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# **ACCESSIBILITY IN SPORTS COMPLEX DESIGN: EXAMINING THE INCLUSION OF PEOPLE WITH DISABILITIES IN THREE NIGERIAN FACILITIES**

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**Abstract:** The research studied the inclusion of people with disabilities (PWDs) in the design considerations of sports complexes in Nigeria. The research adopted a qualitative design, and an interpretivist philosophy guided the study. A structured literature review was deployed to gather information on technical considerations for the inclusive design of sports complexes. The study finds that the seven technical considerations for PWDs in the design of sports complexes were partially included in the complexes studied, with the worst-case scenario being the Steven Keshi Stadium Complex in Asaba. The study recommends 7 technical guidelines of accessibility, horizontal circulation, internal doors, vertical circulation, visual contrast, internal floor finishes & court markings, and acoustics; for the inclusive design of sports complexes.

**Keywords:** Sports, Physically Challenged, People with Disabilities, Rehabilitation, Design Considerations

## **Introduction**

A person with a physical disability, often known as someone who is physically impaired or a person with a disability, is one who experiences difficulties with movement, agility, coordination, or other aspects of physical functioning as a result of their handicap. Congenital (existing at birth) and acquired (by injury, sickness, or other means) physical limitations exist (Mohammed, 2017, & Adima, 2011).

A person's quality of life may be affected in various ways, depending on the kind and degree of their physical disability. Among the many types of physical impairments are: a disability that hinders one's capacity to move around and may call for the use of assistive devices like crutches, wheelchairs, or walkers. Immobility can be the outcome of several medical conditions, including spinal cord injury, muscular dystrophy, and cerebral palsy (Allam & Schwabe, 2023).

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According to Dyer, (2018), the absence, deformity, or loss of a limb or extremity constitutes limb differences. This can happen for various reasons, such as a congenital limb defect or an amputation brought on by an injury or surgery. Movement, coordination, and strength also can be negatively impacted by neuromuscular disorders such as Parkinson's condition, multiple sclerosis, and muscular dystrophy (Laghi & Tobin, 2003).

Fourth, a person's eyesight may be impaired, resulting in a spectrum of difficulties from low vision to total blindness. Conditions include macular degeneration, glaucoma, and congenital visual abnormalities that can contribute to impaired vision (Sapp, 2010). The ability to hear could be diminished or lost altogether in those with hearing impairments. This can be inherited or acquired due to things like disease, trauma, or extended prolonged contact with loud noises (Dror & Avraham, 2010).

Chronic pain or pain-causing diseases, for example, fibromyalgia or persistent backaches, can affect anyone at any time. Physical capabilities and regular activities may be severely impaired due to these disorders (Ballantyne & Sullivan, 2022).

The term "sport" refers to any types of competitive physical activity that, whether done on an ad hoc or organised basis, tries to make use of, maintain, or enhance one's physical abilities and skills while simultaneously providing players and, in some circumstances, spectators with amusement.

To emulate the ideal human physique, the ancient Greeks produced sculptures that came dangerously close to transforming competitive athletics into a religion. Such veneration may have contributed to the development of sports, which can be traced back to the ancient Greeks. It was customary for them to organize races as a way of commemorating sorrowful occasions, like funerals. The aforementioned fervor led to the formation of the inaugural cyclical athletic competition—the Olympic Games—which, as customary, commenced in 776 BC and are presently conducted every four years. During the preliminary phases, this constituted a solitary event athletic competition spanning a single day. The day is dedicated entirely to the heats of a competition, which consists of a 200-meter-distance dash that encompasses the entire stadium. Over time, an increased quantity of events was incorporated, and amphitheatres came into service as the venues (Olympic Museum, 2021; Goldblatt, 2016; Wallechinsky & Loucky, 2009).

The inception of formal sporting associations in Nigeria can be traced back to approximately 1910, when inter-school Empire Day competitions commenced. The expansion of Mission Schools across diverse regions of Nigeria played a substantial role in fostering the development of established sports as well as the introduction of novel ones. Despite the fact that the majority of the sports were unfamiliar to the Nigerian population, they were embraced on the grounds that they served the common objectives of social mobilization, promoting unity in diversity, leisure activities, and entertainment (Aderinto, 2018).

Dr. Nnamdi Azikiwe, of blessed memory, in 1934 A.D., represented Nigeria in the 440-yard (400meter) event at the British Commonwealth Activities and Empire Day competitions in London. Nigeria was competing in its inaugural international tournament.

