

DESIGN STRATEGIES FOR THE DEVELOPMENT OF A SUSTAINABLE RESTAURANT IN LAGOS, NIGERIA

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Abstract: Restaurants are essential part of hospitality industry which contribute considerably to the economy. The design of restaurant significantly impacts customer's experience and satisfaction level, influencing the business success and its sustainability. This study examined design strategies for the development of sustainable restaurants in Lagos, Nigeria, with a view to establish guidelines for designing an eatery capable of meeting customers' satisfaction which will improve business performance in the study area. The study adopted a qualitative research approach that collected data from secondary sources. The data were gathered through internet search and libraries of higher institutions in the study area. The data gathered were analyzed by content analysis and presented descriptively, using thematic approach. The findings indicated that the design of a restaurant plays a significant role in achieving users' satisfaction and business promotion. Some of the key design strategies designers need to pay attention in achieving sustainable development include: lighting, layout, colour, landscape and exterior elements. Other considerations include: heating, cooling, ventilation, material selection, sitting area and development regulation requirements. The study concludes by considering and implementing these design strategies appropriately. Restaurant owners and designers can create spaces that are functional, visually appealing and comfortable for customers, ultimately leading to increased business success in sustainable development. The study provides valuable recommendations towards the development of sustainable restaurants for owners, as well as designers.

Keywords: Design Strategies, Development Regulations, Restaurant, Sustainability, Users' Satisfaction.

1. Introduction

Restaurants are essential part of the hospitality and foodservice industry that contribute significantly to the economy. In an increasingly competitive market, restaurant owners and designers need to consider the various factors that influence customers' dining experiences to attract and retain customers. The design of a restaurant, including its interior and exterior design elements, significantly impact customers' perceptions of food quality, service and overall satisfaction. Design strategies for restaurants are the specific elements and features that are incorporated into the restaurant's design to create an optimal customer experience [1]. These strategies include factors such as lighting, layout, functionality, and branding, among others. By considering and implementing such design

39 strategies, restaurant owners and designers can create spaces that are visually appealing,
40 functional, comfortable for customers, ultimately leading to increased customer
41 satisfaction and business success. The design of a restaurant have a significant impact on
42 customers' experience and satisfaction levels [2].

43 However, restaurants contribute largely to energy consumption, impact carbon foot
44 print, heightened waste and water consumption level [3]. The restaurant industry releases
45 a significant amount of carbon emissions that degrade the environment while maintaining
46 the ambiance for its patrons due to this extensive and careless use of conventional
47 resources. Moreover, the restaurant sector produces a significant amount of food waste
48 and other resource waste, which contributes to material waste, GHG pollution, and
49 significant investment costs [4]. Researchers therefore, opined that the industry should
50 promote eco-friendly and ethical business practices to support sustainability [5].

51 Due to the importance of restaurants to the economy, studies have been conducted
52 to examine the impact of hospitality industry on sustainability design strategies that are
53 considered in the restaurants towards achieving sustainable development environment.
54 Some studies include: a critical analysis of the restaurant industry's effect on environment
55 sustainability [5]; an assessment of the carbon footprint of restaurants based on energy
56 consumption: a case study of a local pizza chain in Turkey [3]; acoustic design of ordinary
57 spaces: offices, schools, healthcare facilities, restaurants and retail [6]; sustainability
58 indicators in restaurants: the development of a checklist [7]; understanding the
59 psychological effects of colors in interior spaces: case study of major eateries in Akure,
60 Nigeria [8]; and a study on the perception of restaurant facade design by customers [9].
61 Regardless of the valuable contributions of the aforementioned studies, no study was
62 found to have examined and articulated all the various key design strategies required for
63 the development of a sustainable restaurant that is capable of satisfying users' expectations,
64 especially in Lagos, Nigeria, as well as providing investors with the desired benefits of
65 such facility, thereby contributing to economic development in the study area.

