

SUMMARY OF CONTENT

There are five papers in this issue of Petroleum Technology Development Journal. The first paper deals with the title *Digital Technology Service Provision by Indigenous Companies in the Nigerian Oil and Gas Industry*.¹ The authors observe that the oil and gas industry is facing pressures on multiple fronts. Depleting natural deposits, high costs of operations, volatile crude prices, increasing crude demand, calls for clean energy sources, etc. As one surefire way out of these, they note, oil and gas companies around the world have been taking advantage of the massive efficiencies and cost-cutting opportunities afforded by advanced digital technologies. The paper submits that in Nigeria, this trend is found mostly among the few mega multinational companies operating in the country and the indigenous companies still need to optimally leverage these technologies as the provision of digital technology services as a local content input is missing, having been largely sidelined both as a field of practice and of study. This article seeks to break ground in drawing research and intervention attention to the area. As a foundational study, it takes a look at some of the digital technologies deployed by multinational oil companies and the legal and regulatory framework in Nigeria that can be leveraged to engineer the emergence of indigenous service providers in the field.

The second paper *Market Segmentation, Customer Value Propositions and Organizational Performances of Indigenous Oil and Gas Companies in Rivers State, Nigeria, as Moderated by Market Innovations and Local Content Policy*² investigates the effect of market segmentation and customer value proposition on organisational performances of indigenous oil and gas companies in Rivers State, Nigeria as moderated by market innovation and local content policy. The theory underpinning this study is the resource-advantage (R-A) theory of competition. Survey research design was used and the population of study consisted of 322 Management Staff of 11 indigenous oil and gas companies in Rivers State. Total enumeration method was adopted through a validated and structured questionnaire to collect data. Data were analysed using hierarchical regression. Findings revealed that the effect of market segmentation and customer value proposition on organisational performances of indigenous oil and gas companies in Rivers State was significantly affected as moderated by the combination of market innovation and local content policy ($\beta = -2.322E-6$, $\Delta R^2 = 0.006$; $\Delta F = 10.055$, p). The paper concludes that market segmentation, customer value propositions as moderated by market innovation and local content policy had significant effect on organisational performances of the selected indigenous oil and gas companies in Rivers State, Nigeria. It recommends that, management of indigenous oil and gas companies should segment their markets, and tailor their products and services to meet customers' needs, and also develop a strong value proposition with adequate adherence to local content policy.

In the paper *Mathematical Modelling of Energy Subsidies in a Recessionary Economy: Impacts on Market Dynamics and Environmental Sustainability*,³ the author develops a mathematical model to explore the impact of energy subsidies on market dynamics and environmental sustainability in a recessionary economy. The model examines how subsidies influence energy demand, government costs, and carbon emissions, with a focus on the trade-offs between short-term economic recovery and long-term environmental impact. The findings of the author suggest that while subsidies can stimulate demand and support economic recovery, they can

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also lead to increased emissions, particularly when applied to non-renewable energy sources. He submits that the optimal subsidy level is determined by balancing consumer welfare gains against environmental costs. The model provides policymakers with a framework to design energy subsidies that promote both economic growth and sustainability, particularly in times of economic downturn. The author suggests that future research should explore non-linear market relationships and validate the model using empirical data.

The paper on *A Review on Strategies and Technologies of Corrosion Prevention in Seawater Pipelines*⁴ provides a detailed examination of the current strategies and technologies employed to combat corrosion in seawater pipelines. The authors observed that effective corrosion prevention is crucial to ensure the safety, reliability, and longevity of these pipelines. Key topics covered in the paper include the selection of corrosion-resistant materials, the application of protective coatings, and the implementation of cathodic protection systems. Also, the use of corrosion inhibitors and advanced monitoring techniques are explored. The paper highlights recent advancements and research findings, offering a contemporary perspective on the most effective methods for preventing corrosion. Through this commendable review, the paper to presents an integrated approach to corrosion prevention, combining traditional practices with cutting-edge innovations to enhance the durability and performance of seawater pipelines in various industrial applications.

Increasing interest in oil and gas exploration in the Nigerian inland frontier basin has necessitated re-evaluating the once-neglected Late Cretaceous Hydrocarbon Source Rocks from the basins. The paper on *Comparative Analysis of Hydrocarbon Generation in the Nigerian Frontier Basins: Insights from Late Cretaceous Hydrocarbon Source Rocks and Confined Pyrolysis Experiments*⁵ investigates hydrocarbon generation characteristics of representative Cretaceous outcrop source rocks and geochemical properties of their generated products, using a confined gold tube pyrolysis experiment. The authors observe that conventional geochemical analyses (TOC and Rock-eval) reveal that the source rocks are rich in organic matter and in the immature hydrocarbon generation stage. They note that the gold tube experiment at six (6) different temperature stages (300°C to 500°C) indicates that the source rocks produced oil and gas in different proportions, and the pyrolysis products contained a certain amount of C₆₊ liquid hydrocarbons. Observed peak oil yields of the Bida, Dahomey, and Anambra shales were 5.80, 24.09, and 6.63 mg/gTOC, respectively. The gas yields of the source rocks drastically increased with rising heating temperatures (maturity). They observed that after exceeding 450°C (about EasyRo of 2.0%), methane and ethane gases were the dominant components in the pyrolyzates, which means that oil in the products gradually cracked into gas during the high-temperature stages. They found out that maximum gas-to-oil ratio (GOR) of the shales ranges from 2.52 to 5.50. The $\delta^{13}\text{C}$ of C₁, C₂ and C₃ from the pyrolyzates are similar to those generated from the Niger Delta and this could be a result of marine connections among the basins.

This study is valuable for further exploration in the Nigerian Frontier Basins, reducing over-dependence on the Niger Delta Basin for hydrocarbon exploration.

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⁵ Jeremiah Ayok, Abdulkareem Toyin and Habeeb Ayoola Ayinla