LOCATION ORIENTATION AND ACCESSIBILITY OF PETROL STATIONS IN SOUTH EASTERN NIGERIA

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Abstract
The importance of petrol products has continued to gain prominence, hence it is one of the key business ventures that keep developing and attracting competitiveness in Africa. The paper examined location orientation and accessibility of petrol stations in South Eastern Nigeria. The paper was underpinned on central place theory. The paper adopted survey research design. The population was infinite. Simple random sampling was used in selecting 18 petrol filling stations in Abia, Anambra and Imo states. A sample size of 380 was generated using Cochran formula for unknown population. A structured questionnaire was the major instrument of data collection. Data were analyzed using frequencies, percentages, standard deviations and aggregate score, while hypothesis was tested using Pearson correlation analysis through the aid of the Statistical Package for Social Sciences (SPSS) software. The findings revealed amongst others that a significant positive relationship exist between location orientation and accessibility in the petrol stations in South Eastern Nigeria at (p-value=.024). The paper concluded that that proper location is very important in sitting a petrol business. Where it is negleted, there bound to be low patronage that could manifests in poor turnover and possible profit. However, the paper recommeded amongst others those Petrol stations should be built in a reasonable visible distance devoid of bends and unfriendly topography where customers can sight and access the stations unhindered. This can be done in a well-spaced, decongested, convenient and central place without neglecting the importance of safety.

Key words: accessibility, location orientation, patronage, petrol stations.

Introduction

The importance of petrol products has continued to gain prominence, hence it is one of the key business ventures that keep developing and attracting competitiveness in Africa. Just like other notable nations, Nigeria is endowed with abundant natural resources of which petroleum is the most prominent. Nigeria is one of the biggest oil producing in the world and consumer in Africa (Apkan & Nnamseh, 2014). The oil and gas sector accounts for about 35 percent of the nation's Gross Domestic Product (GDP), and petroleum exports revenue represents over 90 percent of its total exports earnings (OPEC Annual Statistical Bulletin, 2017). Domestically, the petrol sector has enjoyed continued patronage due to the increasing number of

automobiles on Nigerian roads and the acquisition of electricity generating machines. Due to the epileptic power supply in the country, especially in the South Eastern Nigeria, almost every home or business venture has a power generating set that provides electricity to sustain their domestic or commercial activities. More still, it is pertinent to note attraction of customers and patronage to kerosene and cooking gas cannot be overemphasized. Incidentally, all these oil products are dispensed almost 100% at petrol/filling stations; hence the inevitable patronage.

A petrol station is a facility that sells fuel products to vehicles and other customers. These products are usually dispensed from a pump at a clearly stipulated metre price. Interestingly, the approval to construct and operate petrol products filling stations is usually obtained from the Department of Petroleum Resources (DPR) and Town Planning Authority (Omeh, 2015). He also noted that often many petrol stations boycott these bodies in establishing their businesses; perhaps to avoid disqualification which could emanate from unsuitable site, incomplete or inadequate facilities and (or) to avoid the payment of required fees; thus, operating in an unapproved and derisory environment that is often detrimental to human health and other economic activities.

The poor location orientation in many of these fuel stations is often associated with unease accessibility by most vehicles and pedestrians. In some it is usually difficult for long vehicles to supply or buy products and navigate at ease. Location is an indispensible factor that shapes and determines the effectiveness, success or failure of many business activities. Finding a right location involves the selection of the region or town, with relevant labour, power-supply, accessibility to suppliers and customers, and freedom from burdens emanating from regulations and taxation. The most important factor in business development is the strategic location of the business which could include the nearness to raw material, ease of accessibility to the premises, good road network, how busy the area of the business may be (Ilian & Yasuo, 2005).

In studies by Taylor, Sichinsambwe & Chansa (2016), there is usually sight of gridlock when long tankers that supplied petrol products to most filling stations in the city of Kitwe, Zambia try to make their way out. In Obio-Akpor, Rivers State, Nigeria, Arokoyu, Ogoro & Amanoritsewo (2015) observed that only 35 (23%) out of the 153 petrol filling stations in the area conformed to stipulated 400m distance from one another. On the required 15m distance from the road, they found that only 50(33%) petrol filling stations conformed, while majority 103(67%) did not. This is not far from what is obtainable in the south eastern region of the country where there is proliferation of petrol filling stations on small portions of land.

