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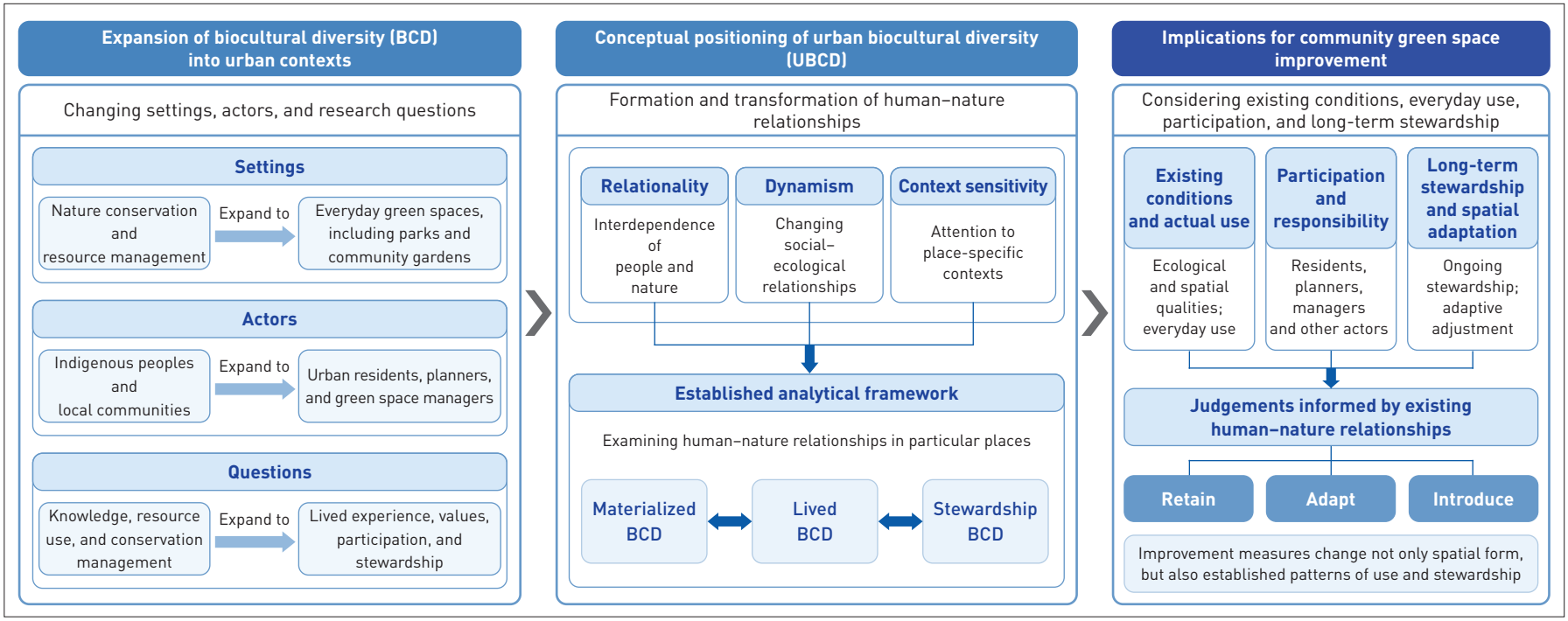
Biocultural Diversity in Urban Contexts: Research Trajectories and Implications for Community Green Space Improvement

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GRAPHICAL ABSTRACT



ABSTRACT

As biocultural diversity (BCD) research has expanded into urban contexts, greater attention has been paid to everyday green spaces, including parks and community gardens, and to the roles of residents, planners, and managers. Yet the research trajectories behind this expansion and the conceptual framing of urban biocultural diversity (UBCD) remain insufficiently synthesized. Drawing on 1,180 BCD-related publications and 71 urban-focused publications retrieved from the Web of Science Core Collection, this review combines bibliometric analyses using HistCite and CiteSpace with close readings of representative studies. The findings indicate that the extension of BCD research into cities involves more than a change of setting. Research has broadened to consider new places and actors, bringing everyday experiences, values, participation and long-term stewardship into sharper focus. Rather than treating biological and cultural diversity as additive, UBCD foregrounds the diverse and changing relationships through which people live with and shape urban nature. The materialized–lived–stewardship framework provides a structure for examining these relationships. For community green space improvement, this perspective calls for attention to ecological and spatial conditions, existing uses, participation, and long-term stewardship. Decisions about what to retain, modify or introduce should also consider how improvement may sustain, alter or reshape established human–nature relationships.

KEYWORDS

Biocultural Diversity; Urban Biocultural Diversity; Community Green Space Improvement; Human–Nature Relationship

HIGHLIGHTS

- Traces the intellectual development of biocultural diversity in urban contexts
- Clarifies UBCD as a perspective centered on diverse human–nature relationships
- Discusses existing uses, stakeholder participation, and long-term stewardship in community green space improvement

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1 Introduction

Global biodiversity governance is paying increasing attention to the connections between nature and culture and to their significance for conservation practice. The Kunming–Montreal Global Biodiversity Framework explicitly recognizes the importance of the linkages between biological and cultural diversity[1], while a related decision further highlights the added value of biocultural diversity (BCD)[2]. BCD seeks to move beyond a dichotomous understanding of nature and culture by examining the mutual influences between biological environments and knowledge systems, values, social institutions and everyday practices[3].

In recent years, urban human–nature interactions have emerged as a distinct strand of BCD research[4]. The EU-funded Green Infrastructure and Urban Biodiversity for Sustainable Urban Development and the Green Economy (GREEN SURGE) project was among the earlier initiatives to connect BCD with urban green infrastructure, planning, and governance[5]. Michelle Cocks, Charlie Shackleton, and colleagues have also examined how groups with different sociocultural backgrounds perceive, use and care for urban nature, and what these differences mean for green space planning and management[6]. More recent studies in urban ethnobiology, alongside research on green space use among residents from different cultural backgrounds, have explored how population mobility, cultural background and lived experience shape urban human–nature relationships[7–8]. Together, these strands of research have contributed to the development of urban biocultural diversity (UBCD). In China, by contrast, BCD research has focused largely on ethnobotany[9], traditional knowledge conservation[10–11], cultural landscape heritage[12–14] and protected area management[15–18], with comparatively limited attention to contemporary urban spaces and their dynamic social processes[19].

As BCD research has moved into urban settings, its scope has come to include particular green spaces that residents encounter, use, and care for in everyday life. The improvement of urban green spaces concerns not only planting design and spatial quality but also which forms of urban nature should be retained, how competing uses might be reconciled, whose knowledge can inform decisions, and who will take responsibility for subsequent stewardship. Because community green spaces are closely woven into residents' daily lives, they offer settings in which these questions, and the changing human–nature relationships they entail, can be examined. There is therefore a need to trace systematically the intellectual development through which BCD has been extended to urban contexts and UBCD has taken shape, and to clarify what this perspective offers for community green space improvement. To this end, this study used bibliometric analysis as a supporting method to examine the conceptual development of UBCD and to discuss its implications for the improvement of community green spaces.

2 Data Sources and Methods

Two bodies of literature were assembled from the Web of Science (WoS) Core Collection under the same search period, language restrictions, and document-type criteria. The first search used "biocultural" or "biocultural diversity" as Topic search terms and retrieved 1,180 BCD-related publications. A separate Topic search for "urban biocultural diversity" retrieved 71 urban-focused publications. Both searches covered the period from 1 January 2000 to 30 May 2025 and were restricted to English-language articles and reviews. The broader corpus was used to examine the overall knowledge base of BCD; the urban-focused corpus was used to identify intellectual connections within research on urban contexts. A small number of more recent publications appearing after the search cut-off were consulted to inform the theoretical discussion but were not included in the bibliometric analyses.

The two corpora were examined using different, complementary analytical procedures. For the 1,180-publication corpus, HistCite was used to trace key citation links, while CiteSpace was used to analyze keyword co-occurrence and identify the principal themes in BCD research and their development over time. For the 71-publication urban corpus, CiteSpace was used to conduct co-citation analysis. This analysis was considered together with close readings of key publications in the network and other representative studies to reconstruct the main research trajectories through which BCD was extended into urban contexts. Bibliometric analysis served primarily to reveal the structure of the literature and guide the selection of readings. The paper's interpretations of conceptual development, theoretical characteristics, and implications for community green space improvement rest principally on representative publications, materials from relevant international research projects, and comparisons across studies.

3 Conceptual Development of BCD and Its Extension Into Urban Contexts

3.1 Conceptual Origins and Research Trajectories of BCD

The concept of BCD emerged from a growing recognition of the close interrelationships between biological and cultural diversity. *The Declaration of Belém*, formulated at the First International Congress of Ethnobiology in 1988, was an early affirmation of their inseparability. It also emphasized the roles of Indigenous peoples and traditional communities in the stewardship of biological resources, the protection of traditional knowledge and related decision-making[20–21]. Luisa Maffi and Terralingua, which she helped establish in 1996, subsequently advanced this line of research[22–23]. Maffi conceptualized BCD in terms of the interrelationships among different expressions of life—biological, cultural, and linguistic diversity—within complex social–ecological adaptive systems. The emphasis was not on placing several forms of diversity side by side, but on their interdependence and co-evolution[24–25].

