ASSESSING FACTORS INFLUENCING SALES PERFORMANCE AND SITING OF A FUEL STATION PROJECT: STUDY OF SPINTEX ROAD, ACCRA-GHANA

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Abstract: **Retail activities are highly location sensitive and fuel retail industry is no exclusion. The unveiling of the deregulation policy has caused profit margins to reduce due to the growth of new entrants whiles operational margins have increased; causing a drastic decrease in fuel station sales and net income. However, the acquisition and building of fuel stations is more rampant than ever. This paper investigates the factors that influence sales performance and siting for a fuel station project. The mixed method and explanatory research design was adopted, focusing on selected fuel stations. The outcomes suggest that out of the three products tested, location is the key variable that receives the most positive influence on sales volumes. Service capacity does not induce a positive influence on sales volumes but rather, increases overhead cost. Other variables that influence sales volumes were identified as promotion, brand, pump price, service quality, opening hours, local authority decision and size of the place. The results further indicate that, the elements that significantly influence fuel station siting are traffic volume, competition on the road, land use in the region, the nature of the road as well as environmental and legislative demands. A consistent model to forecast retail sales volumes of fuel outlets is recommended, which would be useful in retail fuel station appraisals, feasibility studies and investment analysis by project managers and other professionals.**

Keywords: **Location, Factors, Sales, Performance, Fuel Station.**

I.   INTRODUCTION

Many researchers have concluded that retail activities are highly location sensitive [4], [5] and the fuel retail industry is not exempted from the above conclusion [6]. There has been a drastic increment in the development of fuel retail outlets at strategic locations, due to high demand for fuel [6], [7]. The deregulation policy of the petroleum sector introduced in June 2015 has caused drastic changes in the industry [8]. Owing to this exercise, there is free entry in the oil marketing industry. This has generated a ripple effect; increasing competition among Oil Marketing Companies due to a general price war and increase of fuel stations along major roads. The development in the industry is thrilling as it is anticipated to upsurge our economy so much –creating job opportunities for residence in areas and communities where these retail stations are located. From 2013 to 2016, the petroleum downstream sector contributed approximately 10% to the Ghanaian Gross Domestic Product [8]. However, sales volumes and performance in retail fuel stations has drastically reduced in Ghana, due to the deregulation of the petroleum downstream sector [9], [8]. In Ghana, Petroleum Price Regulation gave way to price deregulation in mid-June 2015 and this has caused a knock-down effect on several activities in the sector [9]. This research paper seeks to: 1) identify the key factors that influence fuel station sales volumes, 2) investigate key factors that influences the siting of retail fuel outlet and 3) examine other factors other than the key factors identified. The Petroleum retail industry forms a major part of the Ghanaian economy [9], [8]; contributing about 10% of

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the Gross Domestic Products (GDP). Despite the relevance of the industry to Ghana's economy, research in this sector is very scanty. Most research works in this area, are basically a description of the sector (refer to works [9], [8]). Other researchers investigated the determinants of retail fuel station location but this was in relation to planning, environmental criteria and guidelines and not sales volumes [6], [10]. Other works also considered factors that influence consumer decision on fuel station choice [11], [12], [13], [14]. None of the empirical studies so far concentrates on the extent to which location influences sales volumes of retail fuel stations. [15] in their study in Montreal, identified that non-locational variables affect sales performance at fuel stations instead of geographical zones. An investigation of the South African Market by [16] identified that, price does not affect sales performance as compared to location and station size. However, this market is a regulated sector where petroleum prices are equal at all outlets. This paper thus investigates the deregulated sector –where petroleum prices are not equal– and seeks to identify factors that influence sales volumes in the sector. It further examines the effect of location on sales volumes and not on environmental or planning standards and consumer preference of fuel stations. Also, the paper examines both locational and non-locational variables on sales volumes as opposed to the research work carried out by [16]. In their work, amenities were not included in the regression analysis which to a large extent can be a determinant of sales performance –considering the evolvement of the retail fuel industry. Considering the unavailability of research that analyses factors influencing fuel station location and sales performance in Ghana, this research paper aims to fill that gap.

