

## Public Open Spaces: Enabling or Impeding Inclusive Evacuation During Disasters

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### Abstract

The objective of this research is to identify the main barriers that public spaces pose during disasters for persons with disabilities within informal settings, where poverty, stigma and the lack of technical know-how regarding critical inclusion aspects such as universal accessibility intersect. This conflict could impede persons with disabilities from, among other aspects, evacuating, finding safe areas and meeting with the community. For this purpose, a phased design using multiple methods was employed. The first phase focused on the review of universal accessibility and disaster risk management standards. This phase allowed the building of an instrument for the observation of three case studies or neighbourhoods in the Metropolitan District of Quito: Atucucho, Carapungo and Auqui de Monjas. The territories of all the cases are highly exposed to disaster risk mainly due to their geographical locations. The second phase focused on an in-depth observation of public open space in all three neighbourhoods and the collection of quotes and experiences from older people with disabilities, their families and their neighbours, which was achieved through focus groups. The third phase focused on analysing and interpreting the data, which yielded three sub-themes concerning the barriers posed in public spaces: physical and informational accessibility; public space connectivity or the ability to generate a close network within the community; and social and cultural aspects, as persons with disabilities feel that public spaces are only being occupied by other groups, such as young people.

**Keywords:** universal accessibility, pedestrian mobility, inclusive shelter, autonomy, at-risk populations

### To cite this article:

Pacheco Barzallo, A., Fariña, J., Álvarez de Andrés, E. (2022) Public Open Spaces: Enabling or Impeding Inclusive Evacuation during Disasters, *The Journal of Public Space*, 7(2), 79-92. DOI 10.32891/jps.v7i2.1474

This article has been double blind peer reviewed and accepted for publication in *The Journal of Public Space*.



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## **Introduction**

The United Nations Convention on the Rights of Persons with Disabilities (UN CRPD) establishes that States Parties shall promote universal design to make products, environments, programmes and services usable by all people, to the greatest extent possible, without the need for adaptation or specialised design (Art. 2). It also determines that States Parties will promote universal accessibility to enable persons with disabilities to live independently and participate fully in all aspects of life on an equal basis with others (Art. 9). These countries should also take all the necessary measures to ensure the protection and safety of persons with disabilities in situations of risk (Art. 11) (United Nations, 2006). During disasters, the lack of such conditions or their poor implementation puts persons with disabilities at higher risk of being left behind or abandoned (United Nations Department of Economic and Social Affairs, no date). For example, when Hurricane Katrina struck, many wheelchair users drowned in their beds and chairs, even within specialised care settings; during the 2011 earthquake in Japan, the deaths of persons with disabilities were proportionally double those of the general population, and similar data are observed regarding disasters in Haiti and Indonesia (Aldrich and Benson, 2008; United Nations Office for Disaster Risk Reduction, 2016).

The lack of universal design and accessibility are not the only factors that increase the disaster risk for persons with disabilities; cultural attitudes, stigma and barriers to their full participation in society have the same impact. This was shown in a UN survey conducted in 126 countries, which found that only 14 per cent of people with disabilities had been consulted about disaster risk management in their communities, implying that their risk reduction needs have been ignored (United Nations Office for Disaster Risk Reduction, 2013; Hunt et al., 2015; Nunnerley et al., 2015; Stough and Kang, 2015; Skøt et al., 2016). This is particularly worrying given that, as a result of climate change, the number of disasters is expected to increase over the next few years (United Nations Refugee Agency, 2017), and therefore the disaster needs of older people and persons with disabilities should be urgently addressed.

The New Urban Agenda, the Kyoto Protocol and the Sendai Framework for Disaster Risk Reduction (DRR) have called for States Parties to establish urban and land use management policies for disaster risk management, which could be a very powerful tool through the identification of hazard-prone areas (Burby, 1998; United Nations, 2015; United Nations Human Settlements Programme, 2016), the organisation of spare capacities and urban evacuation networks (Brand and Nicholson, 2016; Sharifi, 2019), and the planning of the availability, distribution and design of public open spaces (French et al., 2019), among others. During disasters, public spaces, such as streets and sidewalks, must enable people to evacuate (Zuo, Zhou and Lin, 2015; Brand and Nicholson, 2016; Gülgün et al., 2016; Chaiyachati et al., 2018), provide the community with a common place to meet and seek shelter until the return to normal conditions (Pizzo et al., 2013), and connect vulnerable areas with safe open ones (León and March, 2014). The lack of such spaces makes cities more vulnerable to natural hazards (Hounakzahi and Fanni, 2019). For this reason, the potential of public open spaces in terms of disaster risk management should be further studied (Koren and Rus, 2019) by considering the needs of all population groups and the different needs for disaster risk reduction among societies and countries (the World Bank, International Food Policy

Research Institute and Global Facility for Disaster Reduction and Recovery, no date; Alejandra and Lara, 2019).