Nigeria initially engaged in international competitions through the delegation of teams during the Olympic Games in Helsinki, Finland, the Commonwealth Games in Hamilton, Canada, in 1950, and the inaugural All Africa Games in Libreville, Congo, in 1965.

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Subsequently, Nigeria has maintained its participation in these athletic competitions, except for the 1976 Olympics, which were hosted in Montreal, Canada, the 1986 Commonwealth Games, that were held in Edinburgh, Scotland, and the 1998 Commonwealth Games, which were held at Kuala Lumpur, Malaysia. The political rationale behind the decision to abstain from those events was predominantly influenced by the apartheid regime that was operational in South Africa during that period.

According to Mohammed (2017) and McCallion (2021), those who live with disabilities encounter a myriad of challenges on a daily basis. These challenges include stigmatization and unfair treatment, accessibility, limited opportunities for education, discrepancies in healthcare, communication barriers, a shortage of support systems as a whole, financial constraints, and social isolation.

People with disabilities have the opportunity to improve their physical, psychological, and social well-being through participation in sports. A number of authors have committed to writing on the positive effects that sports have on individuals with impairments. People with disabilities have the opportunity to participate in sports alongside their peers who do not have disabilities if the appropriate accommodations are made. Individuals with disabilities are able to participate in sporting events on an equal playing field thanks to inclusive sports programmes and adaptive sports. This fosters a sense of belonging and helps break down barriers between people of varying abilities. People with disabilities frequently experience challenges with social isolation and exclusion; thus, inclusion helps fight against those issues and supports social integration.

In addition, those with disabilities who participate in sports and other forms of physical activity can reap major benefits for their mental and physical well-being from these pursuits. The benefits of increased physical fitness, muscle tone, balance, and overall health that come from participating in sports include increased levels of self-esteem and self-confidence. These beneficial results for both mental and physical wellness lead to a feeling of well-being and have the potential to enhance social relationships and interactions.

The physically challenged have the opportunity to acquire a variety of skills, including cooperation, communication, problem-solving, and goal-setting, through participation in sports. This is in addition to the fact that sports are beneficial to mental health. Individuals have the opportunity to develop and improve these abilities through participation in sports, and these skills are not only useful within the framework of sports but also in many other aspects of life. The acquisition of these skills provides individuals with disabilities with increased autonomy, which in turn enhances their self-confidence and encourages them to become more engaged members of the communities in which they live.

Again, sports give an avenue for social interactions and professional connections by bringing individuals together in a common interest. Individuals who have impairments have the opportunity to create connections, establish relationships, and cultivate friendships with their teammates, instructors, and peers when they take part in sporting events. These social relationships may extend beyond the confines of the sporting environment, which can result in enhanced social support, a bigger network of connections, and a stronger feeling of community.

Individuals with disabilities are given the opportunity to observe and be motivated by other athletes who have achieved success despite their disability when they participate in inclusive sports. Individuals who have impairments may find that being exposed to role heroes who have triumphed over adversity and achieved success in sports is uplifting and encouraging for them. These role models provide examples of what is possible to achieve

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through dedication and effort, and they challenge the ideas and stereotypes that society has about those who have disabilities.

Sports offer people with disabilities a forum in which they may speak for themselves and bring attention to issues relating to the inclusion of people with disabilities. People with disabilities are able to push boundaries and preconceptions about their abilities through their participation in athletics, so contributing to the development of a society that is more tolerant and inclusive. They have the potential to become advocates for disabled people's rights and to motivate others in their communities to make positive changes.

### **Statement of Problem**

Those who struggle with disabilities are among the most defenceless members of society (Graf et al., 2017). When it comes to the layout of facilities for sports in Nigeria, there is a prevalent pattern that tends to overlook this demographic of the population. As a consequence of this, members of this population group are participating in sports that are competitive in the country at extremely low rates, if at all (Olonilua, 2019).

### **Aim of the Study**

The primary aim of this research is to create awareness and draw the attention of the appropriate authorities, to the needs of the people with disabilities their interest in participating in organized sports and the needed help with accessibility and accommodation. The desire to provide people with disabilities with opportunities to participate in society and the global community at large through athletics is the impetus for this study.

### **Research Methodology**

The research adopted qualitative research methods, and an interpretivist philosophy guided the study. A structured literature review was deployed to gather information on technical considerations for the inclusive design of sports complexes. Time-saver Standards for Building Types, Architects' Data, and Design and Management Guidelines by De Chiara (2001), Neufert et al. (2012), and Disability Sports NI (2010), respectively, were reviewed. The case studies were assessed using the findings from the structured literature review. The three pieces of literature were chosen based on theoretical saturation.

