

Citizen participation as a fundamental principle in the connection between children and nature.

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ABSTRACT

There are challenges to urban planning and public participation as urban sprawl proceeds rapidly around the world. Close to urban centers, informal settlements are characterized by numerous challenges, including inadequate sanitation, inefficient drainage, and a constrained potable water supply. Nature-Based Solutions (NBS) is an umbrella concept that encompasses Green Infrastructure and proposes a solution to these socio-environmental problems. This paper aims to examine and codify the methodological framework that fosters the interplay between the natural world, community involvement, and childhood. The literature review was categorized into two distinct sections: the first pertains to Green Infrastructure and Nature-based Solutions, whereas the second pertains to urban pedagogy and the involvement of children in urban planning. Nature-based Solutions offer an opportunity to address environmental and social challenges. The literature suggests that NBS planning should follow six main guiding principles: maintenance of biological and cultural diversity, site specificity, evidence base, integration, equity, and transdisciplinarity. The findings strongly suggest that citizen participation is a fundamental principle for achieving Nature-Based Solutions fairly in cities. In order to effectively implement a more ecological urbanism, it is imperative to recognize the context and local knowledge, including those acquired during childhood.

KEYWORDS: Participation. Green Infrastructure. Childhood.

1 INTRODUCTION

This paper explores citizen participation as a fundamental principle in the connection between children and nature in informal settlements, which are in a situation of high socio-environmental vulnerability.

As urbanization accelerates worldwide, the difficulties associated with urban planning and public participation become increasingly apparent. Just around the cities, informal settlements are growing quickly. Families, who were already marginalized in a city with many levels of wealth and poverty, were confronted with the additional hazard of eviction and relocation away from their workplaces. The absence of sanitary facilities, drainage or adequate supplies of drinking water, the overcrowding of residential areas, the risk of fire and illness, and the absence of accessibility to educational institutions and healthcare facilities are some of the issues encountered in these communities (RACELIS AND AGUIRRE, 2002).

The prevailing population growth in Brazilian cities is attributed to social factors (such as socio-spatial segregation) and environmental concerns (such as soil sealing, heat islands, elevated risk of flooding, and deforestation). These negative urban impacts primarily affect the most socioeconomically vulnerable populations, as the majority do not have defense mechanisms against the problems that affect the spaces in which they live, work, and study (REZENDE, 2021).

Low-income and minority groups have disproportionately less access to green space and Green Infrastructure. This phenomenon can be partly attributed to historical practices associated with land use and urban zoning. In addition to the historical legacy of underinvestment in minority neighborhoods, unbalanced power structures, weak or unclear policies, and processes of urbanization and unplanned urban expansion (ZUNIGA-TERAN et al., 2021). The "greening" tactics tend to target middle-class and upper-middle-class populations, sometimes at the expense of less fortunate ones (HAASE, 2017), excluding minorities from the decision-making process.

Despite children being the most vulnerable to environmental hazards in cities, their needs are rarely given special attention. According to AL-DOSKI (2020), children are hardly involved in the planning and making of decisions regarding matters impacting their lives. On this subject, research conducted with children, particularly those who are at risk, when assuming the

assumptions of participatory research, could potentially be tools of excellence, as it can help develop skills for coping with risks that are exposed (FERNANDES E SANTANA, 2011).

The proposal to encourage the involvement of children in the research process stems from the notion that children possess intervention and participation abilities. Thus, it is imperative to acknowledge their legal entitlements and foster their protagonism (FERNANDES AND SANTANA, 2011). This multifaceted and participative approach has gained widespread acceptance worldwide, including in the field of research with children (RACELIS AND AGUIRRE, 2002), based on bottom-up self-organization to address social challenges, as proposed by Montaner and Muxi (2013).

Finally, society as a whole is responsible for thinking, understanding, and proposing cities that are equal, fair, and balanced. Thus, the Sustainable Development Goals may be associated with this research to a greater or lesser extent. For example, “Ensure the availability and sustainable management of water and sanitation for all” (Goal 6). It is also related to “Reducing inequalities” (Goal 10) and, mainly, to “Sustainable Cities and Communities” (Goal 11).