BCD research subsequently expanded into quantitative analysis, policy applications and collaboration across fields. In 2005, Jonathan Loh and David Harmon developed a global index of BCD, providing an early attempt to quantify spatial associations between biological and cultural diversity[26]. In 2010, UNESCO and the Secretariat of the Convention on Biological Diversity (SCBD) established the Joint Programme of Work on the Links between Biological and Cultural Diversity. Subsequent regional declarations and collaborative initiatives brought nature–culture linkages further into international policy and conservation agendas[27–28] (Fig. 1). Discussion within the World Heritage field likewise addressed the

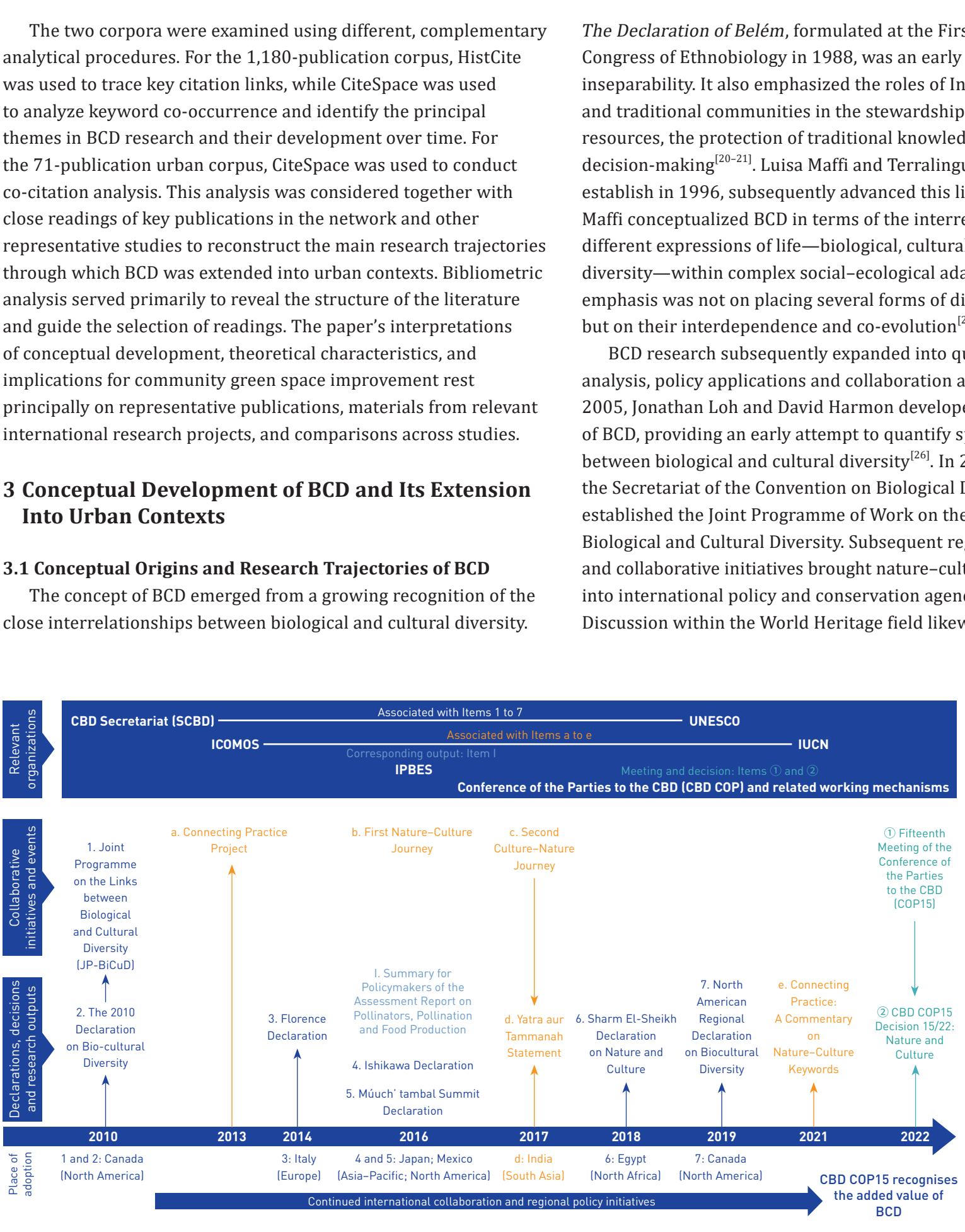


Fig. 1 Major international policy initiatives and collaborative practices associated with biocultural diversity (IPBES stands for Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services).

connections between nature and culture, with cultural landscapes, local knowledge, and associated management experience becoming important considerations in heritage conservation and integrated management[29–31]. From the 2010s onwards, BCD research also examined the significance of Indigenous lands for biodiversity conservation[32], local ecological knowledge[33], assessments of cultural ecosystem services[34], relational values[35], biocultural indicators[36], and the framework of Nature's Contributions to People (NCP)[37–38].

As the scope of BCD research broadened, scholars also began to synthesize biocultural approaches from the perspectives of nature conservation, sustainability, and interdisciplinary practice[29,39–41] (Table 1). Although differing in emphasis, these syntheses share an attention to specific social-ecological contexts and to the influence of knowledge, values, actors, and institutional arrangements on human–nature interactions.

The keyword co-occurrence network for the 1,180 publications, considered alongside representative studies, indicates that Indigenous and local knowledge, conservation and resource management have remained central concerns in BCD research. Other lines of enquiry have developed around plant use and cultural keystone species[42–43], landscapes and land use[44], and multi-actor participation and adaptive governance[45] (Fig. 2). Rather than asking only whether different forms of diversity co-occur, this work increasingly examines how biological and cultural dimensions interact in particular social–ecological contexts, and how knowledge, practices, and institutions shape resource use and conservation.

Overall, early BCD research focused primarily on the relationships among biological, cultural, and linguistic diversity. As the field developed, local knowledge, resource use, valuations, conservation management, and institutional arrangements became more prominent. Much of the empirical literature, however, continued to center on Indigenous peoples and local communities and remained closely tied to biodiversity conservation and natural resource management[46].

Table 1: Representative syntheses of biocultural approaches

Focus	Source	Main points	Literature
Principles of biocultural approaches to conservation	Michael Gavin et al. (2015)	· Recognize multiple conservation goals and stakeholder interests · Emphasize intergenerational planning and institutions in long-term adaptive governance · Treat culture as a dynamic influence on resource use and conservation · Tailor interventions to specific social-ecological contexts · Develop innovative, diverse and nested institutional arrangements · Emphasize partnerships and relationship-building in conservation outcomes · Recognize distinct rights and responsibilities · Respect and integrate diverse worldviews and knowledge systems	Ref. [39]
BCD in nature and heritage conservation	Peter Bridgewater and Ian Rotherham (2019)	· Biological and cultural diversity are closely connected · Their relationships involve both positive and negative feedbacks · These connections vary across places and over time · Cultural heritage may have intangible forms · Biocultural heritage may involve biodiversity elements sustained by traditional management practices · Biocultural heritage may be embodied in ecological and cultural landscapes	Ref. [29]
The biocultural paradigm and global sustainability	Juliana Merçon et al. (2019)	· Emphasize the significance of diversity for global sustainability · Connect nature, human well-being and cultural values · Consider social justice in sustainability · Promote coordination across culture-related policies, governance levels, and actors	Ref. [40]
Links between biocultural approaches and sustainability science	Jan Hanspach et al. (2020)	· Adopt a system perspective on human–environment interactions · Support interdisciplinary and transdisciplinary research · Seek solutions to context-specific sustainability challenges	Ref. [41]

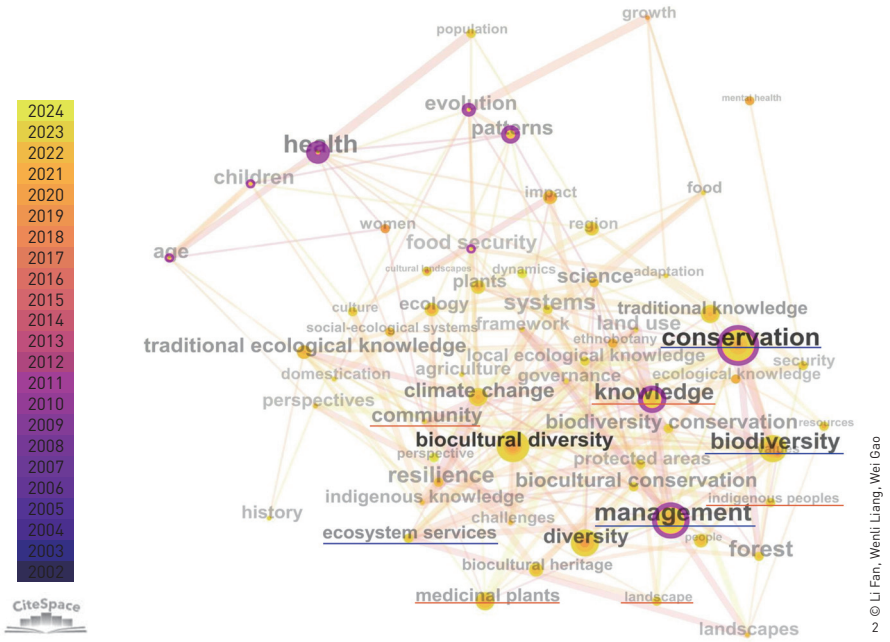


Fig. 2 Keyword co-occurrence network of biocultural diversity research indexed in the WoS.