II. LITERATURE

Theoretical Review:

As cited by [17], a good research should be grounded in theory [18]. Retail Location theories are the basis of spatial demand, retail location investigation, retail competition and retail agglomeration economies [5]. The most relevant theories in relation to this research work are centered on the Theory of Spatial Location, the Central Place Theory and the Loush Theory since these theories were established with respect to location –which is essential to a retail firm's ability to make profit [7]. Hotelling introduced the Theory of Spatial Location in 1929 [19] –where each firm would locate on the extreme ends of a theoretical linear market. The theory indicates how two firms selling homogenous goods would alter their position to gain an advantage. The theory also gave roots to retail agglomeration and competition with respect to location [20]. W. Christaller founded the Central Place Theory in 1933 [21]. The theory proposes that, selecting the right location for a retail shop is the single most important factor in profitability of a consumer service [22]. According to [10], a central place is the point where the exchange of goods and services takes place among people in close proximity to one other. His theory implied that, the purchase of goods from retail centers are based on several properties such as range and threshold. Range is the farthest distance that customers are willing to travel to make a purchase. The theory indicates that, consumers would be willing to travel far to purchase expensive items that are procured occasionally and are less likely to travel that distance to procure low cost items purchased frequently. The profit maximization theory was published by August Losch [23]. The theory indicated that, the main objective of the entrepreneur is to maximize profit; discarding the least cost theory by Alfred Weber. The fundamental objective of this theory is to indicate the most profitable location for industrial establishment. The maximum profit location according to Losch is the place where total revenue exceeds total cost –concentrating on demand as the key determinant for locating a firm– neglecting special cost variations. In view of the above reviewed theories, the following hypotheses are tested: 1) H1: Sales Volumes $=f$ (Location), H2: Sales Volumes $=f$ (Service Capacities), H3: Sales Volumes $=f$ (Additional Facilities).

Empirical Review:

A number of studies have looked into factors that influence consumer fuel demand [15], [16]. The most common ones identified were Fuel Price, Brand, Service Quality, Additional Services, Service Capacity and Location. [12] identified fuel price as one of the factors that influence sales volumes. Their study (conducted in Lithuania) showed that the most important factor consumers look at when choosing a fuel station appeared to be price followed by price-quality relation. [24] indicates that, pricing determinants of fuel stations can influence or ruin the outlet. Yet, in a regulated marketplace where there are no free entry and exit and prices are equal at every fuel outlet, the price does not influence sales volumes [13], [25], [11]. In a deregulated market, price is the major marketing strategy to drive volumes [8] and this was agreed by [15]. In their research in Montreal, the authors were of the view that, price displaced on a signage is what motivates drivers to enter a fuel station to refuel their vehicles and clients, willing to drive additional kilometres for a cent decrease in price in Montreal. Furthermore, [26] argues that, commercial drivers in developing countries consider pump price as

the most important defining element to purchase fuel from fuel stations whiles non-commercial drivers consider convenience. In developed nations with improved road traffic, a rise in the pump price would result in a decrease in road traffic; causing fuel outlets volumes to decrease [27]. Their study indicated that, a rise in fuel price by 10% in France led to a decrease in road traffic by 1.4% and 2.8% in the short and long term respectively. On the other hand [28] contends that, monetary value might not be the sole factor, determining the purchase of fuel. For that reason, if a station can respond to customer demands and provide fast and convenient service, the consumers may opt for that place over competitors with less nimble services though their product pricing may be much better.

Service quality is another factor that influences fuel station volumes [12]. It can be defined as the attributes of excellence that a provision or commodity has to touch for a predetermined threshold [29]. In Nairobi, [30] conducted a research, recommending that, service quality can be a key strategy for attracting consumers and retaining consumer loyalty in the petroleum retailing sector. [31] in support of the recommendation by [30] emphasizes that in the long-term, oil marketing companies with higher quality products and services will most definitely attract and retain clients. In a regulated setting, service quality is the major marketing strategy to increase sales at retail outlets [11]. This can be related to [32] study, where they indicated that, service quality was the major reasons for the choice of fuel stations of respondents. Obviously, clients are willing to ante up for reliable services, and will most definitely, make an unequivocal comparison between the monetary value they pay on the petroleum products and the quality they receive [33].

With the evolution of fuel retail stations, [34] infer that, fuel is not the only product purchased when accessing an outlet. Retail fuel stations are currently making customer convenience the driving force in the sector [35] thus, progressively providing additional services to their outlet. These additional facilities include marts, café shops and fast food joints, banking activities, car wash facilities among others, to increase patronage of fuel at the various stations [36]. [13] highlighted that, additional services and speed in delivering these services are factors that influence consumer choice in the decision of service stations. Accordingly [37] in their study concluded that, there is a direct relationship between additional facilities and gas volumes and further recommended appraisers to incorporate this relationship in fuel station appraisal. [15] also argued that, additional services like longer operating hours in conjunction with security increase sales volumes at fuel stations in Montreal. Service capacity is the number of fuel pumps and pump attendants at a fuel station [15]. The fuel pumps present, as well as the size of the fuel station are indications of the customer's convenience in buying fuel at a particular station [37]. Customers do not like to wait to refuel and tend to dodge conditions where backup traffic exist (Ibid). [37] therefore indicated that, an important factor that influences sales volumes at a fuel station is customer convenience. Customer convenience is affected by several variables, however the most important is the number of hand pumps that can refuel awaiting vehicles without negatively affecting the traffic flow at the station or delaying the refueling period. [36] further reiterates that, the number of fuel pumps determines the number of sales that is done at that station.