66 This study therefore examined design criteria essential for the development of
67 restaurants capable of satisfying customers and improving business performance in Lagos,
68 Nigeria, which focus on providing valuable recommendations towards the development
69 of sustainable eateries. The study setting is Lagos in Nigeria. Nevertheless, the findings
70 and insights provided by the research will equally be beneficial and relevant to other parts
71 of the globe. The scope is restricted to design elements that enhance user's experience, as
72 well as achieve environmental sustainability in the development of restaurants. The study
73 was limited to dining space and environment, starting from exterior parts of the building.
74 Consequently, the study examined design criteria for the development of restaurants and
75 their impact on customer behavior, satisfaction and loyalty, with focus on customer
76 perception to achieve sustainable development.

77 The study provides valuable insights for restaurant owners, designers and marketers
78 for improving the design of restaurants, as well as attract and retain customers. Policy
79 makers will find the study a useful reference material towards the formulation of effective
80 policies for the development of sustainable public restaurants. The study promotes the

81 11th target of the 17 Sustainable Development Goals (SDG) that focuses on making cities
82 and human settlements inclusive, safe, resilient and sustainable. It recognizes rapid
83 urbanization challenges that come with issues related to housing, transport, infrastructure
84 and public spaces development. This study finding are valuable resource for developing
85 a framework for the design of sustainable restaurants developments.

86 **2. Methods**

87 The study examined design strategies for the planning and development of a
88 sustainable restaurant capable of meeting users' satisfaction. It adopted a descriptive
89 qualitative research approach through a systematic literature review of previous related
90 research works. The adoption of the literature review approach provided a broad
91 perspective that captured a wider view on the subject matter. Therefore, data used for the
92 research were mainly from secondary sources. Past literatures were gathered from a
93 systematic search of the internet and libraries of higher institutions in the study area. The
94 internet search was conducted using the Google search engine because it is one of the most
95 popular, readily accessible and widely used data base for scholarly materials by
96 researchers to gain access to valuable academic resources in any field.

97 The studies reviewed were therefore articles largely in Google Scholar and Science
98 Direct which helped utilized the research to a manageable level. In order to conduct the
99 research within the low budget available. The data was filtered through a textual analysis
100 and seventeen of them were eventually found useful for achieving the goal of the study
101 and were reviewed. The selected documents were examined and information considered
102 pertinent to fulfilling the study's goal were extracted. Data gathered were analyzed by
103 content analysis and presented descriptively using a thematic approach.

104 **3. The Study**

105 The analysis from the findings of the study revealed that lighting, color, sound,
106 acoustics, heating, cooling, ventilation, material selection, outdoor area design and
107 restaurant layout should all be properly considered and accounted for in every type of
108 restaurant development [10]. Consequently, design strategies were also found to be
109 embedded in specific planning and development requirements of the study area. The
110 relevant design strategies are generally examined in the following sections.

111 **3.1 Lighting Design**

112 Lighting design is an important aspect of creating a comfortable ambiance in
113 restaurants. It enhances the overall dining experience for customers. Light has the power
114 to affect people's emotions; brightness can make people joyful, while its absence can make
115 people unhappy [11]. Lighting design often focuses on three main factors: function, human
116 health and aesthetics [12]. In addition to providing visual access and daytime illumination,
117 artificial light in interior spaces can produce a variety of appealing and dramatic effects.
118 The colors of the lit space might alter depending on the hues that light bulbs emit. One of
119 the crucial aspects of interior design is lighting, which should be taken into account,
120 especially when various types of artificial light are present.

121 According to Ganslandt and Hofmann [13], there are two types of lighting; the good
122 and the bad lighting. He opined that good lighting is efficient and saves energy. It controls
123 brightness as much as it is needed. However, bad lighting wastes energy and causes light

124 pollution. Visual distortion and glare are other characteristics of bad lighting. The purpose
125 of employing light in architecture is to create, provide and enhance the visual environment
126 in accordance with the purpose of the location. Baraban Regina and Durocher [14],
127 explained that lighting that is too uniform makes an area feel boring. Strong lighting is also
128 noted to be capable of making meals appear unappetizing.