In 2022, the United Nations adopted the idea of Nature-Based Solutions (NBS) to support sustainable development, highlighting the importance of strengthening actions in favor of nature for the implementation of the 2030 Agenda, Agenda for Sustainable Development, and the Sustainable Development Goals and other conventions related to biodiversity, climate change, and disaster risk reduction. Therefore, it is an opportunity to improve cooperation, implementation, and expansion of the NBS while ensuring its social and environmental dimensions are considered (UNEP, 2022).

In this context, the research focuses on understanding shared spaces, as well as seeking innovations for their maintenance that prevent the waste of resources, mitigate the effects of climate change, and enhance the benefits of settlements for all human beings.

2 AIMS

This study aims to examine and systematically outline the scientific discourse that fosters the synergy between nature, civic engagement, and childhood. Ultimately, the goal is to make Nature-Based Solutions more efficient and effective by getting citizens involved, even among the younger population. It also serves as a tool for everyday transformation and a potential path to achieve social emancipation and the right to the city, as well as human well-being and ecosystem integrity.

3 METHODOLOGY

A qualitative methodology was employed, given the emphasis on investigating the phenomenon of civic participation in the planning of green solutions within the context of childhood. The research began with a literature review aimed at identifying pertinent sources concerning participatory planning in early life stages and the significance of green infrastructure within urban settings. The following steps were taken: defining the issue to be addressed, choosing bibliographic databases for consultation and material collection, developing strategies for advanced searching, choosing texts, and organizing the information found.

The literature review was conducted using the Scopus database, and there was no time limit for publication. The investigation was carried out in three distinct search batches. The first search used the Article Title and Keywords with the following terms: "green infrastructure" OR "nature-based solutions" AND "social-environmental perspective" OR "governance" OR "inclusive" OR "participation" OR "co-creation" OR "citizen engagement" OR "social inclusiveness" OR "environmental justice" in the fields of "environmental science", "social science", and "multidisciplinary". Open Access articles in English, Spanish, and Portuguese were selected. This resulted in 129 articles for further reading and selection.

A second search was carried out based on the Article Title, Keywords, and Abstracts using the following terms: "childhood" OR "children" OR "*infância*" OR "*crianças*" OR "child-friendly" OR "child-friendly cities" AND "participation" OR "citizenship" OR "*participação*" OR "participatory" OR "governance" AND "urban" OR "educational territory" OR "urban planning" OR "urban design" OR "participatory planning" OR "participatory urban design" OR "*planejamento*" within the domains of "environmental science", "social science", "psychology", and "arts and humanities". Open Access articles in English, Spanish, and Portuguese were selected. This resulted in 56 articles for further reading and selection.

The third search was conducted using the Article Title, Keywords with the following terms: "child" OR "childhood" OR "children" OR "*infância*" OR "*crianças*" OR "child-friendly" OR "child-friendly cities" AND "nature-based solutions" OR "green infrastructure" OR "biophilia" OR "biophilic" OR "biophilic design" OR "green space" OR "nature" AND "social-environmental perspective" OR "governance" OR "inclusive" OR "participation" OR "co-creation" OR "co-design" OR "citizen engagement" OR "social inclusiveness" OR "environmental justice" in the fields of "environmental science", "social science", and "multidisciplinary." Open Access articles in English, Spanish, and Portuguese were selected. This last search resulted in 9 articles for further reading and selection.

Besides Scopus research, some texts from the academic literature, including books, theses, dissertations, and manuals, were selected to gain insights into how the academic community is addressing this topic.

The analysis and synthesis of the selected articles reveal, first and foremost, the significance of civic engagement in achieving efficacious and equitable planning of Nature-based Solutions and, consequently, Green Infrastructures. Moreover, the notion of the "child" stands out as a political actor capable of actively participating in the city planning process. Finally, a connection is drawn between participatory practices and Green Infrastructure as a solidarity technoscience in childhood.