[38] stated that, brand strength results in added value and therefore increases competitive advantage for the retailer. This was confirmed by [39] when their study identified that, BP fuel station located in Bahru municipality in Malaysia failed to attract customers because the brand was less popular as compared to Caltex brand. [40] in their research findings showed that when variables such as location and price are equal, consumers tend to fall on brand as the determining factor in fuel purchase. They concluded that, purchasers get stirred up and thrilled by promotions, discounts and rewards, if the reward has a solid value to them. It was observed that to avail from rewards, customers sometimes increase the monetary cost of purchasing basic things. According to [41], this attitude of customers help marketers to promote their brands and create a positive perception amongst its customers. The survival and profitability of a business is greatly related to the optimal selection of the business location. From the review, [42] in their report presented solutions for understanding the selection standards for retail business location. The authors concluded that, the criteria for choosing a retail location are classified into seven; performance measures, demographic structure, economic factors, competition, saturation level and storage features. Furthermore, a location analysis for petrol fueling station based on stakeholders' preference and seismic micro zonation was carried out by [43]. The study identified water system security, proper land use and selection, vicinity protection, road guard and emergency response service as location determination criteria for the petroleum fuel station. The survey indicated that, land use, the minimum distance to river bodies and fire station location are the three most important criteria chosen by the stakeholders in determining the placement of fuel stations. Also, [44] focused on site suitability assessment of fuel stations in Nigeria. Their study suggested that in assessing fuel station site suitability, the site should pass three assessments –suitability assessment, proximity assessment and special relationships assessment.

[45] studied the importance of siting of fuel stations; analyzing its effect through theories like fuzzy logic model and similar procedures to determine the most efficient features of locating a gas station. The researcher suggested that factors like population, economic, geographic and government policies should be considered in choosing the optimum site for gas stations. Likewise, [46] carried out a study on a multi-criteria factor evaluation model for gas station site selection. The survey proposed a comprehensive order of factors for picking out the best petrol station site. In the survey four primary factors were identified; nearby traffic location, environmental and legislative, socioeconomic factor and components based on the physical attributes of the country. A study on the potential sites for fuel stations based on traffic count in Malaysia was conducted by [39]. They found out that, traffic volume predictions and further analysis on the basis of individual site must always be made before final site assessment. [6] indicated that, demographic and geographic factors such as population size, income level, downtown and highways should not be overlooked when deciding on fuel station location. [47] also noted that customers, transport, the neighborhood, finances and the long-term future should be part of the variables that should not be ignored when considering the location of investments such as fuel stations. [48] suggested that, the valuation of fuel stations is mostly based on profits thus in siting them, local authority proposals should be considered. Investors must find out if the planned area would increase commercial, industrial or residential developments or if there would be a road realignment in the near future since these changes can make or disrupt a station. [49] highlighted that, the duty of selecting the optimal site for fuel stations depends on factors such as proximity to population centers, distance from neighboring stations, easy access to existing utility, and environmental pollution restrictions. They however concluded that, in considering all the factors discussed above, accessibility is key in selecting a site for fuel stations.

Subsequently, the determinant of fuel retail stations sales can be related to locational and non-locational factors [15]. Non-locational factors relates to management and other mobile attributes of the station as a business entity, while locational factors are those that are inherent in the geographical position of the site in relation to other locational attribute, most importantly accessibility (Ibid). A review of their study therefore pinpoint traffic volume, local competition and market area as locational variables that influence fuel station sales performance. As most operators would wish to locate along the major roads, it is inevitable that there will be several operators along prime sections. However for operational reasons, it is preferable to have competitors located after major sites since competition can be both healthy and disruptive to petrol fueling stations. According to [16], the quality of competition is of a greater value than quantity which will tend to lead to a drastic decrease in sales. A wide distance between fuel stations increases the volume of petroleum products sold [50]. This is in accordance with a study conducted in Scotland on rural fuel stations, which indicated that, fuel stations should be approximately 13 kilometres or not less than 30 *minutes' drive* from the next outlet [16]. Easy accessibility of fuel site to costumers is also an essential location factor that influences fuel demand [50]. Unless customers can easily drive to access pumps at a selected fuel stations, they will tend to go elsewhere. Difficulties can arise when the access points are situated on bends, at traffic lights, by pedestrian crossings, and so on. A position that provides better access like street intersections and corner sites are generally preferred for siting of fuel stations. This is because there is improved visibility, higher traffic volumes and a signalized intersection which improves access to and out of the fuel station [37]. Ideally, the first appearance and exit points should be at the extremities of the site with good visibility to and from both stops. Successful developments are often located at the entry and exit points off roundabouts although obtaining planning permission for these is now more difficult. Finally, customers prefer refuel their vehicles at retail outlets close to their workplace and homes for convenience [50], [48], [37]. Drivers prefer to fill up after work rather than before. Fuel station in near proximity to major routes also influences fuel demand [25]. In this respect, customers attempt to shorten travel time and distance when commuting or traveling longer distances and, therefore, select fuel retail stations which are in near proximity to these routes [48]. This should be particularly valid in regulating markets where there is no price differentiation and consequently, no inducement to travel any farther than necessary.