The sports complexes chosen for the study were Kwara State Stadium Complex Ilorin, Dan Anyiam Stadium Complex Owerri, and Steven Keshi Stadium Complex Asaba. One case study was chosen per geopolitical zone, and the geopolitical zones of South-East, South-South and North-Central were chosen based on their proximity to the researchers' locale.

### **Findings**

Findings from the literature review show seven major considerations for the inclusive design of sports complexes. They are accessibility, horizontal circulation, internal doors, vertical circulation, visual contrast, internal floor finishes and court markings, and acoustics.

Findings from the 18,000-seater Kwara State Stadium Complex reveal that the main entrance of the complex is accessible by PWDs. The colour of the gate contrasts with its surroundings. The car park is situated at a good distance to the stadium. The other facilities are spread on-site and are accessible by car. The design of the stadium shows partial inclusion of the other design considerations of horizontal circulation, internal doors, vertical circulation, visual contrast, internal finishes and acoustics.

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The main entrance to the Dan Anyiam Stadium Complex is accessible by PWDs. The colour of the gate contrasts with its surroundings and is recessed from the ever-busy Wetheral road. The design of the stadium shows partial inclusion of horizontal circulation, vertical circulation, and visual contrast. There was no evident inclusion of the technical considerations for internal doors, internal finishings and court markings, or acoustics at the time of the study.

The siting of the 22,000-seater Steven Keshi Stadium Complex shows partial consideration for accessibility by PWDs. There is partial inclusion of the technical considerations for horizontal circulation, vertical circulation and visual contrast. The technical considerations for internal doors, internal finishings and court markings, and acoustics were not included in the design of the stadium.

## **Conclusion**

The study finds that the seven technical considerations for PWDs in the design of sports complexes viz, accessibility, horizontal circulation, internal doors, vertical circulation, visual contrast, internal floor finishes and court markings, and acoustics, were partially included in the complexes studied, with the worst-case scenario being the Steven Keshi Stadium Complex in Asaba.

## **Recommendations**

The study recommends the following technical details following the seven design considerations:

### **Accessibility**

Accessibility should always be prioritized when thinking about people with disabilities. PWDs are going to get to and from the sporting event using a number of different modes of transportation. The vast majority will go by either private vehicle, cab, or public transportation. Others, particularly those who are blind or partially sighted, may frequently take public transportation to get to the institution, while others who reside in the immediate area would either walk or push themselves to get there. It is vital to provide disabled people who use the facility, as well as disabled people who work at the institution, with specific accessible parking spaces for their vehicles. This accessibility consideration is to begin at the site boundaries and extend throughout the entire facility, not only within the sports complex.

Car parks should have dimensions of 4800 millimeters by 24000 millimeters. 1200 millimeters of clearly demarcated access zone separating each parking spot. 1200 millimeters width safety zone for automobiles with rear hoists and cars with boot access. Placement of parking lots must take place on solid ground that is also level.

There should be raised kerbs with textured surfaces leading from the parking lots to the paths. The parking lots have to be situated within a reasonable distance of the sports complex's primary entrance; if they are further than fifty metres away, the pathways will need to be roofed over.

For external paths, accessible pathways of excellent quality are required from the public roadway to the front door of the building, as well as from the parking lots to the major entrance of the building, in order to make it possible for people who have physical disabilities to move around the site without difficulty or restriction, including some of those who happen to be using sports wheelchairs. The paths should, wherever practicable, be flat or possess the most shallow possible gradient. The pathways ought to have an appropriate minimum width of 2,000 millimeters. The surfaces of the pathway should be strong, resistant to slipping, and smooth. Gravel should never be utilized under any circumstances. Splay curves should be provided on all paths so that wheelchair users can

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easily get around about. Traffic routes and pedestrian pathways ought to be able to be easily differentiated from one another by means of texture and colour.

It is recommended that street equipment, such as lampposts, signposts, and rubbish bins, be placed beyond the borders of the route in order to guarantee that there is a clear width of at least 2,000 millimetres along the whole length of the walk. In a similar fashion, drainage canals and grates ought to be positioned beyond the path's edge. When nearing a junction with a road or parking lot, blind or partially sighted persons should be provided with a warning and direction using tactile pavement. This should be done whenever possible. It is important to avoid walking into windows, doors, and other items that protrude into routes. Every door that opens externally should either be recessed or fitted with protective railings.