4 RESULTS

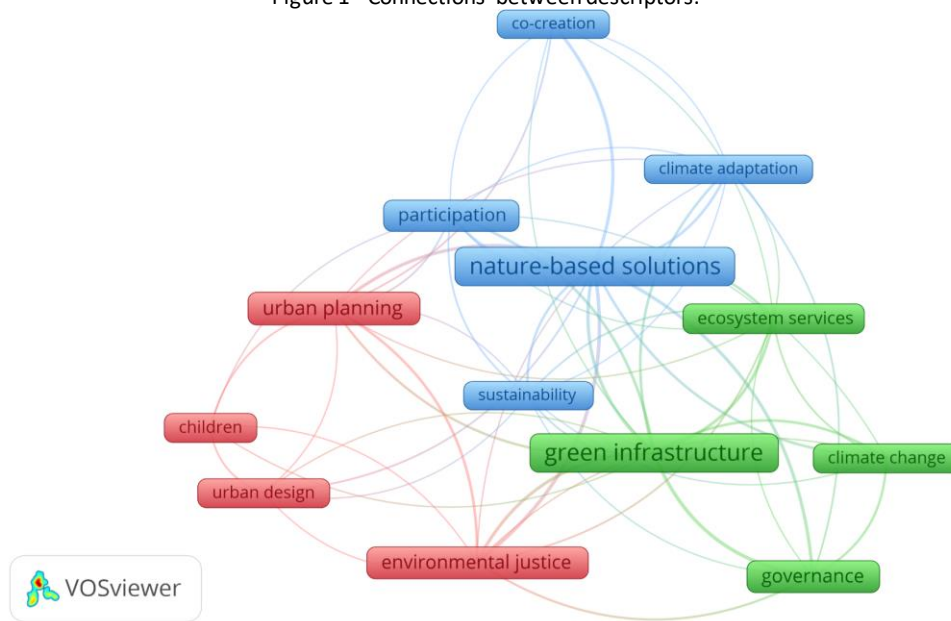
The research was categorized into two distinct aspects. The first was associated with Green Infrastructure and Nature-based Solutions, while the second was focused on urban pedagogy and children's involvement in urban planning. As illustrated in Figure 1, citizen participation plays a connecting role in the relationship between the child and nature.

It is worth noting that a substantial portion of the articles under consideration were co-authored by individuals from diverse disciplinary backgrounds, which highlights the importance of interdisciplinary and transdisciplinary approaches to delve deeper into this

subject. Regarding the subject matter, it is distributed across various countries worldwide, as depicted in Figure 02

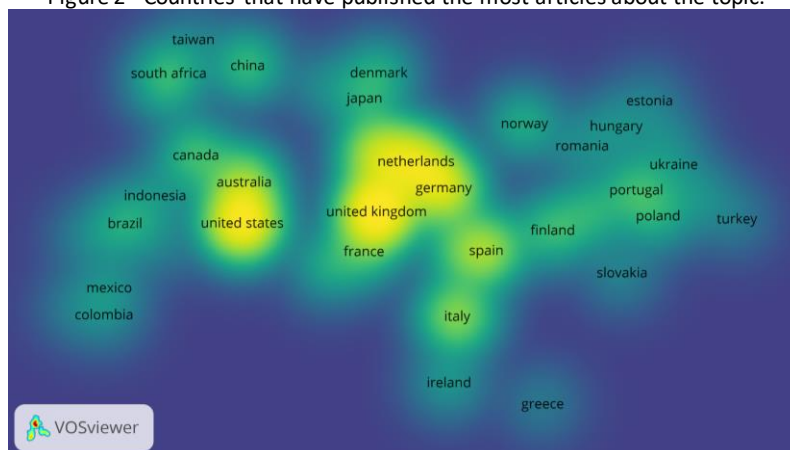
Regarding the articles from the first search (nature), all the papers were published between 2012 and 2023. It is notable that the vast majority of these works have been published within the past five years. As for the second search for articles (childhood), the publications exhibit a more sporadic distribution across time, gaining greater visibility in 2018. The third set of searches, composed of the first two, focuses on the central theme "participatory planning and access to nature in childhood" (childhood and nature), with publications between the years 2015 and 2023.

