

# Operational and Health Problems Associated with Telecom Mast Distribution in Ogun State Nigeria

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## ABSTRACT

The study examined operational and health problems associated with telecom mast distribution in Ogun State. The study adopts purposeful sampling procedure in the selection of respondents within the study area. A total of 150 questionnaires were distributed in the residential area around the selected telecom mast location in the study area. The data collected were analyzed using descriptive statistical techniques which include simple percentage distribution and charts.

From the findings, it was revealed that the majority of the respondents were male with the percentage of 64.7%. Based on the coping mechanism adopted by the residents, it was revealed that the majority of the respondents opted for staying with the pollution as their adopted mechanism with the percentage of 51.3%. It was also revealed that the majority of the residents (58%) opted that the mast owner has no compensating mechanism for the residents. Based on the findings, the study recommended that there is need to create the platforms in corporate settings that foster an effective interface among the various units within the organization especially among the commercial or marketing teams and the project technical teams in an efficient manner. Also, there should be compensation by the mast owners to the people residing in the area where the mast is located, as we all know that masts emit electromagnetic radiation which may be dangerous for human health.

(Keywords: human health, operational considerations, wireless telecommunications masts, electromagnetic emissions, microwave radiation, Ogun State)

## INTRODUCTION

Transportation is the physical movement of passengers and goods from one geographical

location to another to enhance their utility (Akintayo, 2010). Nigerian cities are facing rapid population explosion due to urban rural drift for the search of greener pastures. Transportation gets worst due to the increase in population without improvement on transport facilities. Economic transformation, and indeed, the development of any country is hardly possible without an efficient transport system (Tijani and Nwankwo, 2013). This is because goods should be transported from origin to destination at minimal costs and time (Ubogu, 2011).

The scale of transportation and communication in our cities today is still struggling to compete with the sizes of the cities; no wonder the saying that 'despite all the means of movement, the problem of the city is still how to move' (Owen, 1969). The optimal functioning of any urban center is greatly dependent on transportation and communication that corresponds to its scale. Thus, the world is rapidly moving towards an economic system that heavily depends on continuous and ubiquitous availability and dissemination of information (Akwule, 2010).

The teeming urban population and its propensity to trigger serious transportation problems justify the affinity for effective communication devices like the Global System of Mobile Telecommunication (GSM); the use of which dates back to some two decades in Nigeria, when about 2000 lines were rolled out by three operators in only three cities of the country. The service providers would maximize their productivity and profit when a large population within a relatively small space can pay for their services. Thus, the service has since then been extending to cities and noticeably sensitive to high level urbanization for economic reasons (Akindele and Adeniji, 2014).

The increasing need for functional telecommunication networks to service the

desires and need of the teeming users for effective communication and the use of mobile phones has increased dramatically over the last decade. The launch of GSM Communications in Nigeria in 2001 heralded a dawn of relieve to teeming Nigerians. Today services like mobile TV, electronic payments, mobile tracking services, cheaper international calls, internet banking, and mobile banking etc., occasioned by mobile telecommunication are commonplace in the country. GSM has become a vital and an indispensable tool of transmitting or exchanging information for a modern man (Bello, 2010).

Wireless digital telecommunications, the internet and information communication technology have revolutionized the world, and the impact of information technology (IT) has been felt in all economic and social activities in every conceivable manner. The convergence of all forms of communications on the digital playfield is opening immense new possibilities of achieving speed, versatility and space-time independence. The use and deployment of cellular phones and other wireless communication facilities around the world is phenomena, it has not only reduced the world into a global village but more importantly into a global household (Michael, 2013).

For effective and efficient deployment, use and growth of the telecom-services; service providers must deploy, erect, and install in and around the country telecommunication masts, towers, and base stations to disseminate and disperse information and data services to end users of these services (Otubu, 2010).

Distribution has been an important part of industrial and economic development for many years, but its effect has only been recognized in relative recent past (Ajiboye, 2001; Ogunsi, 2005; Adebumiti, 2007). Rushton and Oxley (1998) asserted that it is not easy to determine which of the many definitions is most suitable for distribution in that it is basically concerned with the efficient transfer of goods from the place of manufacture to the place of consumption in cost effective way whilst providing an acceptable service to the customer. Distribution can thus be described as a service that adds value to products by making them available at the right time, in the right place, which provides an interface with the customer (Hesse and Rodrigue, 2000).

