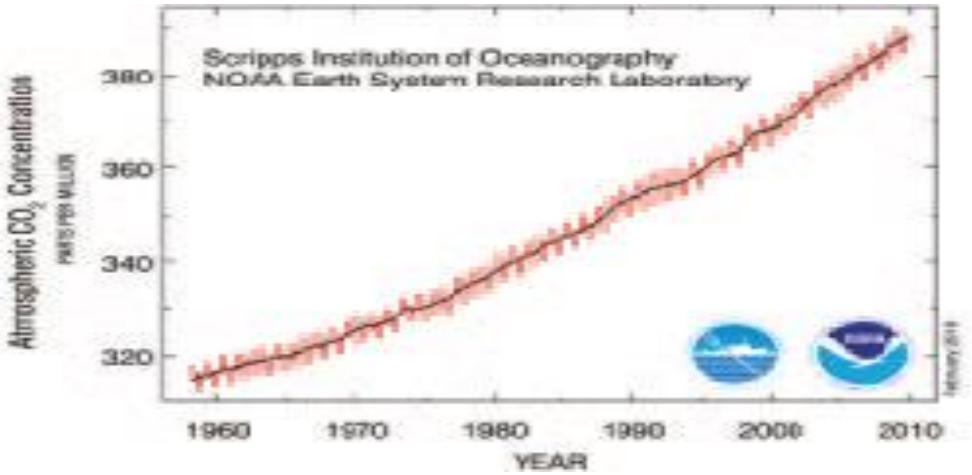


Fig. 2.4: Graph of rise in atmospheric concentration of Co_2 (Source National Research Council)

2.3 Measures to combat climate change

Technology and Innovation

Technology and innovation are key drivers of sustainable development. They remain central for addressing environmental problems. Modern technologies can help address the climate crisis in many new ways by helping countries to move toward a low carbon climate resilient development pathway. Nigeria Policy on Climate Change identified the following technologies as measures for combating climate change:

I. Solar (photovoltaic, thermal);
II. Wind power generation;
III. Energy-efficient light bulbs such as compact fluorescent lights;
IV. Landfill methane capture;
V. Improved cook stoves; drought tolerant crop varieties;
VI. Conservation agriculture; drip irrigation technology for arid and semi---arid regions; and
VII. Water harvesting technologies, among others.

3.0 FUEL-LESS GENERATOR AS SUSTAINABLE ALTERNATIVE ENERGY SOURCE FOR MITIGATING CLIMATE CHANGE

3.1 Features of fuel-less generator

Electricity generation from fossil fuel such as coal, gasoline and diesel has been identified as one of the major polluter of the environment. Studies have shown that an estimated Carbon dioxide (CO2) emission from the world electrical power industry is over 33billion tonnes each. This is quite a hug amount with a devastating effect on the global climate. The rise in atmospheric Carbon dioxide (CO2) increases the effect of heat trapping (Greenhouse) gas effect which is the cause of global warming. Ajav (2012) reported that Nigeria heavy reliance on fossil fuels for power generation leads to pollution and Ozone layer depletion. The growing concern about pollution cause by conventional fossil fuel power generators has motivated research on alternative forms of energy such as fuel-less generator (Tunji et al.,2023)

With obvious adverse effect of fossil fuel on global climate, an alternative source of power generation that does not cause negative environmental impacts is what the world need now. Domestic use of fuel-less generator is sustainable option or alternative to fossil fuel generator. Apart from polluting the environment, the production of fossil fuel like coal and petrol also damage the environment (Abubakar *et al*, 2022).

Fuel-les generator otherwise known as battery generator does not require fossil fuel to generate electric current. It is a sustainable method of generating electricity for household use. Fuel-less generator has been proposed as a way to reduce noise pollution, improve condition and save money (Adiyat et al., 1993) fuel-less generators uses Direct current motor and alternator to generate electricity. The motor gets its power from a secondary battery and the alternator converts the direct current to alternating and the battery gets recharge as the generator is operating. When operating, the battery fuel-less generator is smooth and

noiseless as against the conventional fossil fuel generator that makes a lot of noise and heat. Fuel-less generator eliminates the need for combustible fuel with the attendant emission of greenhouse gases (Ajav and Adewumi, 2014).

3.2 Environmental benefit of fuel less generator

The environmental benefits of fuel less generator are numerous and they include the following.

I. Eliminate the need for combustible fuel.
II. It does not emit greenhouse gas
III. It does not make loud noise that constitute noise pollution
IV. It does not pollute the environment.
V. It does not generate particulate matter.
VI. It is self-sustaining
VII. It is environmentally friendly
VIII. It is economical as it does not require regular fueling like the conventional fossil fuel generators.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The growing global concern about Climate Change triggered by global warming cause by emission of heat trapping (Greenhouse) gases into the biosphere has prompted world need for alternative sources of energy for industrial and domestic uses, rather than the conventional fossil fuels such as coal, diesel and gasoline. This is against the back drop of the discovery that the combustion of fossil fuel is a major emitter of greenhouse gases and by implication cause of Global Climate Change. Electromechanical energy has the potential of generating clean energy (without emission of greenhouse gases) for domestic uses and can also be scaled up for commercial business environment. Therefore, fuel-less generator which derives its energy from electromechanical source is a sustainable source of electric energy for mitigating or adaptation to climate Change.

4.2 Recommendations

Based on the electrical energy generating potential of fuel-less generator for domestic use:

I. Government should sponsor more research targeted at scaling up the potential of fuel-less generator for commercial usage.
II. The local production of the major components such electric motor, alternator, and secondary battery should be encouraged in order to bring down the cost of construction of the fuel-less generator.
III. Government should establish policy that will promote local fabrication and commercialization of fuel-less generators.
IV. Researchers should carry out more researches aimed at optimizing the productivity and efficiency of fuel-less generators.

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OGBOIN ORAL POETRY AS RITUALS

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Abstract
Oral poetry is any poesy that is composed and performed live before an audience. It is transmitted through narration or by word of mouth. Oral poetry permeates every aspect of the human culture and development. This paper examines Ogboin oral poetry as rituals. Ogboin ibe (Clan) is located in Southern Ijaw Local Government Area of Bayelsa State which is situated within the central part of the Niger Delta region. The study asserts that there is a connection between oral poetry and rituals in Ogboin ibe. The study identifies three types of oral poetry that have elements of rituals. They are war songs, work songs and wrestling songs. War songs are performed and sung loudly by warriors to show bravery during war and to invite spirits for protection and victory. The paper affirms that wrestling songs inspire wrestlers to stardom in the wrestling sport. Also, the paper observes that work songs inspire workers to work. Therefore, this study examines Ogboin oral poetry in line with the tenets of archetypal literary theory. The research is important in that it will, among other things, offer to scholarship the relevance of rituals in African oral poetry as remedies for resolving communal hitches in Africa.

Keywords: Ogboin ibe, Ịzọn, poems, song, rituals, spirit

1.0 INTRODUCTION

1.1 Background to the Study

Oral poetry is any poesy that is composed and performed live before an audience. It is transmitted "through narration or by word of mouth" (Odueme, 2019, p.149). Also, oral poetry permeates every aspect of the human culture and development (Okoh, 2010). Thus, the audience places more preference on the performance because the oral poet (performer) communicates in words, gesture, soulfulness of tone, facial expression, theatrical use of pause and beats, the chemistry of passion, humour, receptiveness to the feedbacks from the spectators, etcetera (Finnegan, 2012). However, in Ịzọn culture, there is a connection between oral poetry and rituals. Therefore, Rituals are:

> … symbolic, routine, and repetitive activities and actions through which we make connections with what we consider to be the most valuable dimension of life. They are often associated with a significant events or places in our individual and communal lives. Rituals set aside specific times and places and provide us opportunity to ponder their meaning and to connect emotionally… Ritual actions enable us to maintain continuity with significant persons and events from the past. (Kyalo, 2013, p. 35).

Most Ịzọn rituals are performed in a poetic way. They are performed literally as songs. These songs are used as spiritual mediums to invite supernatural beings and spirits for human fortification and summon the Ịzọn communal spirits on the citizens during recitals in different types of observances. Rituals in Ịzọn culture contain poetic essentials such as rhythm, rhyme, repetition, imageries, symbolism, assonance, parallelism, metaphor, hyperbole, simile, euphemism, allusion, idiophone, alliteration, elision, vowel oxymoron, irony, paradox personification and lengthening. The authorship of this poetry is not private but communal. The poems are composed by different social groups during special occasions. Also, they are "cultural heritages transmitted from one generation to another. They are messages, information and testimonies of a group of people transmitted through speeches, songs and the like" (Okediji, 2017, p. 60 – 61).

Thus, this paper examines the relationship that exist between Ogboin oral poetry and rituals. It sees Ogboin oral poetry as rituals. Ogboin is a clan within the Ịzọn ethnic nationality in Nigeria. The communities that make up Ogboin *ibe* (Clan) are Amatolo (in Sagbama Local Government Area of Bayelsa State), Amassoma and Otuan in Southern Ijaw Local Government Area of Bayelsa State. The study identifies three types of

oral poetry that have elements of rituals in this Ịzọn clan. They are war songs, work songs and wrestling songs. Also, the study examines the practice of chanting, invocation, possession of deities and spirits in the rendition of the Ịzọn oral poems under study.

1.2 Statement of the Problem

Scholarships on Ogboin oral tradition are always engrossed on other issues. A substantial feature of most of the scholarly positions of these critics is that while they accept diverse approaches to construe Ogboin tradition, they have not examined Ogboin oral poetry as rituals. This is because they did not study the relationship between oral poetry and rituals in Ogboin clan. Therefore, this study examines the numinous features of Ogboin oral poetry in line with the tenets of archetypal literary theory. The research is important in that it will, among other things, offer to scholarship the relevance of rituals in Ogboin oral poetry as remedies for resolving communal hitches in African oral literature, folklore, linguistics, ethnography, religious studies and anthropology.

1.3 Aim and Objectives

The aim of this research is to study Ogboin oral poetry as rituals. To fulfil the aim of this study the objectives are to:

- **a)** examine the connection between oral poetry and rituals in Ogboin clan;
- **b)** study the practice of chanting, incantations and otherworldliness during the rendition of Ogboin oral poetry;
- **c)** study the themes, structures and functions of Ogboin oral poetry that aids to authenticate the sacred rudiments of wrestling songs, war songs and work songs.

1.4 Research Questions

This research seeks to address the following questions:

- **a)** What is the connection between oral poetry and rituals in Ogboin clan?
- **b)** How does ritual poetry influence the cultural development of the people of the Niger Delta region and Nigeria at large?.
- **c)** How does ritual poetry impact the religious synchronization of the people of the Niger Delta region of Nigeria?

1.5 Significance of the Study

This study is significant because it contributes to the existing scholarship on African oral literature. Also, the research examines the arts and oral tradition of a major ethnic group in the Niger Delta region of Nigeria. The major concern of the study is to show and document the benefits of rituals in Ịzọn oral poetry as remedies for solving social problems in Nigeria. In addition, the study is relevant to researchers who are interested in African oral literature, folklore, anthropology, linguistics, ethnography and religious studies. Thus, the study creates an opening for the concept of Ịzọn oral poetry to thrive in African literature.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework: Archetypal Literary Theory

The theoretical framework adopted for this study is the archetypal literary theory. Archetypal literary theory is a study based on the documentation and interpretation of recurrent metaphorical procedures in culture, art and literature. The theory was initiated in the early 20th century from the theories of Sir James George Frazer in his influential work titled, *The Golden Bough*. Frazer's study was on myths. About twenty years later, Carl G. Jung brought archetypal research into the study of psychoanalysis (Baldick, 2015). Jung described archetypes as forms of psychic energy making the communal unconscious of man. He describes "four archetypes of man that are Persona, Self, Shadow and Anima/Animus. Persona traces its etymological roots to a Latin word that means 'mask'. It is how we present ourselves to the world. The Self represents the unified unconsciousness and consciousness of an individual" (Gijo & George, 2013, p. 55).

Jung archetypal analysis suggested that some symbols in dreams and myths were deposits of ancestral reminiscence conserved in shared unconsciousness. The theory depends on a number of primary proposals, the most vital of which is that the total gathering of human beliefs, antiquities, and observations inbred as a body of widespread codes. Archetypal literary theory signifies frequent "narrative designs, patterns of action, character types, themes, and images that recur in a wide variety of works of literature, as well as in myths, dreams, and even social rituals. Such recurrent items are often claimed to be the result of elemental and universal patterns in the human psyche"

(Abrams & Harpham, 2015, p. 18). This theory sees a work of art as a creation of culture that goes beyond the present or resent past. Thus, this study examines Ogboin *ibe* oral poetry as rituals in line with the premises of archetypal literary theory.

2.2 Conceptual Framework

2.2.1 Ogboin *ibe*

Ogboin *ibe* is located in the central part of the Niger Delta region (Alagoa, 2005). The clan is made of the following communities in Southern Ijaw Local Government Area of Bayelsa State: Amatolo (in Sagbama Local Government Area of Bayelsa State), Amassoma and Otuan in Southern Ijaw Local Government Area of Bayelsa State. It was documented in history that Akama was the founder of Ogboin *ibe*. Akama voyaged along with his father and relatives to search for his father's uncle along River Niger to an area identified as Agadagbabou (Yengizifa, 2013). It was at Agadagbabou that he left his father and siblings to start a new life on his own. It was at Orubiriobabou that he settled and built the Ogboin clan. Ogboin *ibe* is surrounded by Kabiama to the north-east and Oweikokogha to the south-east. Kolokuma, Gbarain and the Atissa group are the neighbours from the west (Ayibatari, 2023).

2.2.2 Oral Poetry

Oral poetry is a poetry that is composed, conveyed and appreciated vocally. It "is aimed to be performed in a musical setting, with the spoken constituent reliant on the performative skills of the artist" (John & Visser, 2017, P. 29). Oral poetry serves as an imaginative communication that is geared in the direction of stirring the human soul by linking morals to humanity (Kwokwo & Angaye 2019). This is because it informs, imparts, and alters the perception of awkward members of the society.

In Ogboin clan in Bayelsa State, oral poems are composed by different communal groups during special events and transmitted orally in Ịzọn language from one generation to another. Examples of oral poetry are epic, elegy, lyric, ballad, religious poetry, war songs, hunting songs, work songs, political song, children's songs, rhymes, and so on. The ownership of oral poetry in Ịzọn culture is not private but communal. Nevertheless, this research examines three types of oral poetry that have rudiments of rituals in Ịzọn culture. They are war songs, work songs and wrestling songs.

2.2.3 Rituals

Ritual is a system of religious or cultural rites. It is an endorsed order of monotonous sacrament that is stereotyped. Also, a ritual is an order of activities including gestures, words, and objects, performed in an appropriated place, and done in harmony with set order. In most African settings, ritual actions have always generated serious metaphysical, epistemological and logical issues given its esoteric nature, its association with symbolism and its integration with belief" (Etim, 2019, p. 2).

Correspondingly, cultural displays in most African societies use ritual activities in interacting with spirits (Duru, 2016). This is because it is a practice endorsed for mystical activities. Also, rituals are branded by formalism, traditionalism, rule-governance, sacral illustration and portrayal. Thus, the attention of the study is on the ritual rudiments of Ogboin oral poetry.

2.3 Empirical review of studies on Ogboin *ibe* oral poetry

Ogboin oral tradition has received different degrees of critical attention from researchers. However, a notable feature of most of the critical positions of these scholars is that while they use various approaches to study Ogboin oral tradition, they did not show that Ogboin oral poetry basically addresses issues of chanting, invocation, possession of deities and spirits. Thus, this section will begin a chronological order of the publication of the works to be reviewed.

Asanebi (2018) examined the historical impact of Amassoma Seigbein fishing and feasting festival on the people of the Niger Delta region of Nigeria. For Asanebi, the festival is set aside by the natives of Amassoma in Ogboin *ibe* to memorialise and honour Oboro the ancestor of Amassoma community. Also, Asanebi's study is divided into three sections. The first section examined the geographical location and history of Amassoma community and the theoretical amplification of the Seigbein festival in Ogboin oral tradition (Asanebi, 2018).

Again, his work x-rayed the developmental impact of the festival on the natives. The third section dealt with the traditional practices and lineups of the festival. Thus, the aim of the study was "to spotlight the rich cultural festival of the Amassoma people to the globe and to add to existing body of knowledge of festivals of Ijo ethnic group of Central Niger Delta region of

Nigeria" (Asanebi, 2018, p. 137). However, Asanebi did not study Ogboin *ibe* oral poetry as rituals. Also, Asanebi did not examine the relationship that exist between the Ịzọn oral poetry and rituals. Therefore, the present research examines this relationship.

A study by Ayibatari (2020) showed the factors responsible for the impact of the Atlantic Trade on Ogboin kingdom. Ayibatari claimed that Ogboin kingdom played an important part in the trans-Atlantic trade of which without the kingdom the narrative about the connection of the bigger groups like the city states of the Niger Delta would have been different today. Ogboin *ibe* "played the role of the middle men between other hinterland groups in the Niger Delta, thereby connecting them to the people of the city states" (Ayibatari, 2020, p. 103). Again, Ayibatari revealed that the trans-Atlantic trade had an incredible impact on Ogboin economically and politically.

Economically, the trans-Atlantic trade brought about the rise of the wealthy class in the society. Politically the people of "Ogboin modeled their political institutions to that of their Eastern Delta counterparts taking on the title of *Amayanabo* (*Amananaowei*) instead of the *Ama-akosiowei*, which was the traditional title for kings in Ogboin society" (Ayibatari, 2020, p. 104). This system is still in existence. However, he failed to study the ritual elements in Ogboin *ibe* oral poetry. Also, he paid less attention to the impact of war songs, work songs, and wrestling songs on Ogboin clan which this study shows.

3.0 METHODOLOGY

3.1 Study Area

Ogboin *ibe* (Clan) is located in the Central part of the Niger Delta region (Alagoa, 2005). The communities that make up Ogboin *ibe* (Clan) are Amatolo (in Sagbama Local Government Area of Bayelsa State), Amassoma and Otuan in Southern Ijaw Local Government Area of Bayelsa State.

3.2 Method of Data Collection

The study uses the primary and secondary method of data collection. The primary source of data collection is gathering of data from oral interview, participant observations, partaking of religious ceremonies by the researchers and documentation (taking pictures with camera and making audio-visual recording). Also, the data was translated and transcribed into English language. Secondary sources of data collection, was basically library-based (relying on books, articles and reviews on Ịzọn oral tradition).

3.3 Data Analysis Technique

The study adopts the qualitative data analysis method because it is fully based on fieldwork. Data was collected from members of social groups, contributor clarifications, involvement in both wrestling and pond digging activities by the researchers and documentation. The data was decoded from the Ịzọn language into English language. Afterwards, the data was transliterated using poetry analysis technique.

Poetry analysis is an imaginative and inventive illustration of qualitative research. Examining the oral poems line by line allows the scholars to breakdown the poems in order to observe their language, themes and form (Mezmir, 2020). Poetry analysis aids the researchers to interpret the meaning of the Ịzọn oral poems under study and appreciate them literarily. Also, the research examines the different elements of a poetry in the songs understudy.

4.0 DISCUSSION

4.1.1 War songs

The people of Ogboin *ibe* are peace loving people. They have maintained cordial and peaceful relationships with their neighbouring clans for many years. However, there were two instances where they were provoked to take arms against their neighbours. These examples were the Nembe-Ogboin war of 1873 and the Akedei-Amassoma war of 1840 which was due to an attack on some natives of the Amassoma by the Akedei warriors (Ayibatari, 2011, p. 174).

Thus, war songs were composed during these wars to inspire motivation and courage in the hearts of the warriors. War songs celebrate the ideas of courage, escapade and triumph associated with war. An example of such war songs is "*Tẹị mọ kụrọ ẹmị yẹ*". The song was composed anonymously by some Ogboin oral poets during the Akedei-Amassoma war of 1840.

Also, the song has elements of ritual because it is presented in order of activities including incantation, gesticulations and the use of objects in accordance with set order. The composers of this oral poem were also warriors from the Ogboin clan. The song is celebrating the spirit of brotherhood, gallantry

displayed by the warriors of Ogboin *ibe* during the war and the assurance of victory in all battles. Below are the lines of the poem:

Tẹị mọ kụrọ ẹmị yẹ
Tẹị mọ kụrọ ẹmị yẹ
Tẹị mọ kụrọ ẹmị
Owei awọụ bọ pa bọ mẹnẹ
ama sẹ
Tẹị mọ kụrọ ẹmị
Angọ kụrọ mọ owei awọụ
Omẹnẹ kẹ ebe mị di ọtụbọ
Ọgbọ mọ, bạ turọ mọ
Omẹnẹ mụ nọ owọ gbo kẹrẹ
akẹ mi sẹị
Kẹmẹ bọ bra kon ogbo mọ
Bạ beni mọ

Tẹị mọ kụrọ ẹmị yẹ **[English Translation]**
The Celebration is high,
The celebration is high
The men are trooping across our land
The celebration is high,
Brighten up fellow comrades,
The celebration is high,
We are the defenders of our clan
Both on land and on sea
The celebration is high,
We are moving forward to reclaim our land from those agents of destruction
that are destroying our lands and rivers.

The theme of the poem is assurance of victory. This assurance comes when the warriors share their responsibilities in protecting their territory with their ancestors. This is because in Ịzọn culture, ancestral spirits are seen as protectors of their terrains. Also, there is assonance in the poem. This figure of speech happens when there is a reappearance vowel sounds in a group of words in close proximity (Kramer, 2021). The use of assonance in the poem shows the place of incantations and vows of devotion made by the warriors. Thus, the long vowel ***"o"*** helps to highlight the vows of devotion in line 6 ("***Ọ***gbọ m***ọ***, bạ tur***ọ*** m***ọ***"), which invokes land and marine spirits for protection and advancement of the clan. Again, there is a system of cultural rites in line 5, when the poet chants: "*Omẹnẹ kẹ ebe mị di ọtụbọ*" which is translated into English language as: "We are the defenders of our clan".