3.2 The Extension of BCD Into Urban Contexts and the Development of UBCD Research

The key citation pathways generated by HistCite for the 1,180-publication corpus indicate that, after 2015, studies addressing urban contexts gradually formed a relatively concentrated set of connections within the wider BCD citation network[26,36,39,47–53] (Fig. 3). The key nodes and representative studies suggest that this development did not follow a single trajectory. Cocks was among the earlier scholars to examine natural resource use and its cultural significance in the context of modernization and population mobility. In 2006, she observed that BCD research had largely focused on Indigenous and local groups, whereas certain uses of natural resources and their cultural meanings could persist, adapt or be reconfigured as social and material environments changed. She therefore argued for extending BCD research to a wider range of social groups[54]. In 2014, Cocks and Freerk Wiersum found that some forms of natural resource use, cultural practice, and place-based identity persisted among

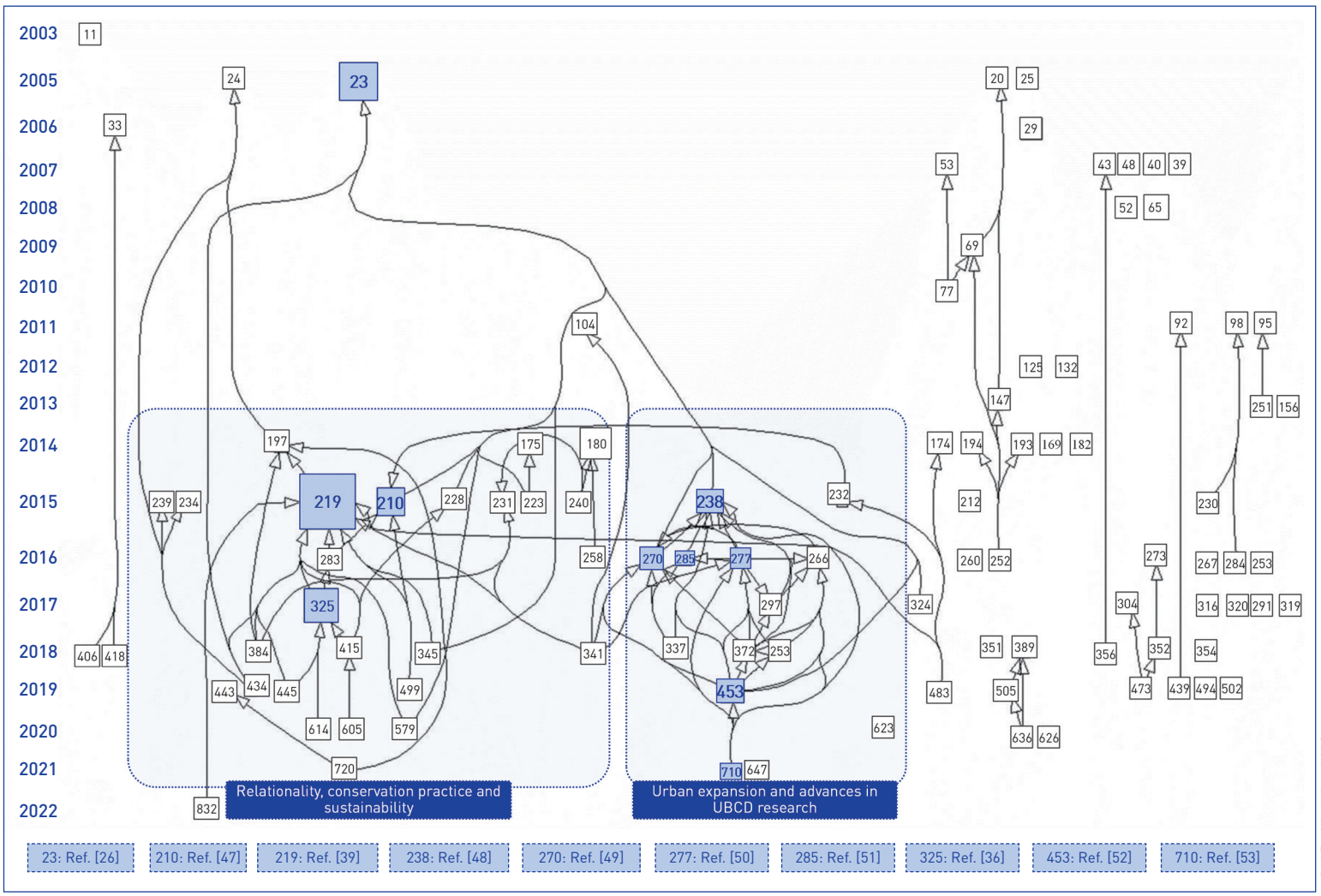


Fig. 3 HistCite citation pathways in the corpus of 1,180 BCD publications. In the figure, nodes represent the 100 most locally cited publications identified by HistCite; labels are HistCite record numbers, and lines denote direct citations within the broader corpus.

AmaXhosa people who had moved to peri-urban and urban areas[55]. By 2016, Cocks and colleagues were examining urban residents' encounters with nature and their connections to identity, well-being, and shared heritage[51].

Launched in 2013, the GREEN SURGE project approached BCD through urban green infrastructure and more systematically addressed its relationship to urban planning and management. The project encompassed policy, ecological conditions, residents' use of green spaces, and governance[56–57]. In a study of 20 European cities, Birgit Elands et al. found that although municipal green space managers rarely used the term BCD explicitly, existing policies and practices already addressed biodiversity, cultural values, green space use, and citizen participation. At the city scale, attention was directed more towards green space networks and policy arrangements; at the site scale, links to residents' everyday use, participation, and management were more apparent[48]. Subsequent studies by scholars such as Kati Vierikko and Marleen Buizer brought into view how different sociocultural groups use and understand urban green spaces, as well as differences in knowledge, value judgements, competing interests, and participation in governance[49–50,58].

The co-citation network of the 71 urban-focused publications further reveals connections among these strands of research. It links studies of urban residents by Cocks and colleagues, GREEN SURGE outputs, and research on experiences of urban nature and biodiversity assessment (Fig. 4). In thematic terms, urban ethnobiology has continued to examine plant use, residents' experiences of nature and their cultural meanings, while GREEN SURGE-related scholarship has focused more directly on green infrastructure, planning, and governance[5,48–50,52-53,56,58–63] (Fig. 5). The two strands have increasingly intersected around human–nature interactions and green space use and management in cities.

Around 2017, GREEN SURGE Work Package 2 consolidated research materials on UBCD and developed typologies and assessment content[56–57]. Building on these outputs, Elands and colleagues further elaborated the three-layer framework of materialized, lived, and stewardship BCD in 2019[52]. In 2021, Sanna Stålhammar and Ebba Brink applied the framework in an informal settlement in Rio de Janeiro, examining residents' experiences of nature, group values, and participation[53]. Paula Gonçalves et al. also developed an indicator-based decision-support tool for individual urban green spaces and tested it in parks in Lisbon[62].

As BCD research expanded into urban contexts, everyday green spaces such as parks and community gardens received greater attention. The range of actors considered also widened

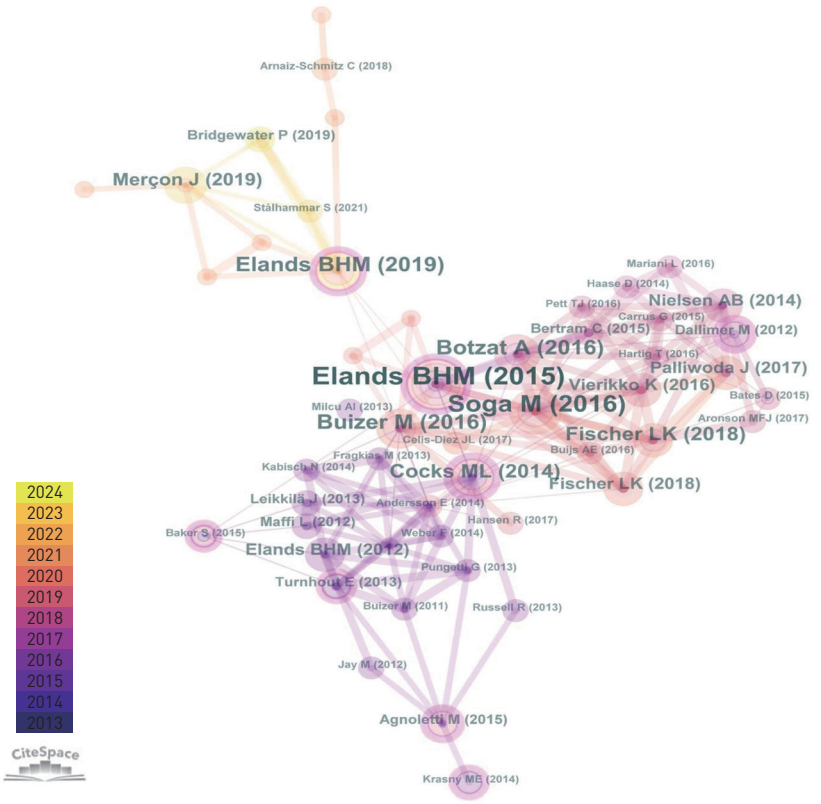


Fig. 4 Co-citation network of 71 urban-focused publications.

to encompass urban residents from different sociocultural backgrounds, as well as planners and managers. Questions about how residents use green spaces, how different groups perceive and value urban nature, and who takes part in planning, management, and long-term stewardship became increasingly important. This growing body of research helped clarify the concept of UBCD and the analytical framework developed around it.

4 Conceptual Positioning and Analytical Framework of UBCD

4.1 Conceptual Positioning and Complementary Contribution of UBCD

As BCD has been extended into urban contexts, both the subjects of enquiry and the questions asked have shifted. Research has increasingly examined how different groups use, understand, and shape urban nature, and how these relationships change with social composition, ways of life, and management arrangements[48,50]. Values, experiences, everyday practices, and participation have also become important concerns[52–53]. UBCD thus brings human–nature relationships in particular places more clearly into focus.