The particular interest of this work is to analyse the main barriers that public open space poses for persons with disabilities, impeding them from using it to reduce their risk during disasters, specifically within informal settings. In such contexts, the lack of technical know-how leads to the poor implementation of construction standards, a lack of universal accessibility, and the presence of several barriers to the mobility of persons with disabilities and older people and their use of public spaces (Food and Agriculture Organization of the United Nations and United Nations Human Settlements Programme, 2008; Mitra, Posarac and Vick, 2013; United Nations Committee on the Rights of Persons with Disabilities, 2014). In the Metropolitan District of Quito, the capital of Ecuador, a large part of the informal territory is highly exposed to disaster risk as the country is located on the west coast of South America, an area with some of the highest tectonic complexity in the world (Food and Agriculture Organization of the United Nations and United Nations Human Settlements Programme, 2008). Quito was built on geological faults (Aguiar, 2017), and it is estimated that 296,100 of its 423,000 hectares could be seriously affected by the occurrence of different phenomena derived from their geographical location (Municipio de Quito, 2015). From the latest disaster records available, with the last event being an earthquake that took place in April 2016, some data show that people with disabilities are among the most affected groups (*La República*, 2016; Secretaria de Gestión de Riesgos, 2016), particularly in poor and informal areas where vulnerability and exclusion intersect (Vicepresidencia Ecuador, 2012).

## **Methodology**

The research uses a mixed methodology and includes three phases with a multi-case approach. It must be mentioned that this methodology was used in a research project focused on several aspects for inclusive disaster risk management. In this work we present the results referring to public space. Findings from other aspects of the study will be reported elsewhere.

### ***Phase 1: Literary review***

The literary review process focused on collecting national standards about disaster risk reduction and universal accessibility from documents such as the NTE INEN-ISO 21542 Standard on the Accessibility and Usability of the Built Environment, which was adopted in Ecuador in 2014, and the Ecuadorian Construction Standard (NEC), as well as local guides from Ecuador's National Secretariat for Risk Management. The set of standards collected concerns pedestrian accessibility; the availability and quality of ramps and walkways; the availability of tactile flooring and pedestrian crossings; the proximity of public transportation facilities; and the availability of inclusive signage, among other aspects. An indicator of pedestrian urban proximity was necessary for the analysis, and it was set at 200 metres by the research team as no inclusive parameter was found in the existing literature; deeper analysis is thus required in future studies.

### ***Phase 2: Case selection, focus groups and spatial audits***

The case selection focused on identifying informal territories in Quito with the highest exposure to disasters based on their locations. The final selection of cases was also marked by the willingness of community leaders to participate in the study. Three neighbourhoods were selected: Atucucho, Carapungo and Auqui de Monjas.

In each neighbourhood, focus groups were held to collect perceptions and experiences from older persons with disabilities, their families and their neighbours regarding public open spaces and the use of such areas during disasters. As no contact information for potential participants was initially available and no organisations of persons with disabilities (OPDs) were identified within the case studies, invitations to join the sessions were made by community leaders, which resulted in the following numbers of participants: 21 in Atucucho, 12 in Carapungo and 16 in Auqui. Among these, 27 were older people with special healthcare needs, only 13 had legally recognised disabilities, 8 had physical disabilities, 2 had visual disabilities, 1 had a hearing disability, and 2 had multiple disabilities. People with intellectual disabilities did not participate. Eight people required mechanisms or devices in their daily lives. The remaining participants were neighbours, family members or caregivers. It was decided that the sessions would not be filmed or photographed; instead, the conversations were recorded and notes were taken. In addition, no personal data or individual-specific health information was requested. All the sessions were held in the communal houses of each case, where ramps and different verbal and written communication channels were provided. Before starting the meetings, the participants were informed of the study's objectives and signed an informed consent letter.

Spatial audits were carried out in all the public open spaces, such as in the parks and squares of all the neighbourhoods and their entire street network. The spatial audits were carried out by professors, students in their final year and architects of the International University of Ecuador, who visited and walked around all the streets and public open spaces of the case studies.

### ***Phase 3: Data analysis***

The qualitative data from focus groups were studied following thematic analysis, which yielded three sub-themes concerning the characteristics of public open spaces that prevent persons with disabilities and older people from using them and decrease their disaster risk reduction needs as established in the results section.

The data of the spatial audits were first quantified to obtain global results describing the actual conditions of public space. Then, to further interpret these data and map them within the territories of the public space of the case studies, they were aggregated and categorised into three levels – "favourable interactions", "likely to be blocked interactions" and "blocked interactions" – following similar risk and inclusion models, such as the methodology for Disability Inclusion in Hospital Disaster Risk Management (INGRID-H) (Pan American Health Organization, 2018) and the Ecuadorian methodology for developing universal accessibility plans, which was recognised as a best practice model by the Design for All Foundation (Europe, 2015). These three levels are an abstraction of the interactions that could occur within a disaster scene between public spaces and people with disabilities. The categorised results were subsequently mapped in the two case studies of Atucucho and Carapungo; an updated cadastral was not found for Auqui de Monjas.

The "blocked interactions" level indicates that the evaluated space does not meet any or minimum inclusion and disaster risk management standards. The "favourable interactions" level indicates that the evaluated space satisfies several or most of the disaster risk

management and inclusion standards. The "likely to be blocked interactions" level indicates that the space meets some of the standards but not others, impeding the creation of accessible chains within the built environment. To establish the quantitative limits of each level, identical values were granted to each standard, and minimum and maximum numerical values were set for each level.

