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**EVALUATION OF CIRCULATION STRATEGIES IN AN URBAN PUBLIC MARKET ZARIA,  
NIGERIA**

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**Abstract**

*Markets have been long known as a commercial platform and forms and integral part of many towns. Most markets in Africa as well as Nigeria have their transactions taking place in open-air. Over time some of the activities are now permanently situated in halls (covered market). The combination of open air market as well as covered market within an urban environment as can be found in Nigeria are bedeviled with a lot of circulation challenges. More also, market as an urban infrastructure offering the public a platform for continuous buying and selling attract traffic congestion, as any urban facility that draws inhabitant to congregate, causes traffic congestion. Planners have identified poor circulation as one of the nine infrastructure deficiencies within the public facility, and a common scene found in a public facility such as market is congestion due to poor traffic flow. Hence the need for proper circulation measures and strategies within a market, from various perspective most especially the residents (shop owners) and the users (customers). This research therefore embarked upon an empirical study of a market in Zaria Kaduna state with the view to explore the challenges of circulation with its antecedent challenges of both the shop owners and the customers using qualitative research approach. This entail participants' observation and conduct of interviews. The results of the findings which was content analyzed showed that circulation challenges in the market can be resolved through incorporation of spatial strategies that can hinder or promote effective circulation within the urban markets.*

**Keywords:** *Architecture. Behavior, circulation, congestion, design planning*

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**Introduction**

The urban central markets are said to be the focal point of activities, which tends to give the city life. In a local setting, commercial activities such as market is done in open air with individuals advertising goods physically with a linear arrangement. (Onuorah , Mbah , & Okafor , 2021) In the past and until now most rural market are done under trees, thatched roof shelter, and temporary timber shops exposing both buyer and sellers to the adverse effect of weather, (Onuorah *et al*, 2021). However in some urban environment market activities are now carried out in halls (covered market), (Peter, David, & Daphne, 2007). Market host heavy traffic especially on market days as a result of human and vehicular movement in most cases causing congestion in the environment. The daily necessity of individual desire to satisfy their needs has transform place like market to a point of high activities, characterized by heavy pedestrian traffic and vehicular movement this has largely boycotted the free flow of circulation and creating high congestion in such areas, (Onuorah *et al*, 2021). According to a study carried out by Organisation for Economic Co-operation and Development. (OECD), alongside the European Conference of Minister of Transport (ECMT) reveals in their study, that any form of attraction that draws inhabitants to congregate in multitude can also lead to congestion, (OECD & ECMT, 2007). According to Onuorah, (2013). Poor circulation within a facilities, tends to creates a lot of disordering causing congestion within the facilities and it surrounding, he further opined that one of the major resolve that should be considered in circulation is the conflict between human and vehicular circulation, because failure to consider that will hamper the proper efficient operation of the market. Urban research reveals circulation congestion as one of the nine infrastructure deficiencies within a facility and it environment, (Jones, Moura, & Domingos, 2014). However in Zaria and in Nigeria as a whole most existing market are bedeviled with circulation challenges. Most urban market are characterized with lack of clarity disorderliness in spatial arrangement, poor transition and buffer zones, regular conflicting of human and vehicular movement, poor provision of parking spaces, lack of good display area, poor offloading point, spatial disorderliness and poor arrangement of stall and shops. Therefore the need to bring passive architectural solution to this ugly situations cannot be over-emphasized. Hence the study seeks to explore the challenges of circulation with it antecedent challenges of both the shop owners (sellers) and the customer (buyers).

#### **LITERATURE REVIEW**

According to Neil & Ryan. (2015), market is a social platform or a gathering were continuous transaction is being carried out between buyers and sellers based on mutual

understanding between participants. Market provides a robust social platform for interaction, creativity, proximity, identity and diversity, (Guardia & Fava, 2010). Apart from being a major forum for commercial activities, market in local and rural areas are place for socio-cultural interaction. There are diverse documents with claims of pioneering the first central market. However one of the earliest predecessors of central market is known as “the Canton Bazaar”. Opened in 1842 by Chinese living in same neighborhood. The Canton Bazaar was renamed to Central Market and moved to the current site in 1850 In 1895, the Government rebuilt the former Central Market to a more elegant and western style, (Cheng, 2001).

