

**1<sup>st</sup> INTERNATIONAL CONFERENCE AND EXHIBITION OF TECHNOLOGICAL INNOVATION  
AND GLOBAL COMPETITIVENESS.  
THE FEDERAL POLYTECHNIC ILARO, OGUN STATE.  
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**LOCATIONAL EFFECTS OF PETROL STATIONS IN ILARO, OGUN STATE.**

**Abstract**

Ilaro continues to witness urban transformation expressed in various dimensions, and this include the filling stations in different locations. The survey exercise revealed that a total of twenty seven (27) filling stations are functioning in the study area. An on-spot assessment of the filling stations revealed that: fourteen (14) filling stations, representing 52% of the total filling stations in the study area are within the residential area; one (1) filling station has no space for parking; one (1) filling station with inadequate space for parking; while eight (8) filling stations, representing 30% of the total filling stations in the study area are located less than 100 meters to public facilities. Eight clusters were formed with respect to the locations of the filling stations for the purpose of assessing potential effects of the locations of the filling stations. The identification of the locational effects takes into cognizance the level of compliance to five compliance factors of the 2010 Ogun State Urban and Regional Planning Law. Potential effects of the locations of the filling stations in the study area are; fire outbreak hazards from the filling stations within the residential zone and those close to public facilities; traffic bottleneck due to lack or inadequacy of spaces within the filling stations and those filling stations that are close to public facilities; and the possible water pollution resulting from close proximity of filling station to water bodies. It is therefore recommended that the planning authority enforce the planning regulations in the study area in order to prevent negative consequences resulting from illegal locations of filling stations in the study area.

**Keywords: Urban Transformation, Pollution, Parking, Traffic Bottleneck, Environmental Impact Assessment,**

## 1.0 Introduction

The increasing awareness of the value of the environment as a resource has brought into sharper focus the locational effects of developments, such as the filling stations, which if not properly located constitute threats to man and his environment.

Agbola (2008) pointed out that the stress of environmental challenges is often overwhelming primarily due to rapid urban growth and deteriorating urban environment, and that at least 600 million people in human settlements already live in health and life threatening environmental situation.

Development regulation is very important for achieving a functional environment devoid of pollutions and other several of environmental hazards. Akinsola and Fatokun (2012) pointed out that the Building Regulations guides the operations of the building industry, and has been adjudged as one of the tools of development control, while Ude, Umen and Ukwunna (2017) noted that Development Control exist in order to regulate, in public interest, the development and the use of land, and therefore, pointed out that Town Planning Authority's Building Regulation is a legal document guiding the development control operations in Nigeria.

Samuel et al (2015) pointed out that there is high demand for land for socio-economic services, and this high demand often results to land scramble and illegal conversion of landuses, leading to haphazard development and the deliberate location of filling stations in unsuitable area that are highly vulnerable to hazard. It was also pointed out that the dimension and extent of the problems depend on the criteria or variable, such as location, size, and set-back from the road.

Abdulhammid (2009) analyzed the site potential of filling stations, with respect to traffic volume, and other locational factors, and concluded that location without adherence to the planning standard result into environmental problem ranging from air pollution, water pollution and even noise pollution when traffic congestion occurs as a result of lack of parking spaces and adequate circulation within the petrol filling station.

Ilaro continues to witness urban transformation express in various dimension, and this include the filling stations in different locations. Ilaro's urbanization is linked to: its location as a major town to the international border; an administrative headquarters of Yewa Local Government, a town that has a tertiary institution ( The Federal Polytechnic Ilaro, Ogun State ); and a town with close proximity to Dangote Cement Factory Ibese, and therefore provides residences for significant number of staffs.

The filling stations in the study area (Ilaro) are located within different land uses, with negative consequences of varying magnitude. However, it is worrisome to spot filling station that contribute threat to the environment due to non-compliance to these regulations in the study area, hence this paper assessed the locational effect of filling station in the study area.

## **2.0 Statement of Problem**

In recent time, the increasing rate of filling stations developments in the study area is alarming owing to their locations, which obviously demonstrate non conformity to the planning regulations and guidelines. Sodiya and Okubena (2018) observed that despite the leading role of Urban and Regional Planning in the use and management of the environment, its comprehensiveness, multi-dimensionality and base in the public interest, has remained far removed from popular public consciousness.