129 3.2 Colour Design

130 Lighting and color design in the development of restaurants are inseparable.
131 Without light, color cannot be recognized. Color impacts the feel in a space. Warm and
132 cold tones of color can change how a person feels about the temperature. However, neutral
133 colors like cream and gray are considered to have no effect on how an individual feel about
134 the temperature [8]. A person's perception of color can change into how they perceive
135 temperature. The capacity of color to alter space dimensions is quite strong. Color has the
136 power to drastically alter the atmosphere and the area. It makes tiny space appear larger
137 or dark space appear lighter. In order to create a nice ambiance that pleases both restaurant
138 patrons and owners, architects and designers should select appropriate hue. Designers
139 should consider the tone they want to convey in the room before selecting colors. Quick
140 service restaurants and fast-food chains use vibrant colors tones to stand out and draw
141 customers from a distance, while full-service restaurants tend to use muted colors and
142 tones [12].

143 3.3 Sound and Acoustic Design

144 Environment depends on sound, with science controlling it. It is crucial when people
145 are cohabitating and working together. Specialists in acoustic design concepts and task-
146 related issues, meeting spaces, music halls, workplaces, homes, restaurants etc., propose
147 adjustable sound necessary for video conferences and teleconferences. In residential areas
148 and restaurants, with required noise level. Thus, it is conceivable that all types of spaces
149 from residential to the farthest technologically demanding environments, where sound
150 that is conducive to hearing or upsetting [15]. Fast food eateries top the list of the noise
151 restaurants. All that happens in a restaurant makes noise, including cutting, washing and
152 cooking in the kitchen, moving chairs, food delivery, eating, conversation in the dining
153 room, background music with entertainment that add to the noise.

154 However, it is impossible to control sounds, without incorporating acoustic and
155 sound-absorbing materials in restaurant design [15]. Each area has its own noise
156 requirements, with restaurants preferring between 35 and 40 decibels (dB) [6]. Acoustic
157 materials can be used as carpet or for sound absorption in the ceiling. Utilizing partitions
158 to divide and separate the dining area into smaller sections can minimize noise. Similarly,
159 the use of chair and table covers, acoustic wall panels and other sound-absorbing materials
160 also help to minimize noise [16].

161 3.4 Heating, Cooling, and Ventilation

162 The heating, cooling and ventilation systems are one of the most crucial and
163 expensive factors in any restaurant design. The air channeling device is the most effective

164 technique to regulate the temperature and air quality in restaurants [15]. Every kitchen,
165 regardless of size or type, generates heat and smells, and when it comes to large crowded
166 kitchens for restaurants, ventilation systems are crucial. On the other hand, heating and
167 cooling systems protect diners in restaurants from the heat and cold during the summer
168 and winter, which leads to better business for the owner and customer satisfaction.

169 Thermal discomfort if not addressed while choosing building materials for the
170 construction and implementing them in the design stage, are expensive to handle later [17].
171 Over time, most restaurants' sides have started to take heating and air-cooling systems for
172 granted. A well-placed heating, ventilation and air-conditioning (HVAC) system would
173 often offer a more controlled, cooled and well-ventilated environment during construction
174 with automated centralized using computer technologies.

175 **3.5 Selection of Building Material**

176 The materials selected for a restaurant can greatly impact the overall look, feel and
177 functionality of the space. Using similar and common materials unifies a place and reveals
178 the flow throughout. However, using various materials might segregate functions and
179 divide spaces. Materials are typically utilized as finishes, floor coverings and wall
180 coverings [18].

181 **3.5.1 Floor Covering**

182 Restaurant flooring is more than just a surface-covering design. The floor's elegance,
183 softness and ability to serve as a sofa and either reflect or absorb sound make it useful as
184 a directional signal. Three factors largely influence the designer's decision in making
185 appropriate material choices for spaces: the function of the building, the conditions of the
186 interior's use, and the users [19]. At the same time, maintaining harmony between
187 materials is important and should be taken into account. It is crucial to select the right
188 covering for a restaurant floor; in addition to being simple to clean, it shouldn't get dirty
189 quickly. It should also be smooth but not slippery, and it is preferable if it is sound-
190 absorbing and doesn't make a lot of noise when chairs are moving and people are walking
191 on it.

