

Accessibility in Public Spaces for Persons with Disability- A Case of Kathmandu Metropolitan City

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Abstract

Accessibility is the possibility of circulation and giving equal access to everyone. One of the problems of an urban area like Kathmandu is the inaccessibility to urban public spaces such as sidewalks, bus stops, pedestrian crossings etc. for people with all kinds of abilities. There is a certain group of people in society i.e. persons with disability (PWDs), who often struggle with the complexities of built environment (structural barriers) in urban areas that hinder their equal participation in daily activities. This research aims to identify the problems and challenges faced by PWDs in using the public spaces of Kathmandu. A review of literature and existing policies confirms that in the context of Kathmandu, there is a lack of comprehensive and holistic approach to ensuring accessibility for PWDs to public spaces. The findings made from direct observation, questionnaire survey and key informant interviews conducted during the research reveal several issues of urban accessibility in Kathmandu- such as unsafe, overcrowded and encroached sidewalks, hazardous obstructions for PWDs in public spaces, poorly maintained and improperly designed physical infrastructures etc. In addition, it is also concluded that the problems to accessibility seem to arise from the poor implementation of policies, lack of legal framework for planning, implementing and monitoring that accessibility mentioned in policies is ensured in action and a lack of coordination between the various authorities of government who share the responsibility of providing physical infrastructures and services.

Keywords

accessibility, persons with disability, public spaces, universal design, usability

1. Introduction

According to the United Nation Convention on the Rights of Persons with disabilities, around 10 percent of the world's population, or 650 million people, live with a disability and they are the world's largest minority group[1]. In 2011, around 2 percent (513,321 people) of the total population of Nepal reported as having "some kind of disability" [2]. According to the Census of Nepal 2011, Kathmandu has the biggest population of physically disabled and people with blindness/ low vision at 6,030 and 3,703 respectively. In Kathmandu, there is a severe issue of haphazard and unmanaged infrastructure development. The features of the city including physical design, institutional policies and mobility systems have prevented persons with disability (PWDs) from participating in mainstream urban social life. PWDs' participation in society is adversely affected by the city's infrastructural and architectural obstacles that

limit their movements; and this will lead to breaking the link between this group and the rest of the society. Therefore, it is of utmost importance to develop the city as an inclusive, accessible urban environment that can truly be called a 'city-for-all'. Despite severe shortcomings, it is still the most developed urban area of Nepal and people from all over the country have and continue to pour here annually in search of better education, health care and employment opportunities. PWDs naturally form a part of this population.

1.1 Accessibility and Disability

Accessibility is a right as well as prerequisite for people living with different types of disabilities towards increasing their reach to any kind of facilities and services intended to support their participation in society[3]. Since the idea of accessibility is to minimize the physical effort and barriers of the PWDs, enforcing it is an integral part of infrastructure

development. It is the right of every individual to participate in daily, social and economic activities irrespective of their physical conditions and limitations. There are various international as well as national policies intended to guide the planning of any urban area to be universal and inclusive. However, at the stage of implementation and monitoring of urban development, accessibility for PWDs is often completely forgotten, creating barriers for PWDs in their social participation. Basic purpose of urban planning is to design spaces providing comfort, safety and quality to meet the needs, requirements and preferences of the users. The principles of accessibility and universal design address the requirements of the PWDs when it comes to the physical infrastructures in public spaces and they are: equitable use, flexible in use, simple and intuitive, perceptible information, tolerance for error, low physical effort and appropriate size and space for approach and use[4]. The physical impairments are generally the most obvious challenges to be met when addressing the problems of accessibility to the built environment. Those can be overcome by mainstreaming the concept of accessibility and universal design principles in urban planning and design.

1.2 Problem Statement

Various features of contemporary cities including physical design, institutional policies and mobility systems might have prevented disabled people from participating in the mainstream of urban social life[5]. PWDs' equal participation in social lives is adversely affected by the infrastructural and architectural obstacles in cities which limit their movements and lead to breaking the link between this group and the rest of the society. They become subject to unequal treatment merely because the urban built environment are not designed to meet their requirements and policies safeguarding their right of access to public spaces are simply disregarded or not implemented. In the context of Kathmandu, throughout the years, its urban spaces have never been built with universal utility design principles. Even though some parts of the city have pedestrian infrastructures that seem to be designed for the physically disabled people, they are not continuous, thus leaving the chance for PWDs to be stranded in the middle of nowhere. A lack of attention to the PWDs' physical and mobility needs is still one of the biggest challenges preventing their use of public spaces and access to possible independence.

2. Research Question and Objective

The main purpose of this research is to explore how the accessibility is implemented in urban planning in the context of Kathmandu. More specifically, this research tries to understand about the factors that have led to the poor implementation of PWD-friendly policies in infrastructure planning and its consequences. As such, the purpose of the research is to answer the following question:

How can accessibility be implemented in planning of public spaces in Kathmandu so that they become PWDs friendly?.