According to Wood (1974), market in Africa evolved locally within communities and were found at communication nodes of maximum accessibility, for example at road junction. However, Mullur & Deblij. (1994), in their research on evolution and development of market in Africa, argued that development of traditional market in Africa started with the sub-saharan African trade and concluded that market institution in Africa evolved as a result of external trading. Several factors that supported evolution of trade in certain part of Africa includes; Peace in area, accessibility, increase in population density and administrative influence.

The presence of markets is desirable in any city or town due to the fact that commercial activities are the strength of several economies (Fakere & Fadamiro, 2012). Market afford society the platform to transact their business and create balance in the economic life of society. Market serve as a driving force for change in the cities cultural, social, and economics life, as it provides the urban environment with regeneration models as a system of sustainable living, (Schappo & Van Melik, 2017). According to Fabrizio (2013), expert on the future transformation of town and cities highlight on the importance of public market in the era of globalisation, as a platform which creates social interaction, security, identity, creativity and diversity, (See fig 1.0). Market is seen as the city’s original civic centres, this is because market provide space for social interaction with people from different ethnic, cultural and socio-economic communities (Sara, 2014).

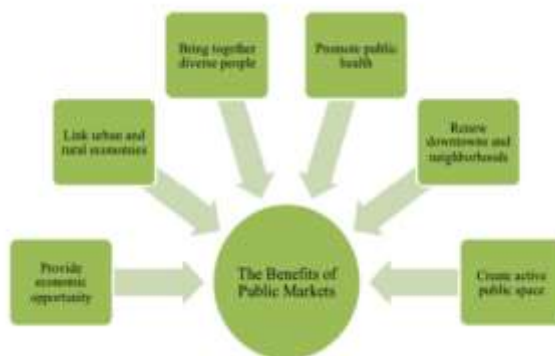


Fig 1. Image showing benefit of public market

Source: Sara, 2014

### Architectural Circulation of Market

Architectural circulation refers to how occupants traffic and move within a building and it

surrounding, and how they relate with the physical space around them. Asya *et al.*, (2015) People by their inherent instinct determine where to go, however their behavior can often be determined by the nature of form and layout of space within the building, (Giovanni, 2018). In order to prevent people from creating a haphazard circulation path in a public facility like market a well define circulation path is of great necessity. The concept of movement through a building space is one of the core themes in architectural theory, design, and practice. According to Jiang & Liu. (2010), the circulation system is often referred to as a “skeleton” that forms the supporting structure of the building. Building circulation is a principal organizing mechanism of layout and communication space as it connects exterior and interior areas and reflects the overall spatial organization of the building. In a huge facility such as market proper circulation helps in making the destination evident to the user (occupants), so that users can easily direct their movement towards their goals. Thus, circulation reveals in an effective way how patterns of space and configuration affect users through movement, (Asya *et al.*, 2015).

### **Types of Architectural Circulation**

According to Onuorah, Mbah, & Okafor. (2021), There are two main types of circulation in architecture, they are, horizontal circulation; this are transit path within a building and its surroundings that leads occupants from one space to another within a particular level. These paths are required to be adequate in size and proportion, and characterized with elements such as railing, kerps, change in level. Vertical circulation these are building elements that help convey occupants of a building from one level to another. They are in form of Elevators, stairs, ramps escalators.

### **Circulation as a Challenge in Urban Market**

With the recent increase in population as a result of urbanization, cities in developing countries are beginning to experience high influx of people within the urban environment, such that public spaces such as market experience heavy pedestrian and vehicular traffic as a result of economic activities being carried out within and around it surrounding, (Garret, 2009). An important factor to consider in the design of market is the ease for pedestrian circulation and proper vehicular traffic. Fig 2. shows Congestion in a market as a result of poor circulation, which further buttress the need for proper circulation measures and strategies within public space such as market. A research carried out by Mustafizur, Shahidul, & Mohammad. (2016), a market redevelopment process is expected to meet up with proper security, increase economic returns, and reduce congestion, hence a proper market circulation. The research further reveals that

circulation within the internal part of the market need to be considered in the design for easy access of customer. This makes circulation a phenomenon to consider in the design of public facility such as market.