**Limitations**

The main limitation of the methodology concerned the impossibility of directly observing a disaster. However, considering the notion that “what does not work properly in normality will not work well in times of crisis; it will only get worse” (P. Burbano, interview, 30 September 2019), the analysis was performed within daily life scenarios where people face physical and cultural barriers and define their risk disaster needs. A second limitation regarded the lack of contact information for potential participants and the fact that no local OPDs were identified. As a consequence, only older persons with disabilities participated thanks to their enrolment in physical and recreational activities in the community.

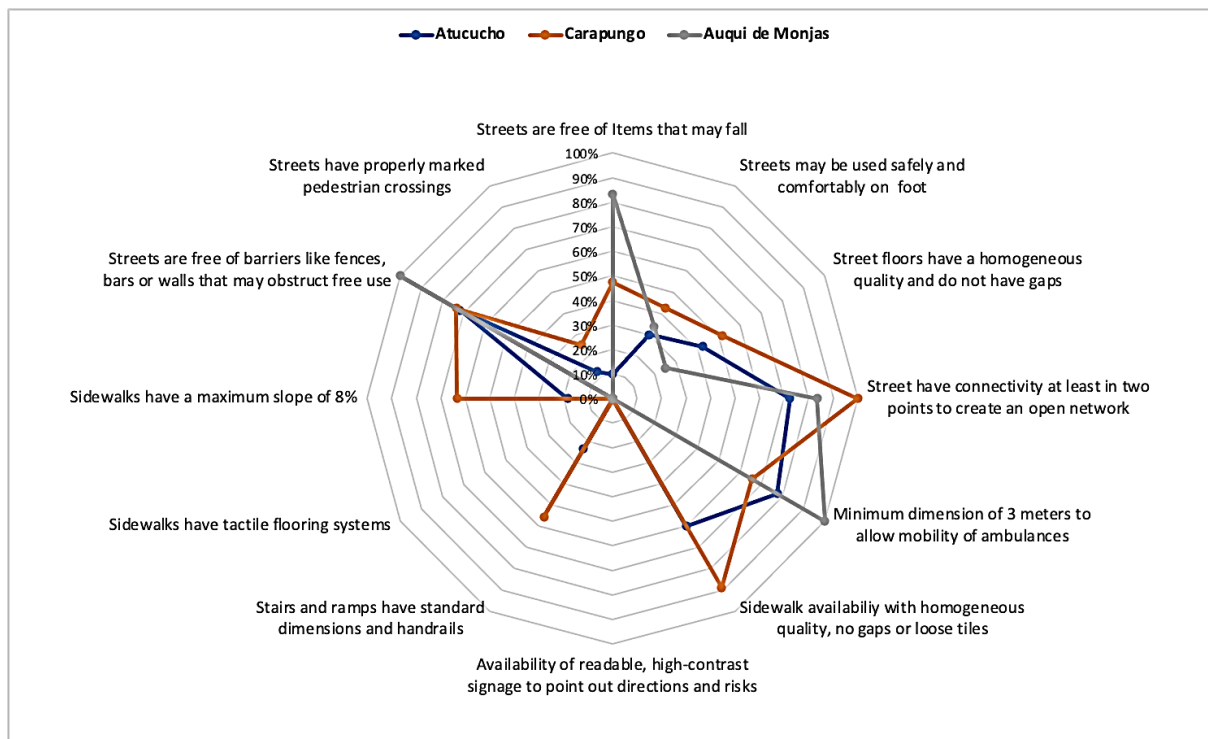


Figure 1. Results of physical and informational environments in street networks.

**Results**

The results obtained from the focus groups indicate that the characteristics of public open spaces that prevent older people with disabilities from using them to reduce their disaster risk are related to three different dimensions: first, physical and informational elements, which must comply with universal accessibility standards; second, public open space availability and connectivity within the entire community; and third, social and cultural aspects, such as exclusion attitudes and stigmas that still rule within all case studies.

Atucucho is a neighbourhood whose beginnings date back to the 1980s (*El Telégrafo*, 2014) and that nowadays has around 20,000 inhabitants (*Quito Informa*, 2022). Similarly, Auqui de Monjas was established in 1966 by its community (Carvajal Flores, 2013). In contrast, Carapungo was formed in 1984 as part of a governmental programme to provide 84,000 homes (*El Universo*, 2009); however, to date the neighbourhood is not congruent with its initial design, and its population has multiplied to the extent that it is now being considered a micro-city within Quito (*El Telégrafo*, 2015).

#### Accessibility to physical and informational environments

The results from the analysis of public open spaces indicate that physical and informational environments create several barriers to inclusive disaster risk reduction. Figure 1 shows the descriptive results obtained from the observation of street networks. These have many shortcomings in terms of universal accessibility or risk management standards, with the lack of sidewalks with tactile flooring systems, and the lack of readable, high-contrast signage being the two main barriers in all case studies. Table 1 details the descriptive results of the conditions of public open areas such as parks and squares. All cases lack inclusive signs and tactile flooring. Also, the quality of slopes and pedestrian crossings present major universal accessibility issues.