Figure 1 - Connections between descriptors.

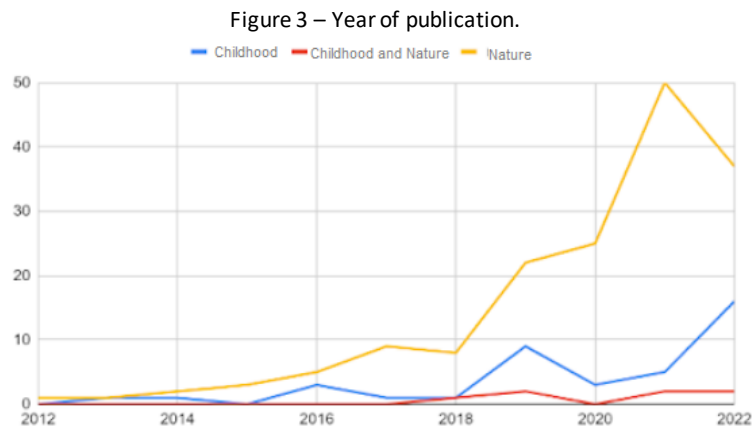


Source: Developed by the author.

Figure 2 - Countries that have published the most articles about the topic.



Source: Developed by the author.



Source: Developed by the author.

4.1 Nature-Based Solutions (NBS) and Green Infrastructure (GI)

Nature-Based Solutions (NBS) have gained substantial recognition as a prominent approach in the realm of urban sustainability. They strive to address social, economic, and environmental challenges through sustainable alternatives. The term was first mentioned in 2008 by the World Bank as a way to manage natural systems and balance the benefits between nature and society. In other words, by working with nature rather than against it, human communities can develop and implement solutions to the challenges they face (SOWIŃSKA-ŚWIERKOSZ and GARCÍA, 2022).

The International Union for Conservation of Nature (IUCN) defines NBS as Actions to protect, sustainably manage, and restore natural or modified ecosystems that effectively address social challenges in an adaptive manner while simultaneously providing human resources, well-being and biodiversity benefits (COHEN-SHACHAM et al., 2016). In this context, NBS can be an umbrella concept encompassing different technical options, characterized by being multifunctional, multiscale, adaptive, and providing important environmental services (CAMPOS, 2021).

The ONU resolution recognizes that NBS (i) address social, economic, and environmental challenges while simultaneously providing human well-being and ecosystem services; (ii) have the potential to contribute to climate action; (iii) play a role in fostering sustainable consumption and production; (iv) align with ecosystem-based and other conservation and management approaches; (v) facilitate transparent and inclusive consultations; (vi) encompass the participation of developing countries; (vii) foster partnerships with local communities, women, youth, and indigenous populations; and (viii) follow a participatory model (UNEP, 2022).

Nature-Based Solutions (NBS) present a valuable opportunity for tackling contemporary environmental and social challenges, as noted by PUSKÁS et al. (2021). In light of this, the literature suggests that NBS planning should follow six main guiding principles: *maintenance of biological and cultural diversity, place-specificity, evidence base, integration, equity, and transdisciplinarity*.

NBS must be developed with the goal of maintaining both *biological and cultural diversity* to ensure the sustainability of ecosystem services. They should avoid changing or simplifying an ecosystem, such as replacing mixed natural forests with a monoculture tree plantation.

It is essential to consider the local context because the social challenges and potential of NBS are always *specific to the context*. This includes traditional, local, and scientific knowledge. NBS planning should be *evidence-based*, meaning it should rely on the information and knowledge available for a specific NBS in a specific environment. Evidence can be obtained from various sources, such as science and traditional knowledge (COHEN-SHACHAM et al., 2019; ALBERT et al., 2021).