The path leading up to the main entrance door must be marked with unmistakable signage so that visitors can locate it easily. The entryway needs to stand out visually from its immediate surroundings and be immediately identifiable in order to fulfil these requirements. The space directly in front of the entry doors should be level, and the primary entrance should have some type of weather protection such as a canopy or a recessed entrance in order to give shelter for individuals who are required to wait before entering the building. In a perfect world, the threshold of the door should likewise be level.

In light of the fact that individuals utilizing sports wheelchairs would be using the sports complex, the proportions of the doors should also take this into account. In less-spacious buildings that do not require automated doors, a doorbell with an intercom should be installed so that a member of the staff can be summoned whenever assistance is required. In the event that automatic doors are going to be built, automatic swinging doors, automatic folding doors, and automatic revolving doors should all be avoided since they present a risk to individuals who are physically challenged. In an ideal scenario, the automatic doors would be operated by a passive laser system that would be placed in the proper location and would be sensitive to youngsters as well as people who were seated and standing. However, in the event that there is a problem with the electricity, the doors have to be able to be operated manually.

### **Horizontal Circulation**

For horizontal circulation, it is important that the welcome area be built such that everyone has easy access to it. The front desk or counter serving as reception should be in plain view from the entry, and those who are blind or have low vision should have little trouble finding it. The walkway that leads from the front door to the waiting area needs to be simple, free from impediments, and a minimum of 2000 millimeters wide to guarantee simple maneuvering for wheelchair users. The arrangement of the reception room needs to be clear and logical. It is important to have a reception desk or counter that has both a higher and lower counter space in order to accommodate customers and staff members who prefer to stand or sit down including people who use wheelchairs. The height of the bottom counter area ought to be no more than 760 millimeters across its whole length of 1800 millimeters, and it should be placed in an easily accessible region.

Help for those who have hearing difficulties should be provided in the form of an induction loop. It should be made abundantly apparent, using the industry-accepted symbol, that the induction loop is available for use. The reception room ought to be outfitted with a suitable level of acoustic insulation to reduce the amount of ambient noise in order to be of assistance to those who are deaf or hard of hearing.



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The use of distinct floor finishes should be employed in order to clearly demarcate circulation routes and waiting areas. It ought to be possible for wheelchair users to take a break near seats in the waiting sections of the facility.

### **Internal Doors**

Internal doors shall be at a minimum width which will aid in the free flow of people in order to make free and simple mobility possible for large groups of individuals with impairments, including wheelchair users. This requirement is intended to facilitate wheelchair accessibility. The unobstructed opening width of doors should be extended to 1200 millimetres whenever there is a possibility that the facility will be utilized for wheelchair tennis activities. This will allow for larger wheelchair tennis chairs to be accommodated. A minimum number of doors should be installed inside the building so that entry can be gained without difficulty. It is recommended that double doors have double swing action built into them so that they are less difficult to navigate.

In addition, unless there is a specific need for privacy, all doors should be designed with visibility glazing included in the construction. The minimum area of visibility that should be provided by vision panels should be between 500 and 1500 millimetres above the floor level. All of the door furnishings and fittings should have a hue and brightness that contrasts with the outermost part of the door, since this will help persons who are partially sighted.

### **Vertical Circulation**

If the building has more than one level, the vertical circulation will be accomplished mostly through the use of ramps, stairs and elevators. The main entrance, the reception area, and the main circulation pathways should all be within close proximity to the lifts. It is recommended that the following be given on each floor:

- A clear area of at least 1500 millimetres by 1500 millimetres, and preferably 2000 millimetres by 2000 millimetres, to ensure space for wheelchair users to manoeuvre.
- An audible announcement to signify the arrival of the elevator and the direction of movement should be provided to assist those who are blind or partially sighted.
- A distinct visual display that indicates the level that the lift has reached, for the benefit of individuals who happen to be deaf or have difficulty hearing.

Call buttons on landings should neither be lower than 900 millimetres nor higher than 1100 millimetres above the surface of the landing. The buttons need to have appropriate raised tactile indicators to signify their function, and they also need to be easily identifiable from one another using appropriate visual contrast.

Because the majority of users of this sports complex are physically disabled and use wheelchairs, the inclusion of ramps is a crucial requirement in the planning of a sports complex for changing levels. Ramps are also necessary for facilitating easy movement for those who are visually impaired. The minimum width for unidirectional movement on ramps should be 1200 millimetres, whereas the minimum width for bidirectional movement should be 1500 millimetres. Wheelchair users who have access to lengthy ramps (those that are longer than 10 metres) should be supplied with rest platforms. The level surface of rest platforms should measure 1800 millimetres in length, and they should be spaced approximately 10 metres apart. In addition to that, the ramp's angle of inclination cannot be steeper than 7 degrees.