Also, repetition is present in the poem as a medium of inspiring the warriors for triumph. For instance, "*Tẹị mọ kụrọ ẹmị yẹ tẹị mọ kụrọ ẹmị*" (The Celebration is high, the celebration is high) is voiced more than once in the poem to keep the men committed to their oaths of allegiance to the *Egbesu* deity which is the motivation behind the celebration. All the motivations "will amount to nothing if fighters themselves do not have the assurance that they will be adequately protected" (Ezejiofor, 2016, p. 26). This is because *Egbesu* is both a way of thinking and a preparation for war for these warriors. The deity is known as a spiritual asset of warfare that inoculates Ijaw fighters against bullets (Courson & Odijie, 2020). Also, these fighters abstain from sex during war periods to help them win battles (Golden, 2015).

4.1.2 Work Songs

A work song is a song that is associated with a type of work. It is either sung while working or voicing something about work. Chronicles of work songs are as old as historical accounts, and anthropological indication suggests that most rural areas tend to have them (Gioia, 2006). Work songs are ephemeral and thematically clear. Rhythms of work songs help to harmonise bodily movement in the workers (Peek & Yankah, 2004). The song lessens the weight of the work and inspires collective essence among the workers.

In Ịzọn culture, work is habitually accompanied by a song that is closely related to the work. Like other Ịzọn clans, a work song in Ogboin *ibe* is usually sung with working tools, drums and dance. The song prepares natives for farming, smiting, fishing, building a fish pond, boat building, house building and lumbering activities. However, in Ogboin clan, some work songs carry elements of rituals. An example of an Ịzọn work song is "Osobe!":

[Solo]: Osobe!
[Chorus]: Hey!
Olulu ibe yesibebra
[Solo]: Osobe!
[Chorus]: Hey!
Hayehaye osobe
Olulu ibe otu yesibebra
[Solo]: Osobe!

[Chorus]: Hey!
Olulu ibe yesibebra
[Solo]: Osobe!
[Chorus]: Hey!
Hayehaye osobe
Olulu ibe otu yesibebra

Osobe! [English Translation]
[Solo]: United we stand
[Chorus]: Hey!
Working together like the ant kingdom to achieve success
[Solo]: United we stand
[Chorus]: Hey!
Working together like the ant kingdom to achieve success
[Solo]: United we stand
[Chorus]: Hey!
[Solo]: United we stand
[Chorus]: Hey!
Working together like the ant kingdom to achieve success
[Solo]: United we stand
[Chorus]: Hey!
Working together like the ant kingdom to achieve success

The poem is structured as a call and response song. The theme is unity in the working environment. The poet deliberately uses enthusiastic lines to show the earnestness in the poem to motivate workers to work. The poem has elements of rituals because "Osobe" is an old Ịzọn incantation word decoded as "United we stand". Here, with musical embellishments, the word invokes the Ịzọn communal spirits on the workers to achieve a task. Also, the lines of the poems inspire the workers at work. "Osobe!" is example of exclamation in the poem. There is an example of simile in the poem which is a declaration of similarity (Irmawati, 2014), when the poet chants: "Olulu ibe yesibebra" (Working together like the ant kingdom to achieve success) to encourage the workers stay focused on the assignment. There is also an example of allusion in the poem when poet makes reference to the ant kingdom.

4.1.3 Wrestling Songs

Wrestling songs were sung for specific days. The words in these oral poems inspire bravery and human tactics. The songs evoke an atmosphere of celebration amongst opposing groups. This is because the songs are composed for and against the wrestling champion and his challenger. Each of the groups would have their supporting wrestling songs for motivation and incantation. Most of the songs are accompanied by traditional musical instruments made from trees and animal skins.

In Ogboin *ibe*, wrestling songs are composed by wrestlers or former wrestlers who writes these songs from shared experiences from previous wrestling events. Also, wrestling competitions are accomplished by wrestling songs at the community level, where wrestlers challenged each other in wards (*biri*) and in compounds (*pele*). Most of the wrestling songs in Ogboin *ibe* were composed in honour of wrestling champions from the clan. The purpose was to inspire the younger wrestlers to stardom in the wrestling sport. Some prominent wrestlers from the Ogboin clan were Mr. Jackson Bidei of Amassoma, Mr. Ibo of Otuan, and Mr Deitei Kainga of Amassoma. Wrestling is one entertaining event that fosters "peace and unity at the communal and the kingdom level, as young men would journey from one community to the other for wrestling contexts, the host community was expected to treat the members of the visiting team with respect and high sense of hospitality" (Ayibatari, 2011, p.74). Below is an example of a wrestling song from Ogboin *ibe*:

Bidei owei ooh!
[Solo]: *Bidei owei oọḥ*
Bidei owei oọḥ
Owei oọḥ Owei oọḥ
Akpo oluto owei oọḥ
[Chorus]: *Palemo anda, toun tua*
Olotu sei gbein
[Solo]: *Owei oọḥ Owei oọḥ*
Bidei owei oọḥ
Owei oọḥ Owei oọḥ
[Chorus]: *Palemo anda, toun tua,*
Olotu seri gbein!

***Bidei owei ooh!* [English Translation]**
[Solo]: Bidei is the man
Bidei is the man
The World wrestling champion
He is the man
He is the man
[Chorus]: Go close and throw your opponent down

[Solo]: He is the man
He is the man
Bidei is the man
He is the man
He is the man
[Chorus]: Go close and throw
your opponent down

This is an inspirational oral poem to young Ịzọn wrestlers. It was composed anonymously by a group of young wrestlers from Ogboin *Ibe* in the 1990s. Bidei is a retired wrestler from Ogboin *Ibe*. He represented Nigeria at the 1988 Summer Olympics and other world wrestling championships. The poem is structured as a call and response song. The lines echo the feat of Jackson Bidei as a successful wrestler: "*Owei oọḥ Owei oọḥ/Akpo oluto owei oọḥ*" (lines 2 and 3). Thus, the theme explores Bidei's courage and brevity to motivate wrestlers during a wrestling contest. The diction of the poem is simple and clear. Also, *"Bidei owei oọḥ"* is an example of apostrophe in the song. This is because the name (*Bidei*) is proclaimed with a vocative cry (Sayakhan, 2018), as a man that has been initiated into the Ịzọn Hall of fame.

Furthermore, there is example of anaphora in lines 1 and 2: *owei oọḥ/Bidei owei oọḥ*". Here, "*Bidei*" is repeated at the initial position in immediate succession to assemble the ancestral spirits that helped "*Bidei* to achieve success in the wrestling sport. Also, the repetition of "*Bidei owei oọḥ*" is a connotation for courage. Similarly, the repetition of "*Owei ooh!*" throughout the poem invokes the Ịzọn ancestral spirits of sportsmanship on the singers, wrestlers and audience. There is an existence of assonance in the poem because of the recurrence of matching vowel sounds: "***O**wei **o**ọḥ **O**wei **o**ọḥ*". The vowel **"*o*"** helps to emphasis the idea of courage and brevity on the wrestling arena.

4.2 Research Findings

This paper examines Ogboin oral poetry as rituals. Scholarships on Ogboin tradition are always occupied on other issues. This is because they did not study the relationship between oral poetry and rituals in Ogboin clan. However, this research identifies three types of oral poetry that have elements of rituals in Ogboin *ibe*. They are war songs, work songs and wrestling songs. This paper has found that these songs are used as spiritual mediums to invite supernatural beings and spirits for human fortification, summon the Ịzọn communal spirits and inspire brevity among the natives during different types of events. Therefore, this paper has helped in enriching scholarship on Ogboin oral poetry, by showing connection between oral poetry and rituals in Ogboin *ibe*.

5.0 CONCLUSION

This paper has been concerned with Ogboin oral poetry as rituals. Ogboin *ibe* (Clan) is located in the central part of the Niger Delta region. The study claimed that there is a connection between oral poetry and rituals. The research identified three types of oral poetry that have elements of rituals. They are war songs, work songs and wrestling songs. War songs are sung to inspire bravery during war and to invite spirits for protection and victory. The paper revealed that wrestling songs inspire wrestlers to stardom in the wrestling sport. Also, the paper claimed that work songs inspire workers to work. This study examined Ogboin oral poetry in line with the doctrines of archetypal literary theory. Thus, this research is important in that it will, among other things, offer to scholarship the relevance of rituals in African oral poetry as remedies for resolving communal hitches in Africa.

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IMPACT OF CAPACITY BUILDING AND MANPOWER DEVELOPMENT INITIATIVES ON EMPLOYEE PERFORMANCE IN NIGERIAN BUSINESSES

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Abstract
Capacity building and man power developing is a major consideration of many public and private sector organizations. The major target is to increase workers' productivity and effectiveness. The impact of capacity building and manpower development initiatives on employee performance in Nigerian businesses was investigated in this study. Literatures relating to this study were reviewed and appropriate content analysis undertaken. In the selected organizations, the findings revealed a substantial positive link between capacity building and employee performance. Capacity building and personnel development initiatives. Findings also revealed that Capacity building and man power development result to new knowledge, skills, and managerial capacities, and hence should be given more attention and resources dully allocated by organizations.

Keywords: Capacity building; Manpower development; Staff performance

1.0 INTRODUCTION

In most organizations whether large or small, there are three basic elements to look out for. The first is the human element which comprises of employee working in the organization, second is the method of operation needed to enable the organization function effectively both internally and externally, while the third element is how to enhance productivity and the efficiency of employees. This is where capacity building and manpower development come into play. Capacity building, training and manpower development have over the years gain prominence in private and public organizations, so much so that numerous literatures abound on the topic both within the academic and non-academic circles. It is much more than training and includes; human resources development, which involves the process of equipping individuals with skills, understanding, access to information, knowledge, and training which enables them to perform effectively (Barney, 2001).

Capacity building has its origin in the United Nations and its quest is to develop people and entities. Capacity building in relation to United Nations (UN) is traceable to the UN system for action and thinking in this area was given to United Nations Development Programme (UNDP) and has offered guidance to its staff and governments on what was then called institution building. This involves building up abilities of basic national organizations, in areas such as Civil Aviation, Meteorology, Health, Education, Nutrition etc., to do their task well (FY, 2012).

UNDP recognizes that the capacity building is a long-term process in which all stakeholders participate (Ministries, Local authorities, Non-governmental organizations, Professional Associations etc.). This creates enabling environment with appropriate policy and legal frameworks, institutional development including community participation (of women in particular), human resources development, and strengthening of managerial systems.

In every organization manpower represents a key decision area and as such occupies an ever increasing significance in modern day organizations. This is primarily due to the fact that manpower is an extremely valuable asset in any organization. This importance can be exemplified in the crucial role it plays in attainment of any organizational goal as organization activities revolve around it for their success (Akinusi, 1983).

It is noteworthy to mention that the single advantage that any organization may have over any competition sometimes consist of the number and quality of people employed to manage organizational activities. For manpower to be able to perform its duties, it needs to acquire necessary knowledge and skills, which will help in no small measure to improve the productivity of the organization. This is made possible by the provision of adequate training and capacity building programme by the organization.

According to Nwachukwu (1988) emphasis placed by any organization on training and development of its employees determines the productivity of the organization. Technological innovation which occurs everyday, renders today's skills and method ineffective for tomorrow's activities. Thus, one crucial function of management is to ensure that employees without necessary skills are helped to acquire them, while those who do are helped to update them.

Furthermore, to emphasize the importance of capacity building in employees, the International Labour Office (2000) affirmed that development and training improve their trainees "prospects of finding and retaining jobs' while also improving their productivity at work, their income earning capacity and as a result their living standard. It also effectively widens their career choices and opportunities.

Shields (2007) conceptualised 'performance' as a ―manageable human resource phenomenon‖ to achieve prescribed outcomes, using insights from open systems thinking in cybernetics. Three main elements are placed in a linear arrangement: inputs, throughputs, and outputs, and understood in terms such as the application of knowledge and skills to transform the 'input factors' into tangible outcomes – managerially desired behaviours and goal attainment. Locating the definition organizationally, Shields (2007) explained that each of the systemic factors that may be subject to performance management interventions may be extended to include collective and, in turn, organization-wide dimensions, where managers take active steps to align people with processes and forming a technical system from which to deliver, desired levels of service delivery in cost effective ways.

In view of the dynamics in the modern day business environment, capacity building and manpower development is one of the key activities that any organisation must engage in if it hopes to survive. A capacity building and manpower development unit (training) is created in any organisation to coordinate all training activities of the organization. It has the responsibility of determining training and development need by deciding when and what kind of training, for whom, where, under what conditions, at what cost and by whom the training will be implemented. All these activities are necessary to enable the organisation derive the utmost benefits from its capacity building activities. However, many organisations fall short of focusing adequate attention on building adequate capacity among their workforce thereby inhibiting the productivity, efficiency, effectiveness and growth of the organization. The aim of this paper to review and analyze the element of capacity building and it impact on business organizations.

2.0 LITERATURE REVIEW

2.1 Conceptual Reviews

Capacity is defined as the ability of individuals and organizations or organizational units to perform functions effectively, efficiently and sustainably. Capacity building is an evidence-driven process of strengthening the abilities of individuals, organizations, and systems to perform core functions sustainably, and to continue to improve and develop over time (Fy, 2012). According to Morgan (1998), capacity building is a risky, messy business, with unpredictable and unquantifiable outcomes, uncertain methodologies, contested objectives, many unintended consequences, little credit to its champions and longtime lags.

Capacity building activities involves strengthening organisations in the areas of administration, finance, human resources, and facilities. Capacity building is a complex notion-it involves individual and organisational learning, is inevitably long term, and should be demand driven. If successful it contributes to sustainable social and economic development. Capacity building is the process of developing and strengthening the skills, abilities, processes and resources, that organizations and communities need to survive, adapt and thrive in the fast changing world.

For the organization, capacity building may relate to almost any aspect of its works, improved corporate governance, leadership mission and strategy, administration (including human resources, financial management and legal matters), program development and implementation, evaluation, advocacy and policy change, marketing, positioning, planning, income generation etc.

For the individual, capacity building may relate to leadership development, skills acquisition, speaking abilities, technical skills, organizational skills and other areas of personal and professional development (Linnell, 2008).

The Department for International Development (DFID) (2010) defines capacity building as enhancing the abilities of individuals, organisations and systems to undertake and disseminate high quality research efficiently and effectively. Capacity building efforts can be designed to serve individuals, organizations, geographical or interest communities, or the nonprofit sector as a whole. Furthermore, the intensity and duration of the effort can distinguish a capacity building engagement as either aimed at implementing new systems (short term) or achieving wider organizational change (long-term). These efforts can further be usefully classified based on the areas of organizational life they seek to affect: external relationships, internal structure, leadership, and/or internal management systems.

Emmanuel (2013) conducted a study on the effect of capacity building on employees' performances. The researcher collected facts from subjects through questionnaires. The results of the facts analysis revealed that training when properly given, has a significant effect on employee performance. However, the study also established that training does not always answer job performance problem. Reward system in the form of salaries, bonuses and allowances are major ingredients that drive performance.

3.0 NECESSITY OF CAPACITY BUILDING

The goal of capacity building, according to DFID (2010), is to facilitate individual and organisational learning which builds social capital and trust, develops knowledge, skills and attitudes and when successful, creates an organisational culture and a set of capabilities which enables organisations to set objectives, achieve results, solve problems, and create adaptive procedures which enable them to survive in the long run.

Staff capacity building has been identified as part of an organizational strategy to improve overall productivity, motivate staff to deliver high quality services and create an ongoing commitment to innovation and system improvement. Viewed from this perspective; staff training is an integral part of a larger human resources investment strategy designed to transform workforce service delivery system into "high performance" organizations that strive continuously to improve service quality and customer satisfaction. Most organizations also find out that staff training is essential to support several specific elements of system change as described here:

- Team-building training is often required to mould staff from a number of different partner agencies-each with its own identity, work culture, program rule and job expectation-into a functioning career centre system with a shared customer-service approach and seamless service delivery.
- Staff often need training in computer literacy and specific computer skills, because services emphasize the use of up-to-date information technologies to deliver customers services and support internal management functions.
- Staff usually requires training to move from narrow program-based job functions to the delivering of broader service functions that receive funding from a variety of program-based funding streams.

In addition to contributing to the development of technical outputs, human capacity building can directly benefit both the newly trained individuals and the organisation that they work for. The benefits to trainees is the most direct link between capacity building and impact. The main benefits to trainees include improvements in confidence, competence, promotion and higher income (Templeton, 2009).

Also, the benefits of capacity building can flow to the trained individual, other workers in the organisation, the organisation as a whole and communities. The community-level impact of the capacity built arises from the outputs generated (and adopted) when this capacity is used. Gordon and Chadwick (2007) state that as a rule of thumb, a worker's lifetime income is higher, on average, by around 10% for each additional year spent in formal education. At the organisational level, the efficiency of the organisation can be enhanced through the trainees' capacity-induced changes in practice and behaviour. This is reflected in increased efficiency in the provision of services or outputs; innovations in the type of services or outputs delivered and in the delivery process; in new and better R&D effectiveness and increased influence in the policy arena.

As a general rule of thumb, workers tend to accrue around half of the productivity improvement from training, the other half being captured by the firm (Gordon and Chadwick, 2007). Systems and policy

level capacity building activities improve the external environment in which organizations and individuals function, including structures supporting the way organizations interact, and/or policies and standards that must be adhered to. These may be at the national level or below. Organizational level capacity building activities improve the performance of internal organizational systems and processes, leading to stronger organizations with the ability to adapt and continue to develop over time. Individual/workforce level capacity building activities improve the performance of staff according to specific, defined competencies and job requirements (Fy, 2012).

According to Paul and Elizabeth (2004), the following are the four key elements that play a significant role in determining the scope, design, and ultimate success of any capacity building engagement:

- the desired outcome or defining goal;
- the change strategy selected to help realize that goal;
- the champions guiding the efforts, be they internal or external; and
- the resources—time, energy and money—invested in the process.

Letts, Ryan, and Grossman (1998) noted that the results of capacity building can be seen at three levels:

- improvement in the capacity of the organization to do what it already does (products/services delivery capacity),
- improvement in the organization's capacity to grow (expansion capacity), and
- improvement in the organisation's ability to sense needs for change and respond to them (adaptive capacity). All three are needed to produce high-performance levels over time.

4.0 CONCLUSIONS AND RECOMMENDATION

4.1 Conclusion

This study examined the impact of capacity building on staff performance in selected organisations in Nigeria. Findings showed that there is a strong positive relationship between capacity building and staff performance in an organisation. This implies that capacity building enhances employee performance which ultimately translates to improved organisational performance. Capacity building is considered an important management issue in any organisation because capacity building inputs and activities not only result in capacity-building outputs (in the form of new knowledge, skills and management capabilities), but also contribute to the realisation of other output targets.

4.2 Recommendations

It is therefore recommended that organisations should improve on their capacity building activities, so as to facilitate higher employee performance. Furthermore, Individual and workforce level capacity building activities should be within the context of and accompanied by strengthening of organizations and systems that will ensure the sustainability of activities, outputs, and outcomes.

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STRESS ANALYSIS OF HIP JOINT PROSTHESIS: FINITE ELEMENT METHOD FINITE ELEMENT ANALYSIS OF THE BIOMECHANICS OF HIP JOINT PROSTHESIS 2

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ABSTRACT
Hip joint prosthesis is used to replace a damaged hip joint. The most common materials used for artificial hip joints are metal alloys, ceramic or certain types of plastic. It is important to study these prostheses to understand how much compressive force will be transferred directly to the femur bone and minimize stress shielding which is a common problem with hip joint prosthesis. Reducing the replacement cycle of hip prosthesis could be achieved if better materials that reduce stress shielding can be obtained. This research investigates the stresses on the femur when different materials combinations are used for hip joint prosthesis as to better understand which materials are best suited to reduce stress shielding effect. Twenty (20) biomaterials of various densities, poisson ratios and Young's Moduli of elasticity were investigated using the finite element method. The geometry of the bone was obtained via CT scan and the geometry for the prosthesis material was created using computer aided design software. The boundary condition was set for walking conditions. The result shows that grade 4 titanium alloy allow more compressive force transmission to the proximal femur, followed by grade 2 titanium alloy, grade 3 titanium alloy and grade 1 alloy, while stainless steel 316 and 316 L transmitted less compressive force to the proximal femur. Titanium alloys also showed more displacement. The investigation did not show any connection between the chosen material properties and the minimum principal force exerted at the proximal femur. Other material properties such as shear modulus etc. should be investigated in relation to stress shielding effect of biomaterials.

Keywords: Hip prosthesis, finite element, stress shielding, compressive force, proximal femur, biomaterials.

1.0 INTRODUCTION
One common phenomenon that arises in total hip athroplasty is stress shielding. According to Wolf's law (www.webmd.com.oste), bones grows and remodels in response to the force that are place upon it. Bone desorption due to stress shielding is a common problem with hip joint prosthesis due to lack of compressive force being exerted on the proximal part of the femoral bone which then require replacement of the prosthesis. Stress Shielding in hip joint is mainly due to biomechanical incompatibility of the material used. Repeated subjection of implant to cyclic load place very high biomechanical requirements on the materials used for implant.

Fracture produced in the prosthesis due to inadequate strength or other material requirements or modulus between bone and implant is known as biomechanical incompatibility. Depending on the type of bone, modulus vary from 4 to 30 GPa. Thus, where the material is stiffer than the bone, it prevents stress from being transmitted to the adjacent bone resulting in resorption around the implant and loosening of said implant.

The biomechanics of the lower limb allows for stance and bipedal propulsion. The head of the femur together with the acetabulum form a multiaxial ball and socket joint with motion in three degrees of freedom which includes flexion-extension, abduction-adduction, plus medial-lateral rotation. However, the femoral joint is limited in transitional motion in the antero-posterior, transverse and vertical planes. (Drake et al. 2009).

The factors influencing both the magnitude and direction of the compression forces acting on the hip are the position of the center of gravity; the abductor moment arm, which is a function of the neck length and shaft angle; the magnitude of the body weight. (Sandring et al. 2008).

In a single-leg stance, $5/6$ of the total body weight passes through the lateral to midline. This exerts a moment in the clockwise direction on the pelvis. The

clockwise movement is countered by the pull of the abductors whose lever arm (a) is approximately half that of the body center (b). Therefore, the abductor force needed to sustain equilibrium is about twice that of the body weight, which gives rise to joint reaction force that is three to four times the body weight.

Miyanaga et al. (1984) on studying the deformation of the hip joint under loading conditions, articular surface contact areas and forces acting on contact found out that as load increase the contact area enlarges to include the outer and inner edges of the lunate surface of the acetabulum.