Fig 2: Showing congestion due to poor circulation in market  
Source: Adeke and Aper (2018)

### Causes of Congestion in Market

According to Agyapong *et al.* (2018), one of the major phenomenon that have bedevilled the urban environment especially market centres, is traffic congestion. This is as a result of continuous inflow and outflow of people into the market. With the increase of population (urbanization) within an environment such situation has a negative implication on the growth and the socio-economic development of the community causing delay, waste and loss of money (Baffour, 2010). Yildirim (2001) in his research asserted that any urban facility that is economically active will scarcely avert congestion. Congestion becomes an unavoidable situation resulting from scarce circulation facilities such as, inadequate walk ways, inadequate stairs, lifts and escalators, inadequate parking spaces, way finding signals and ineffective traffic management, spatial disorderliness, (Blanco, *et al.*, 2009). Traffic congestion also results from pressure on the use of circulation facilities beyond its capacity, poor market management.

## METHODOLOGY

A qualitative research method was adopted in this study; this involves a descriptive research employed as a scientific method that can be used in observing and describing the nature of a subject.

A desk study was done on relevant material related to proper circulation in public buildings especially markets. After that, case studies were carried out as a primary source of data collection method adopted in this study, where relevant information was obtained through physical observation. An observation guide was drafted by the researcher. This gave the researcher more focus on needed parameters to observe and information to extract. Table 1 contains the parameter that were observed

Table 1. Checklist for observation and assessing sampled market

Source: Author's field work

S/No	Variables
1	Site accessibility
2	Parking Spaces (For different vehicle)
3	Circulation Path (Movement pattern for both pedestrian and vehicle)
4	Spatial arrangement (stalls and stores)
5	Circulation elements (Stairs, Ramps, Escalators, Elevators)
6	Circulation Buffer Zones
7	Defined Goods display area

A non-random sampling techniques was adopted in this study, which involves intentional selection of specific samples relevant to the subject of judgement. These samples were selected to be subjected under observation by the researcher in line with the drafted observation schedule, in order to extract information relevant to the study. The following are listed samples(markets) selected to be observed as shown in table 2.

Table2: List of Sample Markets

Source: Author's field work

S/No	Samples	Locations
1	Sabon-gari market	Zaria
2	Kure Market	Niger State
3	Ariaria Market	Abia State
4	Sokoto Central Market	Sokoto State
5	Kejetai Market	Ghana, Kumasi

## DATA ANALYSIS

In this research, data gotten have been analysed using qualitative data analysis principles. The data gotten by the researcher using the observation guide was analysed using the Microsoft excel software, and the results were presented using plates and figures.

### Evaluation of Circulation Strategies in Markets

#### i. Site accessibility

Accessibility into the site is an important factor to consider, because it define how pedestrian, and vehicle such as bicycle, motorcycles, tricycles, cars and even trucks traffic in and out of the market. The urban markets observed shows that 60% of the whole market observed has define entrance point and 40% don't have.(See fig.3)

Table 3: Site accessibility

Source: Author's field work

Markets	Present	Absent
Sabon-gari market zaria	✓	
Kure market	✓	
Sokoto central market		✓
Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