Integration means considering thematic, temporal, spatial, and sectoral dimensions, as stated by ALBERT et al. (2021). The planning of the NBS can incorporate methods from different approaches, such as Ecosystem Services, Green and Blue Infrastructure, and Ecological Engineering. (NESSHOVER et al., 2017). Integrative and multi-scalar approaches make valuable contributions to the effective planning and implementation of the NBS (COHEN-SHACHAM et al., 2019). Different scales of the NBS can contribute to more livable and resilient cities (FRANTZESKAKI, 2019). This includes the design of regional and urban ecological networks, the development of multifunctional urban parks, offering recreational amenities, and micro-level projects, such as streets engineered for water retention, and the integration of living systems with built environments, including green walls and green roofs (REMME and HAARSTAD, 2022).

Integrative planning approaches should also consider temporal scales. According to the existing literature, the impacts of NBS can exhibit temporal variation and require a longer duration to achieve effectiveness in delivering comprehensive ecosystem services and social benefits in contrast to conventional or rigid engineering solutions (ALBERT et al., 2021). NBS initiatives are multifunctional, meaning multiple benefits are delivered simultaneously from a single project. For instance, urban community gardens not only provide food (service provision), but also furnish opportunities for social interaction and connection with the natural environment (cultural services). Similarly, different types of NBS, such as parks, urban forests, urban agriculture, ditch, rain gardens, and green roofs, offer unique or multiple benefits such as recreation, water management, temperature regulation, pest control, soil formation, and education aspects (PUSKÁS et al., 2021).

Equity can be comprehended through four interconnected dimensions: recognition, procedure, distribution, and context. This means recognizing the rights, values, and interests of different actors based on the inclusive participation of all relevant actors, in the equal distribution of costs and benefits among the actors, while considering the extant political, economic, and social circumstances within a given context (ALBERT et al., 2021). Experiences with Nature-based Solutions (NBS) necessitate the establishment and cultivation of a trustful relationship between the urban environment and its inhabitants, encompassing both the objective of the NBS experience and the process of experimentation. In communities where both the objective and the experimentation process are continuously nurtured, people are seen as equals in terms of their contributions of knowledge and ideas to urban experts, science, and consultancy (FRANTZESKAKI, 2019). For this purpose, participatory approaches for co-design, co-creation, and co-management (PAULEIT et al., 2017) are advocated. The way participation is conducted is closely related to the just distribution of the NBS benefits among various social groups and geographic locales (KISS et al., 2021), as well as secure and enduring access to urban nature (TOZER et al., 2020).

The term "*transdisciplinarity*" means that researchers from different disciplines and non-academic stakeholders work together (ALBERT et al., 2021). Transdisciplinary planning should be applied in various ways to engage the community and empower its citizens. A

common vocabulary needs to be developed to effectively share and co-generate information about NBS (FRANTZESKAKI, 2019), thereby involving citizens and the competencies of diverse actors (NESSHOVER et al., 2017). This principle is widely advocated to enhance relevance, justice, acceptance, and, ultimately, sustainability (WAMSLER et al., 2019).

As with numerous concepts, NBS establishes an explicit connection with the fundamental principles of sustainable development, placing the social, environmental, and economic dimensions, at least conceptually, on the same level of importance (NESSHOVER et al., 2017). The multiple dimensions of sustainability, including cultural and emotional aspects (ANDRADE, 2005), provide a framework for planning and evaluating NBS. For example, a green infrastructure strategy can provide physical measures that have environmental, economic, social, and cultural outcomes, namely increased vegetation and biodiversity (environmental); enhanced educational activities or reduced unemployment (economic); development of knowledge, social learning, increased reflexivity, or social equality (social and cultural).

The extensive scope of the NBS encompasses various concepts, including urban Green Infrastructure (NESSHOVER et al., 2017; PAULEIT et al., 2017; WAMSLER et al., 2019). Concerning urban drainage, Green Infrastructure contributes to efficiently managing rainwater in urbanized areas. It can serve as both a complement to conventional infrastructure (CAMPOS, 2021) and as a leapfrogging process, which transforms a rudimentary infrastructure model into an ecologically sustainable and water-sensitive model, eliminating the need for traditional urban infrastructure solutions (BRODNICK et al., 2018). Informal settlements with limited or no established infrastructure are particularly susceptible to adopting leapfrogging approaches. In contrast to the conventional system, Green Infrastructure addresses the issue at its source by implementing a series of locally adapted, small-scale interventions interconnected in a network. This approach enhances convenience and promotes a stronger connection between urban spaces and the natural environment (PELLEGRINO AND MOURA, 2017).