The biomechanical function of the human lower limb is primarily to allow stance and bipedal propulsion. (Bronzino & Peterson, 2015). The hip joint is made up of the pelvic acetabulum as well as the head of the femur. The stability of the joint is due to the adaptation of the acetabulum and the head of femur to each other. It is a multiaxial ball-and-socket type of joint. Joint stability and range of movement, as in all joints is in reverse proportion to each other. (Chummy S. Sinnatamby, 2005). The range of movements allowed at the hip joint include abduction, adduction, lateral rotation, medial rotation, extension and flexion (Drake et al.). In the event of fracture in the neck of the femur the shaft rotates about its own axis whereas psoas and iliacus rotates the limb laterally. This is an indication of a fractured femoral neck. (Chummy S. Sinnatamby, 2005).

The materials employed for constructing implants should not result to inflammation, allergic reaction or toxin in the human system. Also, the reaction of the human system with the implant material will determine the success of the material biocompatibility. The two factors that influence biocompatibility are the body's response to the materials and the material disintegration within the body (Aherwar et al. 2015). Moreover, the choice of materials used will take into consideration the part of the body the implant is to be situated as well as the medical usage.

This research is aimed at investigating the stresses on the femur when different materials combinations are used for hip joint prosthesis in order to better understand which materials are best suited for hip joint prosthesis so that stress shielding effect can be reduced.

2.0 MATERIALS AND METHODS

2.1 Methods

A computer Aided Design (CAD) model of hip bone prosthesis was provided by Grab CAD (Computer software). The scan of a hip bone consisting of cortical bone, marrow bone and tubercular bone was obtained by CT scan. The scanned image was then imported to SpaceClaim software for conversion to stereo lithography (stl) type file. This file was then imported to the ANSYS workbench.

AMSYS, a Finite Element Method Software was used for the simulation of the principal working forces. This was done by running simulation of the load on the femur in walking conditions, set boundary conditions of the various solid work then, result of the simulations were obtained when various materials are used.

In setting up the boundary conditions, two forces were considered. The first boundary condition is the weight exerted by the body on the limb while standing. This was set to 826N in the Z-component and 0N in the X-component and Y-component.

The second, walking force was applied to the prosthesis head in contact with the hip when the person is walking. The force was applied as a variable force. The computer aided design of the Part of prosthesis and bone are presented in Figures 2.1 and 2.2

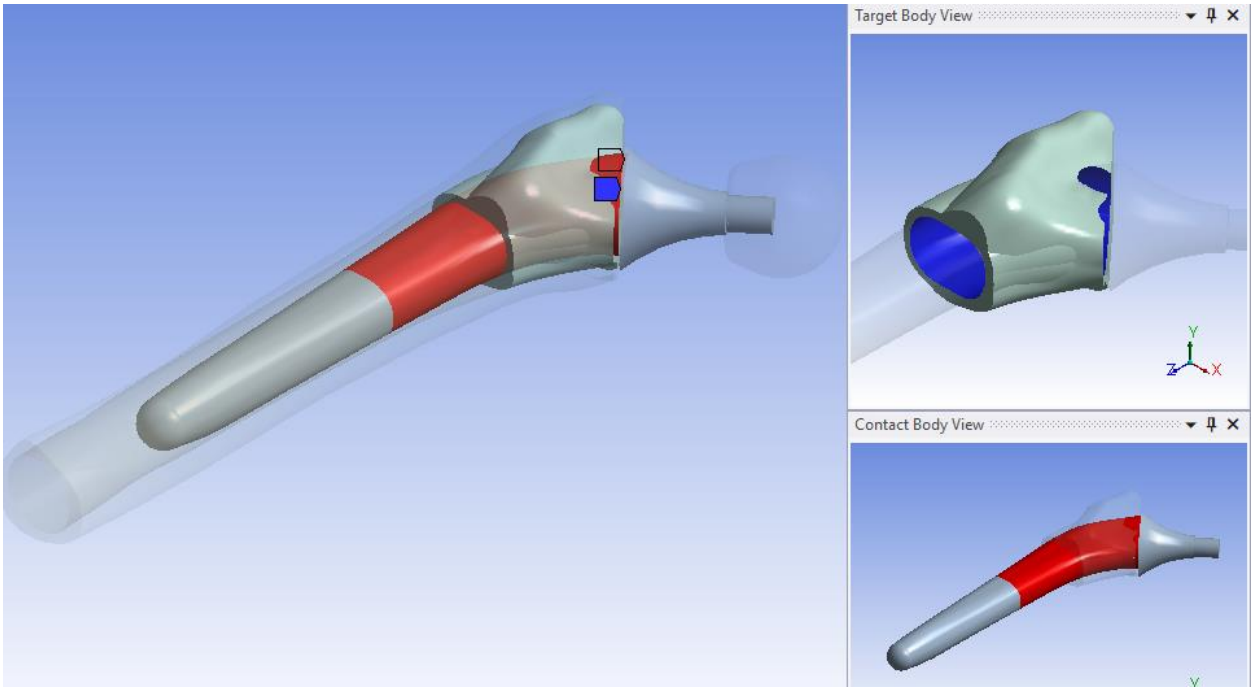


Figure 2.1: Part of prosthesis and bone

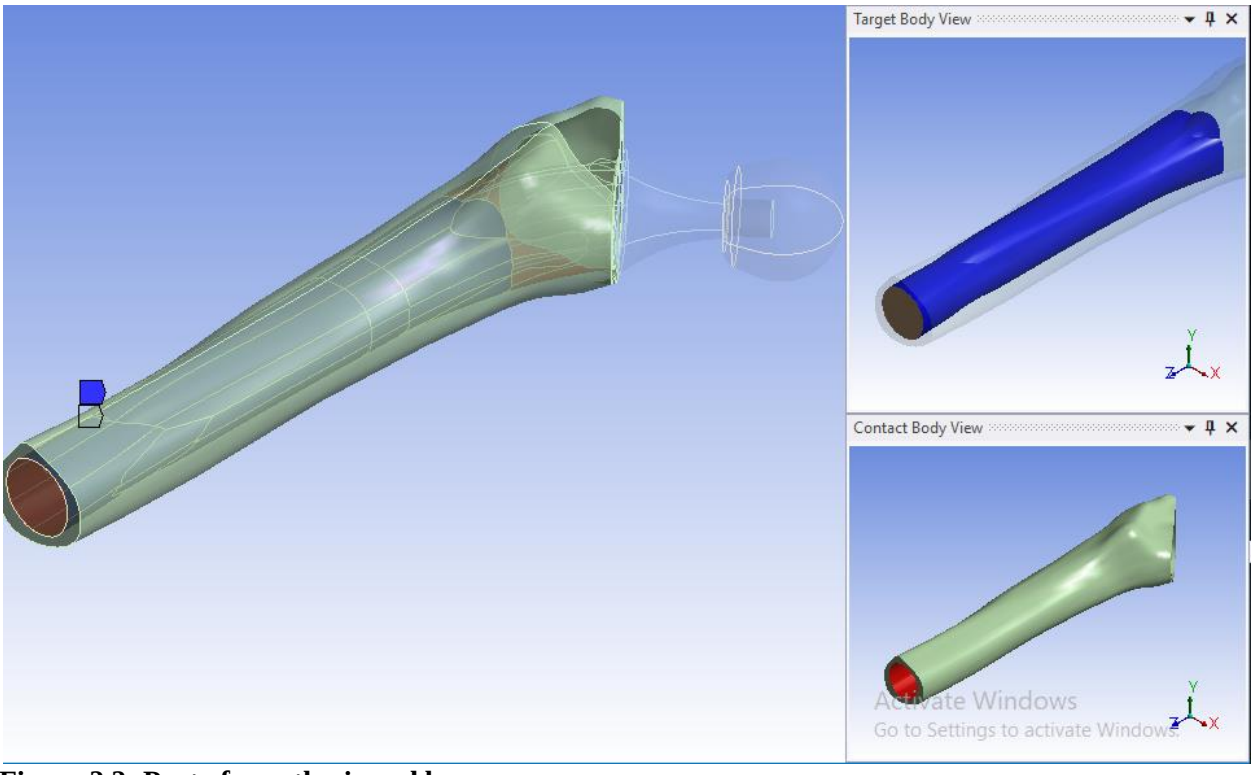


Figure 2.2: Part of prosthesis and bone

2.2 Specification of material properties

The material properties used to calculate isotropic elasticity which is the equation-set employed by Simscale/ANSYS Mechanical are Young's modulus, Poisson's ratio and density. Properties of various materials investigated are presented in Table 2.1.

Table 2.1: Required material properties for biomaterials under investigation

Material	Young's modulus(E) – Pa	Density – kg/m^3	Poisson's ratio
Stainless steel 316	1.93E +11	8020	0.3
Stainless steel 316L	1.90E +11	8000	0.25
Cast Co-Cr-Mo	2.80E +11	7800	0.3
Wrought Co-Cr-Mo	2.10E +11	9150	0.3
Grade1	1.07E +11	4500	0.34
Grade2	1.05E +11	4510	0.37
Grade3	1.07E +11	4500	0.36
Grade4	1.03E +11	4500	0.39
Ti-6Al-4V	1.16E +11	4430	0.342
Ti-13Nb-13Zr	6.40E +11	4660	0.3
Alumina	3.75E +11	3900	0.22
Zirconia	1.50E +11	5900	0.3
Pyrolitica	2.80E +10	1500	0.3
Bioglass-ceramics	2.20E +10	1700	0.3
Calcium phosphates	1.15E +11	3160	0.27
Graphite	2.40E +10	1700	0.3
Vitreous carbon	2.70E +10	1500	0.3
Polymethylmethacrylate(PMMA)	2.60E +10	1100	0.4
Polycaprolactam	2.80E +10	1140	0.4
Silicon nitrate	3.10E +11	3200	0.26

Material properties of various bones are presented in Table 2.2

Table 2.2: Material properties of bone is given

Material	Young's modulus(E) – Pa	Density – kg/m^3	Poisson's ratio
Trabecular bone	1.0E +9	900	0.30
Bone marrow	0.3E +9	1000	0.45
Cortical bone	1.6E +10	1850	0.30

Table 3: variable forces applied in walking conditions

TIME (S)	VARIABLE FORCES APPLIED COMPONENTS		
	X (N)	Y (N)	Z (N)
1	**- 15**	**-20**	**80**
10	**- 20**	**-30**	**185**
20	**12**	**-35**	**220**
30	**30**	**-40**	**200**
40	**50**	**-35**	**195**
50	**60**	**-27**	**170**
60	**20**	**-40**	**90**
70	**0**	**-25**	**60**

3.0 RESULTS AND DISCUSSIONS

3.1 Results

The maximum principal stresses at the distal end of the bone/prosthesis, at 0 displacement and maximum displacement are presented in Table 3.1.

Table3.1: The Level of stress and displacement at the distal end of bone/prosthesis with different materials

Material	Max Principal stress, distal end(Pa)	Min. principal stresses(Pa)	Max displacement
Stainless steel 316	7.204e+6	1435.82	5.42885e-4
Stainless steel 316L	6.170e+6	1457.18	5.52172e-4
Cast Co-Cr-Mo	5.284e+6	4877.67	3.81902e-4
Wrought Co-Cr-Mo	5.320e+6	4919.02	4.15184e-4
Ti alloys Grade1	5.380e+6	8751.50	4.84797e-4
Grade2	5.380e+6	8994.60	4.84170e-4
Grade3	5.379e+6	8858.23	4.83223e-4
Grade4	5.381e+6	9193.24	4.83567e-4
Ti-6Al-4V	5.307e+6	3679.70	3.98163e-4
Ti-13Nb-13Zr	5.237e+6	4337.21	2.77012e-4
Alumina	5.243e+6	3579.38	3.47428e-4
Zirconia	5.334e+6	5258.86	4.35013e-4
Pyrolitica	5.334e+6	5258.86	4.35012e-4
Bioglass-ceramics	5.314e+6	4986.29	4.09934e-4
Calcium phosphates	5.291e+6	5355.63	3.78112e-4
Graphite	5.304e+6	5164.58	3.99980e-4
Vitreous carbon	5.289e+6	5071.76	3.86220e-4
Polymethylmethacrylate(PMMA)	5.285e+6	5060.63	3.78209e-4
Polycaprolactam	5.274e+6	4875.05	3.69165e-4
Silicon nitride	5.271e+6	4845.17	3.70831e-4

Results of different material combination for femoral and socket components are presented in Table 3.2

Table 3.2: Some combinations and their effects

Femoral Component	Socket Component	Results
Co-Cr-Mo	Co-Cr-Mo	High loosening rate and restricted use, minimum wear
Co-Cr-Mo	UHMWPE	Low wear rate
Alumina/zirconia	UHMWPE	Relatively low wear, more impact resistance by zirconia
Alumina	Alumina	Least wear rate, possibly causes discomfort
Ti-6Al-4V	UHMWPE	UHMWPE breakdown due to titanium surface
Surface-coated Ti-6Al-4V	UHMWPE	Best wear resistance property

Results of material properties and stress simulations are presented in Figures 3.1 and 3.2

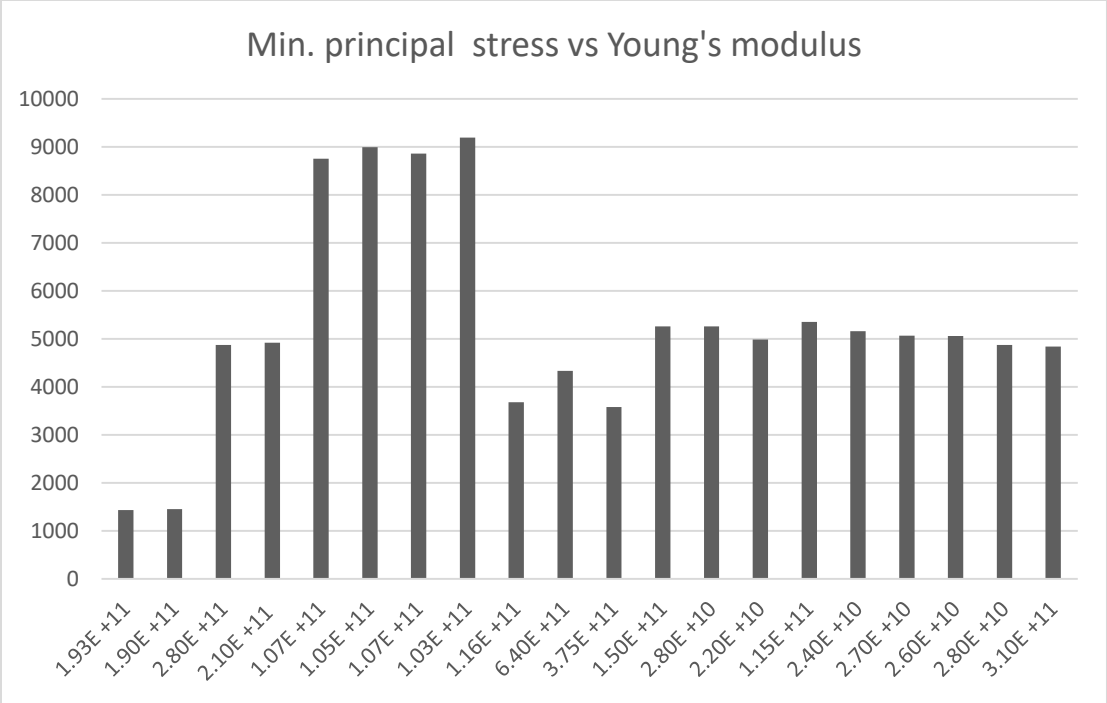


Fig. 3.1 Principal stress and Young's modulus

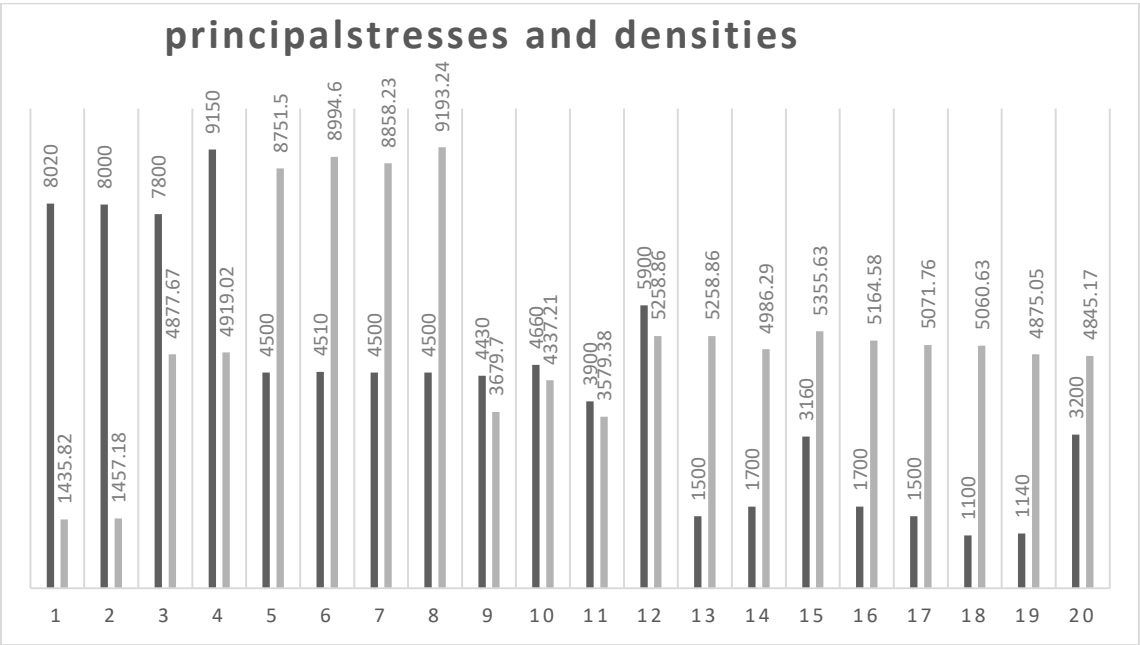


Figure 3.2: Principal stress vs densities

Discussion

The investigation shows that titanium alloys allows more stress transmission to the proximal bone. Grade4 titanium allow more compressive force transmission to the proximal bone(9193.24Pa), followed by grade2 titanium alloy(8994.60Pa), grade3 titanium alloy (8858.23Pa) and grade1 alloy (8751.50Pa). Zirconia(5258.86Pa), pyrolitica(5258.86Pa) and graphite(5071.76Pa) fall within the same range while stainless steel 316(1435.82Pa) and 316L(1457.18Pa) transmit less compressive force to the proximal bone. Ti13Nb13Zr (4337.21Pa) Ti6Al4V and (3679.70Pa)

shows less stress transmission compared to other titanium alloys and every other biomaterials investigated, only surpassing stainless steel 316 and stainless steel 316L. The maximum principal stresses also placed the titanium alloys ahead of other biomaterials investigated except stainless steel 316 and stainless steel 316L. Beredugo, (2021) reported that, Titanium alloys (grade1, grade2, grade3 and grade4) also show greater degree of freedom of movement (displacement) compared to other investigated materials, with the exception of stainless steel 316 and stainless steel 316L.

Nevelos *et al* (2001) studied the behaviour of CoC bearings realized with hot isostatically pressed alumina and compared with the standard alumina ones. The result shows a reduction of the wear rate for the hot pressed prosthesis when working under standard conditions. Different behaviour was observed under Gelofusion (4%) w/v solution of succinylated gelatin) and water lubricants, when the non-hot pressed ceramic showed a lower wear rate.

However, the results reported by the researchers under standard testing conditions were an order of magnitude lower than the majority of the reported clinical wear rates for in vivo ceramic prosthesis. Affatato et al (2006) tested different ceramic configurations, ie. (Pure alumina vs alumina composite. The wear rate was found to be lower in the lower pure alumina than in the alumina composites. However, the observed wear behaviour difference of the studied materials was not statistically significant.

Another study by Affatato et al (2009) on a wear test to compare the tribo- behaviour of the different sizes of ceramic components. Two different batches of alumina biolox (Fort 28mm vs 36mm) tested on a hip simulator under bovine cell serum for five million cycles. They found that the 36mm Biolox forth size showed less weight loss than the the 28mm Biolox forth size.The result of this study did not show any connection between the chosen material properties such (densities, Young's Moduli of elasticity, poisson ratios) and the minimum principal force exerted at the proximal femur. Massimilliano and Saverio (2019) reported that the best and most common traditional metals used for THA are Cobalt, stainless steel, Titanium Alloys (Ti6A14V) and mainly Cobalt-Chromium-molydenum alloys. Cobalt-chromium-molybdenum alloy have good corrosion resistance compared to metals and high toughness, high wear resistance and high hardness (HV=350) than other metals and polymers. Alumina ceramics has been used in clinical applications for their tribological properties due to their hardness. Among the ceramics, alumina is the most commonly used materials. Ceramics are good, however in recent times concerns have been raised on the use of some ceramics because of the presence of audible noise in some ceramics-on – ceramics THA patient (Affatato et al., 2009).

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Bone resorption due to stress shielding is a common problem associated with hip joint prosthesis and this is due to lack of compressive force being exerted on the proximal part of the femoral bone which then require replacement of the prosthesis. The problem of Stress Shielding in hip joint is primary cause by biomechanical incompatibility of the material used. The more compressive force is transmitted to the proximal femur bone the better suited the biomaterial is for prosthesis construction.

This research undertook the study of the stresses on the femur when different materials combinations are used for hip joint prosthesis. This is aimed at understand which materials are best suited for hip joint prosthesis so that stress shielding effect can be reduced. The results of the investigation show that titanium alloys allow more stress transmission to the proximal bone. Grade4 titanium allow more compressive force transmission to the proximal bone (9193.24Pa), followed by grade2 titanium alloy(8994.60Pa), grade3 titanium alloy (8858.23Pa) and grade1 alloy (8751.50Pa). It is concluded that Grade 4 titanium allow is the best biomechanical material for hip joint prosthesis.

4.2 Recommendation

In other to achieve optimum performance of hip prosthesis and prolong the time before bone resorption occurs around a prosthesis due to stress shielding, a suitable biomaterial should be adopted for the prosthesis. Further investigation to the subject require an interdisciplinary approach. More options for suitable biomaterial require investigation to get the best options for patience during prosthesis. Also requiring further study is the geometry of the hip joint prosthesis. This simulation was done using 'ANSYS Student' (with limited meshing and solver

capabilities) and cloud based Simscale. Better simulation software can be used to obtain better results. As the field of bio-simulation improves better software and algorithm should be used to get a better bio-simulation. Other material properties such as shear modulus etc. should be investigated in relation to stress shielding effect of biomaterials.