Generally, there has been proliferation of petrol filling stations that seems to lack proper location orientation of the DPR in Nigeria and South East in particular. Such stations are usually close to residential buildings, public places, along the expressways or in the middle of nowhere, in an undulated topography, in sharp bends, in traffic congested city centers or insecure locations, which often makes accessibility difficult. In a distance of less than 4km from Amansea River to Anambra state Government house gate, there are about seventeen petrol stations by the expressway. Apart from three that are functional, others are either in epileptic operation or abandoned. It is against this backdrop that the paper examines location orientation and accessibility of petrol stations in South Eastern Nigeria. In doing this, the paper hypothesised that

H_0: There is no significant relationship between location orientation and accessibility in petrol stations in South Eastern Nigeria.

Conceptual Clarifications
Location Orientation
Location orientation plays a vital role in accessibility and overall performance of a business. To site a business calls for a place that suits that form of business operation without prejudice to other factors. When the choice of location is poorly made it affects accessibility and other activities of such business.

Business location is a panacea for easy accessibility and patronage. Ilian and Yasuo (2005) define location as the choice mode of entering business, in terms of type which could be local or international location. To this definition, there must be an identifiable or traceable point of the business venture; meaning that once this strategic operational point is not identifiable, one may not say that there is an operational location. Additionally, Kala et al., (2010) conceived location as choice of where a business is to be located, be it small, medium and large cities or urban or rural locations. This definition is in line with Esteban, Yancy and

Christian (2010) who referred to location as the choice of locating your business either in the rural or urban centre and they also linked location with the type of product or service the firm intends to offer. Conversely, Orloff (2002) perceived it to include the followings: economic situation, density of entrepreneur's per capita, composition of local communities etc to location. Therefore, location could entail nearness and accessibility of the firm to raw materials, infrastructures, busyness of the area and its accessibility to the targeted customers. Based on these views, once an identifiable site, place, whether in the rural or urban centre has an entrepreneurial activity it could be classified as a business location.

Bolen (2008) stated that every location on earth has its analyzable advantages and disadvantages. According to him, the factors can be classified into two; physical conditions. These are the real and analysis physical. Real physical is a visible condition in relation to area such as land condition, the width, and the distance from the highway. Analysis physical, on the other hand, is the physical condition obtained from the physical analysis such as population analysis, neighborhood factor, and competitor analysis. The consideration of both factors is very important while locating a petrol business. This is because while the physical conditions can affect the nature and type of business to be conducted, physical analysis can affect the business performance. For example, if the distance between one petrol station and anoother is too close, then it will lead to decreased turnover on each station (Oetomo & Sesulihatien, 2012). Therefore, there is the need for proper application or enforcement of the distance specification rules by DPR and other petrol station establishment agencies.

Accessibility

Accessibility is the ease of entry and exit from a particular site or residential area. It also measures the ease of entry and exit for motorists on a station's side of the primary street. Petrol sales potential varies depending on such degree of accessibility, but if a station is to achieve its maximum potential it must be easy for motorists to see it and to enter it (Sedgwick, 1969). In measuring accessibility, traffic lanes, traffic speed, congestion and traffic control devices need to be considered. That is, a petrol station cannot be said to be accessible when it is hidden or in a tight corner, or even difficult for long vehicles to navigate and make their way out. To Sedgwick, once a petrol station is in sight that can aid ease of movement for motorists and easily turn to find their way out, sales and maximization of its potential are guaranteed.

It is pertinent to note that where it is difficulty to access due to traffic or congestion or wrong situation, motorists tend to avoid buying from such station. This can be when sited close to a traffic light, once the indicator light of green displays, motorists that are in haste may not find it easy to navigate therein, but may prefer elsewhere. So, when ensuring that the filling station is well sited, it is also good to adopt good business strategies that could aid sales and enable the station to remain in business. Such a context requires companies to balance their foundation with an 'outside-in' thinking process (Brondoni, 2007; Sciarelli, 2008). This market approach stimulates firms to continuously explore the market in order to identify new business opportunities and adapt their strategies to changing conditions (Lambin, 2008).