Biodiversity describes variation within living systems, including

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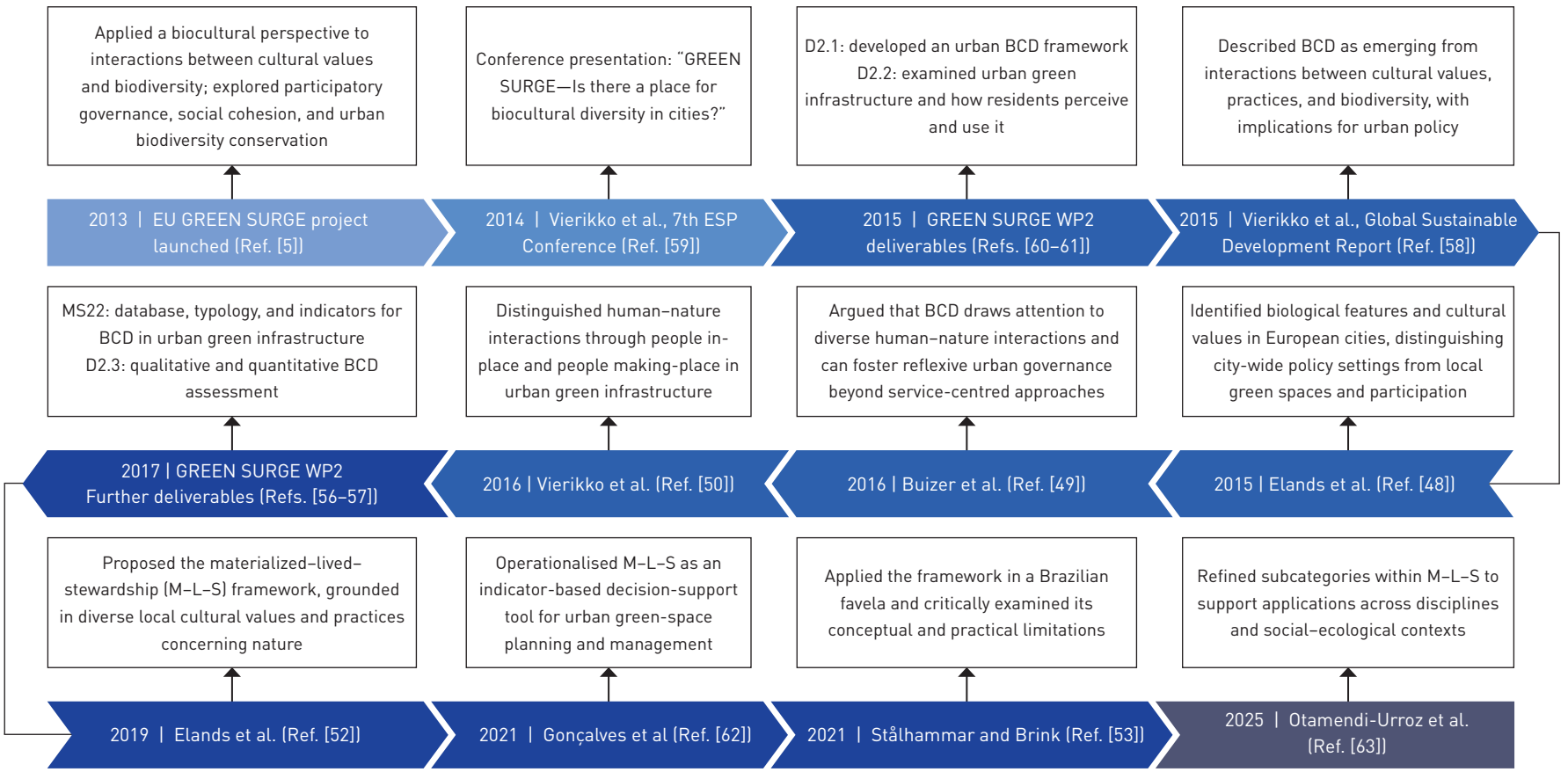


Fig. 5 Selected developments associated with GREEN SURGE. In the figure, D2.1, D2.2, and D2.3 refer to GREEN SURGE Work Package 2 deliverables 2.1, 2.2, and 2.3, respectively; MS22 denotes Milestone 22; and M–L–S abbreviates materialized–lived–stewardship.

differences among species and habitats, whereas cultural diversity encompasses differences among social groups in values, knowledge systems, and everyday practices. UBCD does not simply add these two forms of diversity together. Instead, it asks how they are connected and change through people's everyday interactions with nature. In cities, different groups assign meanings to green spaces through their use, experience, interpretation, and stewardship, and may thereby also alter their material form and ecological characteristics. Thus, even green spaces with similar biophysical conditions and user populations may sustain different human–nature relationships and stewardship practices. The "diversity" at issue in UBCD refers not only to variation in biological and cultural attributes but also to the multiple, changing ways in which people live with and shape nature[50]. From this perspective, UBCD overlaps with biodiversity, ecosystem services, and NCP, while differing in its analytical emphasis[3,37,49–50,52–53,64–67] (Table 2).

This positioning also has implications for how UBCD is studied. Previous studies have used indicators covering species, habitats, spatial use, and participation to analyze urban green spaces[62]. Yet the principal aim of UBCD research is not to measure static correspondences between biological and cultural diversity[58]. Elands et al. describe BCD as a "sensitizing and reflexive" concept: it provides a way of approaching a research problem in its particular context rather than prescribing a uniform set of benchmarks[52–53]. Indicators and aggregate scores can support comparisons across sites, while examining individual indicators and site-specific evidence remains important for interpreting differences and their possible explanations[62].

The complementary contribution of UBCD, therefore, is neither to add a separate set of cultural-diversity indicators to urban green space assessments nor to replace established biodiversity monitoring or ecosystem services assessment. Rather, it is to understand green spaces as places continually shaped by ecological processes, everyday practices, and governance actions. Alongside questions about what is present and what a green space provides, UBCD addresses how that space has come to take its present form, how different actors develop relationships with nature, and how those relationships are affected by planning and management

Table 2: Key definitions of concepts related to urban biocultural diversity

Concept	Definition	Source	Literature
Biodiversity	The variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems	Convention on Biological Diversity	Ref. [64]
BCD	Ongoing co-evolution and adaptation between biological and cultural diversity, including local expressions of the diverse ways in which people live with nature and the ecological knowledge and practices transmitted across generations	Convention on Wetlands thematic group, as quoted from *Connecting Practice: A Commentary on Nature–Culture Keywords*	Refs. [3,65]
Ecosystem services	Benefits people obtain from ecosystems, including provisioning, regulating, cultural, and supporting services	*Millennium Ecosystem Assessment*	Ref. [66]
NCP	The positive and negative contributions of living nature—including organisms, ecosystems, and ecological and evolutionary processes—to people's quality of life; recognition of culture and different knowledge systems is central to how these contributions are understood	Díaz et al.	Ref. [37]
Urban biodiversity	The variety and abundance of organisms, including genetic variation, and diversity of habitats from the urban fringe to the urban core	*Cities and Biodiversity Outlook* issued by SCBD	Ref. [67]
UBCD	The interconnections between biological and cultural diversity in cities, with particular attention to diverse and changing human–nature relationships and differences in knowledge, values, and practices among people engaging with urban nature	Synthesised by the authors	Refs. [49–50,52–53]

arrangements. It thus brings local knowledge, multiple values, and differences in everyday practices into the analysis of urban green spaces and reflection on their governance.

4.2 Materialized, Lived, and Stewardship BCD

The GREEN SURGE project and related studies distinguish three interrelated dimensions of UBCD: materialized BCD, lived BCD, and stewardship BCD[52,56–57]. The framework brings observable material expressions, everyday experiences, and active stewardship into a shared analytical structure, allowing ecological conditions, lived practices, and stewardship activities in particular places to be considered in relation to one another (Fig. 6).

Materialized BCD concerns identifiable and measurable biophysical expressions, together with associated cultural or technical artefacts. Lived BCD, at the center of the framework, encompasses people's everyday encounters with, uses of, and experiences in green spaces, including the values, norms, traditions,

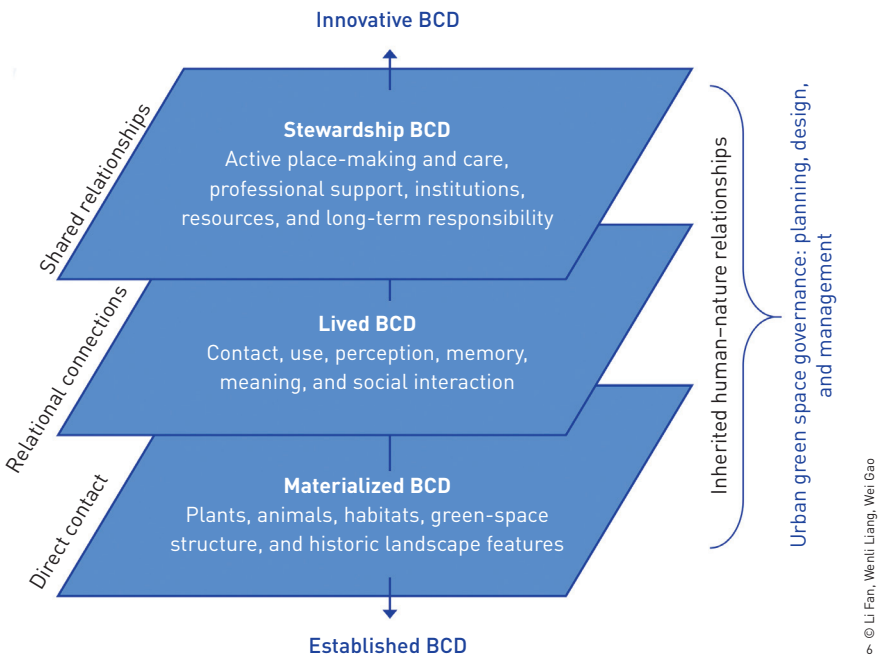


Fig. 6 Analytical framework for UBCD: materialized, lived, and stewardship BCD.

and knowledge involved. Stewardship BCD concerns people's active involvement in shaping and maintaining green spaces, including motivations, values, actions, norms, and knowledge at both individual and collective levels[52]. Stewardship here extends beyond routine maintenance to deliberate efforts by different actors to protect, create, and modify places. The three dimensions may influence one another in particular settings: material conditions shape everyday use and experience; values, knowledge, and place meanings developed through lived experience may inform stewardship; and sustained stewardship may, in turn, change spatial form and biophysical conditions.