Standard	Atucucho	Carapungo	Auqui de Monjas
Public open spaces are free of items that may fall	48%	67%	67%
Public spaces can be entered safely and comfortably on foot	31%	43%	27%
The floors of public spaces have a homogeneous quality and do not have gaps or loose tiles	37%	58%	33%
Availability of a bus stop within 200 meters from public space perimeters	20%	53%	100%
The access to public spaces has the minimum dimensions for the entrance of an ambulance (3 free meters)	36%	76%	0%
Availability of readable, high-contrast signage to point out directions and risks	5%	3%	0%
Stairs and ramps have standard dimensions and handrails	20%	69%	17%
Walkways inside public spaces have ramps, if needed, and have tactile floors	0%	0%	0%
Walkways have a maximum slope of 8%	32%	67%	33%
Public spaces are free of barriers, fences, or any other elements that may impede free access	44%	57%	100%
Near the entrance to public spaces, there are properly marked pedestrian crossings	8%	4%	0%

**Availability and connectivity of public open spaces within the entire community**

This aspect of the analysis focuses on the distribution and availability of a network of public open spaces such as parks and squares for the entire community within the territories of the case studies.

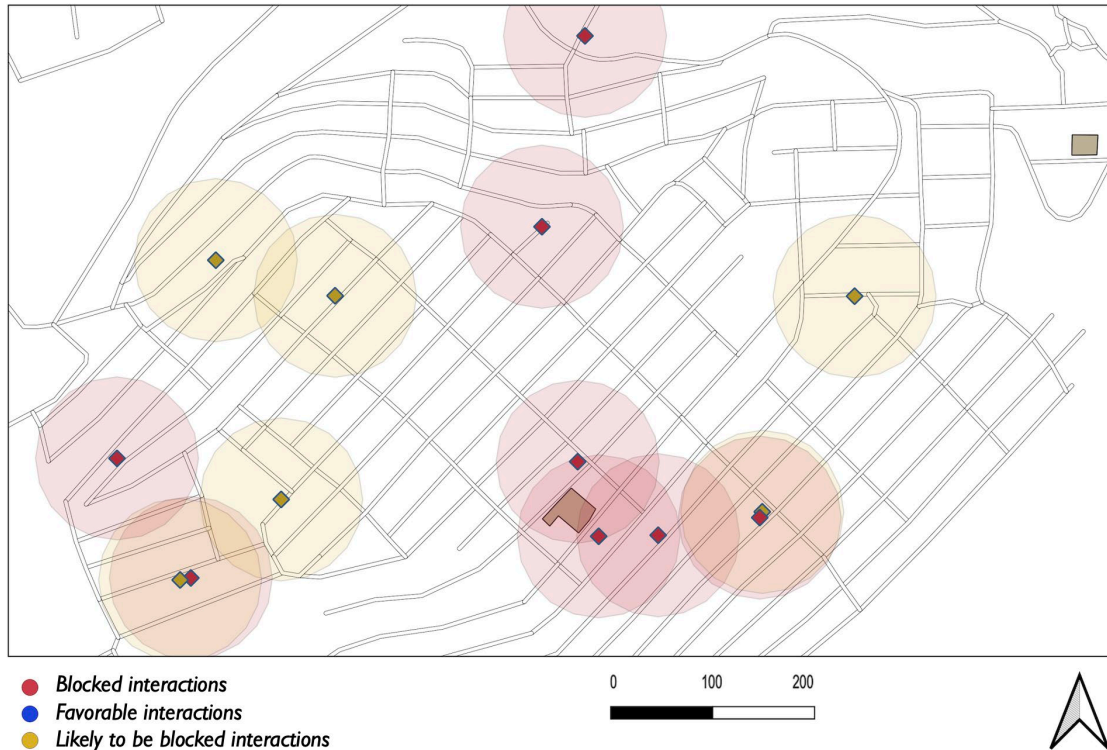


Figure 2 Map with the categorized results of public spaces in Atucucho. Discussion available below.

Figure 2 is a map of Atucucho and all its public spaces, which are mostly located on the outskirts of the neighbourhood, while the central part of the territory lacks open areas. Of these public spaces, eight are blocking interactions with older people with disabilities, six are likely to be blocking such interactions, and none of the public spaces favour these interactions. Around each space, a radius of 200 metres showing the proximity area has been marked, revealing how most of the territory does not have a public open space nearby. The participants of the Atucucho focus group mentioned how it was very difficult for them to access public places because they are far away, because they have complicated topography, and because the quality of the sidewalks is not good. In Carapungo, the network of public spaces shows a substantial improvement in comparison with Atucucho. This neighbourhood has a much wider network of public open areas distributed throughout the territory. However, as indicated on the following map, 30 of these areas are yellow, which means that these are likely to be blocking interactions with older people with disabilities during disasters. Of the remaining public areas, 27 are red and blocking such interactions, and 6 are blue, which means they favour the interactions. These results are linked to the flat topography of the territory and the main accessibility issues are related to the lack of maintenance of walkways, the absence of tactile floors and the lack of informational elements.