Literature Gap:

There has been extensive research on factors that influence fuel demand and the siting of fuel stations. Nonetheless, most of these studies are linked to planning, environmental standards and guidelines [6], [10]. Other works also examined factors that influence consumer decision on fuel station choice [11], [12], [13], [14]. From the review, none of the empirical studies focused on the extent to which location influences sales volume at retail fuel stations. [15] study in Montreal identified that non-locational variables affect sales performance of fuel stations instead of geographical zones. Also [16] investigated the South African Market and observed that, price does not affect sales performance as compared

to location and station size. This study was conducted in a regulated setting –where petroleum prices are equal at all outlets. Although this research paper is similar to [16] study, a different scenario is created as the Ghanaian fuel market is not regulated (so far as fuel retail prices is concerned). In addition, both locational and non-locational variables on sales volumes will be considered as opposed to scholarly work done by [15]. It is evident from literature that, research analyzing factors that influence fuel station location and sales performance in Ghana are not available. This paper therefore seeks to fill the gap. In view of the above literature the following questions are posed: 1) What are the key factors that influence fuel station siting? 2) What other factors other than service capacity, location and additional facilities at the station influences fuel sales. Furthermore, the following hypotheses were made: a) H_1 –Location has a significant influence on sales volumes, b) H_2 –Service Capacity has a significant influence on sales volumes c) H_3 – Additional facilities has a significant influence on sales volumes

III. METHODOLOGY

The aim of this research paper is to assess the determinants that influences the siting and sales volumes of retail fuel stations using operational fuel stations along the Spintex road as a case study. The study also identified non-locational factors and its correspondence to sales in a deregulated environment. Researchers stress that the role of the mix method provides an important instrument in overcoming the limitation of both quantitative and qualitative approaches [51]. As such, a combination of both qualitative and quantitative methods were more appropriate for the study. Both approaches also increases the robustness and credibility of the research outcome. A paradigm is a nationwide opinion on values, commitments and methods that assists in understanding and resolving problems in a discipline [52]. The main philosophical assumption of this research is epistemology, which focuses on acceptable knowledge in a discipline [53]. The research philosophy adopted influences the research design, methodology and methods applied to the research in order to bring about satisfactory answers that can address the problem being investigated [54]. This study thus adopted the explanatory research design as it embeds research techniques that described events, explained the impact of variables on sales volumes and identified relationships between variables through the test of hypothesis. The target population for the study was the 15 operational fuel stations along the Spintex road, made up of 105 operational staff. Out of the 105 operational staff, 100 were randomly selected from the strata at a significant level of 5% [55]. Further to this, 5 managers who have been managing the facility for the past 5 years and more were conveniently selected from the 15 operational fuel stations. Both primary and secondary data were elicited. Two years' secondary data from the fuel stations was used for the regression analysis, while questionnaires and in-depth interviews were used as primary data source. Data was analyzed using both the inductive and the deductive analysis techniques. The deductive analysis technique was used to analyse the quantitative data whereas the deductive technique linear regression analysis was used to test hypothesis using SPSS as a tool to run the regression model. With the inductive, thematic analysis was used to analyse the qualitative data gathered. This was applied to understand other factors that influence fuel sales and also factors that influence siting of fuel stations. Graphs and descriptive analysis were employed to illustrate relationships between the predictor variables and the dependent variable using also using SPSS. Ethical issues were handled with high level of professionalism where informed consent was sought from respondents and the purpose of the study was explained. A pilot test of the interviews and research questionnaires were conducted to understand the working environment and respondents' attitude towards work. This was largely to ensure that the interviews and questionnaires were administered at time intervals devoid of stress and other factors which could affect the findings.