The main objectives of this research can be outlined as follows:

- To study the present condition of public urban spaces (sidewalks, bus parks, and open spaces) and infrastructures (bus stops, pedestrian crossings, foot over bridges/ subways, public building entrances etc.) in Kathmandu with regards to their ease of access and utilization by the PWDs
- To identify the actual needs and determine the problems encountered by PWDs in urban areas like Kathmandu when it comes to having accessibility to public spaces and infrastructures, places of services and transportation
- To review the existing practices of planning and policies related to inclusive urban planning and development

3. Methodology

The research, which is both qualitative and quantitative in nature, uses direct observation, questionnaire survey and key informant interviews as the tool to collect primary data and information about the existing condition of accessibility in Kathmandu and the problems faced by the PWDs. Qualitative data is utilized to support or expand upon quantitative data and adds to the description. The secondary data are extracted from available policy documents, previous studies, reports, books and journals and examples of national and international practices in accessibility. From extensive literature review, a framework matrix consisting of the best recognized parameters of accessibility and universal design principles is created, against which the existing conditions of accessibility

can be compared.

For the purpose of studying accessibility in Kathmandu, stretch area from Sundhara to Ratnapark, a commercial and transportation hub of Kathmandu city is chosen as a representative case. Streets around Ratnapark are one of the most crowded ones in the capital- the streets absorb everyone including the ordinary and the PWDs as the area lies in the center of Kathmandu and the streets not only serve the variety of functions related to people's daily lives but also provide gateways to many attractions in the area. The site area is divided into nine different zones based on land use and a data sheet consisting of date, time and number of persons is prepared to find the frequency of use by PWDs in each zone.

4. Site Overview and Data

4.1 Micro accessibility

The study area acts as a commercial, transportation and recreational hub of Kathmandu Metropolitan City. The public spaces are interconnected by a major street i.e. the street around the Tundikhel (see Figure 1). The study area connects commercial areas like New Road, Indrachowk, Ason, Mahabaudhha, Khichapokhari, etc. to the people from Kathmandu valley. Many people also use this street for their daily activities. This street acts as a major conduit of access to public buildings like hospitals (Bir Hospital and Trauma Center), shopping malls and government buildings and connects them to the transportation network of Kathmandu valley. Even though in the macro level, the public spaces along the street are accessible by public transportation from all over the valley, in the micro level, linkages to services and public space in the area of study are, however, not accessible to PWDs because of physical obstructions in the built environment and presently available infrastructures.

4.2 Frequency of Use by PWDs

The study area is divided into nine zones the basis of provision of services and use of land (Figure 2). Each zone of the stretch area was visually observed, and a data sheet was prepared to record and find out the frequency of use by PWDs in each zone. From the observation it was found that the fourth zone along Bir Hospital is the one mostly used by the PWDs. The concentration of PWDs is more towards the services

and transportation facilities such as hospitals, shops, bus stops and crossings. During the observation, 5-6 PWDs were found to be using public spaces every hour. Among them, crutch users and visually impaired people seemed to outnumber the wheelchair users. The fact that the majority of the PWDs found in the area of study were crutch users is probably due to the presence of health services like Bir Hospital, National Trauma Centre, and the Army hospital in the area. The majority of PWDs were found to be of age group 20-30 years, an economically more active and physically stronger group compared to other age group. The majority of the PWDs were unemployed and lacked proper education and training as they are deprived of physical and social infrastructures that are conducive to their educational needs.

4.3 Evaluation of Existing Condition of Public Spaces

Sidewalks

As the area is located in the commercial center of Kathmandu, it accommodates a large volume of pedestrian traffic every day and gets especially crowded during major festivals like Dashain, Tihar, etc. In most of the areas, widths of sidewalks are sufficient but in some, they are too congested for large volume of pedestrian traffic. In most areas, pavement blocks were broken or removed, creating uneven surfaces that might lead to accidents or injuries to crutch or wheelchair users and visually impaired people. Haphazard placement of overhead pedestrian bridges in the area has made the sidewalks congested and narrow. Tactile tiles are provided with directional and warning tiles in each segment of the sidewalks; however, in most of the places they are discontinuous and lead to physical obstructions like trees, broken pavements and drainage covers on the sidewalks. The level difference between sidewalks and road is high i.e. 230-300 mm and lack ramped kerbs. Sidewalks are also encroached by tree plantation, construction works, electric poles, vendors and parked vehicles. Thus, the experience of PWDs in using the sidewalks is not seamless as they face different hurdles during movement. Compared to the standards of accessibility which emphasize equitable, flexible, and intuitive use of public spaces as well as require them to have perceptible information, tolerance for error and be of approachable size and space, the existing sidewalks do not meet them even at the minimum.