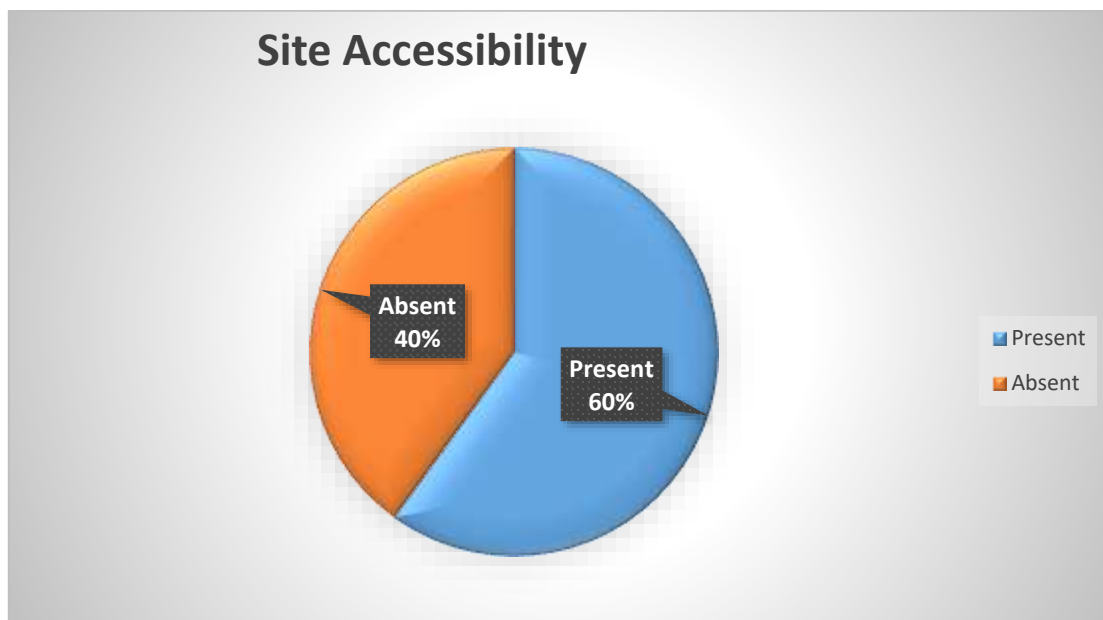


Fig 3: Percentage distribution Site accessibility

Source: Author's field work

**ii. Parking Spaces (For different vehicles)**

Presence of vehicular parking space is of paramount importance in creating proper circulation within a facility such as market, as it help prevent irregular and haphazard parking within the market and it surrounding. From the observation carried out in different market 20% of the market has adequate parking while 80% is lacking in parking spaces (See fig.4)

Table 4: Parking spaces  
Source: Author’s field work

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market		✓
Sokoto central market		✓
Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

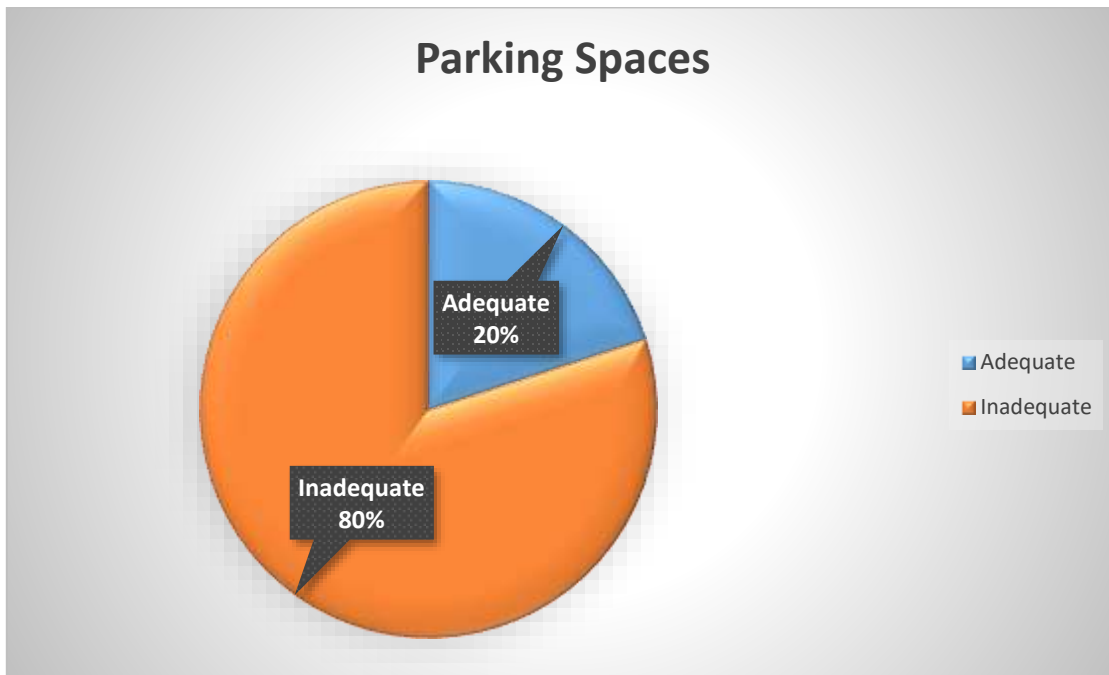


Fig 4: Percentage distribution adequate parking space  
Source: Author’s field work

**iii. Circulation Path (movement pattern for both pedestrian and vehicle)**

Circulation path shows the predefined paths and pattern of movement for both vehicle and pedestrian, were a tarred road is made for vehicles and pedestrian path are interlocked. From the observation carried out, 80% of the market experience inadequate



parking space while only 20% have adequate parking space for various vehicles (See fig.5)