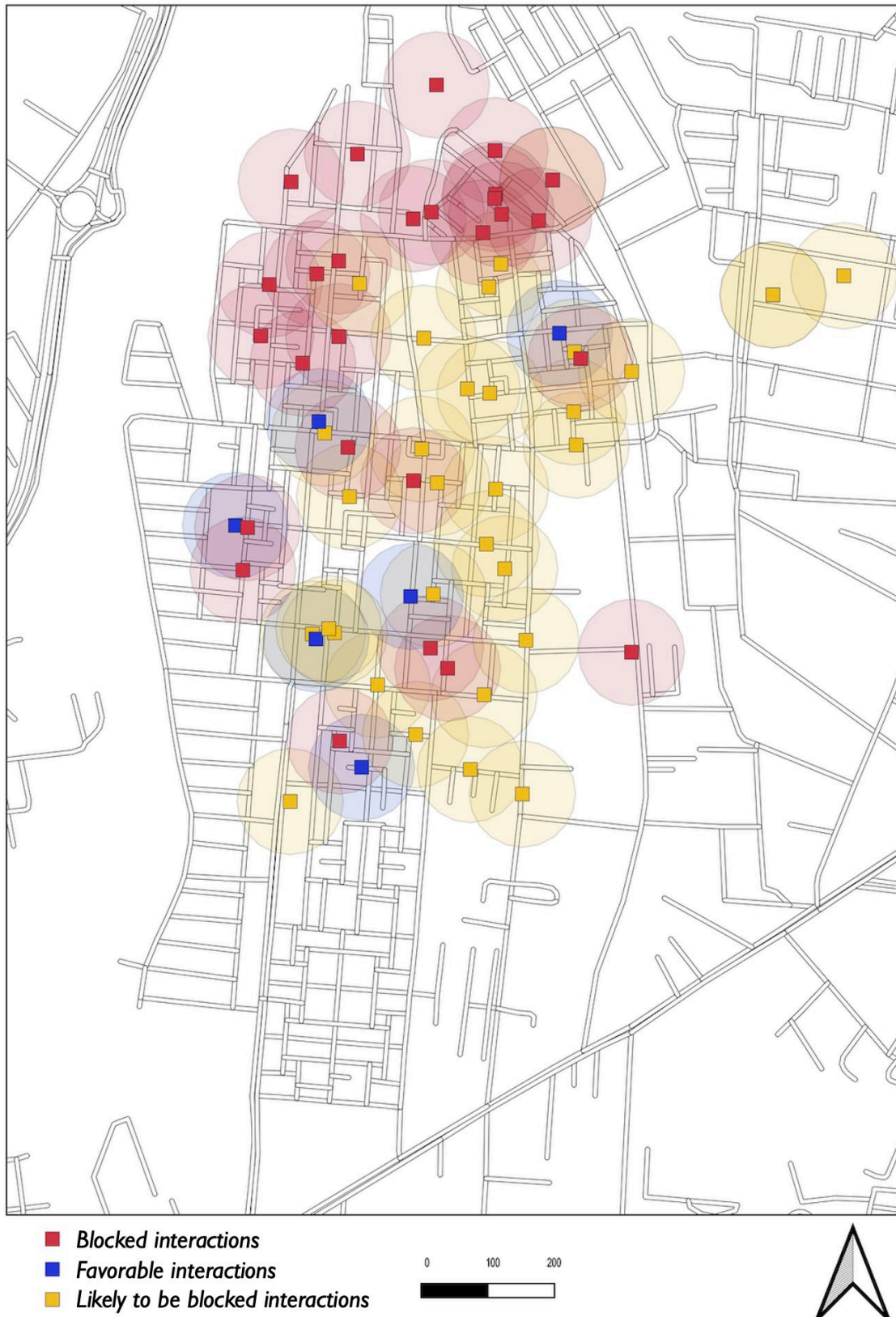


Figure 3. Map with the categorized results of public spaces in Carapungo (Source: Author, 2021).



### **Social and cultural environments**

Beliefs, attitudes and stigma towards older persons and people with disabilities remain an important issue in all the case studies. Just as there are different definitions of disability, there are also different models of disability. The functional model sees an individual as having a problem, whereas the social one sees society as the root of the problem in terms of not being able to accommodate everybody (Oliver and Barnes, 2012; Christian Blind Mission, 2017; Levitt, 2017). During the focus groups and in all the cases, it was possible to identify how the functional model prevails in the community; persons with disabilities are seen as defenceless and in need of help to reduce their disaster risk, and their autonomy and self-protection rights are ignored. The dominance of this functional model is also present among persons with disabilities who, faced with constant barriers, have developed a dependency and fatalistic ideas about their possibilities for acting and protecting themselves in case of disasters. Some participants mentioned the following:

*“... in those cases ... the police could help. And there are also some groups, like the Red Cross ... if there is an earthquake, they would have to see exactly how they can help people who cannot fend for themselves ...” (Participant from Atucucho, July 2019)*

*“... we do not coordinate that ... the neighbourhood committee links vulnerable groups with the relevant institutions, and they help them there ...” (Participant from Carapungo, July 2019)*

*“... in an emergency, I would stay at home. How scary to go out! If my family came later, they would not find me ...” (Participant from Auqui de Monjas, November 2018)*