IV. FINDINGS

Presentation of Data:

The display of data accumulated, its analyses and results are presented in this section in the form of tables and graphs. Results discussed factors that influence fuel station sales the most: location, service capacity and additional facilities. Other factors that influence sitting of fuel stations were also discussed. The data on the average sales was collected from the National Petroleum Authority (NPA) from the Unified Petroleum Price Fund Department. This was because fuel stations managers were reluctant to reveal their actual sales that passes through the nozzles. Thus, data collected and analyzed from NPA shows sales volumes in liters ranging from 68,348.75 to 436,250.00 with an average value of 207,269.58 and a standard deviation of 118,686.25. The stations and their average sales volumes are represented in Fig. 1 below.
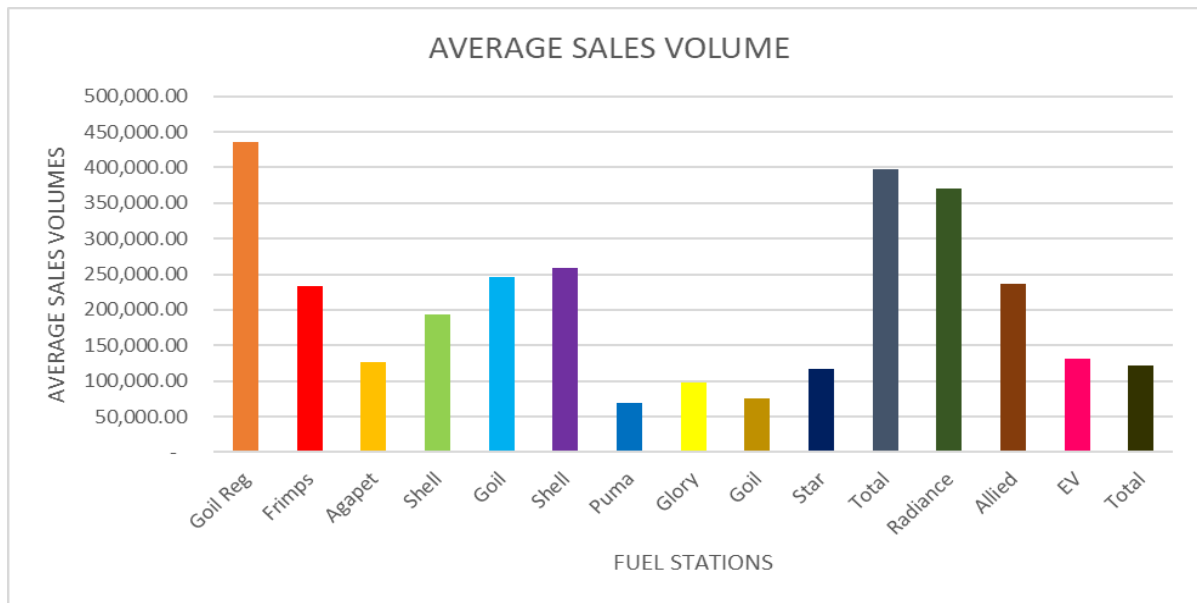
Fig 1: Station against Average Sales Volumes

Hypothesis I: Sales Volumes =f (Location)

In order to link location to sales volumes, location was quantified using a rate, ranging from 1 and 10; 1-3 being poor, 4-6 being good and 7-10 being excellent. The rating was further divided into four components that included location close to a residential area, commercial and industrial land usage (3), limited competition (3), easy approach to filling station (3) and location near major shopping centers (1). The dependent variable (sales volumes) was the average monthly sales for the period of two years. The significance of the relationship between location and sales volumes was analyzed using a linear regression analysis. Location rating from 1 to 10 had a maximum rate of 9 and a minimum rate of 2 with an average rate of 5.5 and a standard deviation of 2.13. The stations and their location rates are illustrated in Fig. 2 below.
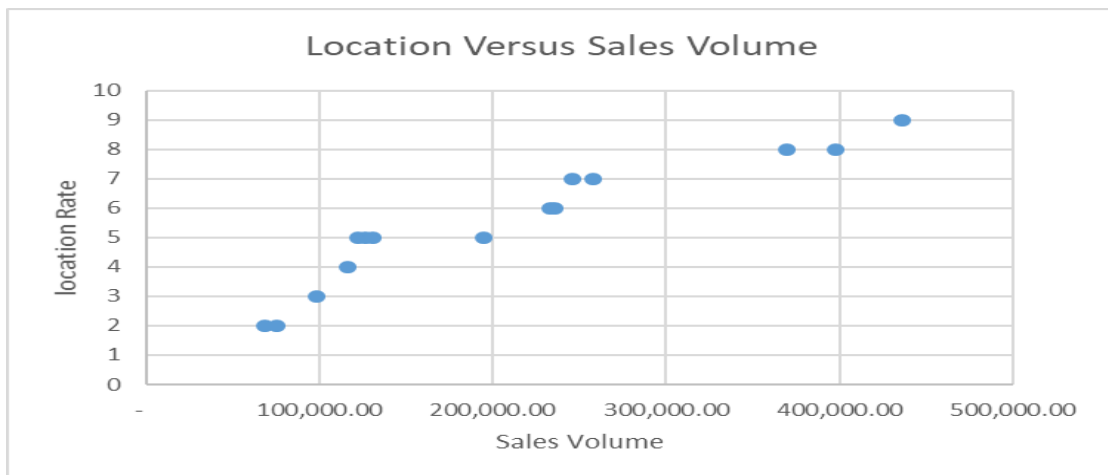