The potential hazards of illegal location of petrol filling station ranges from: fire outbreak; traffic bottleneck particularly during fuel scarcity, and road crashes when the urban landuse density is high. Achi (2001) observe that urban spatial organization in Nigeria is creating changes in values, taste and intensity of demand for space, and this resulted into various urban problems.

A reconnaissance survey of the study area revealed a close proximity of a filling station to a water body where agro based industry is located, filling stations location side by side to each other, a close proximity of filling stations to public facilities, filling stations located within residential areas and filling stations that lack spaces for parking and internal movement of vehicle.

## **3.0 Literature Review**

Agbola (2008) observed that environmental challenges manifest in various forms and dimension, and the effects are felt locally, nationally, continentally and globally. These problems is traceable to the noncompliance to the planning regulations, guidelines and standards.

The proliferation of filling stations in Nigeria urban settlements has been a major concern to environmentalists due to their illegal locations which posed negative consequences to the urban environment. Hence, Ayodele (2011) noted that the filling stations have significantly contribute to traffic problems, pollutions, and fire outbreak in Nigerian Urban Settlements.

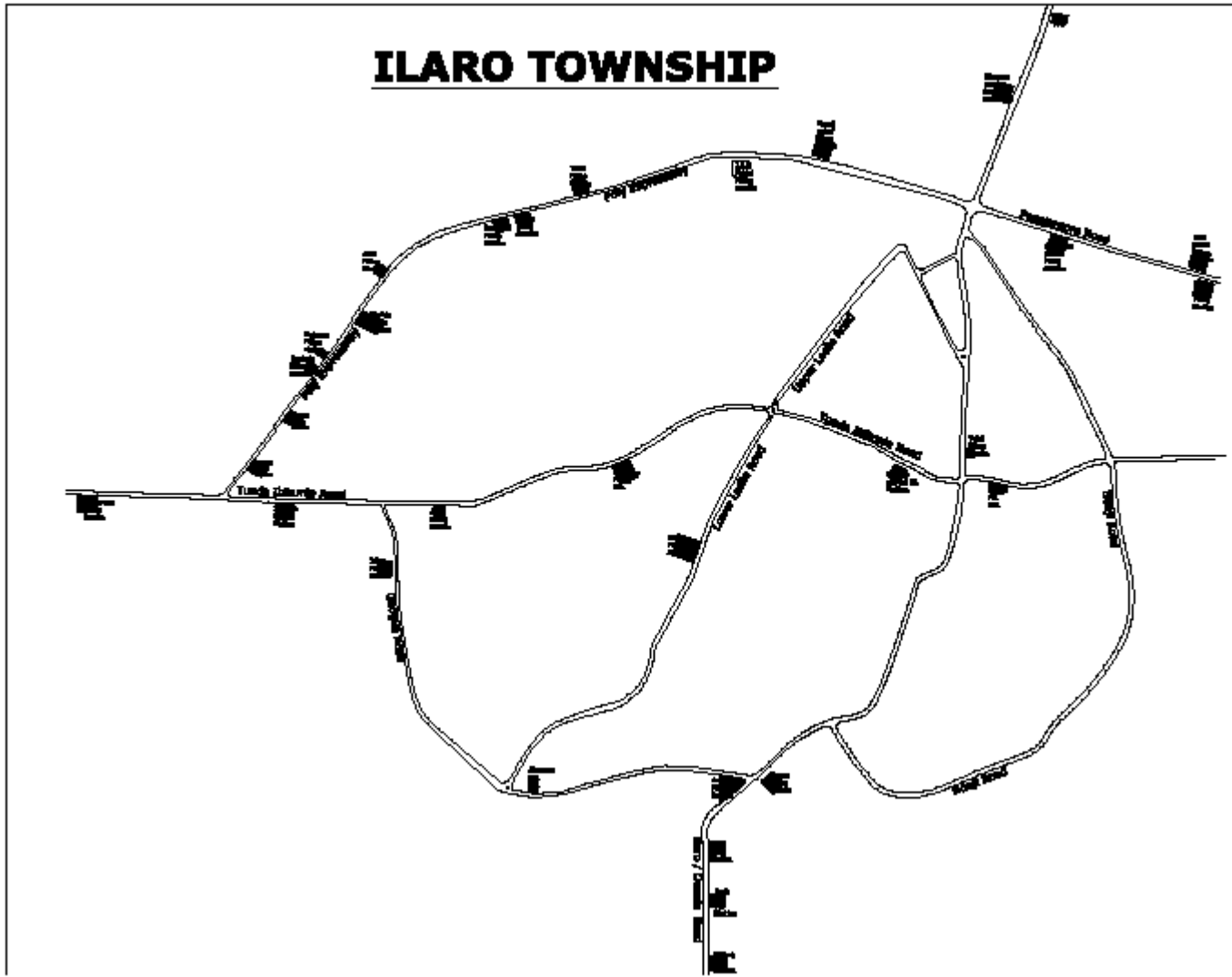
## **4.0 Research Methodology**

An on – spot survey was conducted to take an inventory of the filling stations in the study area and locations of the filling stations are shown on the street map of Ilaro (Plate1), while eight (8) clusters were formed with respect to the locations of the filling stations (Plate2).

Furthermore, the Planning Criteria for the location of petrol filling stations and the Department of Petroleum Resources (DPR) guidelines for approval to construct and operate petroleum products filling stations were sourced through a secondary source for the purpose of assessing the compliance level of the filling stations.

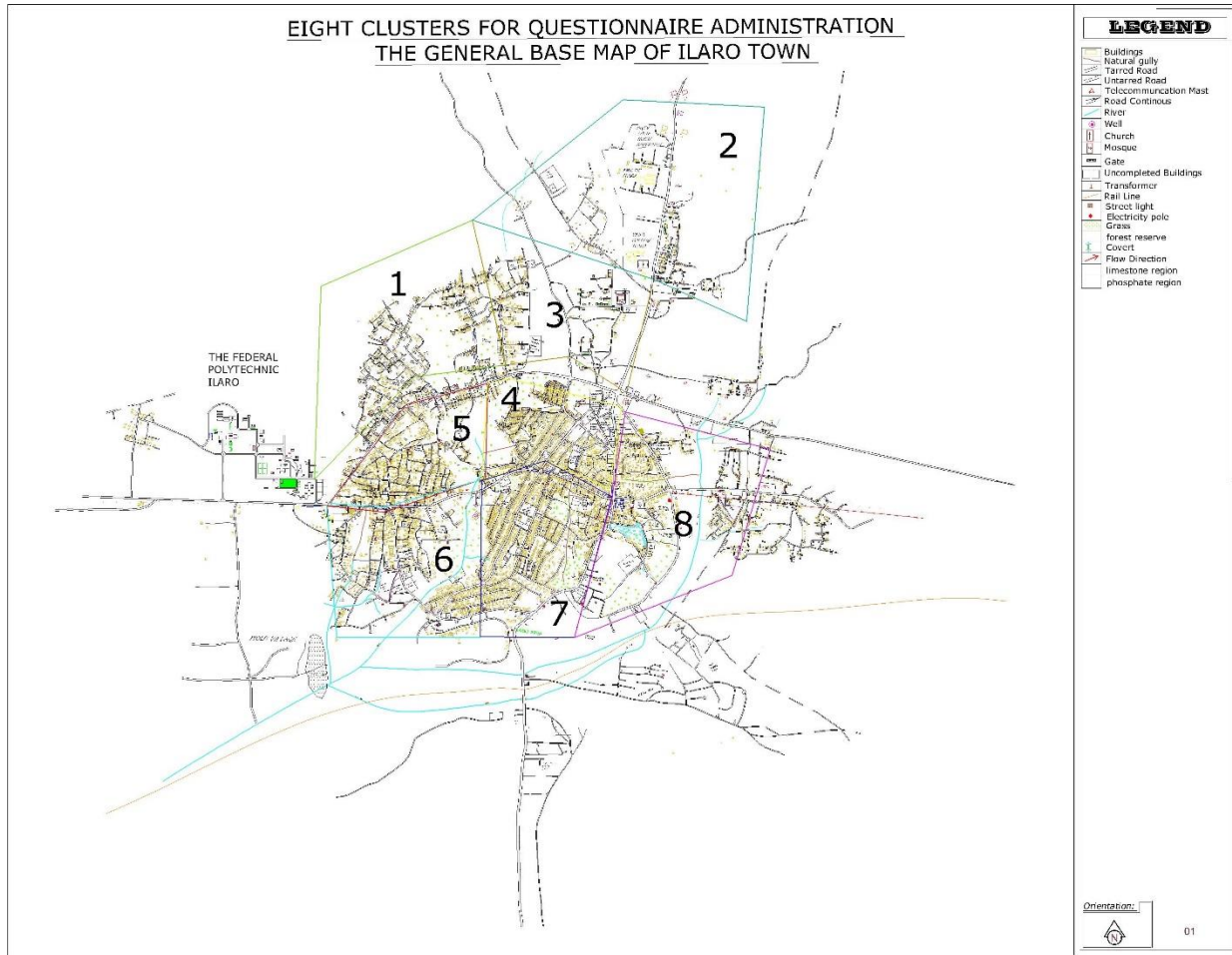
Both the Planning criteria and DPR guidelines for approval to construct and operate petroleum products filling stations are used for comparison of what is expected and the observed situations on the site where the petrol filling stations are located. It should be noted that a descriptive analytical technique was adopted for this research.