These potential interactions also mean that the dimensions cannot be treated as entirely separate. Lived BCD and stewardship BCD overlap in their concern with values, motivations, actions, and norms[52]. Subsequent research has cautioned that simply placing quantitative biophysical data alongside qualitative sociocultural accounts does not necessarily reveal the relationships between them[53]. More recent work has likewise suggested that values and sense of place may span both lived and stewardship dimensions[63]. The framework is valuable not merely for distinguishing three domains of inquiry, but for directing attention to whether and how they are connected, which practices and institutional arrangements shape these connections, and how they change over time or generate feedback. It provides a starting point for relational analysis; it does not presume reciprocal shaping in every setting, nor does it constitute a causal model or a theory of governance.

The three-dimensional framework does not rule out quantification. Subsequent research has operationalized it as an indicator-based decision-support tool for individual urban green spaces, allowing assessment benchmarks to be adapted to site-specific contexts[62]. Such applications serve purposes that differ from those of comprehensive city-scale assessment tools. The City Biodiversity Index (CBI), also known as the Singapore Index, for instance, was developed primarily for city-level self-assessment and ongoing monitoring. Its 2021 edition comprises 28 indicators covering native biodiversity, ecosystem services, and biodiversity governance and management[68]. The CBI facilitates the establishment of citywide baselines and the monitoring of change, while site-level applications of UBCD place greater emphasis on the connections among materialized, lived and stewardship BCD in their particular contexts (Fig. 7).

At the site scale, residents' participation and cultural dynamics become more readily apparent[48]. Community green spaces are closely connected to everyday life: vegetation and spatial conditions, residents' actual uses, and the stewardship activities of different actors often intersect in the same place. The three-dimensional framework makes it possible to examine these elements as interrelated processes. A community green space thus comprises more than its existing vegetation and spatial form; it also involves the ways people use and care for the place in relation to its material conditions. These relationships may continue to change as everyday life and management arrangements evolve.

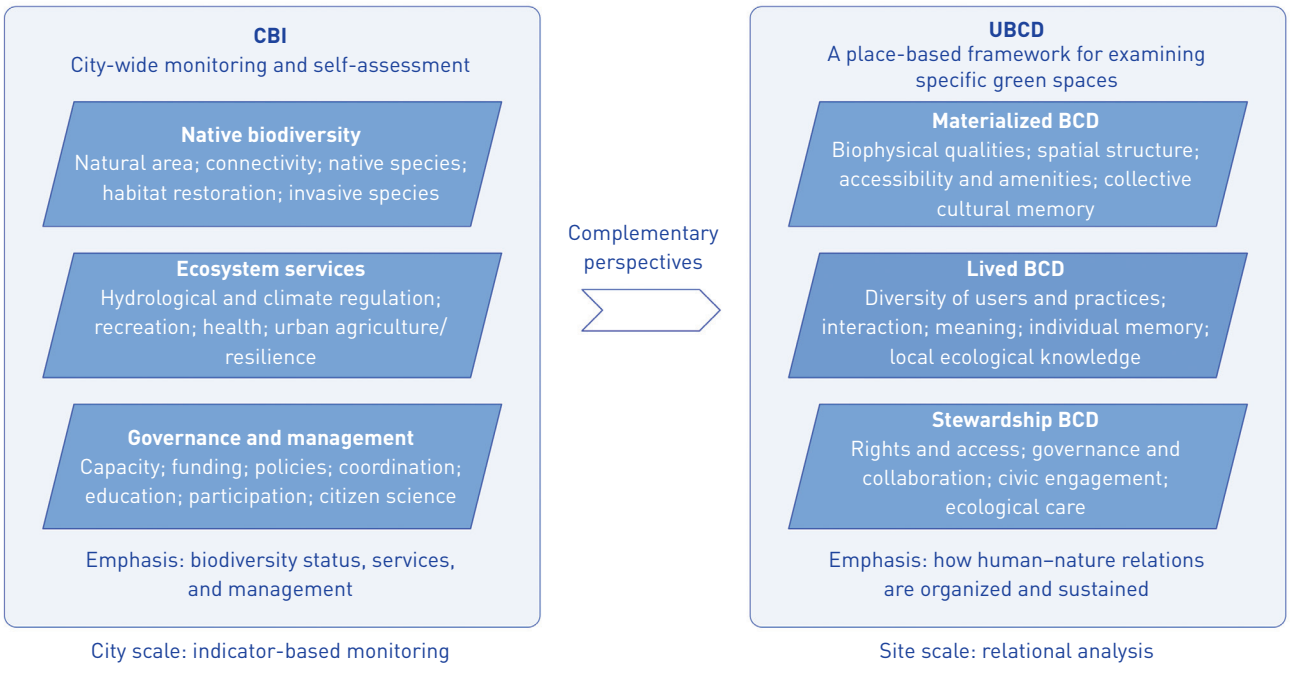


Fig. 7 Comparison of the typical applications and analytical emphases of CBI and UBCD framework.

5 Implications of UBCD for Community Green Space Improvement

UBCD brings the material conditions, lived experiences, and stewardship practices of everyday green spaces into relation. For community green space improvement, this broadens what is understood as a site's existing conditions. Community green spaces have measurable ecological and spatial characteristics, but they also embody established patterns of use, value judgements, and stewardship relationships. These relationships often predate a regeneration project and may be altered as it proceeds. Decisions based solely on vegetation cover, species composition, and facilities and spatial form risk overlooking aspects of place that matter to everyday use and subsequent stewardship. The task, therefore, is not simply to document plants, residents' uses, and cultural meanings separately, but to examine how these relationships have developed, who sustains them, and which existing human–nature relationships renewal might retain, modify or interrupt.

5.1 Existing Conditions and Actual Use

Judgements about existing environments cannot rest on material conditions alone. Different groups may use the same green space in different ways and attach different values to it; even among people with similar cultural backgrounds, individual experience, ways of life, and social circumstances can produce differences[7]. Historical records, customary uses, and broad cultural categories may therefore offer useful clues, but cannot substitute for an understanding of present-day practices. Planning and design need to establish which spaces continue to accommodate movement, rest, social interaction or cultivation; which natural features have become connected to everyday use and care; which established relationships are weakening; and what new needs are emerging. This does not mean that everything already present should be retained, or that cultural meaning should be attributed in advance to every place or natural feature. Understanding these relationships provides a sounder basis for decisions about what to retain, modify or introduce, so that ecological improvement and spatial enhancement remain grounded in everyday life.

5.2 Participation and Responsibilities of Different Actors

UBCD brings residents, planners, managers, and other actors into the analysis. Participation is more than a procedural arrangement; it also concerns how different actors contribute knowledge, mobilize resources, and take responsibility. Residents and other regular users are familiar with long-standing uses and subtle changes in a place. Professionals contribute ecological, spatial, and technical judgement, while community organizations and management agencies coordinate local activities, address community affairs, and organize projects. Research on community gardens shows that governance arrangements and actors' roles change across the stages of planning and design, implementation, and management[69]. The aims and policy instruments of participation likewise vary across stages of green infrastructure projects[70]. Collaboration between local governments and civic initiatives is also shaped by access to land, funding, knowledge, and institutional rules[71].

Governance, in this context, is not synonymous with routine management and maintenance after construction. It also concerns how improvement objectives are established, who makes decisions, how different forms of knowledge and competing demands enter the process, and how action and responsibility are distributed. Effective participation is not determined simply by the number of participants, nor does it require everyone to be involved in the same way throughout a project. More pertinent questions are whose use of a place will be affected, which experiences and forms of knowledge can change a proposed scheme, how conflicting objectives will be negotiated, how implementation requirements will be met, and who will assume responsibility after completion. Participation becomes substantively relevant to governance when different actors' knowledge and needs influence design decisions, professional and managerial support can be mobilized, and responsibilities for implementation and long-term stewardship can be sustained.

5.3 Long-Term Stewardship and Spatial Adjustment

Green spaces continue to change after construction is complete. Plants grow, patterns of use shift, and management resources and participating actors may change. Research on green infrastructure has shown that participation extends across the project life cycle and takes different forms at different stages[70]. Studies of blue–green infrastructure have also identified links between everyday practices, place meanings, and residents' willingness to engage in stewardship[72].

Stewardship therefore needs to be considered from the outset. The labor, resources, and professional support likely to be available over time can influence spatial form, the arrangement of natural features and the complexity of facilities. Pruning, replacement planting, changes of use or partial spatial reconfiguration after completion do not necessarily indicate that the original design has

failed; they may instead be adaptive responses to plant growth and changes in patterns of use or management conditions.

UBCD offers a relational perspective for observing and making judgements about community green space improvement, rather than a fixed procedure to follow. Ecological conditions, everyday life, and continuing stewardship need to be considered together, in relation to particular places and the ways they change over time. Culture is not a separate component added to green spaces, but is expressed in how different groups use, understand, and care for nature. For the improvement of existing communities in China, such a relational, dynamic, and context-sensitive perspective can help spatial improvements respond more closely to everyday use while giving due attention to actors' responsibilities and long-term stewardship.