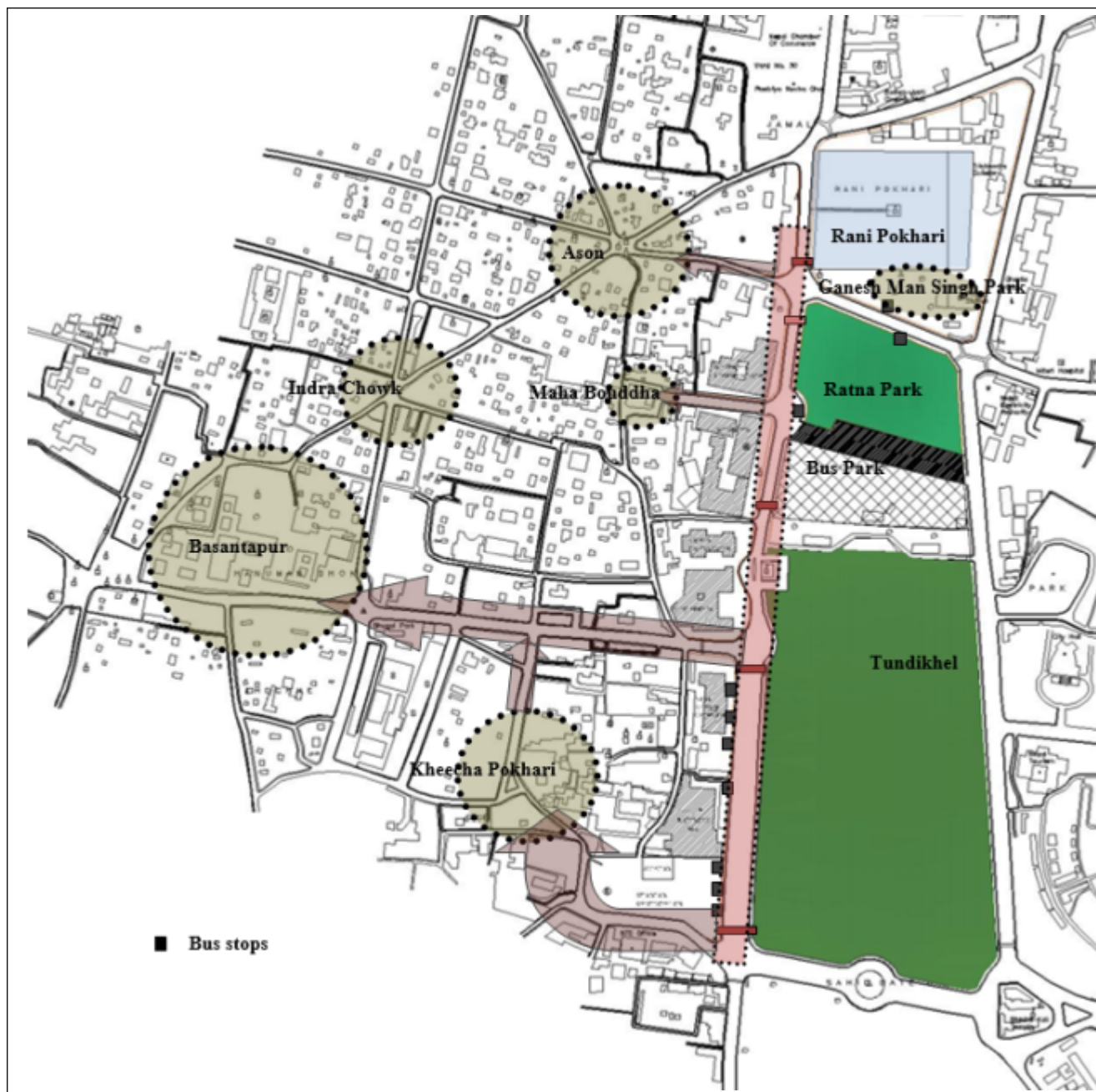


Figure 1: Interlinkage between the services and public spaces in the area of study

Pedestrian Crossings

The road crossings are not properly indicated with zebra crossings and signage in the intersections. The level difference between roads and sidewalks is too high for wheelchair users. Pedestrian crossings also lack directional and warning tactile tiles. Pedestrians seemed to be crossing the roads haphazardly and PWDs do not feel safe while crossing the roads.

Bus Stops

A bus stop is the first point of contact between passengers and bus services. There are three bus stops in the study area, with nine bus waiting shades- seven in Sundhara, one each in Ratnapark and opposite to Ratnapark. These bus stops serve bus routes to and from various places of Kathmandu like Gongabu, Balaju, Imadol, and Budhanilakantha etc. All bus stops are connected to the sidewalks and lead to public buildings with commercial purposes and hospitals. The existing pavements at bus stops are broken and kerbs are too high; bus stops lack

