Accessible and Universal Buildings: A Review of Special Design Needs Towards Sustainability in Nigeria

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Abstract

It is very clear that our building accessibility and universality is falling behind in providing necessary assistance to persons and issues with special needs in our environment as some barriers prevent them to participate fully in day to day activities. The physical structures we have are not user friendly to the mobility impaired. In spite of so much capability and potential, these people have many difficulties due to their disability, while society too is deprived of their abilities and capabilities. Looking critically at sustainability, being the humanity's ability to meet the needs of the present without compromising the ability of the future generations to meet their own needs is still a mirage. Many developing countries like Nigeria did not meet up with the UN target of 2002 as behavioural architecture has been marginalized. This study thus reviews the measures which take into considerations the movement abilities of persons with mobility impaired, disabilities and other special needs with considerations, by finding sustainable solutions to accessibility and universality in buildings by using adequate design considerations of spaces, access, measurements and reach dimensions.

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Background to the Study

Universal Design is the design and composition of an environment so that it can be accessed, understood and to the greatest extent possible by all people regardless of their age, size, ability or disability (NDA, 2014). An environment (or any building, product, or service in that environment) should be ddesigned to meet the needs of all people who wish to use it. For most of us who do not have any form of disability, it is very difficult to appreciate the problems which confronts people living with disabilities in accessing buildings (Osuji, 2007). In Africa, an estimated 60-80 million people are living with disability today (Disability News-Africa, 2014). All people experience changes in mobility, agility, and perceptual acuity throughout their life spans, from childhood to adulthood. At anytime in our lives, we may experience temporary or permanent physical or psychological impairments which may be disabling and which may increase our dependence upon certain aspects of the physical environment. For most of us who do not have any form of disability, it is very difficult to appreciate the problem which confront people living with disabilities in accessing buildings. Most of the infrastructural facilities we have around us are provided without taken into consideration the disabled persons in mind. The buildings are designed to exclude those with physical disabilities. The crippled can not or may have difficulties in climbing the stairs. The designs for access are not conducive for the disabled. It will be an admirable aim to enable the mobility impaired disabled to access buildings without difficulties. Disability is the consequence of an impairment that may be physical, cognitive, mental, sensory, emotion, developmental or some combination of these (Wikipedia, 2014). Also, it has been defined as physical, mental or psychological condition that limits a person's activity (Daniel Mont, 2007). We are all physically disabled at some time in our lives. A child, a person with a broken leg, a parent with a pram, an elderly person, etc. are all disabled in one way or another. Those who remain healthy and able-bodied all their lives are few. As far as the built-up environment is concerned, it is important that it should be barrier-free and adapted to fulfill the needs of all people equally. As a matter of fact, the needs of the disabled coincide with the needs of the majority, and all people are at ease with them. As such, planning for the majority implies planning for people with varying abilities and disabilities. The point made by Access for Disabled People (2002) is to note that: Providing good access does not deter from creating a facility that is imaginative, efficient, attractive and enjoyable, while a combination of good design and good management will integrate all users and increase the independence of everyone using the facility.

Methodology

The methods adopted in this study are based on descriptive survey research technique. The information was generally from secondary sources such as internet, newspaper articles, documents, conducted research, reports and the media.

Statement of the Problem

The alarming rate of neglect of special design considerations, disabled, especially mobility impaired in our environment is one of the injustices, unacceptable to human practices that violate international human right standards. The challenges pose by inadequate relevant literatures, fragile implementation of constitutional legislation, lack of database records of

buildings with considerations to physically challenged people are some of the major factors militating against accessibility in buildings. Also, it is quite unfortunate that the regulatory bodies like Standards Organization of Nigeria (SON), development agents, etc have relaxed in monitoring buildings that are inconformity with the global practices and standards in view of the alarming levels of dangers prone to the citizens. Another important point made by Clifford (2001) is that a person who is afflicted with only a temporary disability can face a physical challenge if access to a facility is impaired. This is the reason Eoin & Jim (2004) stated that accessibility of the built and external environment is a key factor in people with disabilities achieving autonomy, inclusion and participation. However, many people with disabilities face barriers in respect of their equal participation in society. As a result of all these, there is a dire need for a detailed design consideration for the mobility impaired people towards sustainability in Nigeria.

The Disabled in Our Society

'A disabled person is someone who has a physical or mental impairment which has a substantial and long-term adverse effect on his or her ability to carry out normal day-to-day activities' Designing for disabled children and children with special educational needs Guidance (2007). For the purpose of this discourse, the disabled persons can be regarded as s special population and in some cases as physically or mentally challenged as the case may be. These conditions abound in many forms, classified according to Enitan (2007), into the following broad categories:

1. Sensory Handicaps e.g deafness
2. Visually Handicaps e.g sight loss
3. Physically Handicaps e.g problems with locomotion i.e lame, wheel chair bound, spina bifida, amputees, etc
4. Intellectually Handicaps e.g mental retardation
5. Medically Handicaps e.g epileptics, etc