6 Conclusions

Drawing on a broad corpus of 1,180 BCD-related publications and 71 urban-focused publications, this review combined bibliometric analysis with close readings of representative studies to trace the intellectual development through which BCD has been extended into urban contexts and UBCD has taken shape. The findings indicate that this expansion involves more than a change in study setting. As parks, community gardens, and other everyday green spaces have become important research settings, greater attention has been paid to urban residents, planners, and managers as actors. Experiences of use, value judgements, participation, and stewardship practices have become important to understanding human–nature relationships in cities. UBCD thus foregrounds their relational, dynamic, and context-sensitive character, while the materialized–lived–stewardship framework provides a useful structure for analyzing them in particular places.

These insights also provide a broader basis for decisions about community green space improvement. Ecological and spatial conditions need to be examined alongside actual uses, participation, and long-term stewardship; decisions about what to retain, modify or introduce should take account of relationships already established in a place. In the improvement of community green spaces in China, completion of a project does not fix human–nature relationships once and for all. Green spaces continue to change through everyday use and ongoing stewardship. Nor should culture be treated as an additional, separate consideration: it is expressed in how different groups use, understand, and care for nature.

For community green space improvement in China, UBCD does not call for replacing existing ecological assessment or planning and management approaches with another composite index. Rather, it calls for reconsidering the questions that guide improvement practices. Alongside what to retain, modify or introduce, practitioners need to ask whose knowledge and experience inform these decisions, which human–nature relationships they may affect, and who will participate in implementation and assume long-term responsibility. This review accordingly positions UBCD as a complementary analytical perspective connecting ecological understanding, local lived experience and reflection on governance, rather than as an independent and fully developed theory of governance. Given the restriction of the literature search to English-language WoS publications and the geographical distribution of existing UBCD research, the relevance of this perspective to different Chinese cities and community improvement contexts requires further examination.

Competing interests | The authors declare that they have no competing interests.

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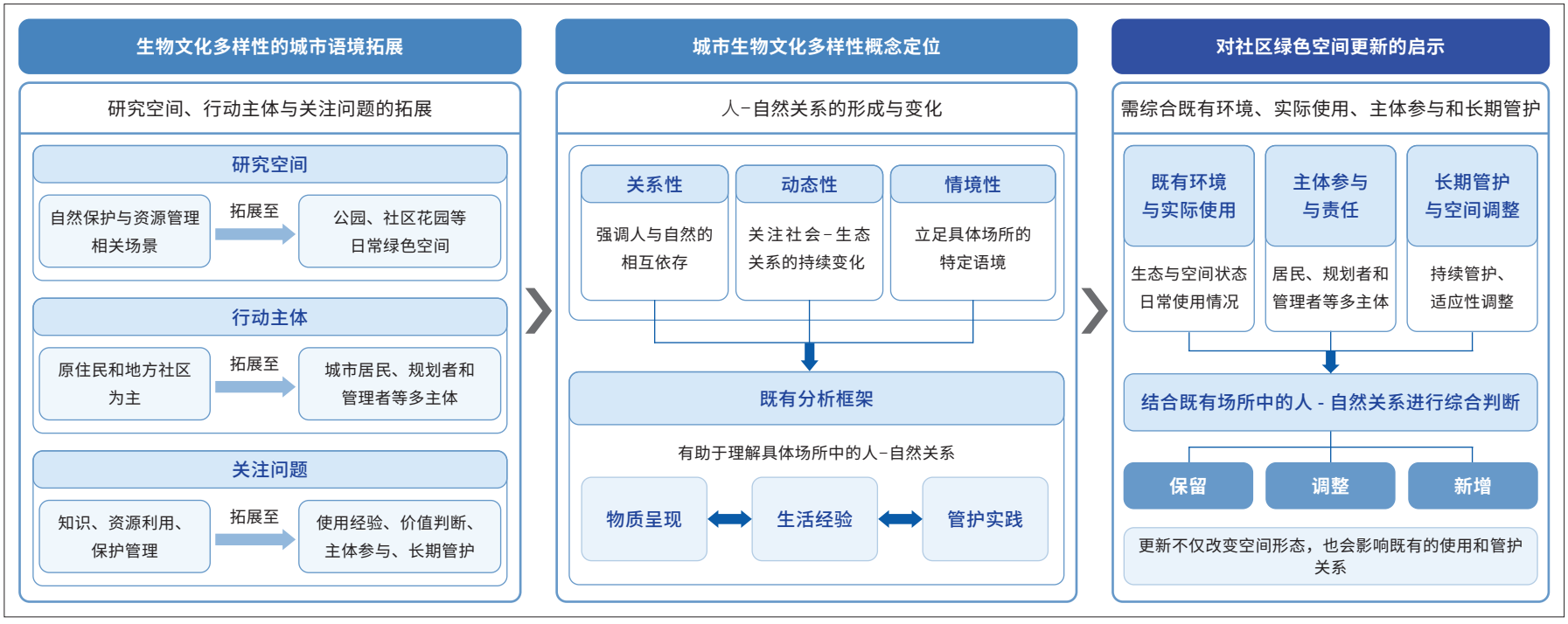
生物文化多样性的城市语境拓展及其对社区绿色空间更新的启示

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图文摘要



摘要

随着生物文化多样性（BCD）向城市语境拓展，相关研究逐渐延伸至公园、社区花园等日常绿色空间，并将城市居民、规划者和管理者等纳入分析，但这一拓展的知识脉络及城市生物文化多样性（UBCD）的概念定位仍缺乏系统梳理。本文基于Web of Science核心合集收录的1 180篇BCD相关文献和71篇城市主题文献，采用HistCite和CiteSpace开展辅助分析，并研读代表性文献。结果表明，BCD向城市语境拓展并非研究场所的简单转换，研究对象、行动主体和关注问题随之变化；使用经验、价值判断、主体参与和长期管护成为重要议题。UBCD的价值并非将生物与文化多样性简单叠加，而在于从关系性、动态性和情境性视角，理解不同主体如何与城市自然共同生活并持续塑造绿色空间；既有“物质呈现–生活经验–管护实践”框架为分析这一过程提供了结构。社区绿色空间与日常生活联系紧密，更新也可能维持、改变或中断既有使用和管护关系，因此设计实践需同时考察生态与空间状态、实际使用、主体参与和长期管护，并结合既有场所中的人–自然关系作出保留、调整和新增等判断。

关键词

生物文化多样性；城市生物文化多样性；社区绿色空间更新；人–自然关系

文章亮点

- 系统厘清生物文化多样性向城市语境拓展的知识脉络
- 明确城市生物文化多样性关注多元人–自然关系的理论定位
- 阐明社区绿色空间更新实践需兼顾实际使用、主体参与和长期管护

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1 研究背景

全球生物多样性治理日益重视自然与文化之间的联系及其对保护实践的意义。《昆明–蒙特利尔全球生物多样性框架》明确提出，应重视生物多样性和文化多样性之间的重要联系[1]，相关决议进一步强调生物文化多样性（biocultural diversity，BCD）的附加价值[2]。BCD试图突破自然与文化相分离的二元认识，关注知识体系、价值观、社会制度及生活实践等与生物环境之间的相互影响[3]。

近年来，城市中的人–自然互动已成为BCD研究的重要拓展方向之一[4]。此前，欧盟“面向可持续城市发展与绿色经济的绿色基础设施和城市生物多样性”（GREEN SURGE）项目较早将BCD与城市绿色基础设施、规划和治理联系起来[5]；米歇尔·科克斯、查理·沙克尔顿等则关注不同社会文化背景的群体如何认识、使用和管护城市自然，以及这些差异对绿色空间规划与管理的影响[6]。近年研究又从城市民族生物学和不同文化背景居民的绿色空间使用等方面，讨论人口流动、文化背景和生活经历对城市人–自然关系的塑造[7–8]。这些研究为城市生物文化多样性（urban biocultural diversity，UBCD）的发展奠定了基础。相比之下，中国BCD研究仍较多集中于民族植物学[9]、传统知识保护[10–11]、文化景观遗产[12–14]和自然保护地管理[15–18]等领域，对现代城市空间及其动态社会过程关注相对有限[19]。

随着BCD向城市语境拓展，研究对象进一步延伸至居民日常接触、使用和管护的具体绿色空间。城市绿色空间的更新不仅涉及植物配置与空间品质的改善，还涉及什么样的自然值得保留、不同使用方式如何协调、哪些知识能够影响决策，以及由谁承担后续管护责任。社区绿色空间与居民日常生活联系紧密，更便于观察这些问题所涉及的人–自然关系及其变化。因此，有必要系统梳理BCD向城市语境拓展并形成UBCD研究的知识脉络，进一步说明这一视角对社区绿色空间更新的意义。基于此，本文采用文献计量分析辅助的综述方法，讨论UBCD的理论发展及其对社区绿色空间更新的启示。

2 数据来源与研究方法

本文以Web of Science（WoS）核心合集为文献来源，在相同的时间、语言和文献类型条件下建立两组语料。第一组以“biocultural”或“biocultural diversity”为主题检索词，获得1 180篇BCD相关文献；第二组以“urban biocultural diversity”为主题检索词独立检索，获得71篇城市主题文献。两次检索的时间范围均为2000年1月1日至2025年5月30日，语言限定为英语、文献类型为Article和Review。前者用于把握BCD的总体知识基础，后者用于聚焦城市主题研究的知识联系。检索截止后的少量新近文献仅用于补充理论讨论，不纳入文献计量分析。