4.2 Nature in Childhood

Green infrastructure considers the urban environment as a socio-ecological system, adopting a holistic and systemic perspective. It involves planning, designing, and managing both new and existing infrastructures in order to make them multifunctional. These elements become part of a network of vegetated or permeable fragments, which are connected by green and blue corridors. In these corridors, biodiversity protects and improves water quality, aiming to restructure the landscape mosaic at multiple scales (HERZOG, 2013). Vidal and Seixas (2022) discuss the concept of Children's Green Infrastructure CGI, emphasizing the need for fairer, more inclusive, and participatory approaches. This concept begins with the principle that nature should be integral to urban planning processes and integrated into urban infrastructures, ensuring access. Understanding the needs of children and integrating their voices into urban planning are necessary conditions to advance toward a more just society.

Children are particularly attracted to outdoor spaces, where they encounter a sense of freedom and engage in authentic experiences (TIRIBA, 2005). Kellert (2002) defines biophilia as: "An innate tendency to affiliate with natural things." The psychological attraction to nature encompasses various contexts and incorporates cognitive and emotional aspects. Several landscape features, such as water and vegetation, are attractive. One of the fundamental characteristics of biophilic cities is their incorporation of abundant and easily accessible natural elements. For children, the creation, maintenance, or restoration of wildlife habitats is

important because it offers opportunities for direct contact with plants, animals, and water, but it also helps teach the connectivity of life (GIFFORD AND CHEN, 2016).

Several attributes of biophilic design prove to be particularly relevant to children: sensory richness, movement, serendipity, a sense of freedom, and refuge. In child development, for example, sensory richness provides important colors, smells, and visual sensations (BEATLEY, 2011). A group of researchers has been investigating the advantages of incorporating nature into the urban environment. These benefits may be associated with mental health, including but not limited to stress reduction, enhanced creativity and well-being (BROWNING et al. 2014), a reduced risk of psychiatric disorders (PICCININNI et al. 2018); intellectual and social benefits, including emotional intelligence and child development (JARVIS et al. 2021); a conducive learning environment, and the promotion of environmental awareness (BARBIERO et al. 2021; FISCHER et al. 2019).

A growing body of research also suggests that direct and frequent experience with the natural environment, accompanied by adult guidance emphasizing respect, influences the development of environmental care and stewardship during subsequent phases of a child's life, not to mention the benefits tied to ethical and affective domains, such as enchantment, empathy, humility, and a sense of belonging. Furthermore, initiatives integrating nature and ecology within urban settings have been explored in various studies (GIFFORD AND CHEN, 2016; BARROS, 2018; CHAWLA, 2015; AMATO-LOURENCO, 2016).

Maximizing daily opportunities for children to access green natural areas and ecosystems is important. Planting more flowers and trees on streets and other open spaces is vital not only to improve air quality and resilience to the effects of climate change but also to expand learning and green space management opportunities for future generations.

4.3 Connections between Nature, Citizen Participation, and Childhood.

When it comes to green areas and access to nature, several challenges arise, especially in the Global South. One of the major challenges highlighted by the authors is gentrification (TORRES et al., 2023; REMME AND HAARSTAD, 2022; TOZER et al., 2020). Research suggests that urban renaturalization initiatives can create not only a form of immediate socio-spatial displacement or exclusive immediate access but also long-term processes of green gentrification. In this particular context, the process of green gentrification manifests itself as an appropriation through green accumulation, a form of neo-colonialism, whereby specialized perspectives on nature, landscape, and acceptable environmental practices are implanted within low-income and minority communities. In exchange, these areas are then seized by various public and private stakeholders. Consequently, urban green areas can strengthen and widen existing inequalities (TOZER et al., 2020; KISS et al., 2021).