Again, the Wayne State University (2007), describes an individual with a disability as a person who has a physical or mental impairment that substantially limits him from one or more major life activities. In this case, disabilities can be categorized into:

i. Cognitive Disability: which is having greater difficulty with one or more types of mental tasks than the average person. This can be in form of learning disabilities, brain injuries, genetic diseases and attention deficit hyperactivity disorder.
ii. Communication Disability: which is having difficulty producing speech sounds, putting ideas into spoken forms and understanding what other people say. This can be in form of Dyslxia-disability in the area of writing
iii. Health Disability: which is a chronic disease which lasts for more than three months and generally can not be prevented by vaccines or cured by medication, nor does it just disappear. E.g asthma, cancer, diabetes, and sickle cell anaemia, etc.
iv. Hearing Disability: which is impairment in hearing which can be permanent or fluctuating but not defined as deafness

v. Learning Disability: which affects a person's ability to process information. It manifests itself in one or more of the following areas. E.g reasoning, communication, writing and spelling.

vi. Physical Disability: which is an impairment that substantially limits an individual in one or more of the following life activities. E.g self care, self direction, independent living and mobility, et.

vii. Psychological Disability: which is any physiological disorder, condition, cosmetic disfigurement or anatomical loss affecting one or more of the following body systems like neurological, special sense organs, respiratory, cardiovascular, skin and endocrine, etc

viii. Vision Disability: which involves visual impairments that adversely affect an individual's educational performance

There are many other types of disabilities which in such circumstances, according to John and Elaine (1999), accessibility standards have simplified the diversity of disability to three main groups of conditions with the related component of the environment. By understanding the physical implications of these broad groups of disabling conditions designers can understand the criteria in the building codes and standards.

These groups are:
Sensory impairments: Design of information systems
This includes vision, hearing and speech impairments including total and partial loss of function and leads us to the design recommendation for redundancy of communication media to insure that every one can receive information and express themselves over communication systems. For example, reinforcing both lighting and circulation cues, way finding can be enhanced. Or by providing both audible and visual alarms, everyone will be able to know when an emergency occurs.

Dexterity impairments: Design of operating controls and hardware
This includes people with limitations in the use of their hands and fingers and suggests the closed fist rule," testing selection of equipment controls and hardware by operating it with a closed fist. In addition, this addresses the location of equipment and controls so that they are within the range of reach of people who use wheelchairs and those who are of short stature.

Mobility impairments: Space and circulation systems
This includes people who use walkers, crutches, canes and wheelchairs plus those who have difficulty climbing stairs or going long distances. The T-turn and 5 ft. (1.52 m) diameter turning area provide key plan evaluation criteria here. These concepts and the accessible route of travel insure that all people have accessible and safe passage from the perimeter of a site to and through all areas of a facility. Therefore, the community of the physically disabled consists of individuals with very disparate characteristics and lifestyles. Nonetheless, as a group, they do agree on how they should be identified and viewed by others that are not disabled. In referring to actual people, adjectives such as "disabled", "physically disabled", and especially "handicapped" should not be employed as nouns. They prefer to be known as people first and

not by their impairment. These individuals also desire to be seen as part of regular society and not as a special group that should be separated from the rest of the world. Even though they may possess limitations, they still aim for integration and achievement in the world.

Solving Problems of People with Mobility Impairment

In solving access related problems, Anthropometry which is the relative measurement of body dimensions such as stature, sizes of body parts and the space in which the body functions, e.g. reach limits and ranges of joint motion, plays a very important role. In architecture and interior design, anthropometry is the basis for many design requirements including those related to accessibility. Also, Promoting Access to the Built Environment **(2008)** captured that accessible design is focused on principles of extending standard design to people with some type of performance limitation to maximize the number of potential customers who can readily use a product, building or service while . Basic challenges of people with mobility impaired in accessing buildings are problems for wheelchair users and Problems for the ambulant person. Some of the problems for wheelchair users are: Changes in level (high kerbs, steep ramps or unclimbable stairs), inaccessible changing, social and toilet facilities_ doorways and corridors that are too narrow_ controls that are too high to reach. Problems for the ambulant person with mobility impairment include: uneven ground_ walking on any kind of gradient_ inadequate clearance for walking aids. Hence, according to Division 5 -----Ramps (2008) ramps of an appropriate design shall be provided at all changes in level other than those served by an accessible lift or accessible lifting mechanism accommodating the specific requirements of persons with a disability. This applies not only to people who use wheelchairs but also to those who have difficulty climbing stairs, such as people who have arthritis or hemiplegia and those who use walkers, crutches or canes(How To Build Ramps For Home, 1992).This now leads to the identification of means of access in buildings below.

Means of Access in Buildings

Access is not a state or act but refers to the freedom of choice to enter, approach, communicate or make use of a situation or environment. Restraint access to the built up environment is consistently identified by persons with disabilities as a major barrier not only to social but also to educational and economic opportunities. Particularly in low-income countries, the situation of poor accessibility contributes towards the phenomenon of the cycle of disability and poverty. Access is a very broad term that can refer to many areas such as education, transport, employment, buildings and public spaces, etc (Promoting Access to the Built Environment, 2008). Many public buildings and houses are built so that individuals with physical handicaps have difficulty getting in, out, and around the structure. The list of structural barriers in architecture comprises a myriad of obstacles that most architects fail to recognize previous to construction. All architectural impediments, no matter how big, can be replaced so that the needs of individuals with disabilities can be fulfilled. Architecturally, access or circulation in building is divided into two major groups; the horizontal and the vertical circulation. Under each of the groups, there are various means in which buildings are accessed or circulated as discussed below.