The rapid growth in the use of mobile phone in recent years has been accompanied by public

concern over the issues of health and safety risks attributable to microwave radiation and the adverse visual amenity aspect of the sitting of telecommunication masts. The remit for researching the possible hazards associated with radiation which includes microwaves, RF radiation, and electromagnetic radiation (Salim, 2013).

According to Christopher (2005) the short effect of these waves causes actual burns to the skin, nausea, vomiting, and diarrhea while long exposure can cause epilepsy, short term memory loss, sleep disorders, increases in leukemia, and speed cancerous growth which might lead to death. He also stressed further that microwaves may cause damage to children's brains. Also, noise, vibration, and fumes are generated from the standby power generators positional at the telecom base station. The noise causes pollution to the environment, and this can result in partial deafening of the ear if long-term exposure persists. Fumes from the generators emit carbon monoxide which may block the respiratory organ when inhaled in large quantity and this may result to death. The vibration from the mast may cause headaches, sleepless nights, and risk of brain tumors for people living around the area.

Tower deployment and operation involves dealing with location-specific issues, including dealing with the landlord and local authorities, and running operations across a variety of geographies and terrains. The inefficiencies associated with the distribution of telecom mast to desired locations of installation include exorbitant freight costs, traffic delays caused by the piece-meal loading, very slow movements and enroute breakdowns as well as armed robbery attack. Also, physical distribution of telecom mast at present has had to contend with numerous constraints among which are delays, costly delivery system, accidents and increasing demurrage. Not much has been done to alleviate these problems because the best practice has not been put in place (Ubogu, 2011).

## LITERATURE REVIEW

The existing body of knowledge on distribution strategies is vast and suggests several techniques and management skills. Only some aspects relating to performance, something of fundamental importance, will be highlighted here. A good starting point is the research done by

Flowmaster (2010), which stressed several contributions in the field. Kumar (2010) created a list of statements for companies to use to achieve the level of trust and commitment with suppliers, which can be adapted in this case to distributors. Distribution builds stable competitive advantages, since marketing channels are of long-range planning and implementation, and to build them needs a consistent structure and due also to the fact that they are focused on people and relationships.

Anderson (2005) stated that there is a relationship between sales volume and distribution channel integration. The most important of these are physical-specific assets, time-specific assets, information and knowledge technology, human-specific assets, location (site) specificity and marketing/transaction specificity.

A variety of approaches have been taken to distribution channels, but distribution structure and intensity has received little attention in academic research (Sahay and Mohan, 2003; Kaneko and Nojiri, 2008; Gunasekaran, *et al.*, 2003). Marketing researchers are more concerned with management issues like power, conflict, satisfaction, and performance (Kinney and Wampe, 2002). Few empirical studies were conducted to study distribution intensity and structure. Most of ideas concerning channel design issues are underlying and theoretical that predicts the choice of channel based on some factors. Although these constructs have been well accepted by marketing scholars, empirical research must be done to confirm these assumptions and to find new factors determining the channel choice.

The primary theoretical statement links distribution structure with class of products (Sahay and Mohan, 2003). The class of products is related with the classification of consumer goods (convenience, shopping, and specialty) first proposed by Copeland (1923). His intent was to create a guide for the development of marketing strategies by manufacturers. His purpose was to show how consumer buying habits affected the type of channel of distribution and promotional strategy (Bucklin, 2000). According to these characteristics convenience goods are associated with intensive distribution, shopping goods require selective distribution and specialty goods are related with exclusive distribution.

## METHODOLOGY

### Study Area (Ogun State)

Ogun state is between latitudes 6.2°N and longitudes 3.0°E and 5.0°E. Ogun state is located in the south-western part of Nigeria. It is bounded in the west by Republic of Benin, in the south by Lagos State, in the North both by Oyo and Osun states and in the east by Ondo State (Figure 1). The state is approximately 19 percent, that is, 17,542 square kilometers of Nigeria's 923,219 square kilometers land area. Locations of telecommunications masts within the study area are shown in Figure 2.