*“... where I live, it is not paved, and I have to walk a lot for everything ... it is pure mud, and it would be chaos in the event of an earthquake. I don't know if I could get out ...” (Participant from Atucucho, July 2019)*

Another cultural barrier identified is linked to the mobility model heavily based on private vehicles, which is detrimental to pedestrian mobility and inclusion. In all the case studies, sidewalks are repeatedly hampered by the presence of infrastructures to facilitate the entry and exit of vehicles from homes. One participant mentioned the following:

*“... here, everything gets congested, that's the law, it's going to happen in the case of a disaster ... also, the number of vehicles is large, and there are just a few routes to evacuate ... I mean, this one here ..., it's paved, and the one over there I think is also paved ...” (Participant from Atucucho, July 2019)*

Finally, during the focus groups, older people mentioned that the behaviour of other population groups is a major obstacle that blocks their interactions with public spaces and even prevents them from trying to access them. In addition to attitudinal barriers, there is a tendency to create extra barriers to the access of public spaces in all the neighbourhoods, as several parks, alleys and even some streets have fences, doors or

padlocks, which some neighbours have installed in an attempt to control their use based on alleged problems with regard to insecurity or cleanliness.

*“... in those cases, you feel frightened when you go out because sometimes you do not know how to get somewhere or where to go because most of the parks are used by younger people. For old people, there are only a few spaces, and they may also be locked ...” (Participant from Atucucho, July 2019)*

*“... there are parks, there are also courts, but for older people there are not many spaces ... young people are sometimes drinking there ...” (Participant from Atucucho, July 2019)*

## **Conclusion**

Three sub-themes have been highlighted regarding the characteristics of public open spaces that could prevent persons with disabilities and older people from using them and decrease their disaster risk reduction needs: physical and informational accessibility; connectivity and availability within the entire community; and social and cultural aspects. This last one is of major relevance as stigma and negative concepts towards disabilities shape the ways societies design, create and use their public spaces.

Apart from evidencing the poor implementation of local disaster risk management and universal accessibility standards, spatial audits highlight the conditions of exclusion that people with disabilities face in daily life, and during disasters, which impede them from evacuating and meeting the community. Particularly, for informal settings, the audit results call for urgent urban policies and projects targeting inclusion, with active participation and political representation of persons with disabilities. It is very important to deepen the analysis of the scope that national and international policies may have in informal contexts since, at the time of this investigation, the standards used seemed completely alien. In this sense, specific projects for the implementation of the UN CRPD and the new urban agenda in these types of communities should be strongly encouraged.

Even when disasters cannot be directly observed, the analysis of public spaces based on people's daily lives allows an understanding of some barriers that persons with disabilities and older people could face, to a greater extent, in case of disaster. Daily negative experiences reinforce stigmas and dependency and block autonomy, and this will not change during an emergency. Therefore, inclusive disaster risk management should pay special attention to the autonomous daily life conditions of persons with disabilities and not only to technical efforts, such as drills and institutional responses. It is transcendental to deepen the study of the messages, ideas and perceptions that people construct from their interactions with the physical and informational environments. The ideas collected during the focus groups indicate that older people with disabilities have a negative view of public spaces.

Regarding the methodology implemented for the analysis, it should be mentioned that the techniques used for the observation of the public spaces, as well as the categorisation of the results, are consistent with the social model of disability, observing the conditions of public spaces as a result of social exclusion. This approach is congruent with the UN CRPD and its adoption should be encouraged. In future studies,

it would be important to complement the set of standards collected and further analyse the categories established for data interpretation.

Finally, although the case studies were selected based on their high exposure to risk and their conditions of informality, it is crucial to mention that the barriers to the use of public spaces during disasters are not isolated issues and that the results represent what is happening in several territories, cities and other countries in Latin America.