192 **3.5.2 Wall Covering**

193 The choice of wall finishes in restaurants is important as it can greatly affect the
194 overall ambiance and mood of the dining area. Wall materials and finishes can affect a
195 restaurant's atmosphere, internal spaces and overall design. They can be made of diverse
196 materials with varying colors, patterns and textures, such as wood, stone, plaster, brick,
197 glass, concrete, metal or wall paper [20]. Restaurant wall covering materials should be easy
198 to clean and maintain for as long as possible. It is preferable for the materials to be sound
199 absorbing and resistant to wear.

200 **3.6 Exterior Space Design**

201 The building's exterior design directly affects how customers see it, visually conveys
202 a basic notion of what is going on inside, and reflects the character of the structure. All

203 these factors can have a direct impact on how successful a restaurant is. It is possible to
204 comprehend the significance of outside space design with this understanding.

205 **3.6.1 Aesthetics and Facade Design**

206 The degree to which humans appreciate both live and inanimate objects in the
207 physical world is measured by their visual quality. Due to its perceptual and subjective
208 structure, it is regarded as one of the most complicated phenomena that can be studied
209 and measured in ecology. The variety of its components, each of which has unique
210 properties, contributes to the complexity of gauging visual quality. Aesthetics is the same
211 as visual quality.

212 A well-designed facade can improve the perception of the restaurant's quality and
213 help to attract new customers [21]. Designing a window into a restaurant façade can
214 establish a visual connection between inside out which provide patrons with a glimpse of
215 what is going on within. Windows can also display the restaurant's interior design and
216 how full the eating area.

217 **3.6.2 Entrance and Signage Design**

218 The entrance signage design of a restaurant are crucial in creating a memorable
219 dining experience. The entrance be easily visible and reflect the restaurant's branding,
220 using high quality materials and lighting to create an inviting atmosphere. The signage if
221 well designed and strategically placed to attract the attention of potential customers, by
222 taking these factors into account: restaurant owners and designers can create an entrance
223 signage design that sets their establishment towards competition, helps attract new
224 customers and reinforce their brand identity [22]. Each restaurant being identified by its
225 entrance and signage, the needs to stand out from other eateries locations, while still being
226 created to be welcoming and enticing. The golden arches of McDonald's and the enormous
227 guitars of Hard Rock Cafés are two prominent examples of these areas. Although, the
228 architecture and designer of Hard Rock Café vary from location to location, the signage is
229 instantly identifiable everywhere. The signage for the restaurants must be distinctive,
230 always visible and uniquely created to be [23].

231 **3.7 Sitting Area**

232 The sitting area in restaurants is an essential part of the total dining experience due
233 to its big impact on how comfortable, satisfied with loyal customers. Many restaurants
234 have outdoor seating area that is normally in front of the building. If this area is used year-
235 round, it should be constructed in a way that keeps patrons safe from inclement weather.
236 For the sake of the workers' comfort, it is preferable that the outside seating area have
237 direct access to the kitchen, storage and services [24].

238 **3.8 Development Control Regulations**

239 The planning, design, and construction of a restaurant are also expected to comply
240 with various development control regulations as captured in the relevant legislation in any

241 locality. In Lagos, Nigeria, the regulations relevant to the development of a restaurant
242 include the following:

243 244 **3.8.1 Building Development and Construction Regulations**

245 The building and construction regulations in Nigeria provide guidelines for the
246 construction of buildings, including restaurants. These regulations provide information on
247 the structural design, materials and safety requirements for the building. The regulations
248 are enforced by the Federal Ministry of Works and Housing in Nigeria [25]. When
249 designing a restaurant, it is important to ensure that the building and construction
250 regulations are followed to ensure the safety with functionality of the establishment. Some
251 of the key regulations that need to be considered include setbacks, parking requirements
252 and accessibility.

253 i. **Setbacks**

254 This refers to the distance between the restaurant building, the property line and
255 adjacent buildings. Setback requirements are typically specified in local zoning
256 regulations, which can vary from states and local government areas. However, in Lagos
257 State, the setback requirement for a commercial building such as a restaurant is specified
258 in the Lagos State Urban and Regional Planning Development Law. According to the law,
259 the setback distance from a road or property line should be 3 meters for buildings less than
260 10 meters in height and 6 meters for buildings more than 10 meters in height [26].