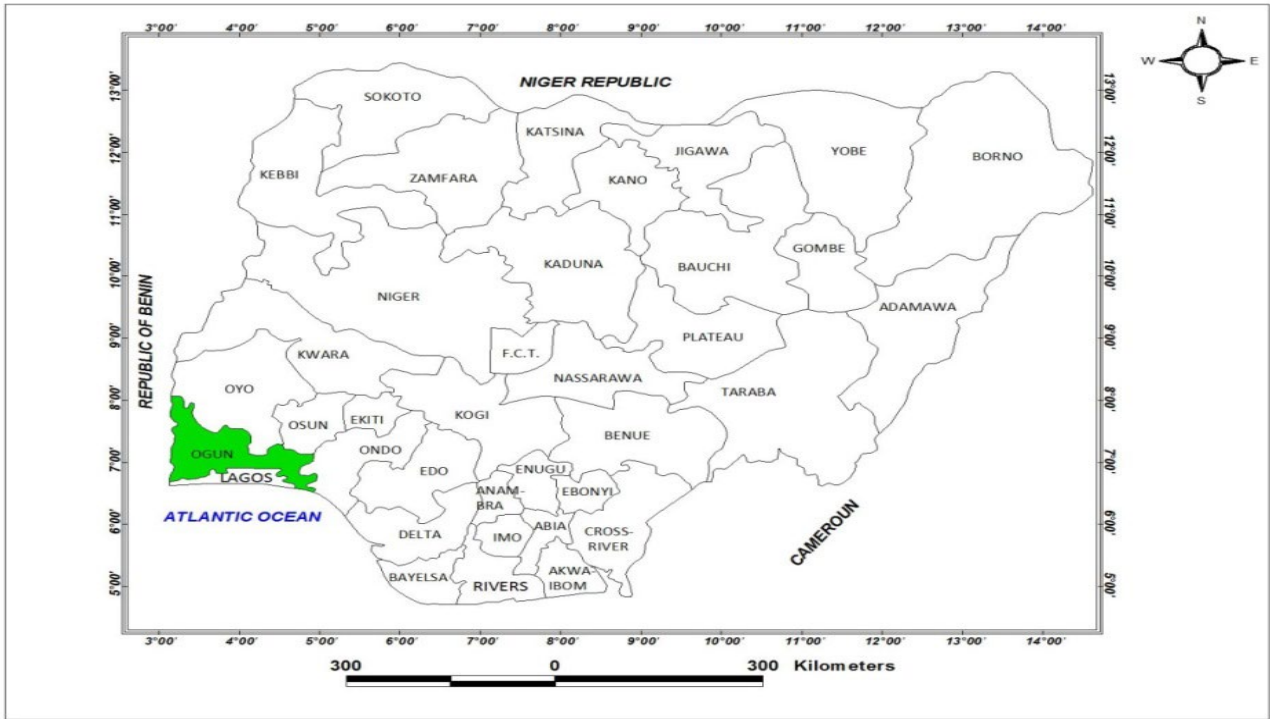
## RESULTS AND DISCUSSION

### Socio-Economic Characteristics of the Residents

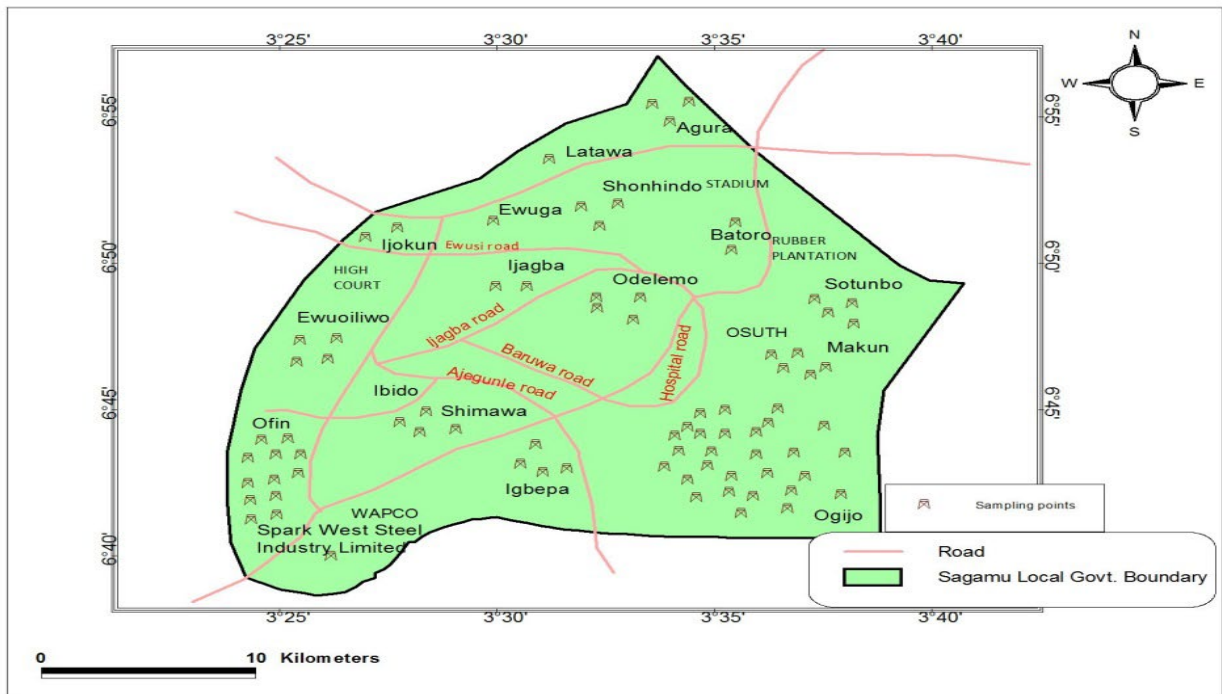
**Gender of Residents:** Analysis shows that 97 of the residents representing 64.7% were male while 53 of the residents representing 35.3% are female. It is indicated that the majority of the respondents were male with the percentage of 64.7%. This is shown in Figure 3.