Petrol Station

The term 'petrol service or filling station' is an expression commonly used in Nigeria and it is synonymously understood differently in different countries of the world. In an attempt to define it, Taylor, Sichinsambwe & Chansa (2016) considered different expressions such as filling station, petrol station, gas station or petroleum outlet as any land, building or equipment used for the sale or dispensing of petrol or oil for motor vehicles or incidental thereto and includes the whole of the land, building or equipment. To them, once petrol products like fuel or oil is being sold at an identifiable land, building or equipment it becomes a petrol station. Arguably, this is inaccurate as a road-side petrol products seller or the black-markers along the roads or in container facilities cannot be said to be operating a petrol filling station. This is because, inasmuch as they are selling petroleum products at an identifiable location or place, it is undisputed that there operations are illegal and unapproved by the appropriate authorities. However, Nieminen (2005) defines a petrol station as an area including fuel equipment and piping, storage tanks, forecourt and possible building premises for the sale of fuel (inflammable liquids) to customers vehicles. To this view, a petrol station sells its products to only motorists. In other words, residents that are in need of kerosene and cooking gas have nothing to do in

a petrol station. It is therefore clear that this definition is lopsided and does not actually cover the essence of this study.

Most filling stations sell petrol or diesel; some deal on specialty fuels such as liquefied petroleum gas (LPG), natural gas, hydrogen, biodiesel, kerosene or butane, while many add shops or eateries to their primary business. From the foregoing therefore, a petrol station can be described as any approved location with buildings, dispensing pumps, storage tanks, for the sell of petrol, kerosene, gas and oil to customers and service of motor alignment, strategic supermarket alliance, and security. Taylor *et al* (2016) outlined some factors usually considered in the selection of a location for this utility outlet. They include proximity to population center, distance from neighboring petrol stations, topography, traffic flow, ease of accessibility and exit, magnitude of environmental pollution parameters etc.

In South Eastern Nigeria, the Department of Petroleum Resources (DPR, 2017) statistics indicate that there are about three thousand, three hundred and fifty-one (3,351) petrol stations. Notably, many of these filling stations are not functional or dormant. The distribution by states is as shown in Table 1.

Table 1: Distribution of Petrol Stations in South Eastern States

South East States	Number of Petrol Stations
Anambra	966
Abia	764
Enugu	668
Ebonyi	291
Imo	662
Total	**3,351**

Source: DPR (2017).

Theoretical Framework

The theoretical framework is Central Place Theory. The theory is relevanvant and suitable in explaining location orientation and accessibility of petrol stations.

Central Place Theory

The central place is a geographical theory that seeks to explain the number, size and location of human settlements in an urban system, especially within a business unit. The theory was developed by a German geographer, Walter Christaller in 1933 and was modified by Taylor, Sichinsambwe & Chansa (2016). The theory posits that settlements simply function as central places in providing services to surrounding areas.

Central place theory essentially concerns the provision of convenient point of focus for easy consumer patronage (Gbakeji, 2014). Centrality refers to a state of high accessibility, the quality of being at the center of a business system (Inyang & Ogbonna, 2001). Thus, central place describes the relationship between a point and other points in the surrounding region, and the central place is that point which can be most 'easily' reached from other locations in the region. Even though filling station operators often have location preferences, it should be understood that the location of filling stations generally despite its importance to the economy, is expected to be guided by a defined standards (Mshelia, Abdullahi & Dawha, 2015). To Mshelia, Abdullahi & Dawha (2015), before the planning permission is granted to construct a petrol filling station, it is a requirement to conduct an Environmental Impact Assessment (EIA). Therefore, only when this is done correctly and rules applied will customers be disposed to patronizing the station.

In application, it is expected of filling station operators to locate their businesses at a central place where they can attract motorists and enhance sustained patronage. In other words, to be sited in places that would minimize travel costs and inconveniences to the consumers in gaining access to the services they offer. Centrality implies that consumers generally use service centers that will enable them satisfy their wants with minimal stress or efforts (Gbakeji, 2014). Therefore sitting in a central place or area that could be a catchment for customers can enhance patronage due to ease of accessibility.