Plate 1: The Spatial Distribution of the Petrol Filling Stations in the Study Area.



Source: Department of Urban and Regional Planning, The Federal Polytechnic Ilaro, Ogun state. (2017)

Plate 2: Eight (8) Clusters Formation for Questionnaire Administration



Source: Department of Urban and Regional Planning, The Federal Polytechnic Ilaro, Ogun state. (2017)

## 5.0 Results, Analysis and Discussion of Findings

### 5.1 Filling Stations in Ilaro and their locations

The survey exercise revealed a total number of twenty seven (27) filling stations located in different areas of the study area. Table 1 shows the filling stations and their locations

Table 1: The Filling Stations and their locations in the Study Area

S/N	Name of Petrol Filling Station	Location
1.	Conoil	Along Papalanto/Obelle Road Ilaro
2.	Total 1	Along Papalanto/Obelle Road Ilaro
3.	Buksol	Along Papalanto/Obelle Road Ilaro
4.	Toyse	Along Papalanto/Obelle Road Ilaro
5.	Olufela	Along Papalanto/Obelle Road Ilaro
6.	Awo	Along Papalanto/Obelle Road Ilaro
7.	Gaboma	Along Papalanto/Obelle Road Ilaro
8.	Hashabi	Along Papalanto/Obelle Road Ilaro
9.	I A B NIG Limited	Along Papalanto/Obelle Road Ilaro
10.	FEYDOC	Along Papalanto/Obelle Road Ilaro
11.	kaolas	Along Papalanto/Obelle Road Ilaro
12.	Honeywell	Ilaro – Oja-Odan Road
13.	Johnfolu	Tunde Ibikunle Road
14.	Kareem	Tunde Ibikunle Road
15.	Wellstead	Tunde Ibikunle Road
16.	Himbab	Tunde Ibikunle Road
17.	Arolat 2	Lower Lesley Road
18.	Ascon	Ilaro – Owode Road (Sabo)
19.	Arolat 1	Ilaro – Owode Road (Sabo)
20.	Ultimate	Ilaro- Ibese Road
21.	Macglobus	Ilaro- Ibese Road
22.	JOAKS	Ilaro- Ibese Road
23.	Afariogun	Ilaro – Papalanto Road
24.	Total 2	Ilaro- Ibese Road
25.	Fabson	Old Motor Park / Town Market
26.	Atinsola	Gbogidi
27.	Himra	Gbogidi