Table 5: Circulation Paths (pedestrian and vehicular)  
Source: Author's field work

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market		✓
Sokoto central market		✓
Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

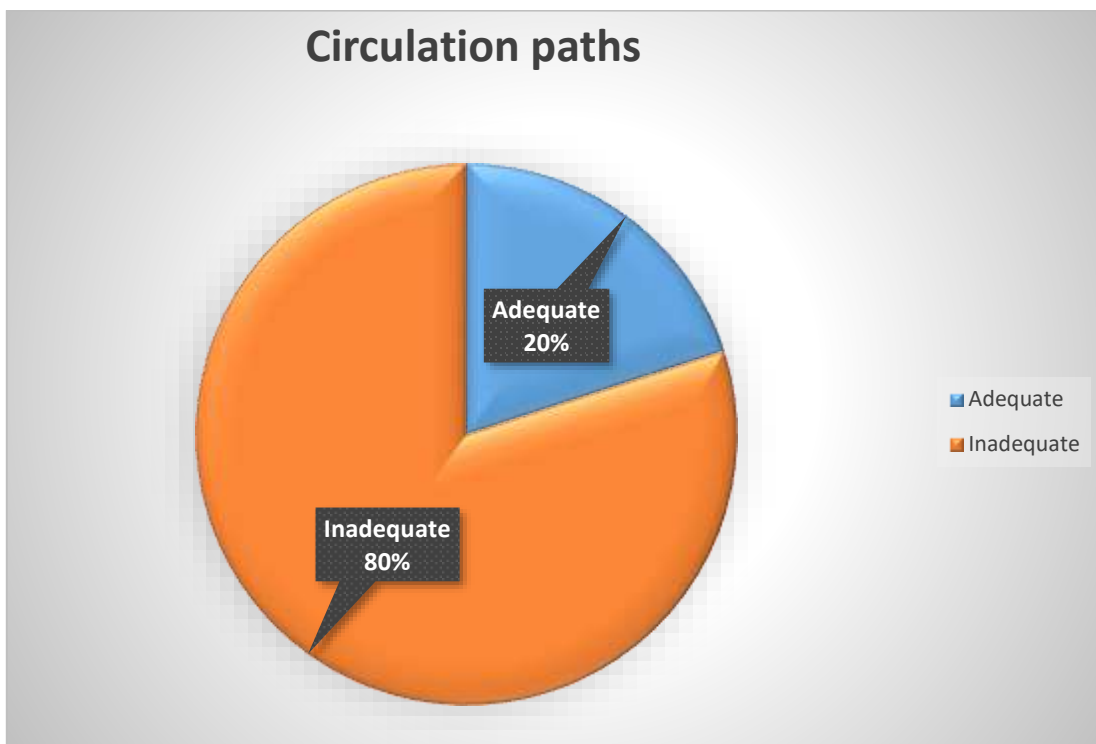


Fig 5: Percentage distribution Site accessibility  
Source: Author's field work

#### iv. Spatial Arrangement (Stall and store)

Proper spatial arrangement of stores and stalls in markets helps a lot in circulation and helps reduce congestion. Proper spatial arrangement also helps prevent development of unwanted stall springing up within the market facility. In the observation carried out 60% of the total market lacks proper spatial arrangement and only 40% have proper spatial arrangement (See fig.6)

Table 6: Spatial arrangement of stores and stalls

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market	✓	
Sokoto central market		✓
Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