Another debated risk is capturing nature within neoliberal agendas. These agendas may facilitate the exploitation of nature through technological innovations used to increase natural productivity, focusing the narrative on growth and sustainable capitalism (PUSKÁS et al., 2021). In this regard, it aligns well with the critique of the 'neoliberalization of nature', which encompasses the privatization, commodification, and financialization of nature (REMME and HAARSTAD, 2022). It is important to note that these dangerous technocratic approaches often lead to unsustainable paths.

It is precisely this that needs to be avoided, especially in contexts like that of Brazil, with an emerging and growing agenda for the implementation of NBS. Brazil has high inequality

in its cities and, therefore, has the opportunity to confront NBS and the problems of inequalities that affect the majority of the population. On the one hand, urban degradation is a reality in many contexts; on the other hand, in these same areas, we find a strong potential for social organization, which is supported by bonds of solidarity and civic commitment (TORRES et al., 2023).

There is a consensus regarding the imperative role of citizen participation and engagement in the planning of nature-based adaptations. Various strategies have been adopted to address these complex social challenges, such as the creation of social values and more suitable solutions; co-production, which simultaneously includes knowledge previously excluded from the dominant canon; and co-governance, through the recognition of the active role of citizens beyond their claim in the public sphere, thereby transforming them into collaborative agents of change (CAITANA et al., 2020).

The authors state that citizen engagement enhances justice, relevance, acceptance, and sustainable development (NUNES et al., 2021; FRANTZESKAKI, 2019; WAMSLER et al., 2020; CÁRDENAS et al., 2020) in both short and long-term contexts (PUSKÁS et al., 2021), fostering more profound manifestations of democracy (NESSHÖVER et al., 2017; KISS et al., 2021). Moreover, it serves as a mechanism for integrating and representing diverse social values and cultural nuances (TOZER et al., 2020; HAASE, 2017; ALBERT et al., 2021; NUNES et al., 2021), as well as addressing intersectional challenges tied to socio-environmental justice, biocultural diversity, race, and gender (REMME and HAARSTAD, 2022).

Participation allows for the incorporation of local knowledge in urban planning and design processes and enhances social resilience. Moreover, active involvement ensures a sense of ownership in both the planning process and the resultant project outcomes (PUSKÁS et al., 2021). Co-design can help planners and policymakers design Green Infrastructure that not only addresses ecological priorities but also incorporates the demands and needs of users (NUNES et al., 2021).

This argument is crucial for projects in the Global South, as it would allow greater involvement of social actors and the creation of projects and plans that address local and community needs. Therefore, it encourages the development of Green Infrastructures and Nature-based Solutions at the community level. This will contribute to the development of more equitable pathways for the establishment of sustainable urban environments. It is critical to consider this point in the plans and projects of NBS in Brazil (TORRES et al., 2023). Despite public participation in the formulation of specific urban projects in Brazil being a legal obligation, limitations are noticeable regarding the representativity. In the multicultural Brazilian scenario, the coexistence of extremely distinct social groups in developing local NBS projects, along with their different worldviews, must be addressed through organized participatory processes to avoid tensions.

Participation is for everyone, as cities are built by everyone and created by everyone, including children. Child participation is a fundamental principle in most scientific discourses about childhood, considering children as social actors (SOARES, 2005). However, the educational potential inherent in NBS remains largely unexplored and continues to be absent from formal and informal education programs for children. In this sense, the research aims to fill this gap by exploring the implementation of NBS from the children's perspective, promoting critical thinking and collaboration.

In Brazil and worldwide, children have been increasingly recognized as social actors and producers of culture. The Child and Adolescent Statute acknowledges the unique stage of development characteristic of childhood and adolescence. The United Nations Convention on the Rights of the Child (CRC) served as a pivotal regulatory framework in this trajectory, aiming to safeguard the participatory rights of children and asserting their status as social actors with political competencies (CECIP, 2016; TOMÁS, 2007; LEITE AND PIORSKY, 2019; JANSSON et al. 2022; CHAPARRO, 2021).