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THE REPRESENTATION OF SCATOLOGY IN AYI KWEI ARMAH'S *THE BEAUTYFUL ONES ARE NOT YET BORN*

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Abstract
This paper examines the representation of scatology in Ayi Kwei Armah's: The Beautyful Ones Are Not Yet Born. The study asserts that scatology is the study of filth and a repeated allusion to excrement and related matters. Also, the paper affirms that Armah uses scatological descriptions in the novel to draw the reader's attention to the awful and disgusting issues that bedevil post-independence Ghana. Thus, the research examines the issue of ambiguity about the question of scatological imaginings in The Beautyful Ones Are Not Yet Born. The scatological images in the novel under study are the chichidodo bird, the banister, shit, the bus and the sea. The study uses eco-criticism literary theory as the theoretical framework to examine the concept of scatology in African literature, and to show the limitations of critical literature on the primary text which has generally underestimated the representational strategies of the novel in its presentation of scatology.

Keywords: scatology, imagery, ethical decay, corruption

1.0 INTRODUCTION

1.1 Background to the Study

The concept of scatology is a human conception. It is a mania for excrement or excretion. Scatology is "the study of excrement. In the literary sense it means repeated reference to excrement and related matters" (Baldick, 2001, p. 229). Also, it is a word that signifies the literary trope of the grotesque body. It is used to define works that make specific allusion to excretion or excrement, as well as to toilet humour. Some writers use scatological imagery as a device to expose extremely appalling and hideous issues like materialism, corruption, rudeness, hypocrisy, spiritual and physical debauchery that bedevil their societies so as to create a positive change (Lehnhof, 2007). For example, Ayi Kwei Armah uses scatological imagery in his novel, *The Beautiful Ones Are Not Yet Born* to reflect the socio-cultural, political and economic decadence in post-colonial Ghana and Africa by extension.

The Beautyful Ones Are Not Yet Born conveys a sense of resentment, due to the life-threatening presence of bribery and corruption which are collectively acknowledged in Ghana as the only way to affluence and progress. Armah uses impolite language in the novel to draw the reader's attention to the awful and disgusting issues that bedevil post-independence Ghana (Osei-Nyame, 2020). Also, the novel builds its actions in such a way that it describes the scatological imaginings Armah has deployed to accentuate the ethical decline in the Ghanaian society. These descriptions are the chichidodo bird, the banister, shit, the bus and the sea. Thus, through these issues this study examines the representation of scatology in Armah's *The Beautyful Ones Are Not Yet Born* in line with the premises of ecocriticism literary theory.

1.2 Statement of the Problem

The idea of scatology in African literature has received different degrees of critical attention from scholars. A significant feature of most of the critical positions of these critics is that while they adopt different methods to interpret the notion of scatology they did not use ecocriticism to study the impact of scatological imagery in African literature. This study, therefore, examines the representation of scatology in Armah's *The Beautyful Ones Are Not Yet Born*.

1.3 Purpose of the Study

The purpose of this paper is to examine the representation of scatology in Armah's *The Beautyful Ones Are Not Yet Born*. To fulfil the purpose of this study the objectives are to:

a) examine the issue of ambiguity about the question of scatological images in Armah's *The Beautyful Ones Are Not Yet Born*;
b) show the limits of critical literature on the primary text which has largely underrated the representational approaches of this text in its presentation of scatology.

1.4 Research Questions

This research seeks to address the following questions:
a) What is scatological imagery in African literature?
b) How did Armah present the concept of scatology in *The Beautyful Ones Are Not Yet Born*?

1.5 Significance of the Study

This study is significant because it examines the scatological imagery used by Armah to highlight the ethical deterioration in the Ghanaian society in *The Beautyful Ones Are Not Yet Born*. The major concern of the study is to show how Armah uses scatological images to describe the extent of corruption in Ghana. In addition, the study is pertinent to scholars who are interested in the study of African novels, especially *The Beautyful Ones Are Not Yet Born.*

Being a literary study, this paper is largely library-based. It based on such critical sources as books, articles and reviews on scatological conceptions. Also, works on Armah's *The Beautyful Ones Are Not Yet Born* have helped to offer more facts on the literary construction of Ghana and the African continent at large. It is the hope that these resources will in turn lead to an in-depth understanding of the representation of scatology in *The Beautyful Ones Are Not Yet Born*.

2.1 REVIEW OF RELATED LITERATURE

Alexander and Theophilus (2011, p. 253) examine Armah's novels as "a kind of continuous and conscious struggle against the forces of slavery and colonization in the past, and neo-colonialism and globalization in the present, forces which have plagued the African continent for so many years". For them, Armah's novels are intended to serve as liberation tools for African intelligentsias in the continent itself. His works can be described as the handiworks of a pan African Marxist slanted flavoured with "negritudinal" thoughts and considered to upheaval colonialism from the African continent.

Also, they see Armah's works as radically jolted and reform the consciousness of the African in the decolonization processes (Alexander & Theophilus, 2011, p. 260). Thus, they write that Armah's novels are deliberate mechanisms "of resistance, change, transformation and liberation. They are counter discourses to colonialism and Europeanism. Armah demonstrates through these novels that he is a revolutionary and belligerent insurgent, who intends to utilize his works to unchain Africa from the shackles of imperialism" (Alexander & Theophilus, 2011, p. 260). This study outspreads the limitations of Alexander and Theophilus's assessment of *The Beautyful Ones are not Yet Born* as a text of Africa's liberation to an argument on scatological imaginings seen to stress the ethical deterioration in the Ghanaian society in the novel.

Nkansah (2021) scrutinises the widespread portrayal of the ills and anomalies in the Ghanaian society right after independence in Armah's *The Beautyful Ones Are Not Yet Born*. The novel "depicts the subject of corruption and its related thematic considerations. The subject matter draws synergies from related subjects such as poverty, social inequality, hero-worshipping, political instability, economic sabotage, solitude, and retributive justice" (Nkansah, 2021, p. 30). He sees corruption as the main theme in the novel, thus, creating repulsive images of public officers over the use of pejorative words such as '"constipating', 'farting', 'flatulence', 'a group of bellies', 'stupid', and 'idiots'. The novel "demonstrates that corruption is the lifestyle of self-serving public officers such that the overthrow of a political regime is thought of as being the panacea to the perpetuation of the ills of corruption" (Nkansah, 2021, p. 30). However, Nkansah ignores Armah's presentation of scatological conceptions emphasizing the moral decay in the Ghanaian society in *The Beautyful Ones Are Not Yet Born* which this paper is set to achieve.

For Mami (2017), the nonappearance of beauty in *The Beautyful Ones Are Not Yet Born* signifies the postcolonial condition whose moral code interprets unpleasant social relations, corrupt politics and massive failure. The "beauty of the African locale should function as an incentive to alter the ugliness of the present, and advance the cultural renaissance that Armah envisages for Africa" (Mami, 2017, p. 217). This is because this "beauty operates as an aesthetic incentive wherein inspiration from the natural locale

is transmuted into university curricula, revamping authentic African values for the pressing need of development changes" (Mami, 2017, p. 218). According to Mami (2017, p. 218), Armah's concept of "beauty (which he deems necessary not for solely aesthetic purposes but for what Asante calls 'self-respect' and self-esteem) itself … translated into an educational system". Therefore, he says that the moral lessons derived from *The Beautyful Ones Are Not Yet Born* should be inculcated in the curriculum of the educational system of Ghana so as to create a beautiful future for the youths. All through his study, Mami does not pay consideration to the scatological metaphors in *The Beautyful Ones Are Not Yet Born*. This makes this study beneficial as it explores the scatological conceptions Armah has deployed to highlight ethical decay in the Ghanaian society.

Shantha (2015) explores Armah's use of language in the novel. According to Shantha (2015, p. 19), "Armah right from the first page captures through his language and tone the decadence of a society where people have lost the zest for life. It is a modern wasteland where the living dead move about mechanically with no purpose". Also, he praised Armah for violating literary norms via his disgusting language in the eyes of African critics. Armah's descriptive language are examples of revolting metaphors in *The Beautiful Ones Are Not Yet Born*. However, Shantha ignores Armah's presentation of scatological images that stresses the moral decay in the Ghanaian society which is the concentration of this present study.

An analysis by Bhardwaj (2019) examined the exposition of the different characters in *The Beautyful Ones Are Not Yet Born*. Bhardwaj's analysis presents the characters in the novel into three groups. The first group are the Protagonists. They are represented by Man and Teacher. The second group are the Hoax (Joseph Koomson and his spouse Estella Koomson). The third group is called the Depraved Partners which is represented by Oyo. Also, Bhardwaj sees *The Beautyful Ones Are Not Yet Born* as a story that reveals the corrupt social order that is predominant in the Ghanaian society and the challenges faced by an upright man who rejects to be stained by the society (Bhardwaj 2019). In spite of all these "intricacies and undesirable circumstances, Man keeps his veracity integral and surfaces out of the torment unscathed" (Bhardwaj, 2019, p. 521). However, Bhardwaj limits analysis of *The Beautyful Ones Are Not Yet Born* to the study of characters and characterisation rather than the scatological descriptions in the novel. This is because he did not use eco-critical literary theory to examine the text.

2.2 Theoretical Framework: Eco criticism

This study adopts ecocriticism as its analytical framework. This analytical framework began in the United States of America and Europe in the late 1980s and early 1990s respectively (Barry 2002). Ecocriticism is a broad area of studies which debates how nature is reflected in literature and literary criticism. According to Buell (1999, p. 430), "ecocriticism is the study of the relationship between literature and the environment conducted in the spirit of commitment to environmental praxis". Also, "ecocriticism takes an earth-centered approach to literary studies" (Glotfelty, 1999, p. xviii).

This "earth-centred" approach infers that "the province of ecocriticism should include human and non-life sphere of the environment such as the soil and water" (Udumukwu, 2021, p. 381). It "designates the critical writings that explore the relations between literature and the biological and physical environment, conducted with an acute awareness of the damage being wrought on that environment by human activities" (Abrams & Harpham, 2015, p. 100). Ecocritics believe that all living and non-living things in the environment possess importance, value and rights. Thus, they advocate respect for physical environment.

Ayi Kwei Armah is a noteworthy promoter of the ecocriticism approach to African literature and this has considerably influenced and shaped his ideologies. Similarly, *The Beautyful Ones Are Not Yet Born* is essentially a novel focused on environmental degradation before any symbolic interpretation. Early in the novel, the man complains about the level of dirt in the surrounding. Part of the measured adopted by the government is to put out boxes where the people could drop used items for quick disposal. These boxes had been launched with fanfare but the will to evacuate them is not there: People did not have to go up to the boxes anymore. From a distance they aimed their rubbish at the growing heap, and a good amount of juicy offal hit the face and sides of the boxes before finding a resting place upon the heap (Armah, 1968).

Similarly, the post office is "a gloomy building" (Armah, 1968, p. 9) and the Atlantic-Caprice is painted in "insulting white" (Armah 10). On the grounds of C.F.A.O. offices are "orange kinds … like some kind of fat worms lying around the lip of the gutter before the road, corns husks that had held together now long-swallowed balls of kenkey" (Armah, 1968, p. 10). Turning to the block where the man works, "for years the building had been plastered at irregular intervals with paint and distemper, mostly of an official murk-yellow color" (Armah, 1968, p. 11). Even the banister of the stair rail of the Block resembles a very long piece of diseased skin" (Armah, 1968, p. 12). The banister wood itself is thoroughly rotten though it is held together by paint and polish. The atmosphere is said to "stewy" because "everybody seemed a sweat a lot" (Armah, 1968, p. 20). The environment of certain parts of Accra are poor indeed such as "the little scratched-out farms of Northern migrant workers…" (Armah, 1968, p. 22), or the sight of "the unconquerable filth" that is beginning to cake together in places" on the gutter around the Block.

The man's experience at the nearby bridge is not even better. As he sits on the cement embankment, "all the filth seemed to have got caught for a hanging moment (Armah, 1968, p. 23). For a stretch the water passing through this filth is clean, but as the man looks further "the already aging into the mud of its beginning" (Armah, 1968, p. 23). Nowhere is free from environmental dirt as with the mother who, observing that the child is being disturbed by a long cough, sucks his little congested nostrils and "the mess she lets fall gently by the roadside and with her bare foot she rubs it softly into the earth" (Armah, 1968, p. 35).

Also, people urinate anywhere as the case of the conductor whose urine hits "the clean-your-city can" (Armah, 1968, p. 39). Public lavatories are hardly kept clean, for "the stench claws inward to the throat" (Armah, 1968, p. 40). At the Essei market, "the whole area around it had been another lagoonland" occasionally "the big drain became a swift river and the market was nothing but a shallow lake (Armah, 1968, p. 49 – 50). Part of what socially defines the man is the type of place he lives in: "the bathroom door possesses the small of dead wood" while the home latrine is avoided, the man preferring to wait "till he got to the office" (Armah, 1968, p. 101). The hole leading used water out of the bathroom is "partly blocked with everybody's sponge strands, so that the scum formed a kind of bar just before the hole and the water underneath went out very slowly …" (Armah, 1968, p. 102).

3.1 RESEARCH METHODOLOGY

Being a literary study, this paper is largely library-based. It banks on such critical sources as books, articles and reviews on scatological conceptions. Also, works on Armah's *The Beautyful Ones Are Not Yet Born* have helped to offer more facts on the literary construction of Ghana and the African continent at large. It is the hope that these resources will in turn lead to an in-depth understanding of the representation of scatology in *The Beautyful Ones Are Not Yet Born*.

4.0 DISCUSSION

4.1 The Language of Ayi Kwei Armah

In the novel, Armah uses impolite language to describe the extent of corruption that occurs in post-independence Ghana. He occasionally refers to parts of the body that can be found spiteful. He uses language as a tool to draw the reader's attention to the awful and disgusting issues that bedevil the Ghanaian society. For example, the narrator tells the reader that in the toilet at the man's working place someone has scrawled on the wall the expression "VAGINA SWEET!" This allusion to the female genital is rude and impolite. It is an offensive expression in most African societies. This image is forbidden to say in public and most Africans avoid to mention it in public.

However, from this expression it can be inferred that there is a wide variety of moral deterioration and Armah uses impolite language to offend the reader so as to stop the extensive spread of corruption in Ghana and Africa by extension. Another example of impolite use of language in the text is when Armah criticizes the corrupt minister Koomson in the passage below:

> His mouth had the rich stench of a rotten menstrual blood. The man held his breath until the new smell had gone down in the mixture with liquid atmosphere of the Party man's farts filling the room. At the same time Koomson's insides gave a growl longer than usual, an inner fart of personal, corrupt thunder which in its fullness sounded as if it had rolled down all

> the way from the eating throat thundering through the belly and the guts, to end in further silent pollution of the air already thick with flatulent fear. Oyo had remained silent all this time, standing close to the door. But now, with choking sound, she retreated into the hall (Armah, 1968, p. 96).

From the excerpt above, the vocabularies: "rotten menstrual blood," "Party man's farts," "an inner fart of personal," "silent pollution of the air" and "air thick with flatulent fear" are shocking expressions. They are very offensive words to most African readers. These words are examples of the deliberately abrasive language that Armah has selected to reveal the demon of corruption present in the Ghanaian society. The offensiveness of these words show Armah's annoyance at koomson's corrupt insolences that put an influence on people's choice. Also, these vulgar expressions show the realism in a postcolonial African society.

4.2.0 Scatological Imagery in *The Beautyful Ones Are Not Yet Born*

This section examines the scatological images in Armah's *The Beautyful Ones Are Not Yet Born*. The imageries are the chichidodo bird, the banister, shit, the bus and the sea. The present study is, therefore, relevant in that it will, among other things, offer to African literature a new conception of *The Beautyful Ones Are Not Yet Born* based on the understandings from the novel.

4.2.1 The Chichidodo Bird

Chichidodo is a bird found in some part of Ghana. The unique thing about the bird is that it "hates excrement with all its soul. But the chichidodo only feeds on maggots, and you know the maggots grow inside the lavatory" (Armah, 1968, p. 45). The bird represents the man's readiness to share in the proceeds of corruption while apparently posing as a moral stand. The man resembles the Chichidodo. He appreciates Koomson's money and wealth, but not the way he gathered his money. The man hates to engage himself in corrupt and filthy practices. Like the bird, the man loves the good things of life but hates the attendant corruption which has become an integral part of the political experience in Ghana. He is insulted by the mother–in–law, the corrupt merchant, the bus conductor and the taxi driver who says to the man that he is a "Worthless life" (Armah, 1968, p. 9).

4.2.2 The Banister

The wooden banister in the novel is very old with deep cracks in which rot and decay is everywhere. The wood of the banister is "age" and "brown" and has cracks all over. Over time so many hands have touched the banister, including lift-hand fingers "in their careless journey from a hasty anus" and the right-hand fingers, "still dripping with the after-piss and the stale sweat from fat crotches" (Armah, 1968, p. 12 – 13). The portrayal of the banister which is filthy from the hands contact with excrement and left overs of food represents the Ghanaian society that is already doomed by colonialists. A simple touch of the banister by the man leads to a detailed description of its genesis, why it feels so repulsive, the people who had held on to it and what they had been doing with their hands before holding on to it. The product of the messengers' "clogged noses" is also deposited on the wooden banister. The author's parting words here are frightening: "the wood would always win" (Armah, 1968, p. 13). The organic decay of the wood of the banister is unstoppable (Armah, 1968, p. 12). However, the man worries that "this wood will rot" (Armah, 1968, p. 29). Also, the banister represents "the rot of the promise" of independence (Armah, 1968, p. 88). This is because "one cannot hope to derive much meaning from *The Beautyful Ones Are Not Yet Born* without paying necessary attention to the use of symbolism" (Taiwo, 1986, p. 154).

4.2.3 Shit

During European colonial rule, "shit" was an appropriate term for racial abuse. It refers to the inferior status of the coloured people. However, in post-colonial African writings the term refers to Africans who imitate the ex-colonizers (Baral, 2019). Also, from the beginning of the novel the reader is met by images of excrement, vomit, spit and rot. The clean-up campaign in the town is shown to be totally ineffectual. Everywhere the man runs into "the unconquerable filth" (Armah, 1968, p. 23). At the same time as this filth is heaping up and the filth inside seems to be blocked up. When Estella goes to the lavatory to answer "Nature's call," she is confronted by a man's constipation (Armah, 1968). Shit is a representation of the spread of corruption and moral

decay that became ostensible after the Ghanaian independence.

4.2.4 The Bus

One bus appears at the beginning of the text and another at the end, the buses are the essentially the same. In spite of the second one looking deceptively bright and new. The driver of the second bus, unlike the conductor of the first one, he is subtler in his small corrupt dealings. The new bus bears the motto: "The Beautyful Ones are not Yet Born" (Armah, 1968, p. 183), which surrounds a "very beautiful" flower. However, with the mis-spelling of the word "beautiful" on the motto, we seem to have been warned not to expect so much from it. Moreover, it does not take long for the beautiful flower design on the bus to disappear from sight and replaced by "a single melodious note" (Armah, 1968, p. 183) issuing from no other bird than the chichidodo close to the "school latrine at the bottom of the hill" (Armah, 1968, p. 183). This bus will soon bribe its way when it reaches the barrier placed on the way by the agents of the new government.

4.2.5 The Sea

The sea is linked to an idyllic past. The man sees in the sea "this clearness, this beautiful freedom from dirt. Somehow there seemed to be a purity and a peace here which the gleam could never bring" (Armah, 1968, p.23). He feels "the breeze blowing in from the sea, fresh in a special organic way that has traces of living things from their beginnings to their endings" (Armah, 1968, p. 77). The sea is an image of a pure, biological ideal, part of the natural development, as in that one positive connection where the land and the sea seem to meet one another (Armah, 1968). The man sees a dead fish "dancing quite violently up and down with the little waves. When he looked closer, he saw a whole lot of little fishes eating the torn white body, breaking the water's surface at dozens of small points" (Armah, 1968, p. 123). The sea proposes an ideal but also the uncleanness of that ideal. For the man "the thoughts rising from the sea all have a painful hopelessness" (Armah, 1968, p. 125).

4.3 Research Findings

This paper examines the representation of scatology in Armah's *The Beautyful Ones Are Not Yet Born*. The study uses the novel as an example of Armah's works that showcase scatological imagery in African literature. Although the critical positions of the literature on *The Beautyful Ones Are Not Yet Born* are enlightening and thought-provoking, none has been able to clearly study the scatological imagery in the novel under study. This is because the critics approached the study through different theoretical perspectives. The research has shown the limitations of critical literature on Armah's *The Beautyful Ones Are Not Yet Born*. The study presents chichidodo bird, the banister, shit, the bus and the sea as the scatological images in Armah's *The Beautyful Ones Are Not Yet Born* via the eco criticism literary theory.

5. CONCLUSION

This paper is concerned with the representation of scatology in Armah's *The Beautyful Ones Are Not Yet Born.* Scatology is the study of excrement in literature. The study has shown that Armah used scatological imagery in *The Beautyful Ones Are Not Yet Born* to echo the socio-cultural, political and economic decadence in post-colonial Ghana and Africa by extension. Also, the paper examined how Armah uses impolite language to describe the extent of corruption that occurred in Ghana. Armah uses language as a tool to draw the reader's attention to the disgusting issues that bedevil the Ghanaian society so as to create positive change. The study presented chichidodo bird, the banister, shit, the bus and the sea as the scatological imagery in Armah's *The Beautyful Ones Are Not Yet Born* to emphasize the moral decay in the Ghanaian society. Thus, this study occupies a central position in African literature and post-colonial writings.