Source: Author's field work

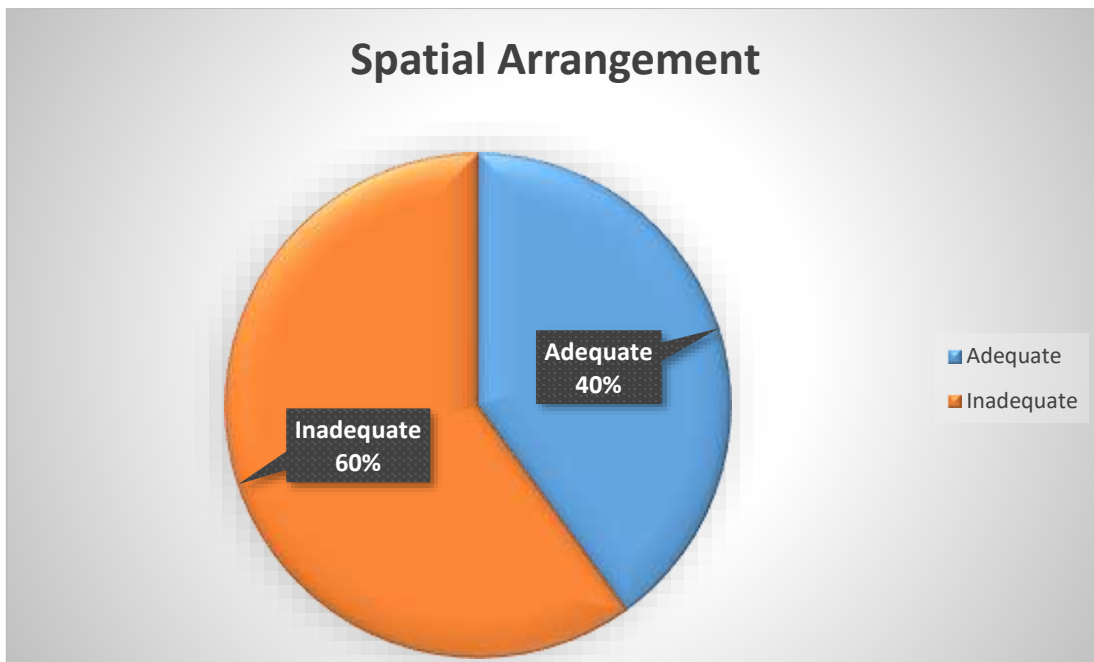


Fig 6: Percentage distribution spatial arrangement  
Source: Author's field work

#### v. Circulation Elements (Stairs, Ramps, Escalators, Elevators)

The importance of circulation element such as stairs, escalators ramps, elevators cannot be over emphasized, as it aids vertical movements of occupants in buildings, especially ones with suspended floors. Circulation elements such as ramps and elevators also helps better movement of walking impaired occupants. In the study carried out only 20% of the market observed have proper circulation elements (See fig.7)