Source: Researcher's field survey October 2018

## **5.2 Planning Criteria for Location of Petrol Filling Stations**

1. Stations should be located within a growth center or an urban area except in circumstances where it can be shown through appropriate studies that the need exists otherwise.
2. Land should be zoned for commercial/industrial use or be designated specifically for the purpose in a subdivision.
3. Stations should be located at a minimum of 500 ft. from any public institution such as schools, churches, public libraries, auditoriums, hospitals, public playgrounds, etc.
4. Area of land to be developed should be sufficient to allow maneuvering of vehicles within its cartilage but should not be less than 12,000 sq. ft. with a minimum frontage of 300 ft. on the primary street.
5. Filling Stations will not be allowed in any area where the traffic situation is such that it will cause obstructions in entering or leaving a station, or on tight curves where visibility is not adequate.
6. Vehicular access/egress/crossover should be reasonably safe with adequate approach distances especially where main roads and intersections are involved.
7. Wherever possible, stations should be erected on level rather than sloping site to prevent rolling or discarded materials such as cans, drums, etc.
8. When sited in shopping centers, stations should be located in an isolated area of the development as long as planning criteria are met, example, set back.
9. Environmental impact on streams, lakes, ponds, aquifer, etc., will be taken into consideration. An Environmental Impact Assessment may be required from the applicant.
10. Buildings are to be located a minimum of 40 ft. from road property boundaries to provide adequate area for maneuvering of vehicles in the service area.
11. Canopies and supports over pumps and service equipment when located less than 20 ft. from interior residential lot lines or building or structure should be constructed of noncombustible material.
12. Petrol pumps shall be located a minimum of 100 ft. from any residential building.
13. No fuel pumps or other mechanical equipment shall be installed so as to permit servicing of motor vehicles standing in a public street or highway.
14. All service areas should be paved to avoid dust nuisance.
15. Exterior design of the building should be compatible with adjacent development and should be such that it is not detrimental to property values in the area.
16. In a residential area a landscaped open area 10 ft. wide shall be provided along the rear property boundary and 15 ft. wide along the side proper boundaries, and be separated from paved area by curb or other barrier.
17. Where the site adjoins the side or rear boundary of a residential lot, a solid wall 10 ft. in height should be constructed and maintained along that lot boundary.



18. A raised curb of at least 6” in height should be erected along street property lines except for driveway openings so as to prevent operation of vehicles on sidewalks, and to define entrance/exit points.
19. Signs should be accordance with the Advertisement Regulations and should be located so as not to reflect the sun into the face of motorists and should be large enough so that they can be seen from a reasonable distance at a reasonable speed.
20. Stations are to be equipped with fire-fighting and fire protection equipment installed in accordance with the requirements of the Fire Department.
21. Each tank shall be vented to the atmosphere outside of buildings by means of an independent vent pipe which should not be less than 12 ft. in height or 2 ft. above the top of the nearest adjacent building.
22. All volatile flammable liquid storage tanks shall be installed below ground in compliance with the requirements of the Ministry of Construction (Works).
23. Integral containers of adequate design and capacity should be provided for solid waste, such as discarded cans, bottles, etc.
24. Proper facilities for storage and disposal of used and waste oil and gas must be provided.
25. Waste water from the washing of motor vehicles et cetera and sewage disposal should be to the satisfaction of the Health Authorities.
26. Notice of intent to construct and operate a Petrol Filling Station should be posted on the site and gazette to enable ad to enable adjacent owners within a specified radius to object if they so desire.
27. Fuel should be stored in double walled container to minimize leakage and prevent contamination of ground water.
28. Normally no access to nor egress from a filling station shall be closer than 150 ft. to any road intersection or 250 ft. from the intersection of two main roads.
29. Other development criteria are given in the Filling Station Development Orders.

### **Guidelines to Applicants**

1. Filling Station is defined as any land, building or equipment used for the sale or dispensing of petrol or oils for motor vehicles or incidental thereto and includes the whole of the land, building or equipment whether or not the use as a petrol station is the predominant use or is only a part thereof.
2. Any erection or alteration of building or equipment for the sale of petrol or oils for motor vehicles on any land or the change of use of land or buildings from any other use to that of a filling station shall be in accordance with the provisions of the Development Order and permission granted by the Town and Country Planning Authority thereunder.
3. All applications for permission to erect a filling station should be made to the local planning authority/Parish Council in the parish in which the proposal is to be located on a form issued and obtainable from that authority.