The design of steps and stairs must take into account the needs of ambulant disabled people as well as blind and partially sighted individuals in order to make them simpler and safer to use.

. The greatest rise per flight is 1800 millimetres , and the highest number of steps that may be found on a single flight is 12. It is imperative that the ascent of each step within a flight or set of flights be consistent.

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- There needs to be a landing at both the top and bottom of each set of stairs. Its length ought to be at least equal to the breadth of the staircase.
- The step width must be clear and unobstructed and must measure 1200 millimetres , and the thread size must measure 300 mm.
- In order to better assist those who are blind or have low vision, the colour and brightness of the step nosing should contrast with the rest of the step. The nosing needs to be constructed out of a material that is slip resistant.
- There should be no risk of slipping on any of the stairs.
- Handrails are required to be installed on all staircases and steps.
- Spiral and helical staircases should not be used in the design since they are difficult to navigate for people who are blind or have low vision.

The supply of handrails that are correctly built is of tremendous assistance to ambulant disabled people as well as those who are blind or partially sighted. They have an easier time going up and down the stairs thanks to it. Therefore, handrails are required to be installed on both sides of the stairway or ramp at each location where there is a change in level. It is required that the handrails have a colour and luminance that contrast with their surroundings. The height of the railing should be between 900 and 1000 millimetres from the pitch line of the flight of stairs, and it should extend horizontally an additional 300 millimetres above both the top and bottom of the initial and final steps, respectively.

Handrails must be designed with tactile warnings of potential hazards so they are accessible to those who are blind or have low vision. Putting tactile signs on the bottom of each railing is an option for accomplishing this goal. The tactile marker is a thin piece of textured engraved plastic or a comparable substance and is in the form of a strip.

### **Visual Contrast**

Many blind or visually impaired people would benefit immensely from increased independence in public spaces if there was greater visual contrast across floor, wall, door, and ceiling surfaces. The following are some guidelines for creating visual contrast through the use of colour, brightness, and texture:

In order to clearly define the boundaries between the various surfaces (floors, walls, doors, and ceilings), finishes should contrast with one another in terms of colour, brightness, and texture.

- The walls, ceiling, and floor should all be a different shade and brightness.
- Door and frame colours should stand out from the background tone.
- Skirting boards should be a different hue or tone than the wall surface, but should also contrast visually with the flooring's finish.
- Use a contrasting colour at the conclusion of each corridor to indicate directional shifts.
- Outlets, switches, and controls should stand out from the wall in terms of colour, lighting, or texture.
- Avoid shiny or high-gloss finishes, as the reflections and glare they create can be disorienting for the visually impaired.
- The hue, texture, and contrast of colours of flooring should all be used to help define places and direct people as they move around a structure.



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### **Internal Floor Finishes & Courtmarkings**

Wheelchair users, "ambulant disabled," and the blind and partially sighted have special needs when it comes to the flooring in public buildings, so it's crucial that these areas be planned with them in mind. The steps below are necessary to accomplish this.

Wheelchair users and other disabled people who are able to walk should feel secure on the floor. The flooring must be nonslip to ensure a secure footing and reliable wheel grip. A Slip Resistance Rating (SRV) of 40 or above is preferred for dry, flat flooring.

Anti-slip carpeting should be used in high-traffic areas, hallways, bathrooms, and around pools. The SRV of this flooring must be at least 65. Avoid using high-gloss floor finishes, since they create glare and can appear wet and slippery, even if they are actually slip-resistant. Carpets should have a low dense unidirectional pile if they are going to be utilized in areas where wheelchairs and walkers are likely to be present.

### **Acoustics**

Some people with impairments may find it more difficult to communicate and find their way around a building due to poor acoustics. It can be challenging for those with hearing loss or impairment to carry on a conversation in loud, reverberant, or otherwise noisy environments. Similarly, blind or visually impaired people who rely on their hearing to get around will have a more difficult time in spaces with poor acoustics.

Reverberation and echo are created when stone, ceramics, metal, glass, or timber are employed because they bounce sound back through the room. Consequently, padding should be utilized for other surfaces in a space when hard substances are employed for one surface. This will help keep echoes to a minimum. The use of sound-absorbing coatings in interior design can help cut down on echo and ambient noise. Reducing echo and ambient noise in waiting spaces is also highly recommended.

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