261 ii. **Parking**

262 Parking requirements for restaurants vary depending on the location and size of the
263 establishment. In Lagos State, the Lagos State Transport Sector Reform Law specifies
264 parking requirements for commercial buildings, including restaurants. According to the
265 law, the minimum number of parking spaces required for a restaurant is 1 space per 10
266 square meters of gross floor area or 1 space per 10 seats, whichever is greater [27].

267 iii. **Accessibility**

268 Accessibility requirements for restaurants in Nigeria are specified in the Nigerian
269 Building and Road Research Institute (NBRI) Code for Accessibility. The code provides
270 guidelines for making buildings and facilities accessible to people with disabilities,
271 including requirements for accessible entrances, parking spaces, restrooms and other areas
272 of the building. Furthermore, the code specifies accessible parking spaces must be located
273 on route to accessible entrance designated with appropriate signage [28]. It is important to
274 note that building and construction regulations codes vary depending on the location of
275 jurisdiction within a locality.

276 **3.8.2 National Fire Safety Code**

277 The National Fire Safety Code is a set of regulations that provide guidance on fire
278 safety requirements in buildings. The code provides information on the design and
279 installation of fire safety systems, including fire detection and suppression systems, fire
280 alarms, and emergency exits. The Federal Fire Service in Nigeria enforces the code [29].

3.8.3 Nigerian Electricity Regulatory Commission (NERC) Regulations

The NERC regulations provide guidelines on electrical safety in buildings, including restaurants. These regulations provide information on electrical installations, grounding, and protection against electrical hazards. The regulations are enforced by the Nigerian Electricity Management Services Agency [30].

3.8.4 National Building Code

The National Building Code is a set of regulations that provide guidelines on building construction and design in Nigeria. The code provides information on building materials, structural design, and safety requirements for buildings, including restaurants. The code is enforced by the Federal Ministry of Works and Housing in Nigeria [31].

3.9.5 Food Safety and Hygiene Regulations

The food safety and hygiene regulations in Nigeria provide guidelines on the handling, storage, and preparation of food in restaurants. These regulations provide information on food safety and hygiene practices, including the use of food grade equipment, hand washing facilities, with waste disposal. The regulations are enforced by the National Agency for Food and Drug Administration and Control [32].

4. Conclusion

This research examined design strategies for developing a sustainable restaurant in Lagos, Nigeria, with a view to establishing informed guidelines for designing restaurants in the study area. It has been established that the design of a restaurant is critical to its success. A well-designed restaurant will attract customers and create a memorable dining experience. Incorporating technological elements of sustainability also enhance the design, resulting in diners' satisfactory experience. The study findings revealed that careful attention should be given to lighting, color, sound, heating, ventilation, air conditioning, material selection, exterior space and signage designs. The design of a restaurant should not only be aesthetically pleasing but should also create a functional comfortable environment for customers and staff. Issues of regulations such as adequate setbacks, parking and accessibility requirements should be carefully addressed. Finally: fire safety, electrical installations safety and hygiene considerations.

The study recommends aforementioned design strategies be carefully considered by designers while planning restaurants. Understanding the requirements of these key design elements and implementing them appropriately. Restaurant owners/designers create environments that are not only visually appealing, but efficient, profitable and sustainable. The study's contribution is the articulation of key design elements and considerations relevant for designing a restaurant from previous literatures to strategies for the development of a sustainable restaurant in Lagos, Nigeria. The study recognizes the resources used for the research are limited, based on the strategies set for their selection. Nevertheless, this does not undermine the contributions of the study. Therefore, similar studies can be conducted by expanding the scope of the literature search to include closed access papers and the use of other data bases to gather literature. The study was designed as a review paper; thus only secondary data were investigated. Further studies be designed to make use of primary field data. Such studies can investigate existing

325 restaurants to ascertain the extent to which the various design strategies articulated in this
 326 study were implemented in them. Studies on users' satisfaction level with the criteria in
 327 existing restaurants, with a view to identifying areas that require enhancement towards
 328 the development of sustainable environment, could be conducted.

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