Fig 2: Location Versus Sales Volumes

Hypothesis II: Sales Volumes =f (Service Capacity)

Motorist avoid queuing at fuel stations to refill their vehicles. The number of fuel pumps at a station influences the speed and frequency of fueling vehicles without causing traffic and congestion at the station [37]. The number of fuel pumps at the station (independent variable) was hypothesized to have an effect on sales volumes (dependent variable). The significance of the relationship between the number of fuel pumps and sales volumes was analyzed using a univariate regression analysis. The service capacity of the fuel stations ranges from 5 to 2 with the maximum being 5 and the minimum 2 with an average of 3.26 and a standard deviation of 0.88. The stations and their service capacity are shown in the Fig. 3 below.
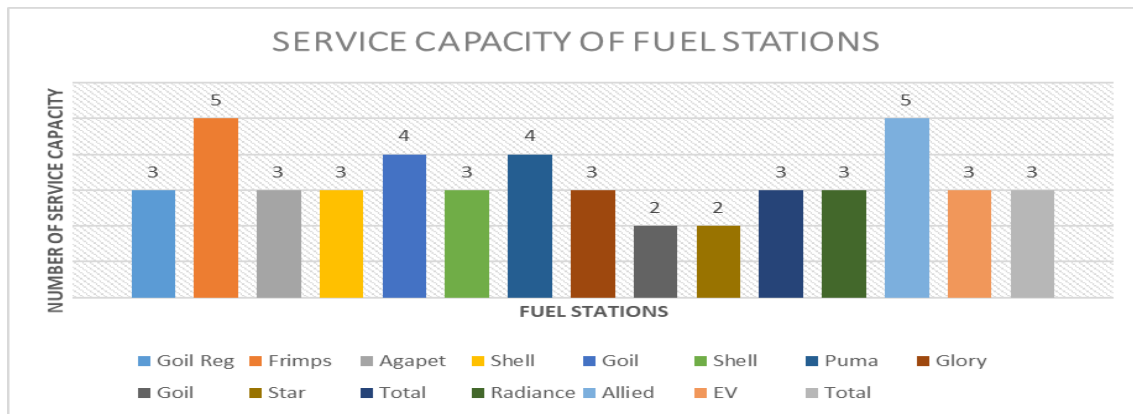
Fig 3: Number of Service Capacity at the Fuel Stations

Hypothesis III: Sales Volumes =f (Additional facilities at the station)

[37] in their study concluded that there is a direct relationship between additional facilities and gas volumes. The number of additional facilities (independent variable) at the fuel station was hypothesized to have an effect on sales volumes (dependent variable). The significance of the relationship between the number of additional facilities and sales volumes was analyzed using a univariate regression analysis. The number of additional facilities at the stations ranged from 2 to 5 with an average of 3.26 and a standard deviation of 0.88. Additional facilities that were identified at the 15 operational fuel stations included: lube bays, offices, marts, tyre centers, ATMs, salons, utility pay points, restaurants, carwash bay, pharmacy, gym, bank and boutique –illustrated in Fig. 4 below.
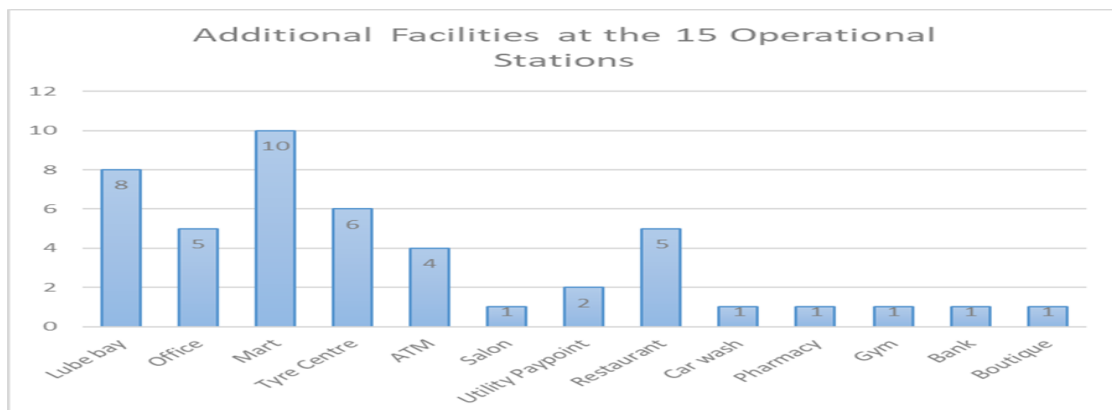