**Age of Residents:** Analysis shows that 43 of the residents representing 28.7% are between 30-40 years of age, 77 representing 51.3% indicated 41-50 years of age, 17 representing 11.3% indicated 51-60 years of age while 13 representing 8.7% of the respondents indicated above 60 years of age. It was revealed that the majority of residents are between 41 to 50 years of age with the percentage of 51.3%. This is shown in Figure 4.

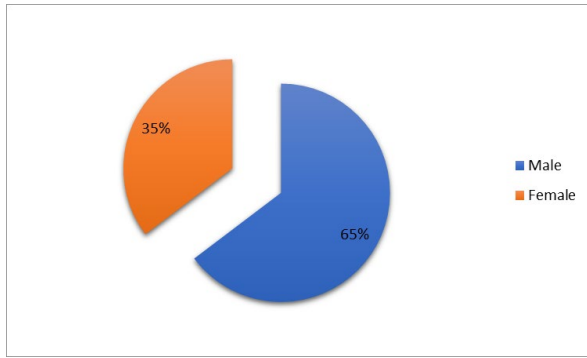
**Distance of the Mast to the Individual House:** Analysis shows that 246 of the residents representing 16% indicated less than 1km as the distance of mast to their house, 31 representing 20.7% indicated 1-2km, 25 representing 16.7% indicated 3-4km, 47 representing 31.3% indicated 4-5km while 19 representing 12.7 indicated above 5km. It was revealed that the majority of the residents opted for 4-5km as the distance of the mast to their house with percentage 31.7%. It was also revealed that the majority of the residents opted for 4-5km as the distance of mast to their house with the percentage 31.3%. This is shown in Figure 5.



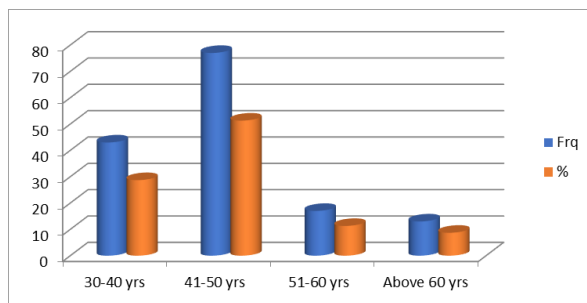
**Figure 1:** Map of Nigeria Showing Ogun State. (Source: Federal Ministry of Land and Survey, 2023).



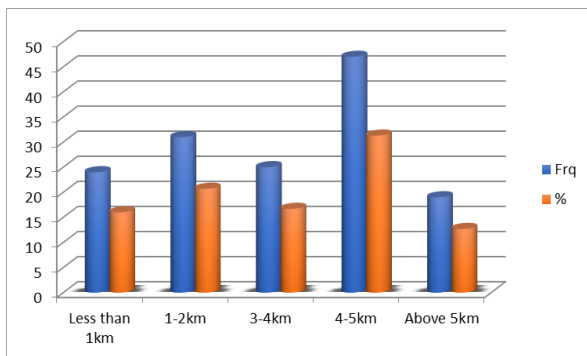
**Figure 2:** Map of Sagamu Showing Distribution of Telecommunication Masts (Source: Federal Ministry of Land and Survey, 2023)