4. Each application is to be accompanied by at least five (5) copies, or the number printed on the application forms, of:
  - a) A Plan sufficient to identify the land to which it relates;
  - b) Plans and drawings as are necessary to describe and illustrated the development in detail.
5. The Planning Authority may request an applicant to produce evidence to verify any particulars of information given in an application.
6. In dealing with applications, the Authority will afford the applicant, if he/she so desires, an opportunity of appearing before and being heard by a person appointed by the Authority for the purpose.
7. The decision of the Authority can be appealed to the Minister responsible for Planning as set out in the Development Order.
8. Under the Law it is a requirement that permission for the erection of a filling station anywhere in the island be obtained from the Planning Authority

### **5.3 DPR Guidelines for Approval to Construct and Operate Petroleum Products Filling Station**

Procedure and conditions for granting approval for the construction and operation of Petrol Station; these guidelines are in compliance with Petroleum (Amendment decree no. 37 of 1977 safety rules and regulations).

#### **1. Suitability Inspection**

The intending Marketer should submit an application to DPR for site suitability inspection. The inspection shall among others issues report on the following basic requirements:-

- (i) Size of the proposed land site.
- (ii) The site does not lie within pipeline or PHCN high tension cable Right Of Way (ROW).
- (iii) The distance from the edge of the road to the nearest pump will not be less than 15 meters.
- (iv) Total number of petrol stations within 2km stretch of the site on both sides of the road will not be more than four including the one under consideration.
- (v) The distance between an existing station and the proposed one will not be less than 400 (four hundred) meters.
- (vi) The drainage from the site will not go into a stream or river.
- (vii) In some instances where site is along Federal Highway, a letter of consent from the Federal Highway is required.
- (viii) DPR guided/supervised EIA study of the site by DPR accredited consultant.

**2. Approval to Construct** If suitability report on the above preliminary issues is favorable, the under listed documents shall be required for submission to DPR office for review without any obligation on DPR to grant ATC if any negative change to the suitability situation of the site occurs before the grant.

#### 5.4 Compliance to Planning Regulations of the Locations of the Filling Stations in the Study Area

Compliance to 2010 Ogun State Urban and Regional Planning Law, the status of filling stations in the study area is presented in table 2.

Table 2: Compliance status of the Filling Stations to Planning Regulations.

Cluster	Filling Stations	Assessments				
		A+	B+	C+	D-	E+
<b>1</b>	Conoil (Along Papalanto/Obelle Road Ilaro)	A+	B+	C+	D-	E+
	Total 1 (Along Papalanto/Obelle Road Ilaro)	A+	B+	C+	D-	E+
	Awo (Along Papalanto/Obelle Road Ilaro)	A-	B+	C+	D-	E+
	Gaboma (Along Papalanto/Obelle Road Ilaro)	A-	B-	C+	D-	E+
	Hashabi (Along Papalanto/Obelle Road Ilaro)	A-	B+	C+	D-	E-
<b>2</b>	Macglobus (Ilaro – Ibese Road)	A-	B-	C+	D+	E-
	JOAK (Ilaro – Ibese Road)	A+	B-	C+	D+	E+
<b>3</b>	Ultimate (Ilaro – Ibese Road)	A+	B-	C+	D+	E+
<b>4</b>	I A B NIG Limited (Along Papalanto/Obelle Road)	A+	B+	C+	D-	E+
	Kaolas (Along Papalanto/Obelle Road Ilaro)	A+	B+	C+	D-	E+
	Total 2 (Ilaro – Ibese Road)	A-	B-	C+	D+	E-
	Fabson (Old Motor Park/ Town Market)	A-	B-	C-	D+	E+