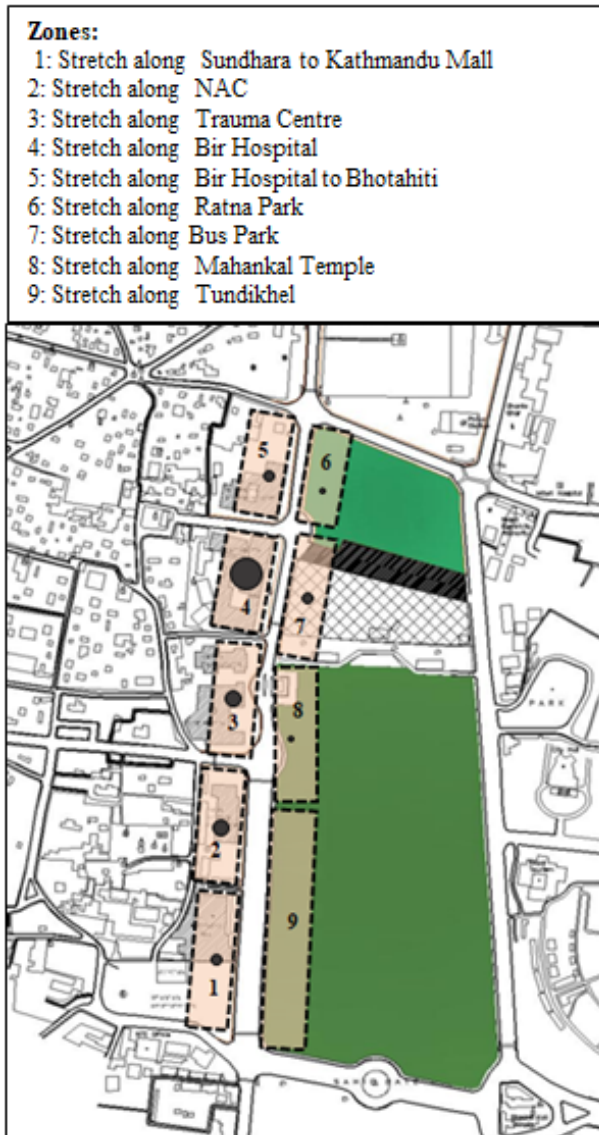


Figure 2: Division of the area of study into zones for observation; the size of the bubbles are proportional to the number of PWDs observed in the zone; smallest =1 person, biggest =12 persons

information about bus routes and auditory cues; and bus shades are improperly designed. The PWDs do not feel that the bus stops are accessible to them.

Subways or Foot Over-bridges

The study area consists of three pedestrian bridges and one subway, all of which are not accessible to PWDs. They lack even the minimums of accessibility such as ramps, tactile markings and riser height. The bridges have slippery treads and subways are encroached by shops and both are in poor physical condition. PWDs do not feel safe using the subways and foot over-bridges.

Public Building Entrances

Within the area of study, there are different public buildings such as Dharahara (under construction), Kathmandu Mall (commercial building), Nepal Airlines Corporation (government building), Nepal Army Hospital, Trauma Center and Bir Hospital (hospital buildings). The linkage between roads, sidewalks, bus stops and these buildings are defined but adjacent sidewalks are not accessible to PWDs. The sidewalk connects the major components of the public spaces to the transportation networks.

Open Spaces/ Parks

Ratna Park, Ganesh Man Singh Park and Tundikhel are the major parks and open spaces in the study area which are accessible from the transportation network. Although the internal part of Ratnapark and Ganesh Man Singh Park are designed in consideration with the requirements and needs of PWDs, Ratnapark still lacks ramps and sufficient width of gate in the entrance making it inaccessible to the PWDs from outside. In that respect, Tundikhel can be considered accessible to PWDs.

Bus Park

The study area includes the Old Bus Park which connects the area with other places of Kathmandu valley. The bus park caters to the transportation from nearby places as well as places as far as Dhulikhel, Banepa and Thankot. Accessibility to the area is poor because the buses are haphazardly parked and do not have designated stops for pedestrians. The signage and information about the routes are not clear to the people. The surface of the bus park is broken and not even which makes it inaccessible to wheelchair users.

Public Toilets

Within the area of study, there is provision of three toilets- one outside Ratna Park and two under separate foot over- bridges. The public toilet outside Ratna Park is somehow provided with ramps for wheelchair users but is hardly usable as it does not meet the required standard of ramp width and gradient. Toilets under the foot over- bridges are too congested and do not have enough width of 600 mm at entrances and are in poor condition.

5. Analysis and Discussion

5.1 Analysis Based on Observation

Each zone of the study area was observed to find out which segment is the one mostly used by PWDs within the study area. The segment along Bir Hospital, National Trauma Centre, and Nepal Airlines Corporation is the one most frequently used by PWDs. This was probably due to the presence of one of the largest hospitals of the country. The sidewalk along the hospital building in this zone also links the Kathmandu valley to the major commercial area comprising New Road, Ason, Indrachowk and Kathmandu Durbar Square. The facilities such as bus stops and public buildings are also lined up in this portion; so this stretch is most frequently used by the PWDs. On detailed and timely observation, it was found that the zones along Tundikhel were not as frequently used by the PWDs. The sidewalks on those segments are also relatively continuous, wide enough to use, with intact pavements and had tactile makings without obstruction. This might be due to the relatively less wear and tear resulting from less frequent use by pedestrians because of an absence of services and facilities like bus stops, public buildings, and commercial area, etc on that side. The major findings made from the observation can be outlined as follows:

- The frequency of use of public spaces depends on the services and facilities provided in the area
- The land use (commercial, institutional, open spaces, etc.) and transportation infrastructures (bus stops, bus parks, etc.) play a major role in the vibrant use of public spaces
- The physical condition of infrastructures deteriorate when they are frequently used
- The public spaces, their infrastructures and elements of accessibility need to be maintained regularly and systematically over time to keep them safe to be used by PWDs

When the site conditions of the public spaces in the area of study are compared with the principles of accessibility outlined in Section 1.1, they do not meet the criteria required to be considered providing accessibility. This shows that the physical infrastructures are not designed and planned to meet the issues and requirements of PWDs, and a long term vision and continuity in infrastructure development is lacking.