Methods

The paper adopts survey design. The population of the study is infinite. This is because they consist of motorists that patronize those filling stations and the choice of motorists is based on the fact that they are major consumers of petroleum products. The sample size is 380. This was statistically generated using Cochran (1967) formula after six days traffic count that gave 7805. Multi-stage sampling procedure was employed which involved. Three states were randomly selected out of the five South Eastern states of Abia, Anambra, Ebonyi, Enugu and Imo. The three selected states were Abia, Anambra and Imo. This selection entails writing of names of the five states on piece of papers and shuffle over times and thereafter random selections were made three times. Thereafter, each of the states were stratified into its three senatorial zones and two petrol filling stations were selected from each of the zone, thereby giving six petrol stations in each state. In Abia north senatorial district, Auto Gas LTD Ohaofia and Oando PLC Arochukwu were selected. While Habazo Holding LTD, IsialaNgwa and Bawas Oil LTD, Umuahia were picked for Abia central; BonimasNig LTD and Anofobipet Nig. LTD, Osisioma were selected for Abia south. Also, the petrol filling stations selected in Anambra north were Abbey Trading Nig. LTD and Capital Oil and Gas, Onitsha. In Anambra central NNPC mega station and Stanel Oil, Awka were selected. While in Anambra South, Agiliga International LTD, Ihiala and Adosiobi Nig. LTD Umunze were selected. Furthermore, NNPC Mega station, Owerri and SteveJet, AhiaraMbaise were selected under Imo east senatorial zone. For Imo West, they were Picoil Nig. LTD and Conoil, Orlu, while Hygienic Petroleum and Crest Oil, Okigwe were selected under Imo North. However, the Bowley's allocation formula was used in distributing the sample size. Questionnaire served as the major source of data generation. Data were analyzed using frequencies, percentages, Standard Deviations (SD) and Aggregate Scores (AS). The stated hypothesis was tested at 0.05 level of significance using Pearson product moment correlation.

Results and Discussion

Table 2: Location Orientation and Accessibility at the Petrol Stations

S/N	Items	AS	SD	Remarks	Decision
	Location Orientation				
1	The petrol station I buy fuel from is secured and close	3.0453	0.1832	ME	Accepted
2	I buy fuel in town before travelling and not in isolated station along the express	4.8524	1.4903	VHE	Accepted
3	The station I buy from have good distance from the major road	4.8963	0.1532	VHE	Accepted
4	The station I buy from is not in a congested place or close to traffic light	4.3852	0.1642	HE	Accepted
5	The station I buy from is on good topography	4.1303	0.0842	HE	Accepted
	Accessibility				
6	The station I buy from have good parking space	3.6952	0.0949	ME	Accepted
7	The pump arrangement is well spaced to allow move to next pump if necessary	4.6942	1.3049	VHE	Accepted
8	I do not like to waste time in petrol stations	4.6922	0.0942	VHE	Accepted
9	The station I buy from have a good and well-spaced forecourt for navigation	3.5265	0.0959	HE	Accepted
10	The station I buy from have ease of access and exit	3.0321	1.0344	ME	Accepted
11	The station I buy from is visible from reasonable distance	2.4924	0.0942	HE	Rejected

Field Survey, 2018

Table 3: Correlation Matrix of the hypothesis

		Location Orientation	Accessibility
Location Orientation	Pearson Correlation	1	.828
	Sig. (2-tailed)		.024[**]
	N	359	359
Accessibility	Pearson Correlation	.828	1
	Sig. (2-tailed)	. 024[**]	
	N	359	359

[**]. Correlation is significant at the 0.05 level (2-tailed).
Field Survey, 2018

R-Square = .685
Correlation (R) = .828
P-value = .024, which is less than < 0.05.
The results show that the R-Square of the model is ($R^2 = 68.5\%$). This implies location orientation (independent variable) is responsible for 68.5% of the fluctuation in accessibility (dependent variable). However, the correlation between the variables is 0.828, which shows strong positive relationship exists between location orientation and accessibility of the petrol stations. Since the P-value (.024) of the model is less than 0.05 level of significance, there exists enough evidence to reject the null hypothesis and uphold the alternate, implying that there is a significant relationship between location orientation and accessibility in the petrol stations in South Eastern Nigeria. This indicates that location orientation correlates with accessibility of petrol filling stations. Accessibility has a lot with entrance of the location, topography of the place, visibility etc. This implies that the location of a petrol station has a lot to do with it accessibility. Therefore, not only that appropriate location will enable accessibility, but also enhances patronage. It was also found that most of the petrol stations are not visible from a reasonable distance, some are located even at sharp bends, this infringes on spot decision to refuel, and most customers miss the location.

Most importantly, this is an indication that the stations did not comply with the basic requirements and processes in appropriate location analysis for maximum returns before seeking the approval of regulating authorities. This finding corroborates Taylor et al (2016) and Arokoyu et al (2015) that filling stations studied in the City of Kitwe, Zambia and Rivers State, Nigeria respectively were not located according to the established planning standards, guidelines and regulations. The findings also align with Bolen (2008) that every location on earth has its analyzable advantages and disadvantages.