两组语料分别采用不同的辅助分析方式。对1 180篇总体语料，利用HistCite梳理关键引文联系，并通过CiteSpace分析关键词共现，以辨认BCD的主要研究议题及其发展变化；对71篇城市主题语料，采用CiteSpace开展共被引分析，并结合关键节点文献及代表性研究的全文阅读，梳理BCD城市语境拓展的主要研究脉络。文献计量主要用于识别知识结构和提供阅读线索。本文对概念发展、理论特征及社区绿色空间更新启示的判断，主要依据代表性文献、相关国际研究项目资料及文献之间的比较分析。

3 BCD理论发展与城市语境拓展

3.1 BCD的概念来源与研究脉络

BCD概念的形成，建立在对生物多样性与文化多样性内在联系的持续认识之上。1988年首届国际民族生物学大会形成的《贝伦宣言》较早明确了文化多样性与生物多样性之间不可分割的联系，并强调原住民和传统社区在生物资源管护、传统知识保护及相关决策中的作用[20–21]。此后，路易莎·马菲及其于1996年参与创立的地球语言组织（Terralingua）持续推动相关研究[22–23]。马菲将BCD界定为生命多种表现形式——生物、文化与语言多样性——在复杂社会–生态适应系统中的相互关联，重点不在多类要素的并列，而在其相互依存及协同演化[24–25]。

此后，BCD研究开始向量化分析、政策应用和跨领域合作扩展。2005年，乔纳森·洛与戴维·哈蒙构建了全球BCD指数，为生物与文化多样性关联的空间量化提供了早期尝试[26]。2010年，联合国教科文组织与《生物多样性公约》秘书处（Secretariat of the Convention on Biological Diversity，SCBD）共同发起“关于生物多样性与文化多样性之间联系的联合计划”，此后形成的区域宣言和合作项目，使自然–文化联系更多出

现在国际政策与保护议程中[27-28]（图1）。世界遗产领域也持续讨论自然与文化之间的联系，文化景观、地方知识及相关管理经验成为遗产保护与综合管理的重要内容[29-31]。2010年代以来，BCD又与原住民土地保护[32]、地方性生态知识[33]、文化服务评估[34]、关系价值[35]、生物文化指标[36]和“自然对人类贡献”（Nature’s Contributions to People，NCP）框架[37-38]等议题形成联系。

在研究范围扩展的同时，学者也开始从自然保护、可持续性和跨学科实践等角度归纳生物文化方法[29,39-41]（表1）。这些归纳虽然侧重点不同，但都强调具体社会–生态情境，并进一步关注知识、价值观、行动主体和制度安排对人–自然互动的影响。

结合1 180篇文献的关键词共现网络和相关代表性研究可以看到，原住民与地方知识、保护和资源管理仍是BCD长期关注的内容，植物利用及文化关键物种[42-43]、景观与土地利用[44]，及多主体参与和适应性治理[45]等议题也逐渐展开（图2）。这类研究不再只讨论不同类型多样性是否共同出现，而是更多考察生物与文化在具体社会–生态情境中如何相互作用，以及知识、实践和制度如何影响资源利用与保护。

总体来看，BCD早期主要围绕生物、文化和语言多样性之间的关联展开。随着研究发展，地方知识、资源利用、价值判断、保护管理和制度安排等问题逐渐纳入讨论，但相关经验研究仍多以原住民和地方社区为对象，并与生物多样性保护和自然资源管理密切相关[46]。

3.2 BCD的城市语境拓展与UBCD研究推进

基于1 180篇总体语料的HistCite关键引文路径显示，2015年以后，涉及城市语境的BCD文献逐渐在总体引文网络中形成了相对集中的连接区[26,36,39,47-53]（图3）。从关键节点和代表性研究看，这一变化并非沿单一路径展开。科克斯较早关注现代化和人口流动背景下的自然资源使用及其文化意义。2006年，她指出，既有BCD研究较多聚焦原住民和地方群体；社会和物质环境改变后，一些自然资源使用及其文化意义仍会延续，也可能调整和重组，因此BCD还应关注更广泛的社会群体[54]。2014年，科克斯与弗里克·维尔瑟姆发现，阿马科萨群体迁居城郊和城市

表 1：代表性研究对生物文化方法的主要归纳

分类	提出者	主要内容	参考文献
生物文化保护方法的原则	迈克尔·加文等（2015）	· 承认保护目标及利益相关者的多元性 · 重视代际规划与制度安排对长期适应性治理的作用 · 将文化视为影响资源利用与保护的动态因素 · 根据具体社会–生态情境制定干预措施 · 构建新颖、多样且嵌套的制度框架 · 强调伙伴关系与关系建构对保护成效的重要性 · 纳入各方独特的权利与责任 · 尊重并吸纳不同世界观与知识体系	参考文献 [39]
BCD 在自然与遗产保护中的作用	彼得·布里奇沃特和伊恩·罗瑟勒姆（2019）	· 文化多样性与生物多样性之间存在明确联系 · 二者之间存在广泛反馈，包括正向与负向作用 · 二者的联系随时间和地点变化 · 文化遗产可能以无形形式存在于特定文化之中 · 生物文化遗产可与依赖传统管理实践的特定生物多样性要素相联系 · 生物文化遗产可体现在具体生态文化景观中	参考文献 [29]
生物文化范式对全球可持续性的意义	朱莉安娜·梅尔孔等（2019）	· 强调多样性对全球可持续性的意义 · 关注自然、人类福祉与文化价值之间的联系 · 重视可持续性中的社会正义问题 · 强调文化相关政策及不同治理层级与行动主体之间的协调	参考文献 [40]
生物文化方法与可持续性科学关键组成部分的关联	扬·汉斯帕赫等（2020）	· 采用人类与环境相互作用的系统视角 · 开展跨学科与交叉学科研究 · 面向具体可持续性问题寻求解决方案	参考文献 [41]

后，部分自然资源使用、文化实践及地方认同仍然延续[55]。至2016年，科克斯等已直接考察城市居民的自然接触及其与身份认同、福祉和共享遗产的联系[51]。

于2013年启动的GREEN SURGE项目则从城市绿色基础设施切入，较系统地讨论BCD与城市规划和管理的关系。项目涵盖政策、生态环境、居民使用和治理等内容[56–57]。比尔吉特·埃兰兹等调查20个欧洲城市后发现，城市管理部门虽然很少直接使用BCD概念，相关政策与实践已经同时涉及生物多样性、文化价值、绿色空间使用和居民参与；城市尺度更多关注绿色空间网络和政策安排，具体场地则与居民使用、参与和管理联系更紧密[48]。卡蒂·维里科、玛琳·布伊泽等随后将不同社会文化群体的绿色空间使用和认识，以及知识差异、价值判断、利益冲突和参与治理等问题纳入讨论[49–50,58]。

而71篇城市主题语料的共被引网络则进一步呈现了上述研究之间的联系。网络同时连接了科克斯等的城市居民研究、GREEN SURGE相关成果，以及城市自然体验和生物多样性评价等文献（图4）。从研究内容看，城市民族生物学持续关注植物使用、居民自然经验及其文化意义；GREEN SURGE的相关研究更多讨论绿色基础设施、规划和治理等[5,48–50,52–53,56,58–63]（图5）。两方面研究在城市人–自然互动、绿色空间使用和管理等问题上逐渐交叉。

至2017年前后，GREEN SURGE工作包2进一步汇总UBCD研究资料，并整理类型与评价内容[56–57]。2019年，埃兰兹等在GREEN SURGE前期成果基础上进一步阐释由物质呈现、生活经验和管护实践构成的三维框架[52]。2021年，萨娜·斯托尔哈马尔与埃巴·布林克将这一框架用于里约热内卢非正规住区，考察居民自然经验、群体价值和参与问题[53]；保拉·贡萨尔维斯等据此建立面向具体城市绿色空间的指标化决策支持工具，并在里斯本城市公园开展测试[62]。

研究拓展到城市后，公园、社区花园等日常绿色空间得到更多关注，研究对象也增加了不同社会文化背景的城市居民以及规划、管理等行动主体。居民如何使用绿色空间，不同群体怎样认识和评价城市自然，谁参与规划、管理和长期管护，逐渐成为重要问题。围绕这些问题的研究积累，也使UBCD的概念和分析框架逐步清晰。

4 UBCD的概念定位与分析框架

4.1 UBCD的概念定位及补充意义

BCD拓展到城市语境后，研究对象和关注问题随之变化。研究进一步关注不同群体怎样使用、理解和影响城市自然，以及这些关系如何随社会构成、生活方式和管理条件变化[48,50]；价值观、经验、日常实践和参与也成为重要内容[52–53]。UBCD由此更加关注具体场所中的人–自然关系。

生物多样性主要描述生命系统在物种、生境等方面的差异，文化多样性则涉及不同群体在价值观、知识体系和生活实践等方面的差异。UBCD并非将两类多样性简单叠加，而是进一步关注它们如何通过人们与自然的日常互动相互联系和共同变化。在城市环境中，不同群体通过使用、体验、理解和管护绿色空间，持续赋予场所意义，也可能改变其物质形态与生态特征。因此，即使两处绿色空间具有相近的生物物理条件和使用者构成，其人–自然关系及管护实践仍可能不同。UBCD所强调的“多样性”，不仅体现为生物与文化特征的差异，更体现为人与自然相处、相互塑造的多种方式及其动态变化[50]。从这一角度看，UBCD与生物多样性、生态系统服务、NCP等相关概念既有交叉，也各有不同的关注重点[3,37,49–50,52–53,64–67]（表2）。