5.2 Analysis based on Questionnaire Survey

Problems Faced by PWDs

As shown in the chart in Figure 3, for the majority of the PWDs, the most common problems in using the public spaces accessibly were that they were overcrowded and had broken pavements. Similarly, poor conditions of roads and pathways (for example, pathways being discontinuous and intermittent) are also significant problems faced by all types of PWDs. The fact that many PWDs also point out to the absence of adequate or designated pedestrian crossings show that not even the most basic aspects of accessibility are fulfilled in the public spaces of Kathmandu. Designating and maintaining pedestrian crossings should, in theory, have been one of the most economical solutions to providing accessibility. However, the absence of them shows that the problem is not economical but that of recognition, policy, implementation and willpower.

Challenges Faced by PWDs

For most of the PWDs, the major challenge in using public spaces is the issue of a lack of safe pedestrian infrastructures (Figure 4). Almost an equal number of them could also clearly see that the lack of co-ordination between government bodies is responsible for creating challenges to their accessibility to public spaces. The PWDs could also clearly feel that the policies enabling accessibility are poorly implemented in practice. The responses given by the PWDs regarding the challenges faced by them in terms of accessibility to the public spaces show that there is not 'one particular' problem or a challenge but a multiple of them with various facets to them. The problems and challenges relate to both the physical infrastructures and facilities as well as to the policies, acts and guidelines and the lack of their implementation.

5.3 Analysis Based on Key Informant Interviews

Researcher's interview with different people and experts involved in the advocacy and planning of accessibility revealed barriers to accessibility that were structural, institutional and social in nature. Laxmi Gurung, a vendor with low vision who is also a member of an organization of the Blinds and advocate of women's rights, has faced social barriers such as discrimination in family and deprivation of education