Fig 4: Additional Facilities Identified at the Fuel Stations

Through interviews, data on factors that influence siting of fuel stations were collected from the managers of these stations who have been in operation for the past 5 years and more. The results as shown in Fig. 5 below indicates that competition and traffic on the road were rated 4 and 5 respectively while the nature of road and land use in the area scored 2 and 3 respectively. Environmental and legislative factors had the least rating of 1.
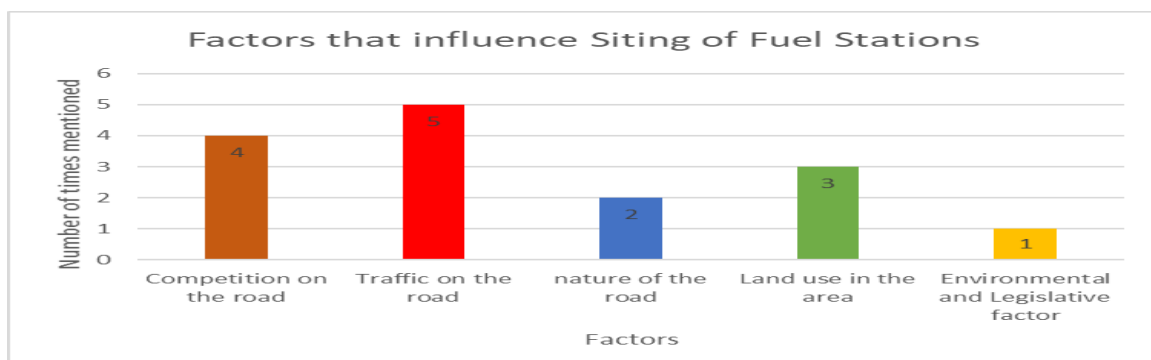

Fig 5: Factors that influence Siting of Fuel Retail Station

Regression Model:

Identify the key factors that influence fuel station volumes

The outcome of testing the three key hypotheses using linear regression are outlined in Table 1 below. The variables tested include sales volumes (dependent variable), location (independent variable), number of fuel pumps (independent variable) and number of additional facilities at the station (independent variable).

TABLE 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.947[a]	.897	.869	42983.61309

a. Predictors: (Constant), What additional or facilities do you have at your station, Whatv are the number of pumps and pump attendants at the station, What is the location rate

TABLE 2: ANOVA TABLE

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	176889255737.925	3	58963085245.975	31.913	.000b
	Residual	20323500939.980	11	1847590994.544		
	Total	197212756677.905	14			

a. *Dependent Variable: what is the average sales volume*

b. *Predictors: (Constant), What additional or facilities do you have at your station, what are the number of pumps and*

pump attendants at the station, what is the location rate

TABLE 3: COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-95187.361	53446.787		-1.781	.103
	What is the location rate	50949.412	5634.584	.916	9.042	.000
	What are the number of pumps and pump attendants at the station	-1601.751	13336.028	-.012	-.120	.907
	What additional or facilities do you have at your station	9511.196	7705.947	.123	1.234	.243

a.   *Dependent Variable: what is the average sales volume*

From these results, an R-square value of 0.897 indicates that 89.7% of the variation in average sales volumes of a fueling station is determined by location rate, additional facilities at the station as well as the number of pumps and pump attendants (service capacity) at the stations. Linear regression equation is usually represented as y=a+bx, where y is the dependent variable and x is the independent variable or factor influencing the dependent variable denoted as (x_1) location rate, (x_2) additional facilities and (x_3) service capacity. Also, 'a' is the intercept (constant) and 'b' (betta) is the coefficient of the independent variable. When dealing with a set of data with several independent variables, the magnitude of the 'b' (betta) tells how significant that factor or variable is on the dependent variable. According to the analysis, the constant is -95187.361 and the coefficient (betta) for location rate is 50949.412, additional facilities is 9511.196 with the number of pump and pump attendants having a coefficient of -1601.751. Substituting these values into the general equation;