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BIOREMEDIATION STIMULATING POTENTIAL OF ORGANIC MATERIALS

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Abstract
Bioremediation stimulation of microbial degradation of pollutants using organic materials as amendment should be promoted. Environmental pollution by chemical substances is one of the contemporary global challenges. Bioremediation has been shown to be efficient and environmentally friendly pollution cleanup or removal technology. This technology makes use of microorganism and plants to degrade, detoxify or bio transform organic pollutants into simpler and nontoxic or less toxic form. The focus of this paper is the review of the biostimulation potentials of organic materials in the bioremediation of environmental pollutants. Literature evident show that organic materials have successfully employed to bioremediate straight chain petroleum hydrocarbon compounds, polycyclic aromatic hydrocarbons, agricultural waste, demineralized heavy metals pollution. Bioremediation has also been shown to remove toxicity of rubber. Various organic materials have been proven by research studies to be very effective in biostimulating microbial degradation of environmental pollutants. It is recommended that pilot field study on the biostimulation

Keywords: organic materials, bioremediation, biostimulation, environment and pollutants

1.0 INTRODUCTION

Petroleum hydrocarbon pollution in the global environment has increased over the past few decades. This is due to increasing population and huge demand on petroleum products for industrial and other anthropogenic activities. Petroleum hydrocarbon pollution comes with negative consequences on the ecosystem and human health.

According to (Tiwari and Singh, 2014), third world network reports show that more than 450 million kilograms of toxic wastes are discharged into the air, water, and land on a global scale. A significant proportion of these toxic waste are petroleum related products These include heavy metals, petroleum oil, pesticides, hydrocarbons such as aliphatic, aromatic, and polycyclic aromatic hydrocarbons, nitro-aromatic compounds, chlorinated hydrocarbons such as polychlorinated biphenyls (PCB) and perchloroethylene, organophosphorus compounds, organic solvents (phenolic compounds), and phthalates (Megharaj et al., 2011). A report by Bhawna and Naveen (2021) revealed that polluted ecosystem or environment adversely affects the soil composition (structure and fertility), soil microbial growth and metabolic activities, plants and aquatic organisms.

Petroleum hydrocarbon pollution in soil causes depletion of soil oxygen. In a study conducted by (Huan et al., 2022) it was reported that the results suggest that petroleum pollution in soil causes a shift in the microbial community structure and ecological functions in the soil. Petroleum hydrocarbon pollution affects nerve disorder called peripheral neuropathy. The international agency for Research on Cancer reported that benzene and pyrene which are components of petroleum hydrocarbon are carcinogenic. Some petroleum hydrocarbon compoenents have also been shown to affect reproduction and developing fetus in animals (London Premier Centre, 2022).

In order to clean the environment of hazardous pollutants, different pollution remediation technologies have been developed. These include chemical, physical and biological technologies. Chemical technologies involve the application of chemical agents and principles to decontaminate or detoxify polluted environment. Chemical techniques include precipitation, stabilization, solidification, immobilization, solvent extraction, oxidation and etc. While physical technologies are environmental pollution remediation technologies that involves the use of physical means such as incineration, pyrolysis, capping, thermal desorption, vaporization, soil washing etc. Physical and Chemical remediation techniques is time-consuming, costly and often times not effective (Harekrushna and Kumar, 2012). Therefore, biological remediation has been the most

preferred remediation technologies for the detoxification and biodegradation of pollutants in waste management and cleanup programs to restore the contaminated sites to their original environment, because they are cost-effective, natural, and sustainable remediation methods (Kumar et al., 2018).

Bioremediation by bio-stimulation involves the addition of substances on the polluted media to enhance the growth and metabolic activities of indigenous microorganisms to stimulate the biodegradation of the pollutant. Bioremediation remains the most economical, efficient and environmentally friendly petroleum hydrocarbon pollution remediation technique, hence various organic materials are being studied as bioremediation stimulants. The aim of this study is to evaluate the bioremediation enhancement potential of some organic materials in the biodegradation of petroleum hydrocarbon in in polluted soil or sediments

2.0 BIOREMEDIATION BY MICROORGANISMS

In bioremediation, living organisms, such as microorganisms (bacteria, fungi, and algae) or plants, are used to degrade and detoxify the hazardous pollutants present or available in the environmental medium such as soil, sediment or water by converting them into nontoxic products like water (H2O), carbon dioxide (CO2), microbial biomass, and metabolites. Bioremediation using plants to detoxify or bio transform the pollutant is referred to as phytoremediation. There are different approaches to bioremediation.

Among the bioremediation approaches, bioremediation by the use of microorganisms such as bacteria and fungi to biodegrade environmental pollutant is the most common and popular approach. These microorganisms can be indigenous to that contaminated site or may be isolated and brought from outside to that contaminated site for bioremediation. The Microorganisms degrade and biotransform these pollutants through their metabolic reactions and utilize them for their growth and multiplication thereby completely degrading the pollutants to very simple and nontoxic form (Kumar et al., 2018).

Bioremediation by microorganisms is divided into intrinsic in situ bioremediation (without any human intervention) or enhanced in situ bioremediation (bioventing, biosparging,) (Azubuike et al., 2016). Although the in situ method is economically feasible, as there is no extra cost needed for any excavation and transportation processes (only the cost of designing and installing the equipment used for the enhancement of microbial activity is required), it is less controllable and less effective than ex situ bioremediation methods. This method is used for effective treatment of sites contaminated with chemical industry products such as heavy metals, chlorinated solvents, fabric dyes, and hydrocarbons (Kim et al., 2014).

Intrinsic in situ bioremediation

This technique of bioremediation also known as natural attenuation is one of the known in situ bioremediation methods. The method involves the unassisted and passive remediation of contaminated sites without any human interference. This technique includes both aerobic and anaerobic microbial processes for the treatment of biodegradable and recalcitrant pollutants. In order to establish a successful and sustainable process, regular monitoring is very necessary in spite of the absence of any human effort in the process, it is therefore also referred to as monitored natural attenuation (Azubuike et al., 2016).

Enhanced in situ bioremediation

This type of in situ bioremediation involves the enhancement of polluted sites by excavation or the addition of nutrients, air, and microbes to enhance microbial growth for the biodegradation process. Examples of enhanced in situ bioremediation techniques are bioaugmentation, biostimulation (Tiwari and Singh, 2014).

Bioremediation by bioaugmentation

In this process, a group of microbes isolated from other sites, or genetically engineered microbes are added to the contaminated site to augment the microbial activities of indigenous microorganisms in the polluted medium in order to improve the degradation process. This method is costly, is used to treat municipal wastewater and soil contaminated with aromatic and chlorinated hydrocarbons. Sometimes it is observed that the nonindigenous microbes compete with indigenous ones for the growth of their population and therefore proper management of the land treatment unit is required (Sharma, 2012).

Bioremediation by biostimulation

In this method of in situ bioremediation, indigenous microbial population growth is stimulated by supplying necessary nutrients in contaminated soil or

groundwater for the effective treatment of pollutants. Kao et al., (2008) reported that this is a useful method for the treatment of hydrocarbons and metal-contaminated sites at the onset of this method, inorganic fertilizers were the commonest supplement usually added to stimulate microbial growth in the polluted site. However, it has been observed that chemical fertilizer leads to other environmental problem such as eutrophication of nearby surface water due to surface run off during precipitation. Also the cost of chemical fertilizer is on the increase. Scholars have therefore studying the use of organic materials in bioremediation and the results have been very impressive. Organic materials that have been investigated as bioremediation stimulants are cow dungs, poultry manure, rice husk, saw dust and bio chars.

3.0 EMPIRICAL STUDIES ON BIOREMEDIATION STIMULATION WITH ORGANIC MATERIAL

Bioremediation is defined as a process that utilizes living organisms, mainly microorganisms, green plants, and their enzymes, to remove, degrade, mineralize, transform, and detoxify the environmental pollutants and hazardous components in the environment into innocuous or less toxic forms during the treatment of contaminated sites in order to return them to their original condition (Azubuike et al., 2016).

The bioremediation process has been used successfully in large and small scale applications; Alaska oil-spill cleanup is one of the good examples of bioremediation application for the treatment of pollutants (Boopathy, 2000). Bioremediation techniques can be applied in the cleanup of contaminated groundwater, soil, lagoons, waste streams, and sludge. With the proper utilization of natural and modified microbes and their processes and appropriate engineering models or designs to provide a favorable growth environment, the bioremediation techniques can be successfully implanted in the contaminated field.

The main objective of this report is to highlight the silent features of bioremediation and its principles, the various methods of bioremediation, that is, in situ and ex situ remediation categories of bioremediation technique, their advantages and limitations, their prospects, and the possible solution of bioremediation techniques.

Research studies have reported the 58.47% removal of polyaromatic hydrocarbons, 85.5%_99.5% removal of anthracene and fluoranthene, and 91.5% removal of PCB from the contaminated soil using rhizodegradation, phytostimulation, and biostimulated rhizodegradation phytoremediation techniques, respectively (Gregorio et al., 2014; Somtrakoon et al., 2014).

Bioremediation of rubber waste

Rubber waste is composed of synthetic polymers and high-grade black carbon, and due to its physical composition it is nondegradable and nonrecyclable in nature. Also rubber waste cannot be burnt due to the release of toxic gases, therefore it is accumulating in the environment and it constitutes 12% of the total solid waste. There is a study of rubber degradation using microbes in which the toxic component of rubber waste was removed by fungi Recinicium bicolor and then it was deculvanized using sulfur-oxidizing or reducing microbes, that is, Pyrococcus furiosus and Thiobacillus ferroxidans (Tiwari and Singh, 2014).

Bioremediation of agricultural waste

Globally, agricultural activities (crops, humans, and livestock) give rise to huge amounts of organic waste which requires proper treatment. As organic waste is highly nutrient rich, it can be treated using microbes and converted into several value-added products. For that, a cheap and efficient technology, that is, vermi-composting, has emerged which utilizes earthworms and microbes to treat agricultural waste. In this method, earth worm processes the substrate and alters the microbial activity and this processed organic waste is degraded further by microbes. Several species of epigeic earthworms such as Perionyx excavates, Eudrilus eugeniae, and Eisenia fetida have been identified to degrade organic waste (Tiwari and Singh, 2014)

Bioremediation of organic pollutant

Due to several industrial agricultural and anthropogenic activities, oil spills, and petroleum industries, a variety of organic pollutants have been released into the environment which show persistence against degradation. Available literatures show that many scientific studies have demonstrated the efficient degradation of toxic organic pollutant via bioremediation by microorganisms. A study carried out by Almansoory et al. (2015) reported 93.5% biodegradation of total petroleum hydrocarbon (TPH) from gasoline-contaminated soil after the addition of

biosurfactant produced by Serratia marcescens and plantation of Ludwigia octavalvis.

In a study by Gomez and Sartaj (2013), results indicated that 90.17% of Total Petroleum Hydrocarbon (TPH) was removed in a field-scale bioaugmented and biostimulated biopiles system at low-temperature conditions in a 94-day treatment period. In a study by (Dias et al., 2015), treatment of contaminated soil using biopile technique after the pretreatment of contaminated soil resulted in a 71% TPH removal of TPH in 50-days experiment period.

In some research studies, bioremediation using the bioreactor technique recorded 82% to 97% degradation of TPH, 51%-68% reduction of BTEX (benzene, toluene, ethylbenzene, xylene), 97%-100% degradation of 2,4-dichlorophenoxyacetic acid, and 88%-97% degradation of carbofuran from the contaminated soil (Plangklang and Reungsang, 2010; Firmino et al., 2015; Mustafa et al., 2015; Chikere et al., 2016). A study by Kao et al. (2008) reported.70% removal of BTEX contaminants from contaminated groundwater using the biosparging bioremediation technique.

Bioremediation of polycyclic aromatic hydrocarbons

Human activities have resulted to the accumulation of several xenobiotic and persistent organic pollutant (pesticides, PCBs, PAHs, dioxin, phthalates, etc) in the environment. Many of these organic chemicals are recalcitrant. However; there are several reports about the microbial degradation of such persistent organic pollutants. A report by Bhattacharya et al. (2015) show that 62%-69% of saturated and aromatic hydrocarbons was removed from an oil-contaminated site using a stir-tank bioreactor system.

Another study by Xu et al. (2015), reported that 48%-98% of naphthalene was removed from coal gasification wastewater in a membrane bioreactor system. A study of Paudyn et al. (2008) reported .80% degradation of diesel contamination by a landfarming approach in 3-year study period in a cold region. Frutos et al. (2010) have reported .93% phenanthrene removal from contaminated soil within a 7-month period using a bioventing bioremediation technique. Some of research studies have reported 58.47% removal of polyaromatic hydrocarbons, 85.5%-99.5% removal of anthracene and fluoranthene, and 91.5% removal of PCB from the contaminated soil using rhizodegradation, phytostimulation, and biostimulated rhizodegradation phytoremediation techniques, respectively (Gregorio et al., 2014; Somtrakoon et al., 2014).

Biostimulation effectiveness of organic materials

Odume, et al., (2023) reported that enhanced bioremediation of petroleum hydrocarbon polluted soil with optimized water hyacinth compost achieved 93% biodegradation of total petroleum hydrocarbon (TPH) while amendment with inorganic fertilizer (NPK) recorded 86% TPH reduction under the same condition and time.

Vincenzo (2021) conducted bioremediation of used lubricating oil by selected organic wastes. The result of the study revealed that spent mushroom compost reduced Polycyclic aromatic hydrocarbon in the soil by 82%, cow dung reduced total petroleum hydrocarbon (TPH) in the soil by 94%, sewage amendment reduced TPH in the soil by 82% at the end of 98days of bioremediation. Victor., Celestin., Emmanuel and Oluwatayo (2010) carried out a study on the biostimulation of hydrocarbon utilizing bacteria in soil contaminated with spent engine oil using banana and plantain agro wastes. The results showed that plantain peel reduce TPH by 93.5% while banana peels reduce TPH by84.11% at the end of 70 days of bioremediation process.

In a biostimulation study undertaken by Kimiya., Ali and John (2021) in which plant compost, paper mill sludge, activated carbon and molasses were used as amendment separately, total petroleum hydrocarbon reduction of 40% in molasses amended soil and 32.50% TPH reduction in plant compost amended soil, 30.56% in paper mill sludge amended soil and 23.06% reduction in activated carbon amended soil were recorded after 15 weeks of bioremediation. (Ugochukwu et al., 2016) reported a 55.35% TPH reduction after 4 months of bioremediation of crude oil polluted soil using poultry dropping as an amendment.

Amechi., Chukwudi., Fidelis and Peter (2016) conducted a study on the bioremediation of automobile gas oil impinged agricultural soil using rice husk as bulking agent, the result showed that TPH reduced by 97.85% after two months. The TPH reduction in the amended soil was significantly higher than in the control.

Ayotamuno., Kogbara and Agunawamba (2006) Conducted a research on bioremediation of petroleum hydrocarbon polluted agricultural soil at various levels of soil tillage in Port Harcourt and find out that there was a marked reduction in the percentage of THC in all the treated and tilled soil after a period of six weeks. Chemical fertilizers were used as treatment in the study. Percentage reduction in total petroleum hydrocarbon (*88% to 99%)*) in the treated cells was significantly different from the one observed in the control. It was inferred that this confirms the view that biodegradation is impeded by nutrient deficiency as well as the depletion of oxygen reserves in crude oil contaminated soils.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Bioremediation as a pollution cleanup technology that utilizes living organisms, mainly microorganisms, green plants, and their enzymes, to remove, degrade, mineralize, transform, and detoxify the environmental pollutants has been described as efficient, economical and environmentally friendly method. Bioremediation by the use of microorganisms has two basic approaches which are bioaugmentation and biostimulation. Between these two approaches, biostimulation has been shown to be most effective and efficient. Biostimulation involves the addition of substances into the polluted media to stimulate microbial growth and activities in order to enhance the microbial degradation of the pollutant. Various organic substances such as rice husk, saw dust, water hyacinth, biochar, cow dung and poultry litter has been shown by research studies as potential biostimulation materials.

4.2 Recommendations

Based on the findings of this review, it is recommended that pilot field study on the biostimulation of microbial degradation of pollutants using organic materials as amendment should be promoted with view to optimizing field effectiveness of the approach.

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COMPARATIVE FEDERALISM OF THE UNITED STATES OF AMERICA (U.S.A) AND INDIA: AN ANALYSIS OF SIMILARITIES AND DIFFERENCES

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Abstract
The study examined comparative federalism of the United States of America (U.S.A) and India. Three research questions were formulated in line with the statement of problem to guide the study; while the objectives were in tandem with the research questions. The study was based on qualitative method to draw data from secondary sources. Furthermore, content analysis was used to analyze the secondary data. The findings revealed that in US President came into power through Popular Vote and Electoral College, and the President must win electoral votes - at least 270 of the 538 votes cast to be declared as elected President. This had created controversy in US presidential election to a point that Senate and the House of Representatives had elected the Vice President and President in 1800 and 1824.This is because no presidential candidate scored up to 270 votes; while Prime Minister of India is appointed by the President from Lok Sabha(The Lower House).The President of United States of America is the Head of State, the Head of Government and the Commander in-chief of the armed forces; while the Prime Minister of India is only Head of Government . The study also, exposed that the President of United States of America appoints all the top government officials; while in India, the Prime Minister as the Head with the Council of Ministers advise the President on the appointment of key government officials, amongst others. In this light, the study recommended amongst others that in US presidential election, Electoral College system should be abolished, and popular vote should be used to decide who become the President. This will help to militate against the dispute that may arise from the Electoral College votes. The President should be the Head of State and the Head of Government to avoid power tussle, chaos and conflict of interest in the cased of India where the Prime Minister is the head of government.

Key words: Federalism, Supremacy, President. Prime Minister

1.1 INTRODUCTION

Historically, federalism can be traced to the United States of America (U.S.A) under the constitution of 1789, which is the archetype of modern federalism (Vats, 2020). The US political structure serves as a threshold for other nations to establish federal political system. Federalism therefore is a constitutional structure having at least two levels of government- one central government acting for the whole country and several component units existing side by side and having control over their areas in social, economic, cultural and political matters. Thus, federalism is a dynamic federal political structure for a nation trying to reconcile "unity with multiplicity, centralization with decentralization, and nationalism with localism" (Vats, 2020; Okereka, 2016; Mukherjee et al, 2016).

Intergovernmental relations is the instrument that marshall a workable synergy and desirable relation-ship between the levels of government for effectiveness and efficiency of government business. Thus, intergovernmental relations (IGR) is "the most frequent and visible manifestation of federalism" (Igbokwe- Ibeto & Anazodo, 2015, p.15; Ekwonna, 2012).

The US and India are the world's largest democratic countries based on constitutional system of federalism (Mukherjee et al, 2016). The US gained the status of a Federal Republic state by upholding its constitution in 1789; whereas India became a "secular, socialist, sovereign, and democratic republic by enacting its constitution in 1950". This implies that both countries had attained the status in which several smaller states got fraternized with a strong central government which is known as Federal Government in the US and Central Government in India to obtain status of federal republic (International IDEA, 2020; Mukherjee et al, 2016).

However, in comparison, there are many similarities and distinctions between both the US and India federal models. Thus, the main thrust of this study is to examine the federalism of US and India in act of governance.

1.2 Statement of Problem

Empirically, it is revealed that 30 of the world's 195 countries operate a federal political system (International IDEA, 2020). Statistically, it means that 30 countries, which represent 40 percent of the world's population, are governed under a federal political model. The adoption was triggered on the premise of size and diversity of ethnic, religious, linguistic, socio-economic and cultural differences to mention but a few, amongst people who wish to preserve their identities. They thus will fabricate a level of self-rule over those things that concern their own interests within the federation (International IDEA, 2020). The foregoing, led to the choice of federalism in countries like United States of America, Brazil, Nigeria, India, Switzerland, Germany, Canada, amongst others. Thus, one can presuppose that there is great uniformity in features and reasons for the establishment of federalism (International IDEA, 2020; Ekwonna, 2012).

However, there are lots of variations being created by the architects of different countries in drafting their constitutions. In this light, "no single country is exactly like another, in other words, no federal political system is exactly alike. Why are these variations despite their similarities in the features and reasons for the establishment of federal political structure in United States and Indian federalisms? For example, in US presidential election, there are manifold controversial issues between the popular vote and Electoral College votes. This is predicated on the fact that the presidential candidate who win in the popular vote, must also score a minimum of 270 in the electoral college votes out of the of the 538 Electoral college votes cast to be declared as elected President and Vice President.

Sequel to this, if no candidate scored up to 270 votes of the electoral votes, the House of Representatives will vote for the President, and the Senate will vote for the Vice President, under Article 1 of the US Constitution. This had occurred in 1800 and 1824 (United States, 1996; United States, 2020). The India federal system also has striking issues. In India, the executive powers are divided between the President and Prime Minister who serve as the Head of State and the Head of Government respectively. Article 74 of the Indian Constitution states that "there shall be a Prime Minister as the head with the Council of Ministers to aid and advice the President in the exercise of his functions. The advice is bound on the President to accept". This had led to contention between the President and Prime Minister. For example, in the February, 2015, there was contention between the President Glorgi Margvelashvili and Prime Minister Irakli Garibashvili. The Prime Minister and Council of Ministers refused to accept the President's nominee of the Chief Justice of Supreme Court of India. This and others have led to showdown of the President and the Prime Minister contrary to what is obtainable in US federal model (Rukhaze, 2015). It is against this backdrop that the study intends to examine the similarities and differences between the American and Indian federalism.

1.3 Research Questions

The following research questions were asked in order to facilitate the achievements of the objectives of the study.

(i) What are the basic contrasts in the exercise of political powers between the President of United States of America and the Prime Minister of India federal model?
(ii) What are the similarities between the federalism of US and India in act of governance?

1.4 Research Objectives

The fundamental objective of the Study is to examine the federalism of the US and India federal model. The specific objectives are:

(i) To examine the contrasts in the exercise of political powers between the President of United States of America and the Prime Minister of India federal model.
(ii) To verify the similarities between the federalism of US and India in act of governance
(iii) To proffer remedies to these variations on how to achieve high level of uniformity in federal political system.

2.0 LITERATURE REVIEW

2.1 Conceptual review.

2.1.1 Federalism

The term federalism is a derivative of the Latin word "foedus", meaning "treaty, pact or covenant". This means that federalism is an agreement that signifies a partnership or marriage in which individuals or group voluntarily consents to unite for a common goal,

purpose and aspiration without giving up their fundamental rights or identities. Premised on this, American Government (2020) defines the concept of federalism as a type of government in which power is divided between the national government and other governmental units.

For Nosiri (2018, p.161), "federalism is a form of government in which there is a division of power between the two levels of government with the central government acting for the whole nation and the unit governments controlling the affairs in their various areas". In a similar vein, Wheare (1943), in Obi (2014, p.12), conceptualized federalism to mean a method of dividing powers so that the general and regional governments are each, within a sphere, coordinate and independent"

In consonance with the above definitions, Appadorai (1975), in Nosiri (2018, p.162) defines federalism as "one in which there is a central authority that represents the whole and acts on behalf of the whole in external and internal affairs, in which there are also provincial or state authorities with power of legislation and administration within the sphere allotted to them by the constitution".