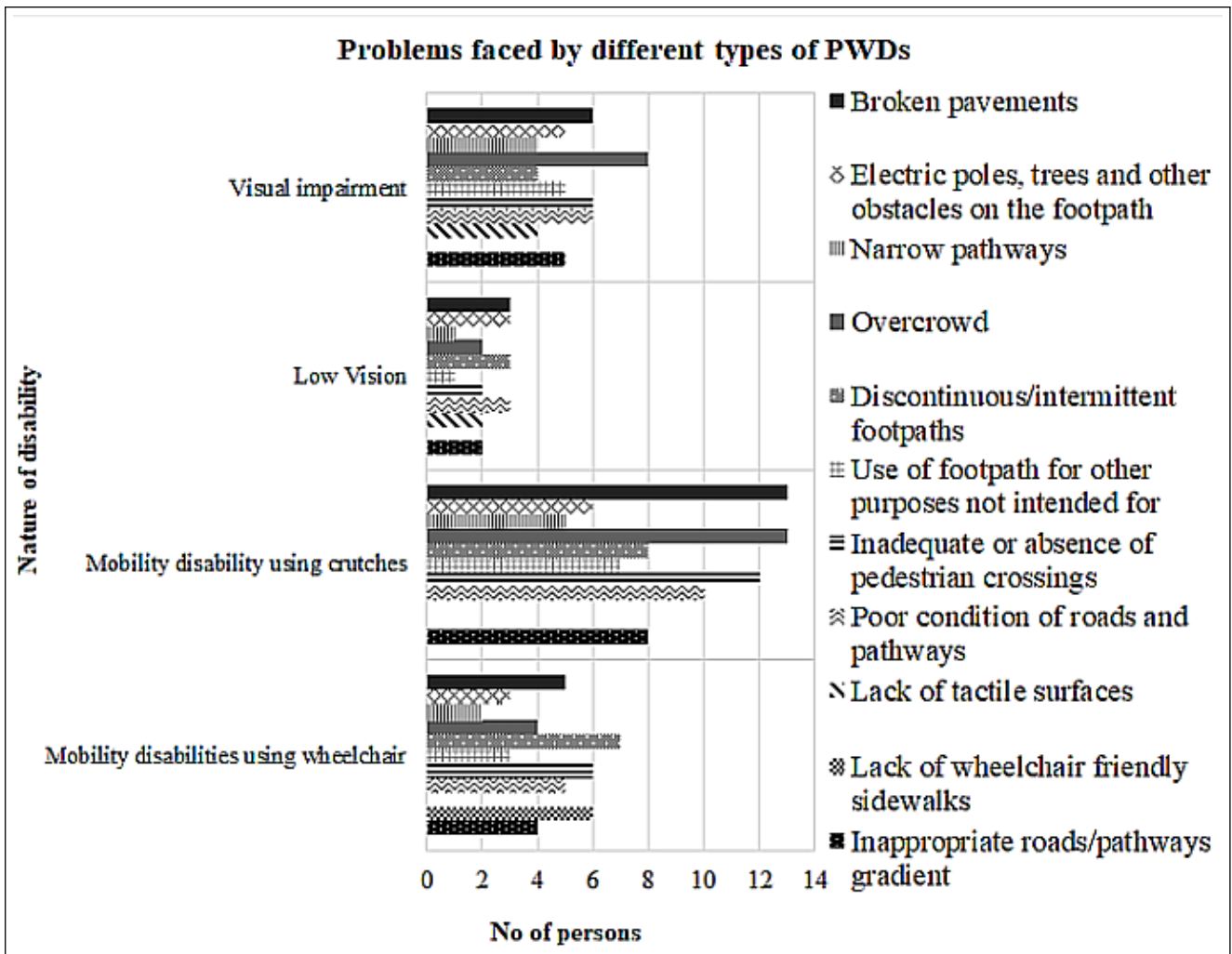


Figure 3: Various problems faced by PWDs according to their nature of disability

due to the lack of infrastructures that met her needs. She has also faced attitudinal barriers in her daily life; for example, people are reluctant to respond to her when she asks about routes and directions in public transportation.

Bimal Paudel, an accessibility expert in National Federation of the Disabled- Nepal (NFDN), pointed out that it does not cost fortune to make PWDs-friendly infrastructures and may cost merely 5-10% more than the present total cost, but a lack of mandatory rules for the implementation of acts and policies safeguarding the rights of accessibility meant that for the PWDs, accessibility was a dream limited to paper.

Milan Bagale, another accessibility expert in NFDN was of the opinion that the driving principle of accessible infrastructure development should be that of ‘universal design’ instead of just ‘disabled friendly design’ so that the public spaces can be used by

person of all kinds of abilities.

Similarly, Rabindra Rai, an engineer at Kathmandu Metropolitan City (KMC), informed that the responsibilities of providing and maintaining different services and infrastructures in the city are given to various authorities of the government depending on size and sector and the problems of accessibility mainly stem from a lack of coordination and common approach between those authorities.

Anjan Raj Shrestha, an architect at Design Cell, lamented that the government has failed to adhere to a long term vision in physical infrastructure development, has failed to acknowledge the importance of public-private partnership in guaranteeing accessibility and has also failed to take ownership of accessibility interventions made by the private sector.