Horizontal Accessibility

Seemingly small things such as lack of railings, high thresholds, narrow doors or long corridors can already present huge obstacles that may cause a significant degree of extra stress and effort. because of such barriers prevalent in the horizontal circulation paths, many people particularly those with disabilities need assistance of an escort or other passengers when moving around or cannot access certain facilities at all. Moreover, the lack of accessible facilities such as toilets may restrain some persons with disabilities from using a building in the first place. Horizontal circulation comprises of access means like doors, corridors, entrance areas and lobbies, travelators, handrails and ramps.

Vertical Accessibility

A whole building is not accessible to all users if changes in levels cannot be overcome or higher floors cannot be reached. This section deals with technical considerations and adequate solutions how to overcome barriers related to the vertical access to allow all people to make full unassisted use of a building. Vertical circulation also comprises of the followings; ramps, stair, steps, lifts and escalators.

Image 1 Example of travelator with emergency stop button and guard rails alongside pedestrian corridor. (Building for everyone, 2010 b)

Image 2 Long-tread, low-riser steps (Daniel Mont, 2007)

Sustainable Design Considerations to Mobility Impaired

In Building for Everyone (2010 a), a very important note was made in such that to achieve a high quality of sustainable design, DCSF's sustainability framework states that: 'By 2020 the Government would like all schools to be models of social inclusion, enabling all pupils to participate fully in school life, while instilling a long-lasting respect for human rights, freedoms, cultures and creative expression.' Schools should demonstrate the followings:

Social: Having a fully inclusive and cohesive school community, with a positive relationship with the wider community and other services accessing the site.

Economic: achieving value for money based on the whole-life cost of the building, bearing in mind the possible higher cost of meeting some of the needs of children with SEN and disabilities and disabled adults.

Environmental: Minimising any negative environmental impact and making good use of the site's microclimate and biodiversity, with efficient use of energy and resources, ensuring the needs of disabled people are not compromised. Again, it is of great important to note that 'Universal Design refers to the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size, ability or disability' (Building For Everyone, 2010).

Image 3 Example of a reception desk with two levels (Promoting Access to the Built Environment, 2008)

Image 4 Example of a toilet with two levels. (Building for Everyone, 2010).

Conclusion

Sustainable access, special design considerations, provision for mobility impaired people by virtue of flexibility, adaptability and technology can play a pivoted role in strategically controlling the building systems in order to accommodate the disabled in our environment. Such design needs portray special intervention programmes to make it possible for a sustainable accessibility and universality for the mobility impaired such as enabling technologies, accessible design, universal design, supporting facilities with interior and exterior considerations. At the long run, if all the recommendations are well taken care of, everybody including the disabled can now access buildings easily and safely in terms of time, place and cost.

Policy Recommendations

In accordance with the results and findings in this study, the following sustainable access provision for mobility impaired people are worth considering.

1. Enabling Technologies & Management: In recent past, global cutting edge technologies are being applied in the built environment. Some of the associated challenges such as electricity, cost and techno phobia should be tackeld in the Sub Sahara Africa. Much of the future improvement to access in the transport environment will take place as part of maintenance, repair and modernization of transport fabric, rather than when brand new

facilities are built. Continuing maintenance programmes give the opportunity to make improvements in access at lower cost and with less disruption than if the improvements are made separately (UK Government, 2005).

2. **Planning and Implementation of Architectural Access Strategies:** Strategies and plans for the implementation of access to the built up environment according to Promoting Access to the Built Environment **(**2008**)** have to be developed aiming at the maximum effectiveness but also considering restrained resources. Interventions that have been shown to influence attitude formation include direct contact; legislation; supporting participation of people with disabilities in all spheres; mainstreaming and dismantling structures of segregation and discrimination Frances Hannon (2006). The provision of an accessible building should therefore consider the following stages:
   i.   Pre-planning phase
   ii. Planning and design phase
   iii. Approval or permission
   iv. Construction and on site monitoring
   v.   Maintenance

3. **Advocacy and public Awareness Raising**
In many societies, certain superstitions, fears and misconceptions about disability prevail resulting in negative attitudes towards or avoidance of contact with persons with disabilities and sometimes also their families. Consequently, a first step towards greater access to the built up environment and hence greater social inclusion of persons with disabilities is the change of such attitudes and perceptions within society. The level of public responsibility and control can be effectively increased through public awareness in social media, NGOs, National Orientation Agency, Ministry of Information, etc. These measures will sensitise the general public, most of whom are oblivious of the needs of the disabled in the society, and will, in turn, accelerate the rate of integration of the disabled persons into mainstream society (Danso et al, 2001)

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