**Figure 3:** Pie Chart Showing Genders of Residents (Source: Field Survey, 2023).



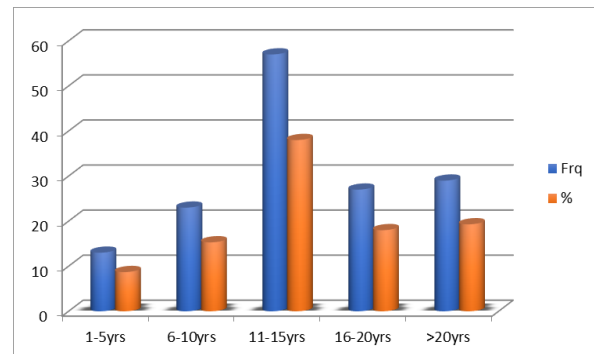
**Figure 4:** Bar Chart Showing Age Range of Residents. (Source: Field Survey, 2023).



**Figure 5:** Bar Chart Showing Distance of the Mast to the Individual Houses. (Source: Field Survey, 2023).

**Period of Stays of Residents:** Analysis shows that 13 of the residents representing 8.7% indicated 1-5 years as the period they have stays in the area; 23 representing 15.2% indicated 6-10 years; 57 representing 38% indicated 11-15 years; 27 representing 18% indicated 16-20 years; while 29 representing 19.3% indicated above 20 years.

It was revealed that the majority of the residents have stays 11 to 15 years with a percentage of 38%. This is shown in Figure 6.



**Figure 6:** Bar Chart Showing Periods of Stays of Residents. (Source: Field Survey, 2023).

**Health Problems Residents have experienced within past Months:** Analysis revealed that 22 of the residents representing 22% said “Yes” that is diarrhea they experienced as the health problem while 128 representing 85.5% said “No”; 14 representing 63.6% said it is “slight” while 8 representing 36.4% said it is “severe”.

Sixty-one (61) of the residents representing 40.7% said “Yes” that they experienced Headache as a health problem while 89 representing 59.3% said “No”; however out of the total residents that says “Yes”, 32 representing 52.5% said it is “slight” while 29 representing 47.5% said it is “severe”.

On Insomnia, 61 of the residents representing 10.7% said “Yes” while 134 representing 89.3% said “No”, however out of the residents that said “Yes”, 10 representing 62.5% characterized it as “slight” while 6 representing 37.5% said it is “severe”.

On Ear problems, 52 of the residents representing 34.7% said “Yes” while 98 representing 65.3% said “No”, however out of the residents that says “Yes”, 32 representing 61.5% says it is “slight” while 20 representing 38.5% said it is “severe”.

On Leukemia, 11 of the residents representing 7.3% said “Yes” while 139 representing 92.7% said “No”, however out of the residents that said “Yes”, 10 representing 90.9% said it is “slight” while 1 representing 9.1% said it is “severe”.

On respiratory disease, 49 of the residents representing 32.7% said “Yes” while 101 representing 67.3% said “No”, however out of the residents that says “Yes”, 34 representing 69.4% said it is “slight” while 15 representing 30.6% said it is “severe”.

On cancer, 5 of the residents representing 3.3% said “Yes” while 145 representing 96.7% said “No”, however out of the residents that said “Yes”, 5 representing 100% said is “slight” while none opted for “severe”.

It was revealed that the majority of the residents opted for headache with percentage of 40.7% had experienced health problem and it was recorded that “slight” has the highest percentage (52.5%). This is shown in Table 1.

**The Extent to which Residents Suffered Health Diseased**

Analysis revealed that 150 of the residents representing 100% opted for “Low” as they suffered from Diarrhea Health Diseased while

none opted for “high” and “fear”. On headaches, 14 of the residents representing 9.3% opted for “high”, 136 representing 90.7 opted for “low” while none opted for “fear”. On insomnia, 150 of the residents representing 100% opted for “low” as they suffered from insomnia Health Diseased while none opted for “high” and “fear”. On ear problems, 12 of the residents representing 8% opted for “high”, 138 representing 92 opted for “low”, while none opted for “fear”. On Leukemia, 8 of the residents representing 5.3% opted for “high”, 142 representing 94.7 opted for “low” while none opted for “fear”. On respiratory diseases, 150 of the residents representing 100% opted for “low” as they suffered from respiratory disease while none opted for “high” and “fear”. On Cancer, 150 of the residents representing 100% opted for “low” as they suffered from cancer disease while none opted for “high” and “fear”.

It is revealed that the majority of the residents opted for headache with a percentage of 9.3% had indicated they suffered health diseases. This is shown in Table 2.