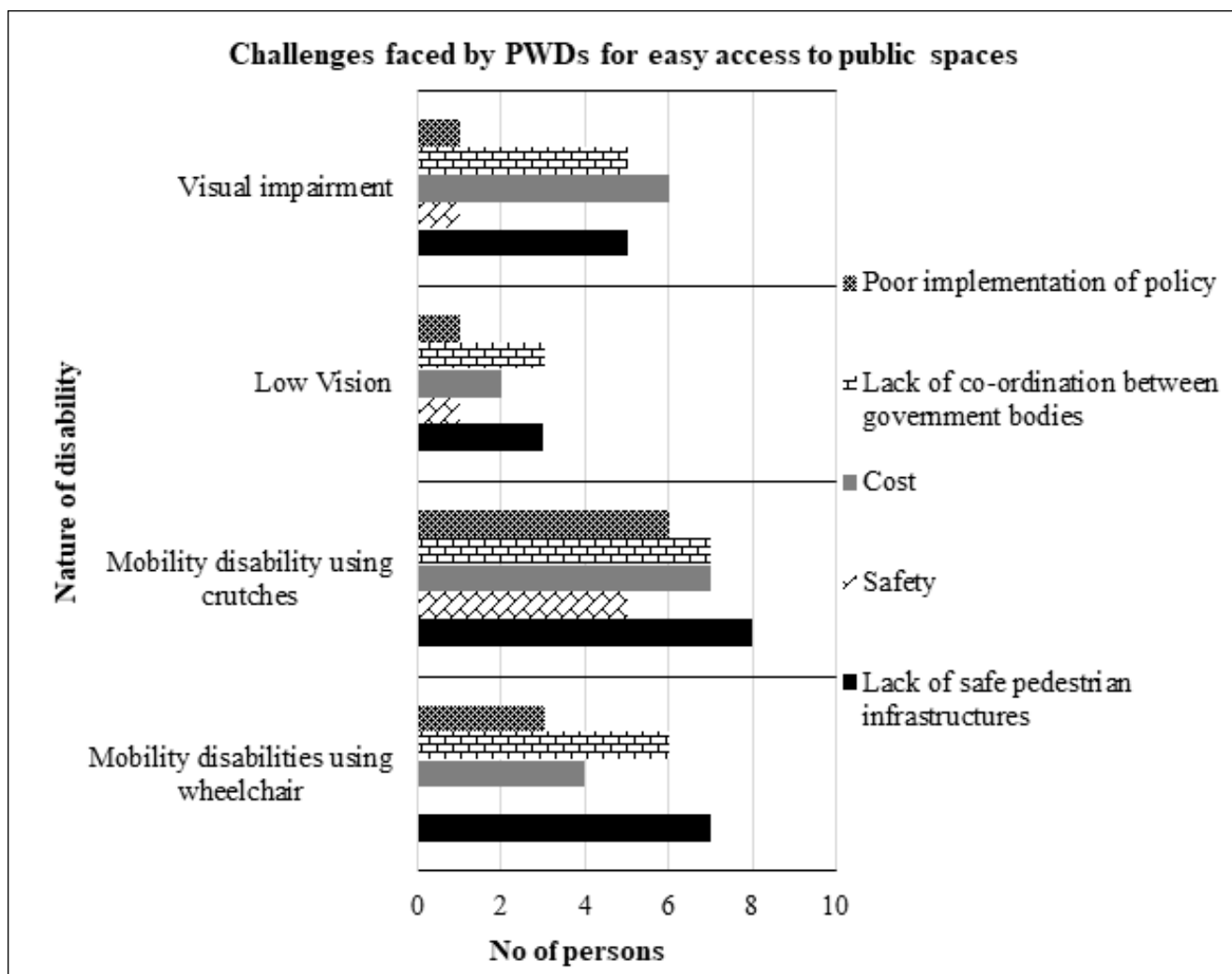


Figure 4: Various challenges faced by PWDs according to their nature of disability

6. Findings

Findings from the survey and interviews point to the existence of serious problems with respect to accessibility of PWDs to the public spaces such as sidewalks, bus stops, pedestrian crossings, foot over bridge/sub ways, etc in the city of Kathmandu. These problems prevent them from equal participation to social life by creating barriers that impede their pedestrian movement, usage of means of transportation, and access to services and commerce. Major factors that have led to barriers to physical infrastructures can be summarized as follows:

- Poor existing conditions of public spaces and physical infrastructures which do not meet the minimum standards of accessibility for PWDs
- Whatever of the few interventions intended to make public spaces accessible, are made without proper planning and neglecting the

requirements of PWDs, and hence are sporadic, not continuous and even lead to obstructions and hazards

- Poor maintenance of public spaces and infrastructures which have resulted in them being unsafe and sources of physical injuries to the pedestrians, especially the PWDs
- Lack of coordination between the government and development authorities such as the municipality, Department of Roads, Nepal Electricity Authority, KUKL, etc. as they blame each other for the causes of unplanned and haphazard construction of physical infrastructures in the city
- Lack of awareness among the government authorities regarding the importance of co-ordination between them
- Policies lacking comprehensive and holistic approach to accessibility in public spaces as the concept of inclusion is still new to Nepal

- The existence of the statement “PWDs friendly infrastructure” in every policy document merely in words but failing to concretely outline the design standards and guidelines about the ways of making the infrastructures PWDs friendly in action
- Lack of knowledge and attitude of negligence amongst the designers, planners and decision makers about the existence of accessibility and mobility standards and their usability, applicability and universal utilization value
- Insufficient by-laws which obligate the concerned professionals to make public spaces and physical infrastructures accessible for all
- Lack of long term vision on the part of government agencies in the development of public spaces and physical infrastructures
- Lack of a dedicated monitoring body of government due to which there is not only the lack of the up-to-date information about the present conditions of accessibility but also a failure to monitor the design and construction of infrastructures and services
- Lack of involvement and consultation with PWDs in planning and design as well as implementation phase in order to mainstream the ideas of mobility and accessibility in the built environment. So far, they have had to satisfy with only token representation in some policy making processes.

7. Conclusion

The concept of providing equal access and accessibility in built environment focuses on making the necessary changes for PWDs who have more limited opportunities to take advantage of services and facilities than others. This research made an attempt to explore the conditions of accessibility and the problems and challenges faced by PWDs in public spaces of Kathmandu by choosing one of its busiest areas as the site of study. The major barriers to accessibility for the PWDs identified in this research are institutional and structural (built-environment), which mainly show the lack of institutional enforcement and monitoring in physical infrastructure development in Kathmandu.

The pedestrian infrastructures and services in Kathmandu often do not meet the required standards of quality (such as usability, durability etc.), and are not safe and comfortable to be used by people with all

kinds of abilities. Infrastructures in those public spaces have been instead, identified as providing continual barriers to the usability of urban space in KMC, especially to the PWDs. The PWDs do not feel safe while using the sidewalks and pedestrian bridges because of physical obstructions such as encroachment, broken pavements, inappropriately located bus stops etc. Such hurdles not only compromise the safety of PWDs but also burden them and possibly their families financially as the cost of maintaining mobility devices like wheelchairs, crutches and walking sticks is not paltry.