In the present era, initiatives centered on nurturing child involvement and engaging in participatory activities have gained increasing prominence and significance. Their perspectives have been incorporated into public policies, laws, and intervention projects related to cities, schools, and other institutions and issues that affect them (LEITE E PIORSKY, 2019). Scholarly investigations indicate that the inclusion of youth and children in urban planning allows them to demonstrate their ability to assess the environment, generate new ideas, and enhance their environmental awareness, knowledge, and skills. It is considered the best way to make cities more welcoming and sustainable (AL-DOSKI, 2020).

The listening process is more complex than the current model of knowledge production and social practices, which starts from a rationalistic and pragmatic perspective, which is centered on logic, reason, linear thinking, and only on the oral discourse of children, without considering the body and its languages, as well as the symbolic and affective dimensions (LEITE AND PIORSKY, 2019). Consequently, action research methodology emerges as a pivotal facet of social research grounded in empirical evidence, conceived and executed in close alignment with an action or the resolution of a collective problem. In this process, researchers and participants representing the situation or problem engage cooperatively or participatively (THIOLLENT, 1985, p. 7; 14).

Children communicate through play, stories, artistic expressions, and gestures (ANDRADE, 2014; AL-DOSKI, 2020; ARRIERO AND JEREZ, 2022; CECIP, 2016; DERR et al., 2013; LEITE AND PIORSKY, 2019). As Pereira (2002, p. 55) asserts, "Play is born in the body, and the body is nature". In this way, children can offer a unique perspective and contribute to individual and collective challenges (LEITE AND PIORSKY, 2019). Table 01 systematizes the connections between nature, civic participation, and childhood.

Table 01 - Connections between Nature, Citizen Participation, and Childhood.

"Nature, citizen participation, and childhood"		
Integration Modalities	Categories and Practices	Guidelines and Strategies
Nature-Based Solutions		
Engagement of the local community	Enhancement of local spatial dynamics and traditional knowledge through active community engagement.	Facilitate the involvement of diverse researchers in the local community through the implementation of listening spaces, circle dynamics, and participatory workshops. Establish a shared vocabulary to facilitate co-creation.
Interdisciplinarity and Transdisciplinarity	Collaboration among researchers from different disciplines and involvement of non-academic stakeholders.	
Integration across spatial scales	Macro-scale focus on regional and urban ecological networks; Micro-level emphasis on streets serving as rainwater retention sites.	
Multifunctional interaction	Recreational activities, water resource management, temperature regulation, pest control, soil formation processes, and environmental education initiatives.	
Nature and Children		
Children's Green Infrastructure	Integrated natural environments (infrastructures interconnected through green and blue corridors)	Provide opportunities for direct contact with plants, animals, and water.
Biophilia	Sensory richness, movement, serendipity, resilience, a sense of freedom, and refuge	
Citizen Participation		
Citizen Engagement	Development of social values and more suitable solutions (co-design, production, and management)	Affective maps, stories, games, drawings.

Source: Developed by the author.

5 CONCLUSIONS

Citizen participation is a fundamental principle for achieving the efficacy of Nature-Based Solutions, including Green Infrastructure, in an equitable manner in urban settings. In relation to projects in Brazil, this argument holds great significance as it facilitates a greater involvement of social actors and the formulation of initiatives that align with local and communal aspirations and demands. Thus, respecting the context and local knowledge becomes imperative for the efficacious implementation of more ecologically oriented urban planning. Despite the legal obligation for the public to participate in the development of specific urban projects in Brazil, limitations are noticeable regarding the representativity. In the context of projects and public policies, children are rarely represented, and their needs hardly receive special attention. Child participation is considered a fundamental principle in most scientific discourses produced regarding childhood, acknowledging children as social actors. Participation functions as a tool for daily transformation and political action, serving as a potential avenue to achieve social emancipation and the right to the city. Citizen participation is achievable through an active listening process, encompassing diverse modalities like play, narratives, and visual representations. Consequently, children can offer a distinctive perspective and contribute meaningfully to both individual and collective challenges.

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