<b>5</b>	Buksol (Along Papalanto/Obelle Road Ilaro)	A+	B+	C+	D-	E+
	Toyse (Along Papalanto/Obelle Road Ilaro)	A+	B+	C+	D-	E+
	Olufela (Along Papalanto/Obelle Road Ilaro)	A-	B+	C+	D-	E+
	FEYDOC (Along Papalanto/Obelle Road Ilaro)	A-	B-	C+	D-	E-
<b>6</b>	Johnfolu (Tunde Ibikunle Road)	A-	B-	C+	D-	E-
	Kareem (Tunde Ibikunle Road)	A-	B+	C+	D-	E-
	Atinsola (Gbogidi)	A-	B-	C+	D+	E+
	Himra (Gbogidi)	A+	B-	C+	D+	E+
<b>7</b>	Wellstead (Tunde Ibikunle Road)	A-	B+	C+	D+	E+
	Himbab (Tunde Ibikunle Road)	A-	B-	C+	D+	E-
	Arolat 2 (Lower Lesley Road)	A-	B-	C+	D+	E-
<b>8</b>	Arolat1 (Ilaro – Owode Road)	A+	B+	C+	D-	E+
	Ascon (Ilaro – Owode Road)	A+	B-	C+	D-	E+
	Honeywell (Ilaro-Oja Odan Road)	A+	B+	C+	D+	E+
	Afariogun (Ilaro- Papalanto Road)	A+	B+	C+	D+	E+

**Source: Researcher's Field Survey (October 2018)**

**Compliance factors for assessment: compliance (+), noncompliance (-)**

Outside Residential area – A

Minimum area size of 1188m<sup>2</sup> – B

Minimum setback of 9m from the road – C

Minimum of 300m away from the nearest petrol filling station – D

Minimum standard of 100m from public facilities - E

Summary of the analysis of the Compliance Status of filling stations in the study area is presented in table 3.

Table 3: Summary of the Compliance Status of Petrol Filling Stations in the Study Area.

Compliance Factor(s)	Number	Percentage
A+	13	48
A-	14	52
Total	27	100
B+	14	52
B-	13	48
Total	27	100
C+	26	96
C-	1	4
Total	27	100
D+	12	44
D-	15	56
Total	27	100
E+	19	70
E-	8	30
Total	27	100

The analysis in table 3 revealed that twenty six (26) filling stations out of a total of twenty seven (27) filling stations, representing 96%, in the study area adhered to the setback minimum standard, while a total of fifteen (15) filling stations out of a total of twenty seven (27) filling stations, representing 56%, in the study area do not comply to the minimum distance radius of one filling station to another filling station.

A critical examination of the assessment for the compliance status of filling stations in the study area revealed that only two (2) filling stations out of the twenty seven (27) filling stations, representing 7%, complied with the five compliance factors for assessment.

## **5.5 Locational Effects of the Filling Stations in the Study Area**

The locational effects of the filling stations in the study area are presented on the basis of a very high of noncompliance of the filling stations to the planning regulations, in which 93% of noncompliance was recorded after assessment.

Wellstead filling station located along Tunde Ibikunle Road posed a great danger to a nearby existing water bodies which is used for cassava processing (potential water pollution). The Filling Station is located at less than 100m to the cassava processing industry.

The fourteen filling stations, representing 52% of the total petrol filling stations in the study area are potential hazards for fire outbreak to the residential buildings. A situation occur where an entrance and exit point is the fence between a filling station and a residential building.

Although the number of filling stations that do not comply with the minimum of 300m away from public facilities is low, with eight (8) filling stations out of twenty seven (27), representing 30% of the total filling stations, the potential hazards in form of fire outbreak and traffic bottleneck particularly during fuel scarcity are likely to be significant owing to the high number of people who use the public facilities.

## **Conclusion and Recommendation**

The achievement of environmental quality suitable for living, working, and relaxation for all human being is germane within the context of Urban and Regional Planning, and this is realizable through proper implementation of the planning regulations. The significant level of noncompliance of the filling stations to planning rules and regulations in the study area has put a question to the effectiveness of the Planning Authority to enforce planning rules and regulations. Hence, an urgent need to enforce these regulations is desirable and mandatory to prevent possible potential negative consequences arising from illegal locations of filling stations in the study area.

It is therefore recommended that the approval status of the filling stations in the study area should be investigated by the Ilaro Zonal Planning Office, and enforcement should be carried out in accordance to the Ogun State Urban and Regional Planning Law of 2010.

Public enlightenment on the negative effects of illegal locations of petrol filling stations is imperative in order to draw the consciousness of the public on the need for quality environment which is rooted in safety and security of lives and properties.

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