Table 7: Circulation elements

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market		✓

Sokoto central market		✓
Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

Source: Author's field work

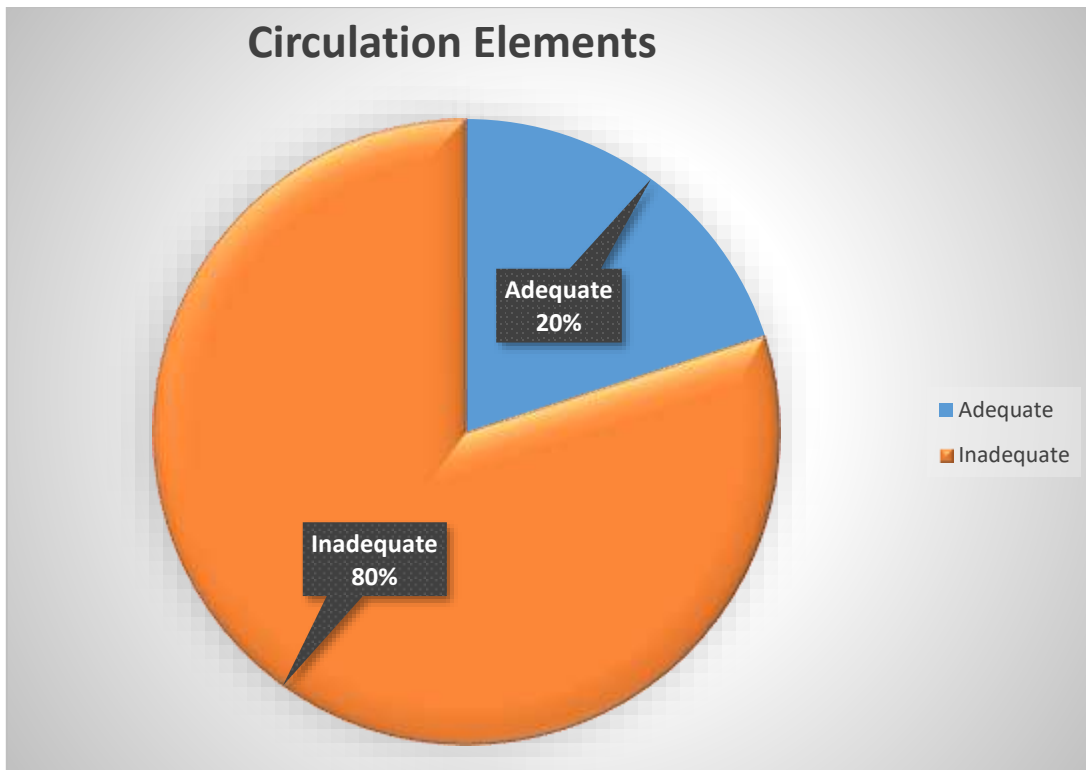


Fig 7: Percentage distribution circulation elements

Source: Author's field work

#### vi. Circulation Buffer zones

Proper circulation buffer zones within a public facilities such as recess from active circulation paths, leisure sitting areas, landings on stair cases and ramps and elevator waiting areas, is necessary and helps to compliment circulation elements within the facility. From the study only 20% of the market observed have buffer zones while the remaining 80% totally or partially lacks buffer zones. (See fig.8)

Table 8: Circulation buffer zones

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market		✓
Sokoto central market		✓

Ariaria central market Aba		✓
Kejetai central market Kumasi	✓	

Source: Author's field work

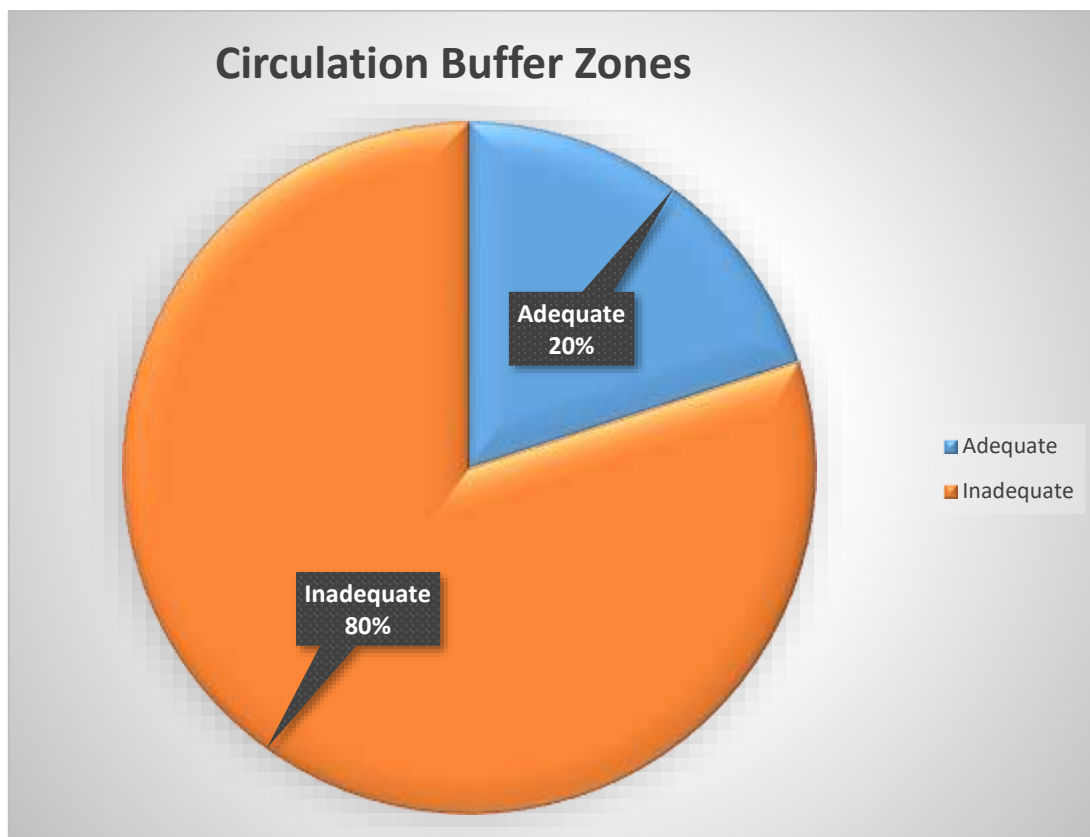


Fig 8: Percentage distribution of buffer zones in markets  
Source: Author's field work