## References

- Aguiar, R. (2017) *Microzonificación sísmica de Quito*, Departamento de Ciencias de la Tierra y la Construcción ESPE. Quito.
- Aldrich, N. and Benson, W. F. (2008) *Disaster preparedness and the chronic disease needs of vulnerable older adults*. *Preventing Chronic Disease*. Centers for Disease Control and Prevention (CDC). Available at: [http://www.cdc.gov/pcd/issues/2008/jan/07\\_0135.htm](http://www.cdc.gov/pcd/issues/2008/jan/07_0135.htm) (Accessed: 29 January 2021)
- Alejandra, M. and Lara, C. (2019) *El reto de la sustentabilidad ante la expansión urbana y la producción social de vivienda*. Available at: <https://www.researchgate.net/publication/336316214> (Accessed: 11 April 2021)
- Brand, D. and Nicholson, H. (2016) "Public space and recovery: learning from post-earthquake Christchurch," *Journal of Urban Design*, 21(2), pp. 159-176. Available at: <https://www.tandfonline.com/doi/abs/10.1080/13574809.2015.1133231> (Accessed: 19 March 2022)
- Burby, R. (1998) *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Joseph Henry Press, Washington, DC.
- Carvajal Flores, B. J. (2013) *Estudio del déficit habitacional y de hábitat del barrio de Auqui de Monjas de la Parroquia de San Blas del Distrito Metropolitano de Quito 2009-2010*. Quito.
- Chaiyachati, K. H. et al. (2018) "Evaluating the association between the built environment and primary care access for new Medicaid enrollees in an urban environment using Walk and Transit Scores," *Preventive Medicine Reports*. Elsevier, 9, p. 24. doi: 10.1016/j.PMEDR.2017.12.001.
- Christian Blind Mission (2017) *Disability Inclusive Development Toolkit*. Available at: [www.cbm.org](http://www.cbm.org)
- El Telégrafo* (2014) "Atacucho, una historia de organización y paciencia." Available at: <https://www.letelegrafo.com.ec/noticias/quito/1/atacucho-una-historia-de-organizacion-y-paciencia> (Accessed: 29 June 2020)
- El Telégrafo* (2015) "Carapungo es una miniciudad que nació hace 3 décadas en la capital". Available at: <https://www.letelegrafo.com.ec/noticias/quito/1/carapungo-es-una-miniciudad-que-nacio-hace-3-decadas-en-la-capital> (Accessed: 23 June 2020)
- Europe, A. F. (2015) *The International Design for All Foundation awards 5 projects*. Available at: <https://www.agefriendlyeurope.org/news/international-design-all-foundation-awards-5-projects> (Accessed: 9 January 2022)
- Food and Agriculture Organization of the United Nations and United Nations Human Settlements Programme (2008) *En Tierra Segura. Desastres Naturales y Tenencia de la Tierra. Ecuador*. Available at: [www.emdat.be](http://www.emdat.be)
- French, E. L. et al. (2019) "Designing public open space to support seismic resilience: A systematic review," *International Journal of Disaster Risk Reduction*. Elsevier Ltd, 34, pp. 1-10. doi: 10.1016/j.ijdr.2018.11.001.
- Gülgün, B. et al. (2016) "Earthquake Park Design and Some Examples from the World and Turkey," *J. Int. Environmental Application & Science*, 11(2), pp. 159-165.
- Hounakzahi, M. A. and Fanni, Z. (2019) "Reduce the effects of natural hazards (earthquakes) on urban environments with an emphasis on capacity building (Case study: Zahedan City),"

- Researches in Earth Sciences. Shahid Beheshti University, 10(3), pp. 191-213. doi: 10.52547/ESRJ.10.3.191.
- Hunt, M. R. et al. (2015) "Haitian and international responders' and decision-makers' perspectives regarding disability and the response to the 2010 Haiti earthquake," *Global Health Action*, 8(1), pp. 1-10. doi: 10.3402/gha.v8.27969.
- Koren, D. and Rus, K. (2019) "The potential of open space for enhancing urban seismic resilience: A literature review," *Sustainability (Switzerland)*, 11(21), pp. 1-20. doi: 10.3390/su11215942.
- León, J. and March, A. (2014) "Urban morphology as a tool for supporting tsunami rapid resilience: A case study of Talcahuano, Chile," *Habitat International*. Pergamon, 43, pp. 250-262. doi: 10.1016/j.HABITATINT.2014.04.006.
- Levitt, J. M. (2017) "Exploring how the social model of disability can be re-invigorated: in response to Mike Oliver," *Disability & Society*. Routledge, 7599, pp. 1-6. doi: 10.1080/09687599.2017.1300390.
- Mitra, S., Posarac, A. and Vick, B. (2013) "Disability and Poverty in Developing Countries: A Multidimensional Study," *World Development*. Pergamon, 41(1), pp. 1-18. doi: 10.1016/j.WORLDDEV.2012.05.024.
- Municipio de Quito (2015) *Atlas Amenazas Naturales DMQ*. Quito. Available at: [https://es.scribd.com/document/275208334/Atlas-Amenazas-Naturales-DMQ#download&from\\_embed](https://es.scribd.com/document/275208334/Atlas-Amenazas-Naturales-DMQ#download&from_embed)
- Nunnerley, J. et al. (2015) "Participation and quality of life outcomes among individuals with earthquake-related physical disability: A systematic review," *Journal of Rehabilitation Medicine*, (11), pp. 385-393. doi: 10.2340/16501977-1965.
- Oliver, M. and Barnes, C. (2012) *The New Politics of Disablement*, Palgrave Macmillan.
- Pan American Health Organization (2018) *Disability Inclusion in Hospital Disaster Risk Management (INGRID-H)*. Washington, DC. Available at: [https://www.paho.org/disasters/index.php?option=com\\_content&view=article&id=3844:inclusion-para-la-gestion-del-riesgo-de-desastres-en-hospitales-ingrid-h&Itemid=1178&lang=en](https://www.paho.org/disasters/index.php?option=com_content&view=article&id=3844:inclusion-para-la-gestion-del-riesgo-de-desastres-en-hospitales-ingrid-h&Itemid=1178&lang=en) (Accessed: 19 May 2019)
- Pizzo, B. et al. (2013) "Earthquakes, public spaces and (the social construction of) environmental disasters: The role of public space for risk mitigation and urban redevelopment and the role of environmental disasters for reassessing the 'space of the Public'." *Italian Journal of Planning Practice*, 3(1), pp. 4-41.
- Quito Informa (2022) "El Municipio llegó al barrio Atucucho para atender sus necesidades". Available at: <http://www.quitoinforma.gob.ec/2022/01/29/el-municipio-llego-al-barrio-atucucho-para-atender-sus-necesidades/> (Accessed: 26 May 2022)
- La República (2016) "Cerca de 2.000 personas con discapacidad entre afectados por el terremoto en Ecuador." Available at: <https://www.larepublica.ec/blog/2016/05/17/cerca-de-2-000-personas-con-discapacidad-entre-afectados-por-el-terremoto-en-ecuador/> (Accessed: 25 May 2022)
- Scheuer, J. (2013) *Proteger a las personas con discapacidad en situaciones de desastre* | Jo Scheuer | UNDP. Available at: <http://www.undp.org/content/undp/es/home/ourperspective/ourperspectivearticles/2013/10/1/protecting-people-with-disabilities-in-times-of-disaster.html> (Accessed: 22 January 2019)
- Secretaría de Gestión de Riesgos (2016) "Informe de situación N°1 16-04-2016 22h30," 1(1), pp. 1-4. Available at: <https://www.gestionderiesgos.gob.ec/wp-content/uploads/downloads/2016/04/Informe-de-Situación-1-22h303.pdf>
- Sharifi, A. (2019) "Urban form resilience: A meso-scale analysis," *Cities*. Pergamon, 93, pp. 238-252. doi: 10.1016/j.CITIES.2019.05.010.
- Skøt, L. et al. (2016) "Accessibility of medical and psychosocial services following disasters and other traumatic events: experiences of Deaf and hard-of-hearing individuals in Denmark,"