Summary, Conclusion and Recommendations
Summarily, the findings revealed that location orientation correlate with accessibility; hence, there is a significant relationship between location orientation and accessibility in the petrol stations in South Eastern Nigeria. Therefore, the study concludes that proper location is very important in sitting a petrol business. Where it is negleted, there bound to be low patronage that could manifests in poor turnover and possible profit. Lastly, the paper recommends that;

1. Petrol stations should be built in a reasonable visible distance devoid of bends and unfriendly topography where customers can sight and access the stations unhindered. This can be done in a well-spaced, decongested, convenient and central place without neglecting the importance of safety. Possibly, experts should be involved from the unset.
2. Petrol stations should try and have visible sign post in a reasonable distance of the road to enable motorists spot it from afar. This would not only enhance ease of access, but could encourage patronage.

References

Apkan, S. S. & Nnamseh, M. (2014). Managing risk of petrol scarcity in Nigeria: A test of the efficacy of strategic management approaches. *Global Journal of Human-Social Science: E-Economics, 14(5), 25-38.*

Arokoyu, S. B., Ogoro, M. &Amanoritsewo, O. J. (2015). Petrol filling stations location and minimum environmental safety requirements in Obio-Akpor LGA, Nigeria. *Int. J. Sci. Res. Innov. Technol. 2(11), 21-39.*

Bolen, H.W. (2008). *Contemporary retailing*. New Jersey: Prentice-Hall International Inc.

Brondoni, S. M. (2007). Management consulting, global markets and corporate networking, symphonya: Emerging issues in management (symphonya.unimib.it), 1, 16-25. http://dx.doi.org/10.4468/2007.1.03brondoni

Department of Petroleum Resource, DPR (2017).*Procedure guide for grant of and approval to construct and operate petroleum products retail outlets.*Issued by DPR, Ministry of Petroleum Resources.

Gbakeji, O. J. (2014). Location theory and public facilities.*Civil Environ. Res. 6(6), 92-97.*

Ilian, P. S., & Yasuo, H. (2005). Influence of location factors on establishment and ownership of foreign investments: The case of the Japanese manufacturing firms in Europe. *International Business Review, 14, 577-598. http://dx.doi.org/10.1016/j.ibusrev.2005.06.001*

Inyang, S.I. &Ogbonna, D.O. (2001).Optimum location for petroleum storage depot in Northern Nigeria.*International Journal of Transportation Studies, 1(1), 55-71.*

Jaworski, B.J. & Kohli, A.K. (2013). Market orientation: Antecedents and consequences. *Journal of Marketing, 57, (7), 52-70.*

Kala, S. S. & Guanghua, W. (2010). Firm location choice in cities: Evidence from China, India, and Brazil. *China Economic Review, 21(1), 113–122. http://dx.doi.org/10.1016/j.chieco.2009.11.003*

Lambin, J. J. (2008). Market-driven management: Marketing strategico e-Operativo. Singapore: McGraw-Hill.

Mshelia, M., Abdullahi, J. &Dawha, E. (2015).Environmental effects of petrol stations at close proximities to residential buildings in Maiduguri and Jere, Borno State.*Nigeria Journal of Business Management, 20(4), 1-8.*

Nieminen, P.M. (2005). *Environmental protection standards at petrol stations: A comparative study of technology between Finland and selected European countries*. Thesis for the Degree of Doctor of Technology, Tampere University, Finland.

Oetomo, W. H. &Sesulihatien, W. T. (2012).*The application of index model for valuation a new gas station*. International Journal of Business Operations, 33(2), 407-413. DOI: 10.7763/IPEDR. 2012. V50. 1

Omeh, O. (2015). Locating petrol stations in Nigeria.*Nigerian Journal Petroleum Economic, 12(1), 10-18.*

OPEC Annual Statistical Bulletin (2017). Nigeria facts and figures. Retrieved 19th January, 2018, from http://www.opec.org/opec_web/en/about_us/167.htm

Orloff, A. (2002). Social venture partners Calgary: Emergence and early stages. *Canadian Centre for Social Entrepreneurship.*

Sciarelli, M. (2008).Resource-based theory and market-driven management.Symphonya.Emerging Issues in Management (symphonya.unimib.it), 2, 66-80. http://dx.doi.org/10.4468/2008.2.06sciarelli

Sedgwick, J.R.E. (1969). The valuation and development of petrol filling stations.*Journal of Business*, 3(1), 251-259.

Taylor, T.K., Sichinsambwe, C &Chansa, B. (2016).Public perceptions on location of filling stations in the city of Kitwe in Zambia.*Developing Country Stud. 6(6), 133-151.*