Thus, Ekwonna (2012), states that federalism: "As a power relationship in which there is clear distinction of roles between the central or joint entity and the composite units, which is the different levels of political relationship and such distinction fairly stable as it is enshrined in and, thus protected by the fundamental law of the land. In this relationship, every party (i.e. the units and the central authorities) has rights (powers and the means to exercise them) and can defend them, and successfully so, within the law; and the obligation to respect the law when it is protecting the right of the other party (p,8)*"*

Ofoeze (1999, p.1) described "federalism as a denoting a state of affairs in a country in which there are two or more levels of government each of which has its own spheres of governmental legislative jurisdiction". This means legislative powers is shared through the provision of the constitution amongst different levels of government. Furthermore, Newton and Van Deth (2010), stated that "In federal system, power is divided not only between the executive, legislative and judicial branches of government, but also between territorial units of government. These territorial units – states or regions or provinces-often have substantial powers and rights that are guaranteed by the constitution. In some ways therefore, federalism is another form of the division of powers within the state a geographical division between geographical areas, to complement the political division between the executive legislative and judicial branches. Moreover, the territorial units of federal system often repeat the division of powers found at the federal level because each unit has its own executive, legislative and judicial branches of government (p.82)*"*.

Taking inference from the excerpt of variant definitions, it shows that a federal state power is shared in such a way that makes each level of government independent or has autonomy to exercise power within their jurisdictions as enshrined in the constitution as well as coordinate amongst each other through the instrument of intergovernmental relations. This makes federalism as a dynamic federal political structure for good governance that has division of power within the federation.

2.2 An Overview of the Development of Federalism in the United States of America (U.S.A)

Historically, the present United States of America (U.S.A) was "formerly a conglomeration of thirteen colonies which gained early settlement from the Europeans". They joined to form a formidable force that enabled them to gain independence from Britain in 1776 as a result of the American Revolutionary War. The independence was recognized by Britain following the victory at Yorktown in 1781. Consequent upon this victory, the 13 original states met to discuss and form a union based on the Articles of Confederation that was drafted, regarding the 13 states as independent authority and sovereign states (Iwuoha, 2014; Muhammad, 2008,).

Under the Articles of Confederation of the 13 states there was a loose central government which created a great contention amongst the confederated states and made it difficult to coordinate public policy. Thus, their desired goals and trading amongst the states faced a number of barriers and the national government seemed too weak to deal with military threats posed by various European nations and Indian tribes (Nosiri & Uhuegbu, 2018).This made it necessary for a movement from the confederated government to a federal political system of

government few years after the revolutionary war; the Philadelphia Constitutional Congress of 1787 was officially adopted on June 21,1788,and the new government officially started operation on March 4, 1789. It was established by James Madison under the leadership of President General George Washington (Vats, 2020; Gentiluci, 2015; Muhammad, 2008).

According to Muhammad (2008, p.325) in the confederacy, they resolved that: "We the people of U.S.A in order to form a more perfect union, establish justice, ensure domestic tranquility provide for the common defence, promote the general welfare and secure the blessing of liberty for ourselves and posterity due order and established this constitution for the United States of America."

This made the United States to become a Federal Republic by upholding the 1789 Constitution. Presently, United States of America (U.S.A) has fifty (50) federating States, one (1) Federal District of the United States, five (5) Major Inhabited Territories of the United States namely, Samoa, Guam, the Northern Marianes Island, Puerto Rico, and the US Virgin Islands, each territory is partially self-governing that exist under the authority of US government. The nine (9) Uninhabited Territories of US namely, Baker Island, Howland Island, Jarvis Island, Navassa, Palmyra Atoll, Wake Island, Kingman Reef, Johnston Atoll and Midway Island (Nosiri & Uhuegbu, 2018, p.370; Vats, 2020).

2.2.1 The Executive Powers of President in United States of America (U.S.A)

The President of the United States of America is empowered as the head of state, head of government and commander in chief of the armed forces. Thus, the President is the chief executive who has both ceremonial and executive powers, that is the President is a unicephalous executive (Nwankwo, 2011). The President is elected indirectly for a period of four years and if reelected by the electorates can stay in office for a maximum of two terms through the popular vote and the Electoral College. Popular vote in US simply means an indirect election of the total number of votes received in the first phase election, as opposed to the votes cast by those elected to take part in the final election. The popular vote in US for the President and Vice President where the citizens of the United State who are registered to vote in one of the fifty (50) states of the United States and in Washington, D.C, only indicate their preference for President and Vice President, but not casting their votes directly for the President and Vice President at all, even though the candidates' names appear on the ballots. This candidate's name that appears is what counted in US as popular votes for president and vice president. The voters only choose a slate of electors from the various states that will represent them in final election of the President and Vice President (United States, 1996).

The number of electors from each state is equal to the number of members in United States Congress. For instance, "New Mexico has five (5) electors vote because it has 2 Senators and 3 Representatives" (United States, 1996; United States, 2020). These electors formed the members of the Electoral College who in turn cast direct votes known as electoral votes to decide who will be the President and Vice President of the United States.

Electoral College in US is referred to a body of people representing the states of US, who formally cast votes for the election of the President and Vice President. The Electoral College in each state gathers in their state capital in December to cast direct ballots for President and Vice President: After electoral votes are cast, the ballots are sent to Washington, D.C where they are opened and counted in early January by the current Vice President before a joint session of the United States Congress. The candidates who receive an "absolute majority of electoral college votes – at least 270 of the 538 votes cast are declared the elected President and Vice President" (United States, 1996; United States, 2020).

Table 2.1 is the presentation of the current United States presidential election, votes, 2020 to support the above discourse.

Table 2.1: 2020 United States Presidential Election Result

PRESIDENT	**DEMOCRATIC JOE BIDEN**	**REPUBLICAN DONALD TRUMP**	**TOTAL**
Popular votes	81,268,924	74,216,154	155,485,078
Electoral votes	306	232	538
Percentage	56.9%	43.1%	100 %
Running mate	**Democratic Kamala Harris**	**Republican Mike Pence**	
Electoral votes	306	232	538
Percentage	56.9%	43.1%	100%

Source: ***United States Presidential Election, 2020***

Thus, "if no candidate receives an absolute majority of vote for the President, the House of Representative elects the President" (Unite States, 2020). Article 11 section 2 and 3 of US Constitution stipulates the functions and the responsibilities of the US President such as assenting to a Bill or vetoes on legislative Bills, appointment of the members of the cabinet and top government officials subject to Senate approval. He serves as the country representative in international matters and negotiation of international treaties subject to approval or ratification of the Senate; and granting of pardon and amnesty. However, in spite of the executive powers vested in the President, he can be removed from office by the Congress through impeachment for gross misconduct under Article 1 of US Constitution (United States, 2020; Arnold, 2004).

2.3 An Overview of Indian Federalism

The idea of Indian federalism can be traced to the Indian Statutory Commission popularly known as the Simon's Commission which was appointed by British government in 1927. Simon was a Member of Parliament in UK, and was the chairman of the seven members Indian Statutory Commission. His full name Sir, John Simon, hence the Commission was named after him. The aim of the Commission was to review the Indian Constitution. The Commission's report of 1930 led to the development of a "federation of self-government units" The manifestation of Indian federation relieved Indian of British Raj clutches. This led to a conglomeration of several princely states which came together to form the Indian Union (Augustyn, 2018; Vats, 2020).

However, the work of various movements led to India's independence on the 15th August, 1947. It started from "secular, socialist, sovereign" to the present democratic republic, and became a Republic of India on the 26th January, 1950; when the constitution of India came into force through the drafting committee chaired by Ambedkar. India adopted the Canadian model of federalism. The country is classified as a quasi-federal country

because it portrays a federal state with some features of a unitary state. The constitution prescribes a federal system of government because there are three tiers of government; the centre, states and the local governments. There are three organs of the government of India namely the Executive, the Legislature and the Judiciary (Federalism in India, 2017, in Ndoh, 2018; Vats, 2020).

Thus, "India is a federation composed of 29 states and 7 union territories and all the states as well as the Union Territories of Puducherry and the National Capital Territory of Delhi have elected legislatures and governments, both are patterned on Westminster model which means, cabinet system of government. The remaining five Union Territories are ruled by the central government through appointed administrators" (India, 2017, in Ndoh, 2018).

India federalism is unique because the constitutional powers that are given to each state are not the same. "The states like Jammu and Kashmir are accorded higher degree of federalism under Article 370 of the Indian Constitution. The Union Territories of Delhi and Puduchery are accorded lesser degree of federalism under Article 239A and 239AA of states in schedule I of the Constitution" (Ndoh, 2018; Vats. 2020). The India federal political model is unique because Indian constitution deliberately avoided the word federal; hence it is called a Union of States. Nevertheless, the Indian States have the attributes of a

strong federal state as well as attributes of Unitarianism (Ekwonna, 2012; Vankataramanon, 2019; Federalism in India, 2021).

2.3.1 The Executive Power of Prime Minister of India

(1) The Prime Minister of the Republic of India is the head of government. He is appointed by the President of India to serve as the chief adviser to the President of India in the exercise of his executive functions. The Prime Minister is the Leader of Lok Sabha (House of the People) in Indian Parliament. The "Prime Minister must be above 25 years of age, is a member of the Lok Sabha or above 30 years of age, is a member of the Rajya Sabha (the Upper House). Prime Minister must be a citizen of India and member of the political party or coalition having a majority in the Lok Sabha". The Prime Minister is for a period of five years; however, he or she can remain in power as long as he /she has the majority support in the Lok Sabha. The Prime Minister and his cabinet can be dissolved when vote of no confidence is passed on them, subsequently a fresh election shall be called (Egeonu, 2008; Ndoh, 2018).

Prime Minister and 35 senior ministers of the government form the cabinet (Council of Ministers): The Union cabinets are collectively responsible to the Lok Sabha (Mohita, n.d; Council of Minister, 2008). Under Article 74, 75, 78 and 366 of Indian Constitution specified the various functions and powers of the Prime Minister are provided as follows:

(i) The Prime Minister is to communicate to the President all decisions of the Council of Ministers relating to administration of affairs of the "Union States" and the proposal for legislations and information for good governance.

(ii) The Prime Minister selects and dismisses members of his cabinet, allocates posts to members within the government. He or she is the presiding member and chairperson of the cabinet

(iii) The Prime Minister at the head with Council of Ministers advise the President on the appointment of top government officials. The President is obliged to accept the advice; under Article 74 0f the Constitution of India,

(iv) The Prime Minister is the chairman of various commissions such as: Planning Commission, National Development Council, National Integration Council, Inter-State Councils, and National Water Resources Councils in Indian federation,

(v) The Prime Minister represents the country in various delegations, high level meeting and international organization that require the highest government office, and

(vi) The Prime Minister decides the assignment of top military personnel such as the Chief of the Army Staff, Chief of Air Staff and Chief of the Navel Staff, and Commander of operational and training command, however, the Prime Minister is not the commander in-chief of the armed forces (India Today, 2016; Iyer, 2001; Indian Law, 2019; Bajayi, n.d).

3.0 METHODOLOGY

The study adopted qualitative method to collect data from secondary sources. Thus, the researcher made use of information from existing documents and records for data analysis to build up a case. To ensure the reliability and validity of the study, multiple secondary data such as textbook, journal, internet materials, articles amongst others were used for content analysis.

3.1 Data Presentation and Analysis

The data presentation and analysis is to address the research questions of the study under investigation by using content analysis to examine the secondary data.

Research Question I

What are the basic contrasts of political powers between the President of United States of America and the Prime Minister of India Federal model?

3.1.1 Exercise of Political Powers between the President of United States of America and the Prime Minister of India.

Constitutionally, the United States federalism is more federal than unitary in character. Whereas, India is more unitary than federal thus scholars also tagged Indian federalism as a quasi-federal state. Hence, the following are some contrasting executive powers of the US President and India Prime Minister.

(i) **Executive Powers:** The President of the United States of America is the head of state and head of government. He is a unicephalous chief executive. Whereas, the Prime Minister is the head of government a bicephalous executive to serve as chief adviser to the

President on administrative issues of Union States of India.

(ii) **Election/Appointment:** The President of United States comes into power through popular vote and Electoral College, and the President must win electoral votes - at least 270 of the 538 votes cast to declare as elected President. While the Prime Minister of India is appointment by the President from the member of Lok Sabha (Lower House).

(iii) **Legislative Powers:** The President of United States initiates bills to the legislature thereby partaking in the legislative process. Every bill passed by United States Congress a copy must be forwarded to the President for his/her assent. Whereas, the Prime Minister of India is not preview to this power vested in United States President.

(iv) **Appointment of Top Government Officials:** The President of United States is empowered by the constitution to appoint key functionaries of government. Conversely, the Prime Minister with the Council of Ministers advises the President on appointment of key government officials.

(v) **Tenure of Office:** The Presidents of United States of America is elected indirectly for a period of four years. He/she can be reelected for maximum of two terms. While the Prime Minister of India is for a period of five years, but he/she has constitutional power to remain in power as long as he/she holds the majority support in the Lok Sabha (House of People, the Lower House).

(vi) **Diplomatic Powers:** The President of the United States is vested with power to represent the government in its relations with other countries on international issues, including signing of treaties. Whereas in India is done by the President of India.

(vii) **Judicial Power:** The President of United States has the power to grant state pardon and amnesties. While, India, the power is vested in the President and not the Prime Minister.

(viii) **Military Power:** The President of United States of America is the commander in chief of the armed forces. Whereas, this power is invested in the President of India and not the Prime Minister (United States, 2020; Arnold, 2004; Mohita, and India Today, 2016; Bajayi, and Ndoh, 2018, p.391).

Research Question 2

What are the similarities between the federalism of the US and the India in act of governance?

3.1.2 Similarities between the U.S and the Indian Federalism.

There are several similarities between the federalism of US and India in act of governance but in this work will focus on the following:

i. **Written Constitution:** The Constitution of both US and India is a written constitution as one of the features of federalism; which provides federal political structure where both governments exercise their respective powers. The constitution of both countries provide for amendment to meet the growing social needs and demand, political and economic needs and demand of their respective countries.

ii. **Bill of Rights and Fundamental Human Rights:** The Bill of Rights of the US Constitution was added by the first Congress in the first 10 amendment of the Constitution as Fundamental Human Rights such as the right to equality, freedom, freedom of religion, culture and educational rights, right to property, amongst others. Likewise, the provision under part 111 in Article 12-35 of the Indian Constitution guarantees the fundamental human rights of citizens.

iii. **Supremacy of the Federal or Union Government**. The Federal or Union Government is supreme in federal political structure. Thus, in both countries, the Federal or Union Government works at the centre in which various states have yielded to in act of governance. In this thrust, US has 50 States and India has 29 States and 7 Union Territories who have accepted this form of Federal and Union Government respectively.

iv. **Separation of Powers:** Both US and Indian Constitution make provision for separation of powers amongst three organs of government namely Legislature, Executive and Judiciary. Thus, each division is empowered with a separate power (Mukherjee et al ,2016; Ekwonna ,2012).

3.3 DISCUSSION OF FINDINGS

In research question one (1) findings revealed that the President of United States of America is the Head of State and Head of Government; while the Prime Minister of India is only Head of Government. The findings also revealed that the President of United States of America is elected through popular votes and electoral college, and must score at least 270 of the 538 votes of the electoral votes cast to declare as elected President; whereas the Prime Minister of India is appointed by the President. It also revealed that the President of United States has the legislative power to initiate Bills and every Bill passed by Congress must be forwarded to the President for his/her assent, before it could become a Law; while the Prime Minister of India is not empowered with this legislative power, he/she only carries out executive functions. The study further revealed that the President of United States appoints all the top government officials; while in India, the Prime Minister advises the President on the appointment of top government officials, the President is bound to accept the advice in line with Article 74 of the Constitution.

Furthermore, the findings revealed that the President of United States is the commander in chief of the armed forces. Thus, he/she has the power to declare war or state of emergency. In India, this power is invested in the President not the Prime Minister. The President of United States has judicial power to grant state pardons and amnesties; while in India, Prime Minister is not empowered by the constitution with this judicial power. The findings are in tandem with Arnoid (2004), Ndoh (2018, p.391) and Bajayi (n.d) on the contrasts between the United States President and the Prime Minister of India.

The findings of research question (2) further revealed that there are similarities between the federalism of US and India. Both United States and India have a Written Constitution, Bill of Rights and Fundamental Human Rights, Supremacy of the Federal or Union Government and provision for separation of powers of the three organs of government namely Executive, Legislature and Judiciary. The findings are in agreement with Articles 1, 2, 3, 5; and Article 4, 12 – 35, 50, 368 of the United States Constitution and Indian Constitution respectively. It is also in tandem with (Mukherjee et al, 2016; Ekwonna ,2012).

4.0. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

The study examined the comparative federalism of the United States of America (U.S.A) and India.

4.2 Recommendations

The researchers have made some useful recommendations on how to achieve high level of uniformity federal political system.

(i) In United States presidential election, Electoral College system should be abolished and popular votes should be used to decide the President and Vice President. This will help to eliminate the dispute that may arise from the Electoral College votes.

(ii) In India, the President should be Head of State and the Head of Government to avoid conflict of interest and chaos in carrying out the executive functions between the President and the Prime Minister.

(iii) Collective responsibility should be discouraged and discarded in the India federal system rather individual responsibility should be the hallmark in case of gross misconduct by any cabinet member.

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THE BIODIVERSITY OF TERMITES IN YENAGOA LOCAL GOVERNMENT AREA OF BAYELSA STATE

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Abstract
The impact of termites in the environment have become of great concern in the world. This is because of the significant role termites play in people's lives. The goal of this study was to ascertain the biodiversity of termites in Yenagoa local government area of Bayelsa state. Samples of termites were collected from different sampling locations in three communities in Yenagoa local government area. The communities include: Biseni, Edepie and Azikoro communities. The collected termites samples were isolated and identified by viewing using magnifying hand lens and the x40 objective lens of the light microscope in the laboratory in order to determine their morphological structure. The termites isolated were identified as: kalotermes spp, Microtermites spp, and Macrotermes spp. The results show the presence of kalotermes spp, in Edepie community, Macrotermes spp and Microtermtes spp, were both found in biseni and Azikoro communities. The study revealed that, the most abundanc and widely distributed termites species recorded in Yenagoa are: Macrotermites spp. and Microtermites spp. whereas, the study showed the presence of kalotermes spp. in Edepie community. Sampling point A shows the presence of microtermites spp. Whereas, sample points B and C show the presence of macrotermites spp. In Biseni community. Sample points A, B and C showed the presence of Kalotermites in Edepie community. While sampling points A and C showed the presence of macrotermes spp. and sampling point B showed the presence of microtermites spp in Azikoro community, all in Yenagoa Local Government Area of Bayelsa state, South-South Nigeria.

Keywords: Termites, biodiversity, insects, environment and man

1.0 INTRODUCTION

Termites are insects that form important part of any ecosystem and the environment. Termites play significant roles in the physical and spiritual lives of human beings (Arnold, 2017). They are classified as invertebrate animals. Some have wings, others have no wings. They are very significant as a result of their beneficial roles to man, animals and the environment. Their roles in the environment make them very significant in the society.

Termites help in the circulation of nutrients in the environment. They help in decomposing dead organic matters in the environment. They serve as agents of pollination of crops, plants and as a source of protein to man and other animals. Some can also be harmful to man and the environment (Stewarts et al. 2014). Termites are groups of animals that are classified as insects. They are insects that are described as eusocial in nature. Entomological society of America (ESA) recently in their update on termites taxonomy, merged the families of their order Isoptera with those of the coackrock order Blattodea (angel grilmadi and Krishna 2009).

Termites now belong to the same taxonomical order as the cockroach Blattodea, following the reclassification (entomologist reclassification 2012) termites were also reported to have once classified in an order separate from cockroach but that phylogenetic study showed that they developed from a close ancestors of cockroach (Donna 2018 and Canbera 2021), according to city pest control services,

Termites play significant role in ecological process (Alamu et al.2018). Insect such as a termite exhibit division of labour like others such as wasps, ants and bees etc. which are from separate order. Hymenoptera. They exhibit division of labour in their castle that contains sterile males and females" workers and soldiers.

Termites' colonies have males that are fertile known as kings whereas the fertile females are called queens (Okuma, Noda, Hongoh, Nadapa and, Nove 2009). They colonize most land masses in almost all the continents except the antarctica. Their colonies are usually in sizes from a few hundreds to a large population with several millions individuals (Grimaldi and angel 2005). They feed on dead plant materials and cellulose especially in the form of wood littered leaves, animal dung and the soil.

By this action, termites help to remove waste from the environment, fertilize the soil and circulate materials and nutrient in the ecosystem by loosening the soil to facilitates aeration (Wood, 1988). Their activities often result in the formation and regulation of the soil. (Ntukuyoh et al. 2012). reports have also shown evidence which points to the substantial positive influence of termites on the soil hydraulic conductively and influence on organic matter decomposition which help in maintaining the chemical and physical conditions which help to support stability and fertility of the soil (John, Holt and Michael Lepage, 2000).

More so, insects such as termites are one of the most populous macro fauna in Tropical forests and they contribute significantly to forest maintenance by decomposing organic waste and dead wood in the forest floor (Eagleton et al., 1999 and chunco 2014). Ecologists refer to termites as ecosystem engineers due to the important role they play in decomposition process as a result of. their ability to recycle organic materials, nutrients recycling, nitrogen fixation, carbon fluxes,soil aeration, distribution and inversion (Yamade et al., Collins et la, Biggnell et al. 2011).

The caste system of termite is made up of workers solders tertiary queen, secondary queen and the king (makitteick 1965). The worker termites carry out the most labour within the colony, they are responsible for foraging food storage broad and nest maintenance (Ntukuyoh Et at.,2012) the workers are also responsible for digestion of cellulose as food, they are the most likely caste found infested wood. The worker termite feed other nest mates, a process known as trophallaxis. An effective tactic in nutrition to convert and recycle nitrogenous component (figueiredo et al., 2015)). It frees the parents from feeding all but the first generation of offspring, allowing the group to grow much larger and make sure that the necessary gut symbionts are transferred from one generation to another (Timothy and corbin 2009). Many species of termites have no true worker castle but they rather depend on the nymphs that perform the same work without showing it as a separate caste (timothy and Corbin 2009). The solder caste plays the role of solder to defend the colony. They have large head with modifies strong jaws so enlarged that, they cannot feed themselves but rather depend on the workers for feeding like the juveniles (Robert, frank and Agbonsalo 2015) the aim of this research is to investigate the biodiversity of termites in Yenagoa local government area of Bayelsa State in other to document for study and to know their relative abundance with view to tapping from their potential.