- Disability and Rehabilitation*. Informa UK Ltd., 0(0), p. 000. doi: 10.1080/09638288.2016.1236154.
- Stough, L. M. and Kang, D. (2015) "The Sendai Framework for Disaster Risk Reduction and Persons with Disabilities," *International Journal of Disaster Risk Science*. Beijing Normal University Press, 6(2), pp. 140-149. doi: 10.1007/s13753-015-0051-8.
- The World Bank, International Food Policy Research Institute and Global Facility for Disaster Reduction and Recovery (no date) *Economic Vulnerability and Disaster Risk Assessment in Malawi and Mozambique: Measuring Economic Risks of Droughts and Floods*. Available at: [https://www.preventionweb.net/files/15520\\_gfdrrrecon.vulnerabilitydrrmalawimoz.pdf](https://www.preventionweb.net/files/15520_gfdrrrecon.vulnerabilitydrrmalawimoz.pdf)
- United Nations (2006) *Convention on the Rights of Persons with Disabilities*. New York.
- United Nations (2015) *Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030*. Available at: [https://www.unisdr.org/files/43291\\_spanishsendaiframeworkfordisasterri.pdf](https://www.unisdr.org/files/43291_spanishsendaiframeworkfordisasterri.pdf) (Accessed: 19 May 2019)
- United Nations Committee on the Rights of Persons with Disabilities (2014) *General Comment no. 2 on Article 9: Accessibility CRPD*.
- United Nations Department of Economic and Social Affairs (no date) *Disability-Inclusive Disaster Risk Reduction and Emergency Situations*. Available at: <https://www.un.org/development/desa/disabilities/issues/disability-inclusive-disaster-risk-reduction-and-emergency-situations.html> (Accessed: 25 May 2022)
- United Nations Human Settlements Programme (2016) *The New Urban Agenda – Habitat III*. Available at: <https://habitat3.org/the-new-urban-agenda/> (Accessed: 9 January 2022)
- United Nations Office for Disaster Risk Reduction (2013) *Encuesta Mundial ONU Explica por qué Mueren tantas Personas con Discapacidad en los Desastres*. Geneva. Available at: <http://www.unisdr.org><http://www.twitter.com/unisdr><http://www.facebook.com/unisdr>
- United Nations Office for Disaster Risk Reduction (2016) *Informe del grupo de trabajo intergubernamental de expertos de composición abierta sobre los indicadores y la terminología relacionados con la reducción del riesgo de desastres*. New York.
- United Nations Refugee Agency (2017) *Los peores desastres naturales del siglo XXI*. Available at: <https://eacnur.org/es/actualidad/noticias/emergencias/los-peores-desastres-naturales-del-siglo-xxi> (Accessed: 31 August 2021)
- El Universo* (2009) "León Febres-Cordero: Legado histórico y obras más importantes." Available at: <https://www.eluniverso.com/2009/01/15/1/1355/EB018FB2EFC48B59EA170DF21329C8C.html> (Accessed: 22 September 2021)
- Vicepresidencia Ecuador (2012) *Primer estudio biopsicosocial clínico genético de las personas con discapacidad en Ecuador 2009-2010*. Vicepresidencia de la República del Ecuador. Available at: <http://biblioteca.iaen.edu.ec/cgi-bin/koha/opac-detail.pl?biblionumber=30652> (Accessed: 19 May 2019)
- Zuo, J., Zhou, T. and Lin, L. (2015) "Medium and Small-Sized City Park Development from the Perspective of city Earthquake Disaster," *Journal of Civil, Architectural & Environmental Engineering*, 30(2), pp. 23-26.



View of historical Quito from Virgin Mary statue "El Panecillo".  
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