y= -95187.361+50949.412 (x_1) + 9511.196 (x_2) -1601.751 (x_3), where y is the average sales volume (dependent variable). The constant value obtained suggest that, in the absence of all the above listed independent variables, the average sales volumes will be -95187.361. The coefficients of the various independent variables from the above equation is also an

indication of their respective magnitude of influence on the average sales volume. Subsequently, this goes to further suggest that, with the significant impact of the independent variables (location rate, additional facilities and service capacity) the constant value obtained from the result will still be the same. In quantifying x_1, x_2, x_3, it can be deduced from the above equation that, location rate and additional facilities at the station have positive relationships with the volume of sales while number of pumps and pump attendants at the station have a negative influence. In that, a unit change in the location rate would lead to 50949.412 liters change in the volume of sales whiles a unit increase in additional facilities at the station would result to an appreciation in volume of sales by 9511.196 liters. There is however an inverse relationship between the average volume of sales and the number of pumps and pump attendants (service capacity) at the station. A unit increase in the number of pumps and pump attendants at the station would however result in 1601.751 liters' reduction in the volume of sales. From Fig. 2 above it is evident that there is a direct relationship between location and sales volumes. The station with the highest location rate makes the highest average sales of 436,250.00 liters whiles the station with the lowest location rate makes the lowest average sales of 68,343.00 liters.

V. DISCUSSION

The findings of this study corresponds to some of the conclusions of [16] and also [25]. Nevertheless, the research was undertaken in a deregulated market as opposed to the studies above hence contributes to the gap in literature. The results showed a major significance between location and average sales volumes indicating the acceptance of the first hypothesis. This is in confirmation with numerous researches undertaken in various countries suggesting location as a major factor influencing fuel demand and profitability of fuel stations as highlighted by [36] and [43]. The relationship between location and the average sales volume makes economic sense since one can easily accept that, location affects sales volumes because of traffic volume, demographic factors, proximity and accessibility to major roads. Remarkably, the results showed no significant relationship between service capacity and average sales volume as opposed to the research work carried out by [25]. The result indicates the rejection of the second hypothesis. This means that adding an extra fuel pump and pump attendants does not necessarily equate to extra sales volumes. This could be that in a deregulated market customers are willing to drive and wait at fuel stations that have reduced pump prices. Extra service capacity would probably increase station overhead cost which is in confirmation with [16] study. Lastly, the result showed a significant relationship between additional facilities and average sales volumes; indicating the acceptance of the third hypothesis. However, the relationship is not as significant as that of location and sales volumes. This could be that consumers are willing to purchase their needs at a one stop shop then move to their final destination. Additional services or activities identified at the stations included lube bay, office, mart, tyre center, ATM, salon, utility pay point, restaurant, car washing bay, pharmacy, gym, banking hall and boutique. Mart and lube bay were the most observed additional facilities at the various fuel stations. Also, it was found out that returns made from additional activities especially marts, lube bays and rental spaces were mostly used for the maintenance works at the fuel stations serving as an extra income to the managers and owners. Most low-sales station complements their sales with returns from the marts and lube bays which agrees with the study by [16].

VI. CONCLUSIONS

The study concludes that out of the three predicators tested, location is the key variable that has a positive influence on sales volume the most. Service capacity does not have a positive influence on sales volumes and rather increases overhead cost. Additional facilities have little influence on sales volumes compared to location. The study also concludes that the key factors that influences the fuel station siting are traffic volume, competition on the road, land use in the area, nature of the road and environmental and legislative requirements. Finally, the study concludes that there are other variables that influences sales volumes; promotions, brand, pump price, service quality, opening hours, local authority decision and size of station. From the study it is evident that location is a key factor that influences sales volumes. Before time, budget and resources are committed into any fuel station project, project managers and investors, operation managers and fuel station owners in the fuel retail sector must conduct a comprehensive locational analysis as part of the feasibility study in the initial stages. The importance of this analysis would determine if the project would be viable and sustainable in the long and short term. From the study there was a slight significance between additional facilities and station sales volumes. Project and operation managers and potential fuel station owners should consider additional facilities to fuel station projects. The returns from these additional facilities can be used to maintain the station. Also, already existing stations that have low sales volumes should consider additional facilities to compliment losses at their outlets. The key factors to incorporate into location analysis should include traffic volumes, competition on the road, land use in the area, nature of

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the road and environmental and legislative requirements since these are the key factors that influence the siting of fuel stations. Selecting a right location and incorporating additional facilities to a service station are not key factors for sales performance. The study identified other factors that influence sales: promotions, brand, pump price, service quality, opening hours, local authority decision and size of station.

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