2.0 MATERIAL AND METHOD

2.1 Sampling Location

The study was conducted within three sampling locations which include; Azikoro, Edepie and Biseni communities all in Yenagoa local government area of Bayelsa state. Yenagoa local government area is situated in (Latitude: 4'55'17;39''N, Longitude :6'15'30.60''E) The different sampling location fall into two clans in Yenagoa Local Government Area. Azikoro which is located at the north-east of Yenagoa falls under Epie clan. Edepie also falls under Epie clan, Biseni which is bordered by the Gbaran on the North and by the Zarama and Okadia clans to the North-East falls under Biseni clan on its own. Yenagoa as a local government area is also the capital city of Bayelsa State it is located at the southern Nigeria at co-ordinate 4'55'29'n 6'15'E e.g 2.1 the map of bayelsa state showing the location of yenagoa local government area.

2.2 Sample Collection

Termites were collected in the different sampling locations from both infested woods together with some of the particles of the mound and from their ant hills with the particles of the mound and put into plastic containers, covered with mosquito nets, fastened with rubber band then properly

labeled. They were then transported to the laboratory for isolation and proper identification. Isolated termites were frozen, dried and then identified according to the method of Throne and Haverty (1989) and Haverty et al, (1977).



PLATE 2.2 Termites sample Collection

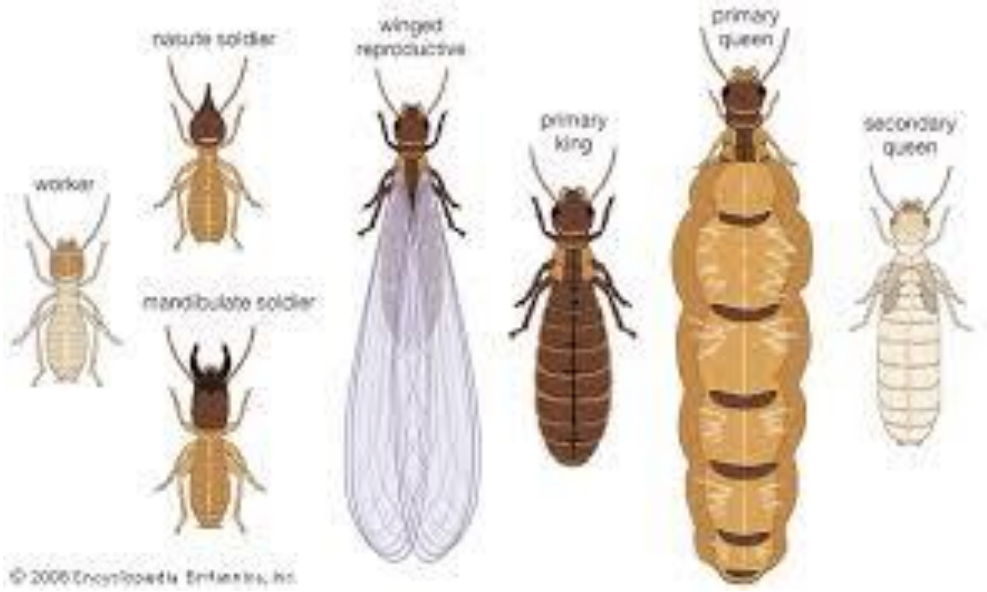


Fig 2.2 images of different types of termites.

2.3 Termites Identification

2. 3.1 Microscopic Identification

The termites sample collected from the different sampling locations were preserved and each placed in a petri dish. The termites in the petri dish were then viewed with the hand lens followed by x40 objective lens of the light microscopic to study their morphological details. From their morphological structure, the termites were identified according to the key compiled by the zoological survey of India sourcebook (chhotami 1997, Roonwal and chhotam, 1989 and

bose 1984). They were identified to species level by their morphological characters of body parts such as head, eye, antennae pronotum, mesonatum, legs, rostrium, (Nasute), cerci etc. Postmentum, labrum and mandible were mounted. Species were identified by taking measurement of different parts and matching them to the compiled keys. The termite samples in the research were classified according to their different nest system and feeding habits following (Abe 1987 and cole et al, 2023).

3.0 RESULT AND DISCUSSION

3.1 RESULT

The result of the termites species identification in this study is presented in Table 3.1. The results indicate that, three different termites species were identified in Yenagoa local government area from the three sampled locations: Edepie, Biseni and Azikoro communities. These termites species are *kalotermes spp*., *Microtermites* spp, and *macrotermes spp*. The results show that the *macrotermes spp*, was prevalent at Biseni and Azikoro communities while *kalotermes app*. Was the only species common in Edepie community. The microtermites were found in sample location B and C in Azikoro community.

Table 3.1: The diversity of termites in three communities in Yenagoa local government area

Yenagoa Local Government Area	Sample points	Species identified
Edepie Community	A	Kalotermes *spp*.
	B	Kalotermes *spp*.
	C	Kalotermes *spp*.
Biseni Community		
	A	Microtermites *spp*,
	B	Macrotermes *spp*,
	C	Macrotermes *spp*,
Azikoro Community		
	A	Macrotermes *spp*,
	B	Microtermites *spp*,
	C	Microtermites *spp*,

3.2 DISCUSSION

Termites play important role and make significant impact in the environment. Termites are very important food source across sub-Sahara Africa. (Barbara et al.; 2002; Tengweh and John 2018), reported that Macrotermes constitute a significant component of diet among the people of Niger Delta region in Nigeria. Termites along with other ants and earthworms are one of the three main group of soil ecosystem (Ntukuyoh *et al*., 2012).

As soil engineers, termites play key role in the tropical and sub-tropical ecosystem (Pascal et al.,2011). Different species of termites process variety of plant organic matter at all stages of decomposition contributing to the different return of nutrient to the vegetation (khan et al. 2018). It has been shown that, termites fauna structure is determined by climate and vegetation characteristics. Termites species richness, abundance, diversity, tropic structures differ between the two kinds of ecosystems and greater species richness have been observed in humid forest than in arid or semi-arid environment (Bignell and Eggliton 2000).

In the present study, Termites were isolated and identified in the laboratory from the samples collected in the three sampling locations in Yenagoa Local Government Area of Bayelsa State South-South, Nigeria. The termites species identified include: *kalotermes spp, Macrotermes spp*., and *Microtermites spp*., The termites spp.,

from Edepie community collected in sampling point A, B and C were identified as *kalotermes spp*. The termites samples collected from biseni community in sampling point A were identified as *Microtermites*, while sampling points B & C Termites were identified as *Macrotermes*. Whereas samples collected from Azikoro community in sampling point A & C were identified as *Macrotermes spp*, all in Yenagoa local government area. The result of this study has shown the diversity of Termites in Yenagoa Local Government Area of Bayeslsa State, South-South Nigeria which can be exploited for cultural and medicinal purposes.

4.0 CONCLUSION AND RECOMMENDATION

4.1 Conclusions

The result of this research revealed that, the most abundance and widely distributed termites species in Yenagoa local government area is the *Macrotermites* and *Microtermites* species. The result indicated the presence of *kalotermes* species in Edepie all in Yenagoa local government area. Conclusively, it can be said that there is diversity of termites in Yenagoa Local Government Area of Bayelsa State and this can be exploited for medicinal, cultural and food purposes.

4.2 Recommendations

Based on the result obtain from the study;

I. It is therefore recommended that, the study should be extended to more communities in Yenagoa local government area in order to ascertain the relative abundance and biodiversity of termites in Yenagoa Local Government Area.

II. It is also recommended that further studies on, the biodiversity of termites should be carried out in all the local government areas in Bayelsa state in other to identify the types of termites in the state.

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IMPLEMENTATION OF CIVIL SERVICE REFORMS POLICY IN BAYELSA STATE AND THE FALLOUTS

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Abstract
Government and business organizations use policy as a major instrument for directing their affairs. Policies used in subjective and objective purposes usually assist senior management with decision. During the immediate past administration in Bayelsa Sate, the government. The government initiated and implemented a public service reform policy in Bayelsa State. The implementation of the policy threw up a lot of issues. While the state government claim that the implementation of the policy resulted to reduction in wage bill and saving of millions of naira, there were woos and cry on the part of civil servants and many were wrongfully disengaged. This focus of this paper is to review the implementation the public service reforms policy and Bayelsa State and the fallouts. The study revealed that while the intention of the government for the implementation of the policy was good, the implementation of the policy left much to be desired as suspension and disengagement of workers were most often done by fiat without recourse to the civil service rules. The disengaged staff in some tertiary institutions also challenged their disengagement in the court and they won the case as the state government was ordered to reinstate them and pay them all the salaries of the period they were out of work. It is recommended that in as much as reforms are necessary to reposition any organization, make it more efficient and result oriented, reforms must be carried out in accordance with extant rules and regulations.

Keywords: Public service, reform, policy, government an d implementation

1.0 INTRODUCTION

1.1 Background of the study

Policy is a major instrument in which government and business organizations used to govern and direct their affairs. Policies assist in both subjective and objective decision making. Policies used in subjective and objective purposes usually assist senior management with decision that must be based on the relative merits of a number of factors and are often times hard to test.

Government and institutions usually have policies in the form of laws, regulations, procedures, administrative actions, incentives and voluntary practices. Usually resource allocation in some organizations is a reflection of the organization's policies. Government policies are public policies. Public policy is framed by the executive branch and executed by public and private actors (Miljan, 2012). Public policy is produced for the assistance of the public by the government that empowers the government to attain definite goals by providing an action plan.

In Nigeria, both federal and state governments have initiated and formulated policies at different time target at achieving certain objectives. For example, the federal government in the year 2016 approved the revised national policy on food and nutrition policy in Nigeria 2016. Other policies approved by the federal government in the same year include, Nigeria debt management strategy 2016 – 2019.The green alternative agricultural sector road map (2016 – 2020). The national water policy etc.

At the state level, deferent state government have also formulated policies to steer the affairs of their respective states at different times. Bayelsa State, one of the states in the Niger Delta region of Nigeria like any other state have also formulated and implemented policies to give direction to the affairs of the government. These policies include the public service reforms which started in 2012. When the government of Hon Seriake Dickson came into effect in 2012, one of the things that were dear to the governor was that for the government to deliver to Bayelsans, the

state they desire. This was the motivated factor the implementation of the policy.

However, the policy has been greeted with mixed feelings. While some people especially political office holders applauded the policy, many civil servants saw the policy as evil as a lot of them were either sacked or retired before their due time of retirement. This has led to the shortage of staff in many government establishment including primary and secondary schools in the state, especially in the rural areas. The aim of this paper is review the objectives and implementation of the policy and the fallout thereof. Bayelsa State.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework On Public Policy

Political science scholars have established different theoretical model on public policies. These models include incremental model, process model, public choice model, Institutional model, group model elite model and rational choice model rational model (Dye, 2013).

Incremental model

According to the incremental model public policy is considered as continuation of a former policy with minor alterations policies, programs and expenditures. Partial and restriction addition and modification in existing policies are done by incremental decisions.

Institution model

The institution public policy model theory states that public policy is determined by government institutions. The judiciary, executives and the legislature are the government institutions that give legitimacy to public policy. This model was popularized by Dye in 1972.

Process model

The process model divides public policy formulation into different stages. These process consist of seven stages which are intelligence, promotion, prescription, invocation, application, termination and appraisal. Formation which involves actors' intelligence is the first stage in the policy formulation. At these stages, the policy actors are observed as authorized policy makers or may be government position holders. Their status authorized them for the formulation of policies and the use of resources.

Group model.

The group model sees public policy as the product of group struggle (Anyebe, 2018). This model emphasizes the influence of interest/pressure group. Group struggle produce the public policy. Interest groups interacts and pressurize policy makers for self-interest and first choice.

Rational choice theory

Looking from the Policy analysis perspective, the theory that is directly linked or related to policy formulation is the rational choice theory. The rational choice theory was put forward by Adam Smith in 1976. It postulates that an individual will perform a cost benefit analysis to determine whether an option is right for them. It also suggests that an individual's self-driven rational actions will help better the overall economy. The rational choice theory looks at three concepts: rational actors, self-interest and invisible hand. The basic premises of rational choice theory are that the decisions made by individual actors will collectively produce aggregate social behavior. It also assumes that individuals have preferences out of available choice alternatives.

2.2 Overview of The Bayelsa State Public Service Reform

When the government of Hon. Seriake Dickson came into office in 2012 in Bayelsa State, he Christian the government, as restoration Government. The restoration agenda government had education, security, infrastructural development and economic diversification as its main focus (premium Times, 2013).

One of the key policies of the Government from inception was the Bayelsa public sector reforms policy. The policy was aimed at stopping the rote in the state civil service according to his Excellency Hon Seriake Dickson (2018). On the 27 of November, 2012, the Governor, Hon. Seriake Dickson had an interactive session with the Bayelsa State civil servants at the glory land cultural Centre in Yenagoa.

At the forum, the governor expressed his views with the civil servants and his thoughts on what an ideal civil service should be as well as his plans to restore the Bayelsa State civil service to meet time tested principles of diligence, loyalty, contentment and been totally apolitical. The Governor further told the civil servants that the state civil service commission and head of service will begin the implementation of the government promised reforms.

In that forum, the governor ordered the immediate suspension of four civil servants for breeching various aspects of civil service rules. First was senior accountant in the office of the secretary to the state government (SSG), for an alleged acts of careless talk, second was a surveyor with the Capital City Development Authority (CCDA), over alleged illegal allocation of lands in the Central business Districts (CBD) area of Yenagoa for the building of illegal structures, the third was a former secretary to the Environmental Sanitation Authority for wrongful recruitment of persons from his community and relations in contravention of civil service rules, and the fourth person was suspended with immediate effect for damaging and dissemination of rumours about the present administration.

The Governor went further to say that a violation of the civil service rule will no longer be acceptable and would not be tolerated for those who will not be flying the flag of the reforms and also the politicization of promotion in the service would no longer be acceptable. "I have decided to meet with you to reposition the service. We need to change to a new song. The reposition plan does not mean people will be sacked but we will go around and ensure that those not on their duty posts will be considered non genuine civil servants" he said. The governor went on to say that the civil servants he wanted was Dickson civil servants in Bayelsa State were most members of the billionaires' club, participated in the politics at very high level and are leading contractors before his assumption of the exalted office of the governor will not be tolerated. He said for those who want to be active politicians, he will advise them to retire from the civil service first, saying, the most sacred law of the civil service is loyalty to constituted authority. (www.channelstv.com/ 27 Nov 2012).

The Governor said the reforms will afford the government the opportunity to collate reliable data of the workforce and block all loopholes and wastages. The governor vowed to continue with the reforms, stressing that reforms have come to stay for the overall interest of the state. He then called for more support insisting that it is only those who are culpable that are kicking against the reforms, assuring the residents that genuine workers need not to be afraid. He said in order to make the reform legally binding, Hon Seriake Dickson said a legal frame work would be put in place at the end of the verification exercise in the state public service to insulate the service from all forms of fraudulent practices and promote service delivery. For the few people that may be adversely affected, the governor said they have nothing to loss as Committees are put in place to attend to genuine complaints if any and address them once proved.

In another forum while the implementation of the reform was going on, the governor said by the implementation of the reform, wage bill as reduced from ₦6 billion to ₦4billion. The Governor went further to say that as a result of the implementation of the policy, government has recovered 1.8bn annually. ₦53M is recovered monthly from the main stream civil service and ₦134M from discrepancies of salaries (grade levels and steps) of secondary school teachers and principals. The public sector reform policy cut across, the civil service, parastatals, government agencies, public institutions. (Kemela Okara, 2019).

The objectives of the public service reforms are to:

I. Reposition our service to make it more result oriented.
II. Block wastages and leakages in the system.
III. Create room for professionalism.
IV. Collate reliable data that will form the records of our public service which were not there before**.**

3.1 Importance of Reviewing Public Policies and Procedures

Effective policies and procedures takes more than just writing it and keeping it there for people to follow as if it is cast on stones. They are not sacred and unchangeable. They are something that must stand the test of time and therefore must be in tune with current societal realities. Effective policies and procedures are living documents hence they must grow and adapt to an organization or public need.

While the core elements and intent of a policy may remain the same, the steps and strategies of how to make it happen may need to adapt to the changes in the society or an organization. Regular review and revision of policy are therefore an important part of policy and procedure management in modern organizations.

Reasons for policies review.

There are many reasons why private or public policies may need to be reviewed. Some of the reasons for policies review are:

I. Outdated policy can keep organization at risk
II. Old policies may fail to comply with new laws and regulations
III. They may not address new systems or technology, which can result in inconsistent practices.
IV. Regular review of organization policies and procedures keeps the organization up to date with the latest regulations and technologies as well as consistent with best practices
V. Consistent and effect policies help protect employees and organization and the people they serve.

Policy review is most effective when it is done regularly and proactively, not in a reactive manner or in reaction to an event. It is not good to wait for a problem or violation to take place before deciding to review policy. AS a general rule, it is recommended policies review should be done between one and two years. When an organization undergoes major change such as change in leadership, it is good idea to review relevant policies. Organization policies should align with the organization's mission, vision and values as well as those of the leadership. www.powerdms

3.2 Fallout of the implementation of the public service reforms policy.

The implementation of the public service reforms policy in Bayelsa State, during the administration of Hon. Seriake Dickson resulted to the disengagement or sack of several workers in Bayelsa State ministries and parastatals. While the disengagement of some of the workers may be justified on account of fake academic credentials, falsification of age, double employment, many were wrongfully disengaged, or retired.

For instance, on the 16th of April, 2022, National Industrial Court sitting in Yenagoa ordered the Bayelsa state Government and the management of the Niger Delta University and Isaac Jasper Boro College of Education Sagbama to reinstate 800 hundred staff of the university and the college wrongfully disengaged during the implementation of the civil service reforms policy in the state. Apart from reinstating the 800 staff, the court also ordered the payment of salary arrears for all the 800 hundred staff from 7th May, 2018 to date.

While delivering the judgment, the presiding judge, Yenagoa Judicial Division of the National Industrial Court. Hon Justice Bashar Alkali, nullified the purported disengagement of the workers from the Bayelsa state. The Judge held that the mandatory requirements of the procedure for disengagement of staff as prescribed by the conditions of service were not complied with.

Claimants (disengaged staff) submitted that they did not breach or contravene any condition of service to necessitate their disengagement and the letter of disengagement issued to them by the both institutions did not state any reason for their disengagement from service. Rather the workers were relieved of their duties on the allegation that they were redundant and declared over age by the Seriake Dickson administration. The Government however claimed that the workers were retired from service by the management of their Institutions in accordance with the civil service rule and not sacked as being rumoured.

On the 3rd of October Senator Douye Diri approved the reinstatement of 704 sacked workers based on the Judgment given by the National Industrial Court and recommendations of verification exercised conducted by a committee set up by the prosperity government to verify the affected staff are the persons disengaged in 2018 as a result of the reforms policy of the previouse government of Hon. Seriake Dickson. They were staff of the Niger Delta University (NDU) Amasoma, (644), Isaac Jasper Boro College of Education Sagbama (48) and the College of Health Technology, Otuogidi (12). While speaking on the matters, Governor Douye Diri said he set up a committee to look into the disengagement of of the staff and approved its recommendations, which include re-engagement of majority of those sacked based on the needs of the Institutions as well as the payment of their salaries and other entitlements (Igoniko, 2023)

A worker in the state civil service who works in the Capita City Develoment Authority (CCDA) in Yenagoa, was suspended for asking question bordering on workers' welfare in relation to proposed civil service tax increase. This is a case of abuse f power, as the suspension done by fiat enhance did not follow any laid down rule. While the disciplinary action metted out on Apah and Ngibina may be justified in his view, Temerigha and Ifidi were unjustified for expressing their constitutional rights of freedom of expression, which may have been merely based on hearsay evidence based (Jeffery, 2012).

While speaking on the reforms, the commissioner for Local Government during the Administration of Hon. Seriake Dickson said the government has been able to reduce total wage bill of councils per months from #1.3billion to #950 million as fallout of the painstaking implementation of the reforms Secretary to state government office (2018). https:facebook.com/p

Salaries of 4,204 workers were suspended in the course of implementing the reforms in 2017. 1,329 of the affected workers were from the Eight Local Government Areas while 2,184 were from the state Universal Basic Education Board, the Primary School Education system and 707 were from pension payroll.

While government was only interested in reducing the size of the workforce in the implementation of the reforms, improvement in the skills and capacity of the workers, motivation of the workers in terms of enhanced welfare, as well as improvement in infrastructure in the civil service especially in the primary and secondary schools were not given the desired attention. Therefore, there is serious infrastructural e decay in our primary and secondary schools and lack of workers' motivation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Throughout the world, the contribution of the civil service in promoting sustainable and equitable economic growth are receiving increasing attention (Rosemary., Joseph and Emma, 2012). It is in the light of the above that that one will agree with the assertion that the public service reforms in Bayelsa state came to stay and the whole intent was to address the menace of workers' absenteeism from work, wrong employment and certificate racketeering and ghost workers' syndrome.

However, while the intent was good the implementation of the policy left much to be desired as suspension and disengagement of workers were most often done by fiat without recourse to the civil service rules. It is a contradiction to see that Hon. Seriake Dickson said civil servants must obey the civil service rules while stressing his commitment to the implementation of the policy, the government on its part fail to follow the rules in the disengagement of staff. This is demonstrated by the Judgment of the National industrial court in which the Judge held that the mandatory requirements of the procedure for disengagement of staff as prescribed by the conditions of service were not followed in the case between the Bayelsa State government and disengaged staff of some tertiary Institution workers

In the case, the Claimants (disengaged staff) submitted that they did not breach or contravene any condition of service to necessitate their disengagement and the letter of disengagement issued to them by the both institutions (Niger

Delta University, Amassoama and the Jasper Isaac Boro College of Education Sagbama) did not state any reason for their disengagement from service. Rather the workers were relieved of their duties on the allegation that they were redundant and declared over age by the Seriake Dickson administration.