**vii. Defined Goods Display Areas**

A well defined goods display area will help in complimenting circulation positively within the market, as lack of this has only forced occupants to display their good on path made for circulation. From the study carried out 100% of the markets observed lack a well define space for goods display for seller to display their goods. (See fig.9)

Table 9: Defined goods display areas  
Source: Author's field work

Markets	Adequate	Inadequate
Sabon-gari market zaria		✓
Kure market		✓
Sokoto central market		✓
Ariaria central market Aba		✓

Kejetai central market Kumasi		✓
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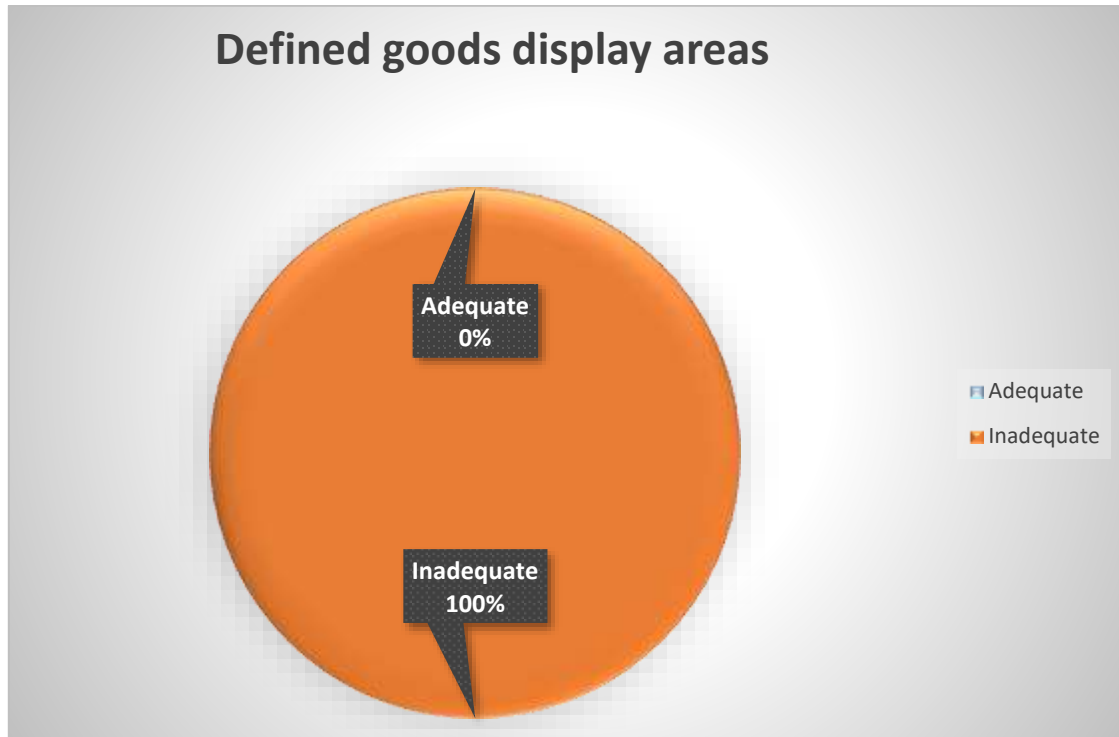


Fig 9: Percentage distribution of buffer zones in markets

Source: Author's field work

### Summary of Analysis and Findings

From the analysis carried out it is seen that most of the market being observed are lacking majorly on the variables considered for proper circulation within a market large percentage of analysis is on the negative side of the variables considered for proper, for proper circulation. This has resulted to poor circulation within our market facilities, causing high congestion and creating high disorderliness in commercial activities being carried out.

### CONCLUSION AND RECOMMENDATION

The study revealed that majority of the market are plagued with circulation problem, as result of negligence in considering various vital factors of circulation that needs to be put in place for a facility such as market to experience proper circulation for both pedestrian and vehicles. Meanwhile some of negative effect that causes poor circulation within they are as result of poor market management.

Therefore this research recommends market designers and planner to consider without negligence various factors that facilitates proper circulation within public facilities such as market, especially creating proper spatial arrangements of stores and stalls and also

adequate goods display areas for sellers as it is observed that due to lack of goods display area; many sellers are force to display their goods on the well designed circulation paths, there by reducing the efficiency of the circulation path. Market officials should also set proper standards that helps boycott springing up of unwanted stores and stalls within the market.

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