**Table 1: Health Problems Experienced by Residents within Past Months.**

Health Problems	Yes		No		If Yes, indicate the degree of the experience			
	Frq	%	Frq	%	Slight		Severe	
					Frq	%	Frq	%
Diarrhea	22	14.7	128	85.3	14	63.6	8	36.4
Headache	61	40.7	89	59.3	32	52.5	29	47.5
Insomnia	16	10.7	134	89.3	10	62.5	6	37.5
Ear problem	52	34.7	98	65.3	32	61.5	20	38.5
Leukemia	11	7.3	139	92.7	10	90.9	1	9.1
Respiratory disease	49	32.7	101	67.3	34	69.4	15	30.6
Cancer	5	3.3	145	96.7	5	100	-	-

(Source: Field Survey, 2023)

**Table 2: Extent Residents Suffered Health Diseases.**

Health Problems	High		Low		Fear		Total	
	Frq	%	Frq	%	Frq	%	Frq	%
Diarrhoea	-	-	150	100	-	-	150	100
Headache	14	9.3	136	90.7	-	-	150	100
Insomnia	-	-	150	100	-	-	150	100
Ear problem	12	8	138	92	-	-	150	100
Leukaemia	8	5.3	142	94.7	-	-	150	100
Respiratory disease	-	-	150	100	-	-	150	100
Cancer	-	-	150	100	-	-	150	100

(Source: Field Survey, 2023)

**Copping Mechanism Adopted by the Residents and Suggestion of Residents**

As shown in Table 3, It was revealed that 77 of respondent representing 51.3% opted that living with the pollution is the copping mechanism adopted, 26 representing 17.3% said migrating to a new area is what they adopted, 26 representing 8.7% said complaining to health authority is what they adopted, none opted for protest, while 34 representing 22.7% choose “others”. It was also revealed that the majority of the respondents opted for staying with the pollution as their adopted mechanism with the percentage of 51.3%.

**Table 3:** Copping Mechanism Adopted with the Effect of Pollution.

Response	Frq	%
Live with it	77	51.3
Migrate to new area	26	17.3
Complain to health authority	13	8.7
Protest	-	-
Others	34	22.7
<b>Total</b>	<b>150</b>	<b>100</b>

(Source: Field Survey, 2023)

**Developing Efforts of the Mast Owner to Compensate for the Damage.**

As shown in Table 4, it was revealed that 17 of the residents representing 11.3% opted for provision of good roads as the compensating mechanism by the mast owner; 14 representing 9.3% said provision of water; 32 representing 21.5% said provision of electricity; none opted paying of compensation; while 87 choose “none of the above”. It is revealed that the majority of the residents (58%) opted for none of the above. That is the mast owner has no compensating mechanism for the residents.

**Table 4:** Developing Efforts of the Mast Owner to Compensate for the Damage.

Compensation	Frq	%
Providing good roads	17	11.3
Providing water supply	14	9.3
Providing electricity	32	21.5
Paying compensation	-	-
None of the above	87	58
<b>Total</b>	<b>150</b>	<b>100</b>

(Source: Field Survey, 2023)

**Suggestions on How to Improve the Community Development Effort**

As shown in Table 5, it was revealed that none of the residents opted for relocation of masts as a suggestion on improvement of community development effort; 46 representing 30.7% opted for adopting of stringent environmental standards; 17 representing 11.3% said the mast owner shall be compelled to increase compensation, while 87 representing 58% opted for “others”. It was also revealed that the majority of the residents (30.7%) suggested adopting of stringent environment standard as their improvement measure of community development.

**Table 5:** Suggestion on How to Improve the Community Development Effort.

Action	Frq	%
Relocate the Mast	-	-
Adopting of stringent environmental standard	46	30.7
The Mast owner shall be compelled to increase compensation	17	11.3
Others	87	58
<b>Total</b>	<b>150</b>	<b>100</b>

(Source: Field Survey, 2023)

**CONCLUSION AND RECOMMENDATIONS**

In the light of the findings, it was recommended that there is a need to create the platforms in corporate settings that foster an effective interface among the various units within the organization especially among the commercial or marketing teams and the project technical teams in an efficient manner that enhances the bringing on board of ideas pertaining to good site locations and satisfaction of customer mobile communication needs.

A fair representation of individuals with various backgrounds to also have evaluative oversight on any site project to be constructed which would go a long way to enhance the achievements of cell site construction objectives. Also, there should be compensation by the mast owners to the people residing in the area where the mast is located, to study and address the potential human health effects of non-ionizing electromagnetic radiation.

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