In a study undertaken by (Koffi,2020), it was discovered that the Bayelsa state public service reforms exercise did not engender efficiency and effectiveness and the exercise did not observe extant rules of the civil service and regulations. The Commissioner for information during the Dickson administration Hon. Iworiso Markson while addressing journalist on the reforms on the 21st of January,2018, said everything about the reforms will be done according to the rules and regulations, that there won't be any form of victimization (Global overseer, 2018). However, the case where a civil servant was suspended because he asked the governor (Hon. Seriake Dickson) a question is a pure case of victimization.

The commissioner also said the reforms was to engender efficiency of the state civil service however that was not the case as many teachers and non-academic staff in several primary and secondary schools were disengaged and no employment was done to replenish the system hence several schools lack the adequate manpower to carry out the mandate of the primary and secondary schools. Therefore, the policy failed to achieve the objective of engendering efficiency and effectiveness of the schools.

4.2 Recommendations

Based on the findings of the research, it is recommended that in as much as reforms are necessary to reposition any organization, make it more efficient and result oriented, reforms most especially in the public service should be carried out in accordance with extant rules and regulations.

Government should not see itself as above the law, hence government decisions should be done by fiat.

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INTERNAL AUDIT FUNCTIONS AND FINANCIAL REPORTING QUALITY IN PUBLIC SECTOR IN RIVERS STATE.

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Abstract
There are concerns about the quality of financial reporting and the internal audit practice employed in both public and private sectors in Nigeria due to persistent financial crime leading to most corporate failures. This ugly trend has placed greater responsibility on financial experts, especially the auditors. Therefore, this study examined the internal audit practice and financial reporting quality in the public sector of Nigeria. A survey approach of a structured questionnaire was used to gather data from the University of Port Harcourt Teaching Hospital Rivers State Nigeria. Variables employed are Auditor independence, Professional Competence, Auditor integrity, Audit Objectivity, Audit Confidence and financial reporting quality. Regression analysis of OLS was employed and the finding revealed that only audit objectivity has a significant influence on the financial reporting quality, while other variables like independence, integrity, and competence of internal auditor and confidence do not have any positive influence on the financial reporting quality in Nigeria's public sector. It was therefore, advanced that in the public sector, internal auditors need to maintain neutrality and impartiality in their work, even if complete independence is not possible. The public sector Internal Audit Units should stay updated with operational procedure changes for professional competency.

Keywords: Audit Quality, Internal Audit, Internal Audit Attributes, Financial Reporting Quality

1.0 INTRODUCTION

Audit quality practices ensure accurate financial information for stakeholders and the public. The procedure and audit practices vary from one organization to the other and it depends on the size, procedures, and regulations adopted by the organization. Ugwu et al. (2020), Saleh and Azary (2008) observed that audit quality is employed to detect discrepancies and to reduce information imbalances between managers and shareholders thereby protecting shareholders' interests. Audit effectiveness is measured by the absence of significant discrepancies or distortions in financial reports (Mustika, 2015).

Maintaining accurate financial records is crucial in revealing and reporting financial information. The internal audit processes are vital for controls in organizations. Internal auditors must apply best practices in internal controls to uphold ethical business values. An internal audit improves financial reporting through implementation by organizations. Soh and Martinov (2011) claimed that management and external auditors should assess internal control quality. Internal audit practice (IAP) is crucial for promoting ethical business practices and optimal internal control methods.

Corporate failures raise doubts about financial reporting methods in Nigerian companies. Financial misconduct is increasing and unethical behavior in Nigeria's corporate sector is becoming more severe. Ettredge et al. (2006) claimed that internal audit ensures financial disclosure confidence for shareholders. Studies on the link between internal audit functions and corporate performance are lacking in both developed and developing nations (Al-Matari et al., 2012). Despite the increased focus on financial reporting quality in Nigeria's public sector, there is no clear evidence on internal audit practices' impact on how internal audit affects the Nigerian public sector's financial reporting. Research studies have examined how audit methods impact financial statement quality, particularly concerning the role of external auditors. This study is needed as there is limited

literature on the role of internal auditors in private and public sectors, emphasizing its significance.

Studies have shown mixed reaction on the impact of internal audit practice and quality of financial reporting in Nigeria and other countries. On the evident of positive relationship, Alsmairat et al., (2019); Kalabeke, et al. (2019) ; Osamudiame et al., (2018) ; Baharud-din et al., (2014); Mustika (2015)[]; Azizi et al. (2010); Kamolsakulchai (2015); Sepasi et al. (2017) ; Siregar and Nuryanah (2019) ; Zeyn (2018) ; Ugwu et al. (2020) among other recorded that internal audit practice improves the quality of audit carried out in an organization. On the other hand, results of Hikmayah and Aswar's (2019); Eyenubo et al. (2017) among others contradict this view, while the study of Lobo et al. (2018), Ching et al. (2015), Kaklar et al. (2012), Bala et al. (2018) among others provided evident of no relationship between the variables. It is based on this ground that further studies are necessary.

This Investigation focuses on audit independence, integrity, competence, integrity, objectivity and confidence on quality of financial reporting. This inquiry concerns management, accounting, and auditing at University of Port Harcourt Teaching Hospital, Rivers State. The research aims to analyze the impact of internal audit processes on financial reporting reliability in Nigeria's public domain.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

Internal Audit Practice

Internal auditing is crucial to ensure smooth business operations and prevent improper use of resources. The key role of internal audit is to regularly evaluate an organization's actions. The goal is to propose improvements to enhance the entity's governance, including risk management and internal control systems. The audit relies on impartiality and neutrality for reliable and authentic results. An effective Internal Audit Practice (IAP) enhances transparency and detects management biases. Salehi and Kangarlouei (2010) identified factors indicating audit quality in 2010. The auditor's scope, experience, expertise, reliability, potential litigation involvement, and impartiality are all important factors (Lobo et al., 2018).

Audit Independence

The auditor must remain impartial and objective during audits and financial reports. Danescu and Spatacean (2018) explain that independent auditors maintain objectivity and impartiality during audits. Possessing key traits enables an auditor to fairly and knowledgeably assess financial statements without bias. Autonomy affects financial statement quality. Hikmayah and Aswar's (2019) suggested that auditor independence and quality affect selection. (Kalabeke, et al., 2019 and Baharud-din et al., 2014) stated that autonomy is crucial for auditing integrity. Auditor independence is crucial for accurate financial reporting. Five essential elements of quality management include independence as a foundational principle. Maintaining independent quality ensures personnel remain unbiased and honest in their professional duties. Internal auditing helps boards make choices with expert perspectives. Internal auditors must maintain neutrality and objectivity while carrying out their responsibilities. Auditors need to comprehend independence, objectivity, and their practicality to meet predefined standards. Auditors must be independent and objective. It means making impartial judgments based solely on audited facts, free from external influence (Hikmayah & Aswar, 2019).

Auditor's Integrity

Internal auditors' trustworthiness is crucial for reliable judgments. Trust is built on integrity. Internal auditors demonstrate professional integrity when gathering and sharing information about procedures or operations under examination. Integrity in accounting means following standardized principles like IFRS (Sepasi et al., 2017). Uniform accounting principles increase trust in financial statements. Integrity audit examines company ethics. Integrity is the quality of a defined ethics code (Bala et al., 2018). Lack of auditors' integrity can harm individuals and organizations. Why perform an integrity audit? It is vital for organizations to comply with authorities' laws

and regulations. Businesses must avoid deceitful activities.

Auditors must avoid wrongdoing and follow legal rules. Honesty and uprightness are crucial for a good professional image. Honesty and consistency are vital for trust in society (Kamolsakulchai, 2015). It sets a benchmark for personal decisions and behavior. Integrity demands honesty, openness, and confidentiality for service recipients. Kalabeke et al. (2019) emphasized the importance of prioritizing public confidence in service delivery over personal gain. Integrity means acknowledging mistakes and opposing views, while remaining committed to one's principles. Audit quality is determined by the auditor's integrity, with higher integrity resulting in better outcomes. Integrity excludes deceitful or ethical violation. Being honest involves following technical and ethical codes. Honest and ethical auditors improve audit quality. Osamudiame et al. (2018)] research states that a trustworthy and ethical auditor is essential for achieving high-quality audits, as integrity is significantly linked to audit quality. An auditor's consistent behavior builds trust for reliable decisions.

Professional Competence and Technical Training

Professional skills and competence are vital for an internal auditor. Nwanyanwu (2013) stresses that relevant professional knowledge is vital for top-notch assurance services. Auditors undergo screening to verify qualifications, skills, and expertise. Having the necessary education and certificates in accounting and finance, as well as regularly participating in professional education programs and seminars, showcase technical expertise. IFRSs and IPSASs adoption is crucial in modern accounting, representing progress in global practices. The norms are now part of education programs to spread in the accounting profession. Auditors' knowledge affects various aspects in audits. According to Al-Khaddash et al. (2013), an auditor's compensation is tied to their education, experience, and certification.

Continuous education keeps individuals informed of accounting, auditing, and finance advance-ments. The use of IFRSs and IPSASs is now vital in accounting and auditing practices, included in academic curriculums and promoted in professional development.

Guidance is critical for quality control in financial reporting. AICPA guidelines ensure audit personnel competence via Quality Control Standards for personnel management. This means assigning tasks based on skills, growth opportunities, and credentials (Alsmairat et al., 2019).

Auditor Objectivity

Objectivity ensures unbiased mindset for auditors to build trust and deliver quality work. Internal auditors prioritize their judgment over external parties for objectivity. Auditors see objectivity as crucial. Auditors must remain impartial in certification exams and professional growth. Understanding objectivity is crucial. Hikmayah and Aswar's (2019) defined objectivity as an unbiased assessment free from outside influence. Objectivity requires unbiased evaluation and reliance on factual evidence by an auditor. An auditor's impartiality is at risk if they consider potential negative impacts on those involved in the audit. Eyenubo et al. (2017) claimed that achieving absolute objectivity as an auditor is limited due to the job's decision-oriented nature. Eyenubo et al. (2017) also assert that auditors can't ignore clients' interests.

Financial Reporting

Financial reporting presents financial statements to meet information needs (Nwanyanwu, 2013). Mustika (2015), states that sharing financial information facilitates accountable management communication. Financial reporting transmits data on monetary dealings of organizations in a different dimension. Accountants aid communities across various structures due to the critical nature of their services. According to Adebayo (2005), disclosing management's responsibility to stakeholders is not limited to this approach. These descriptions show financial reports are important tools for understanding economic activities and aiding decision-making for stakeholders. Auditors need to be meticulous and prudent to deliver trustworthy reports. An audit ensures financial statement accuracy,

reliability, and excellence (Hikmayah & Aswar's, 2019 and Nwanyanwu (2013)[] note that financial reporting goals vary based on organizational activities. Adebayo (2005) states that financial reporting aids decision-making, assesses stability, enables evaluations of resource management and allows for comparisons and communication about financial activities. Financial reports inform decision-making. They must provide clear and reliable financial information (Ahmad, et al., 2016)

2.2 Theoretical Review

The Policeman Theory

This theory holds the view that auditor holds the obligation of carrying out a comprehensive inquiry to identify, expose, and prevent any deceitful behavior (Osamudiame, et al., 2018). Hence this theory sees the auditor as a policeman that prevents crime from occurring. Auditors are responsible for providing a fair and impartial representation of financial statements with a reasonable degree of confidence. In the present era, auditors are under increasing pressure to uncover instances of deception, particularly in light of prominent cases of reporting misconduct. It can be argued that people who trust information in modern societies expect auditors to take responsibility for detecting any fraudulent behavior. Their reliance on audit reports for evaluation and decision-making is the root cause of this. Although auditors are not entirely responsible for detecting all fraudulent activities, it is essential that they enhance their abilities in identifying such incidents to build trust with the public (Bala et al., 2018).

Reputation Rationale Theory

This theory suggest that Audit companies face higher risk if they provide poor services. Hence big audit firms provide better audits to maintain their reputation and retain clients. Ching et al. (2015) found that leading audit firms prioritize high quality auditing for financial gain. They aim to uphold it to their best. The Lending Signal Theory explains how borrowers' behavior and attributes impact their creditworthiness. By showing lenders their ability and willingness to repay, borrowers can gain trust and better loan terms. Lenders assess borrowers based on asset value, financial history, and public opinion. To assess borrower creditworthiness, consider collateral quality, borrowing history, and social standing. To assess loan extensions or partnerships, investors consider factors like guarantee tangibility, payment consistency, and brand credibility (Okpala, 2015).

2.3 Empirical Review

Baharud-din et al. (2014) study examined internal audit effectiveness in the public sector. This study used a cross-sectional survey to analyze internal audit proficiency, autonomy, and management support. Results show a significant correlation between the variables. Management support impacts internal audit's effectiveness.

Organization structure affects internal audit. Function: Provides assurance and advanced advice to optimize organizational resources. Mustika (2015) analyzed factors affecting the internal audit process, such as auditors' skills, independence, audit support, and internal-external auditor connection. Java Province's inspectorate suggests improving internal auditors' competence and independence and fostering a strong relationship with external auditors to enhance the auditing process.

Hikmayah and Aswar (2019)[] studied the impact of ethics, expertise, and values on audit quality. This study used a sample population from DKI Jakarta Province's administrative boundaries, mainly BPKP personnel. Purposive sampling was used based on specific requirements that participants must be qualified government auditors, trained in JFA, with two years' experience. 62 auditors under BPKP in DKI Jakarta were researched. The analysts used Smart PLS and SEM. Outcome showed that auditing is affected by ethical behavior and integrity of accountants.

Integrity and audit quality are intertwined with professional dedication and their negative effects. Auditor competence affects audit quality despite professional commitment. Lobo et al. (2018) carried out their study on innovation, quality of financial reporting, and audit quality with the aid of OLS. It was discovered that financial report standards depend on audit quality. This was

determined through surveys and analyses. The evaluator assessed audit and financial reporting quality based on auditor independence, technical expertise, proficiency, and engagement performance.

The negative correlation between innovation and financial reporting quality stems from managers' ability to manipulate earnings in less transparent environments. Ching et al. (2015) analyzed auditors' quality and organization performance using OLS. The study found that auditors have limited power to enhance financial reporting. Study also shows that better finances with strong audit quality, boost investor trust.

A study by Kaklar et al. (2012) analyzed 91 companies on Tehran stock exchange using systematic exclusion and panel, and correlation analysis. Small audit firms have better financial reporting. Audits with different auditors did not significantly impact financial report quality. A study conducted in Thailand by Kamolsakulchai (2015) on effectiveness of audit committee in improving quality of financial report from 2008-2012 found a positive correlation between audit quality and financial reporting using a panel fixed effect model. Kamolsakulchai (2015) found that effectiveness of audit committee in improving quality of financial report.

Efficient internal audits lead to excellent financial statements in businesses. Good corporate governance improves the link between internal audits and financial reporting. Sepasi et al. (2017) used correlation inferences to examine internal audit in relation with audit quality. Structured questionnaire was employed and the outcome showed that the relationship between variables are positive. This is similar to the findings of Siregar and Nuryanah (2019) when analyzing audit quality and efficiency of investment. They revealed a positive link between high quality financial reports and investment efficiency in Indonesia.

A study on 36 Local Government inspectorates in West Java and Banten carried out by Zeyn (2018) using correlation and regression techniques, highlights the importance of internal auditing in government. The study claimed that better financial responsibility and reporting are positive outcomes of auditing. In the same vein, Ugwu et al. (2020)[] in Nigeria shows positive link between bank performance and audit firm size.

To boost performance, audit quality for efficient resource allocation should be the target of the company. This type of findings was also discovered by Umobong and Ibanichuka (2017) in their study that focused on audit committee characteristics, including autonomy, financial proficiency of members, organization age, and meeting frequency. Contrary to this, Ikpantan and Daferighe (2019) when analyzing audit quality in relation to deposit money bank performance using OLS, suggested that audit fees and auditor tenure have no impact on financial reports.

According to research. An association has been found with discretionary accruals. An analysis of 88 Nigerian publicly traded companies between 2012 and 2016 carried out by Bala et al. (2018) showed that higher audit fees correlate with better financial reporting. The inquiry relied on discretionary accruals as a substitute for reporting excellence. High audit fees = low discretionary accruals. Bala et al. (2018) discovered that higher audit fees deter accounting manipulations and enhance financial reporting standards. Bhuyan et al. (2020) recorded that risk committee enhances financial reporting excellence by reducing optional charges and increasing audit expenses. The evaluation showed a significant correlation between audit tenure, auditing firm size, and audit quality

3.0 METHODOLOGY

3.1 Data collection

This study used a questionnaire to gather primary data through survey research. The respondents consist of managers, accountants, and auditors with accounting and public finance skills. 101 participants were selected from 1,500 individuals. The study used a systematic sampling in the selection of every 15th person from the Account and Finance department at University of Port Harcourt Teaching Hospital, Rivers state to form a representative sample. The survey questions used a five-point Likert scale to gather reliable, measurable data. Data using descriptive statistics was used to analyze the data

collected. The hypothesis was tested via Regression Analysis at 95% confidence.

Model Specification

FRQ= f (AI, AIN, AC, AO, ACM) (1)

$FRQ= \beta_0 + \beta_1 AI + \beta_2 AIN + \beta_3 AC + \beta_4 AO + \beta_5 ACM + e$ (2)

Where:

FRQ= Financial Reporting Quality

AI= Audit Independence

AIN= Audit Integrity

AC= Audit Competence

AO=Audit Objectivity

ACM = Audit

Confidence β_0 =

Intercept

β_1 to β_5 =Coefficients of explanatory variables

e= Component Error

Data Presentation and analysis

Responses were clarified using frequency statistics, and regression analysis to find significant of independent variables on FRQ.

4.0 RESULTS AND DISCUSSION

4.1 Reliability Analysis

Table 4.1 shows analysis of data collection instrument reliability. The observed Cronbach Alpha coefficients exceeded the accepted threshold of 0.7. Results show satisfactory reliability, consistency, and consistent results using the same tools on participants over time.

Table 4. 1: Summary of Reliability Test

Variables	**No of items**	**Cronbach's Alpha**
Audit Independence	4	0.629
Audit Integrity	4	0.705
Audit Competence	4	0.708
Audit Objective	4	0.725
Audit Confidence	4	0.716
Financial Reporting Quality	3	0.740

Source: Authors' Computation (2023)

Summary of Demographic Data are presented in Table 4.2

Table 4.2: Demographic Information of Respondents

Category	**Frequency**	**Percentage (%)**
Gender		
Male	69	68.3
Female	32	31.7
Age		
Under 20 - 29 years	2	2.0
30-39 years	17	16.8
40-49 years	53	52.5
50 years and above	29	28.7
Education		
First Degree	60	59.4
Masters	29	28.7
PhD	3	3.0
Others	9	8.9
Professional Qualification		
ACCA	1	1.0
ANAN	33	32.7
ICAN	27	26.7
Others	40	39.6
Work Experience		
0 - 5 years	3	3.0
6 - 10 years	18	17.8
11-20 years	61	60.4
21 - 49 years	19	18.8
Position in Institution		
Accountant	50	49.5
Auditor	27	26.7
Top Executive	14	13.9
Others	10	9.9

Source: Authors' Computation (2023)

Table 4.3. model used for analysis of data

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.405[a]	.164	.120	.93825308	1.074
a. Predictors: (Constant), Audit Confidence, Audit Independence, Audit Objectivity, Audit Integrity, Audit Competence					

Table 4.4: Model Summary[b]

b. Dependent Variable: Financial Reporting Quality

Table 4.5: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.370	5	3.274	13.719	0.004[a]
	Residual	83.630	95	.880		
	Total	100.000	100			
a. Predictors: (Constant), Audit Confidence, Audit Independence, Audit Objectivity, Audit Integrity, Audit Competence						
b. Dependent Variable: Financial Reporting Quality						

Table 4.6: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-5.648E17	.093		.000	1.000		
	Audit Independence	.051	.117	. 051	.432	.667	.640	1.561
	Audit Integrity	.169	.123	.169	1.376	.172	.587	1.705

4.2 Discussion of Findings

The study shows the comprehensive model as statistically significant as the predictive value F-statistics stood at 13.719 and probability of 0.004 ($p<0.05$) is significant. Auditor Independence, Integrity, Competence, Objectivity, and Confidence explain 16. 4% of the differences in financial reporting quality can be attributed to the R^2 measure. Data analysis shows that auditor independence does not significantly impact financial reporting quality ($t=0.432$; $p>0.05$). Auditor Integrity does not significantly influence financial reporting quality ($t=1376$; $p>0.05$).

Conversely, auditor competency revealed no significant impact ($t=0.164$; $p> < 0.05$). The insignificant of these variables supports previous research by Baharud-din et al. (2014) Mustika (2015), Azizi et al. (2010) among others while it contradicts Hikmayah and Aswar's (2019) work. The t-test found a significant impact of Audit objective ($t=3.171$; $p<0.05$) and financial reporting quality. Auditing Confidence variable has no significant effect ($t=-0.152$; $p>0.05$) on financial reporting quality. The study failed to reject the Null hypotheses that Auditor Independence, Integrity, Competence, and Confidence have no impact on financial reporting quality while the null hypothesis Audit Objectivity on Financial Reporting Quality has been disproven. Durbin-Watson statistic of 1. 074 confirm independent errors.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the internal audit practice and financial reporting quality in the public sector of Nigeria. A survey approach of structured questionnaire was used to gather data from the University of Port Harcourt Teaching Hospital River State, Nigeria. Variables employed are Auditor independence, Professional Competence, Auditor integrity, Audit Objectivity, Audit confidence and financial reporting quality. Frequency and regression analysis of OLS was employed and the finding revealed that only audit objectivity has a significant influence on the financial reporting quality, all other variables like independence, integrity, and competence of internal auditor and confidence do not have any influence on the financial reporting quality in Nigeria's public sector. The insignificant impact of most employed variables showed that public sector auditors lack complete autonomy from their management. The independence of internal auditors affects their integrity and proficiency.

It was therefore, advanced that in the public sector, internal auditors need to maintain neutrality and impartiality in their work, even if complete independence is not possible. The public sector Internal Audit Units should stay updated with operational procedure changes for professional competency. Experts can improve auditing protocols and disseminate fiscal data to advance reportage. Lastly, monetary rewards may motivate auditors. This can give them the tools to uncover errors in financial records.

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