Although, few interventions like placement of tactile markings (directional and warning) and provision of ramps in public building entrances are seen to have been made, they are only sporadic, are not easily usable by the PWDs and in turn contribute to the confusion rather than solution. This clearly shows that there is an attitude of negligence on the part of the authorities of implementation and that the usability and safety factor of infrastructures are not at all considered in design and planning processes. The problems also seem to arise from the lack of coordination between the various authorities of government who share the responsibility of providing physical infrastructures and services in the city and their intent to find loopholes to do away with the implementation of accessibility standards and designs outlined by the prevalent policies. As an outcome of this research, the ways in which accessibility can be improved upon and implemented in the planning of public spaces in Kathmandu are proposed as recommendations in Section 8 further below.

PWDs should no longer be treated as just a minority group and their problems with mobility, accessibility and usability should be recognized as society’s common agenda in the mainstream urban planning and design. Urban planning could and should play a vital role in improving the conditions of accessibility to the built environment by removing existing physical, institutional and social barriers in order to benefit the PWDs just like the rest of the population and to ensure their equal participation in society. Otherwise, inaccessible public spaces and barriers around us will mean the continued struggle for PWDs to guarantee their economic independence and the fulfillment of their human rights.

8. Recommendations

After analyzing the existing conditions of accessibility for PWDs to the public spaces in Kathmandu through observation, questionnaire survey (of PWDs) and interviews with key informants, the following recommendations are deemed important to be made to improve the standards of accessibility in the city:

a. Legal framework on implementation and monitoring of physical infrastructure development

In Nepal, there are various policies that are intended to ensure accessibility in public spaces but what is critically lacking is a strong legal base for implementing the policies into action and then monitoring that those are implemented. A strong legal framework can direct and obligate any infrastructure development authority to implement and periodically monitor the conditions of accessibility as specified in the policies. There are a few initiatives taken by the government to promote inclusive development on the surface but fail to detail out how the requirements of inclusive development are to be met at the grass root level.

Most of the problems of accessibility to public spaces in Kathmandu could be solved if there were better co-ordination between the different authorities of the government. A lack of ownership of the ideas of accessibility from the different government authorities responsible for infrastructure development was a major problem identified in this research. Such a situation must be thus addressed by laws which mandate the undertaking of responsibilities by authorities as well as the necessary coordination between them.

b. Design standards and guidelines incorporated in building code and by-laws

Design standards and guidelines are sets of recommendations intended to ensure a good practice in design of any space. They are intended to provide clear instructions to designers and development authorities on how to adopt specific principles, such as universal design, accessibility, mobility, etc into their designs. However, in Nepal, there are very few guidelines; even the ones stated in the 'Accessible Physical Infrastructure and Communication Services Directive for PWDs (2069)' provided by MOWCS is not able to accommodate all the aspects of accessibility. These guidelines, and if they are not

enough, various other international standards of accessibility should be made mandatory in building codes and bylaws to be followed in every approval of urban space and infrastructure development maps.

The design standards and guidelines for accessibility should specifically include the requirements to be fulfilled for public spaces such as sidewalks, bus stops and parks, pedestrian crossings, parking, public buildings (hospital, commercial, etc.), recreational parks, open spaces etc. and provide detailed narratives to the designers so that they can follow them word-by-word.

c. Public-Private Partnership in infrastructure development

The research found that some of the design and development works promoting accessibility were done by private sector in co-ordination with the government but were later not conserved by the government authority (e.g. DOR) itself. The government and its concerned authorities should take ownership of such initiatives taken by the private sector and utilize as good examples. The government should protect and improve the provisions of existing infrastructures, especially when they are developed by private sector in coordination with itself. Service providers like hospitals, educational institutions and commercial organizations should co-ordinate with the government authorities to provide accessible facilities and services in outdoor spaces that connect people from major road networks and transportation centers to the gates of service providers.

d. Involvement of PWDs in planning, implementation and monitoring level

Although there is involvement of PWDs and activists advocating for the wellbeing of PWDs in planning and policy making level, they rarely seemed to be consulted and given a role in implementation and monitoring phases. The result is poor physical infrastructures which do not meet most of the criteria of accessibility and usability. It should be the PWDs who are given leading role in monitoring whether the public spaces are fully accessible to them or not.

e. Awareness among public for behavioral changes towards PWDs

The research found that a significant section of the general public did not feel responsible towards PWDs; for example, those vending and parking in the

sidewalks who did not seem to be aware or care about the barriers created by them for the PWDs. They fail to realize that even small encroachment on public spaces can impact the safety, comfort, mobility and accessibility of a PWD. So, it is necessary to bring awareness raising programs to the public in order to make them realize how their small actions of irresponsibility can cause huge losses to the PWDs.

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References

- [1] A. Mahmoudi and K. Fanaei. Revision of urban spaces to make it accessible for disabled people in order to achieve the aim of "city for all". 2010.
- [2] Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics. *National Population and Housing Census 2011*.
- [3] NFDN. Report on accessibility audit in Kathmandu, Nepal. 2018.
- [4] A. Fletcher. Overcoming obstacles to the integration of disabled people. 2002.
- [5] S. Hasanvand and et al. Improving of urban public spaces safety in order to using physical disabled persons. 2014.