这一定位也影响了UBCD的研究方式。已有研究据此设置物种、生境、空间使用和参与等指标，用于城市绿色空间分析[62]。但UBCD研究并不以静态测量生物多样性与文化多样性的对应关系为主要目的[58]。埃兰兹等将其概括为具有“启发性和反思性”的概念，强调研究方向和具体情境，而非统一的固定基准[52–53]。指标及汇总评分可用于场地间比较，但理解具体场地的差异及其可能原因，仍需结合分项指标和具体情境资料[62]。

因此，UBCD的补充意义并非为城市绿色空间增加一套独立的文化多样性指标，也不在于替代已有的生物多样性监测或生态系统服务评价，而在于将绿色空间理解为生态过程、日常生活实践与治理行动持续相互塑造的场所。它不仅关注绿色空间中有什么、能够提供什么，还进一步追问这些空间如何形成、不同主体如何与自然建立联系，以及这些关系如何受到规划和管理安排的影响。这一视角使地方知识、多元价值、日常生活实践及其差异成为认识城市绿色空间和反思其治理方式的重要内容。

4.2 物质呈现、生活经验与管护实践

GREEN SURGE项目及相关研究将UBCD概括为物质呈现、生活经验和管护实践3个相互关联的维度[52,56–57]。这一框架把可观察的物质表现、人的日常经验和主动管护纳入同一分析结构，使具体场所中的生态状态、生活过程和管护行动能够联系起来理解（图6）。

物质呈现主要关注可识别和测量的生物物理表现及相关文化或技术载体；生活经验位于框架核心，涉及人们日常接触、使用和体验绿色空间的过程，以及其中的价值观、规范、传统和知识；管护实践则关注人们主动参与绿色空间塑造和维护的过程，涉及动机、价值观、行动、规范和知识，并兼顾个人与群体层面的参与[52]。此处的管护不仅指日常维护，还包括不同主体有意识地参与场所保护、营造和改变的行动。三者在具体场所中可能相互影响：场所的物质条件影响日常使用和体验，生活经验中的价值观、知识和地方意义可能影响管护行动，持续的管护也

表 2：UBCD 相关概念的主要界定

概念	主要界定	来源	参考文献
生物多样性	来自各种来源（包括陆地、海洋及其他水生生态系统及其相关生态综合体）的生物体变异性，涵盖物种内、物种间和生态系统层面的多样性	《生物多样性公约》	参考文献 [64]
BCD	生物多样性与文化多样性之间持续的共同演化与适应；它同时涉及地方多样性，反映人们与自然共同生活的方式，并由此产生地方性生态知识和跨代际延续的实践	《湿地公约》BCD专题组，定义转引自《联结实践：自然–文化关键词评述》	参考文献 [3,65]
生态系统服务	人类从生态系统中获得的惠益，涵盖供给服务、调节服务、文化服务和支持服务	《千年生态系统评估》	参考文献 [66]
NCP	有生命的自然（包括生物体多样性、生态系统及其相关生态和进化过程）对人类生活质量产生的正面和负面贡献；强调文化及不同知识体系在认识这些贡献中的作用	桑德拉·迪亚斯等	参考文献 [37]
城市生物多样性	人类聚居地边缘至城市核心范围内生物体（含遗传变异）的多样与丰富性，以及生境的多样性	《生物多样性公约》秘书处，《城市与生物多样性展望》	参考文献 [67]
UBCD	城市中生物多样性与文化多样性的联系，关注不同群体与城市自然之间多样且不断变化的人–自然关系，以及其中的知识、价值观和实践差异	作者归纳总结	参考文献 [49-50,52-53]

可能改变空间及其生物物理状态。

这种相互作用也意味着3个维度并非截然分开。生活经验与管护实践在价值观、动机、行动和规范等方面存在交叉[52]。后续研究指出，若只是将定量的生物物理资料与定性的社会文化资料并置，未必能够呈现不同维度之间的相互关系[53]。近期研究进一步发现，价值观、地方感等内容可能同时涉及生活经验和管护实践[63]。因此，三维框架的意义并不止于提供3类可分别调查的内容，更在于提示研究者进一步追问：这些维度之间是否存在联系，联系通过何种实践与制度条件形成，又如何发生变化或产生反馈。它提供的是关系分析的起点，并不预设所有场所均存在双向塑造，也不构成完整的因果解释或治理理论。

三维框架并不排斥量化，后续研究已将其操作化为面向具体城市绿色空间的指标化决策支持工具，并允许结合场地情境设置评价基准[62]。这类场地化应用与城市尺度的综合评价工具承担不同任务。例如，城市生物多样性指数（City Biodiversity Index，CBI），亦称“新加坡指数”，主要用于城市自我评估和持续监测，2021年版设置28项指标，涵盖本地生物多样性、生态系统服务，以及生物多样性治理与管理[68]。CBI便于建立城市尺度的基线并跟踪变化，UBCD的场地化应用则更侧重理解物质表现、生活经验和管护实践在具体情境中的联系（图7）。

场地尺度上，居民参与和文化动态表现得更为具体[48]。社区绿色空间与日常生活直接相连，植物和空间状态、居民实际使用，以及不同主体的管护行动常在同一场所交织。三维框架能够把这些内容作为相互关联的过程加以考察。由此，社区绿色空间所包含的不只是既有植物和空间状态，还包括围绕这些物质条件形成的实际使用与管护关系；这些关系也会随日常生活和管理条件继续变化。

5 UBCD视角对社区绿色空间更新的启示

UBCD把日常绿色空间中的物质状态、使用经验和管护实践联系起来。对社区更新而言，这首先拓展了对“现状”的认识。社区绿色空间不仅具有可测量的生态与空间条件，还承载着长期形成的使用方式、价值判断和管护关系。项目介入时，这些关系往往已经存在，更新过程还会继续改变它们。若只依据绿量、物种组成、设施和空间形态作出判断，一些真正影响日常使用和后续管护的内容容易被忽略。因此，关键不只是分别调查植物、居民使用和文化意义，而是进一步追问这些关系如何形成、由谁维持，以及更新将保留、改变或中断哪些既有的人–自然关系。

5.1 既有环境与实际使用

对既有环境的判断不能停留在物质状态。不同群体可能以不同方式使用同一处绿色空间，并形成不同的价值判断；即使文化背景相近，个人经历、生活方式和社会处境仍会造成差异[7]。因此，历史资料、传统用途和一般性的文化归类只能提供线索，不能替代当下的实际使用。规

划设计还需要弄清：哪些空间持续承载通行、休憩、交往或种植，哪些自然要素已经与日常使用和照料形成联系，哪些既有关系正在减弱，又有哪些新的需求出现。这样的认识并不意味着凡是既有内容都应保留，也不宜为每一处空间或自然要素预设文化意义。只有弄清这些关系，保留、调整和新增才有更可靠的依据，生态改善与空间品质提升也不至于脱离实际生活。

5.2 不同主体的参与和责任

UBCD将居民、规划者和管理者等不同主体纳入分析。参与不只是程序安排，还关系到不同主体如何提供知识、调动资源并承担责任。居民等日常使用者熟悉场所的长期使用和细微变化，专业人员提供生态、空间和技术判断，社区组织与管理部门承担在地协调、公共事务和项目组织。社区花园研究表明，治理结构和主体角色会随规划设计、实施和管理阶段发生变化[69]；绿色基础设施项目中的参与目标和政策工具也因阶段而异[70]。地方政府与公民行动之间的合作还受到土地、资金、知识和制度规则等条件影响[71]。

这里的“治理”并不等同于建成后的日常管理和养护，还涉及更新目标如何形成、由谁作出决定、不同知识和诉求如何进入决策，以及行动与责任如何分配。参与是否有效，并不取决于参与主体的数量，也不要求所有人全程以同样方式介入。更值得追问的是：谁的使用会受到影响，哪些经验和知识能够改变既定方案，不同目标发生冲突时如何协调，实施条件如何落实，建成后的责任由谁承接。只有当不同主体的知识和实际需求能够影响具体方案，专业判断与管理条件能够及时跟进，实施与管护责任能够延续，参与才真正成为影响更新结果的治理过程。

5.3 长期管护与空间调整

绿色空间不会在建成时停止变化。植物持续生长，使用方式会变，管理资源和参与主体也可能调整。绿色基础设施研究指出，持续参与贯穿其生命周期，不同阶段需要的参与形式并不相同[70]；蓝绿基础设施研究进一步发现，使用实践、场所意义与居民参与管护的意愿之间存在联系[72]。

管护因而不宜留到工程完成后再讨论。后续能够获得的人力、资源和专业支持，会反过来影响空间形式、自然要素配置和设施复杂程度。建成后的修剪、补植、功能调整或局部重组，并不必然意味着原有设计失效，也可能是对植物生长、使用方式和管理条件变化的适应性回应。

UBCD为社区绿色空间更新提供了一种关系性的观察和判断视角，而非固定的操作方案。生态状态、日常生活和持续管护需要放在同一场所及其变化过程中理解；文化也并非附加在绿色空间之外的独立内容，而体现在不同群体对自然的使用、理解和管护之中。对于中国既有社区更新，这种关系性、动态性和情境性的认识，有助于使空间改善更贴近日常使用，也更能回应主体责任与长期管护。

6 结语

本文以1 180篇BCD总体语料和71篇城市主题语料为基础，结合文献计量与代表性文献研读，梳理了BCD向城市语境拓展并形成UBCD研究的知识脉络。结果表明，这一变化并非研究场所的简单转换。随着公园、社区花园等日常绿色空间成为重要研究对象，城市居民、规划者和管理者等行动主体也受到更多关注，使用经验、价值判断、主体参与和管护实践成为理解城市人–自然关系的重要内容。UBCD由此呈现出关系性、动态性和情境性的特征，既有“物质呈现–生活经验–管护实践”框架则为具体场所中的关系分析提供了较为清晰的组织方式。

这一认识也为社区绿色空间更新提供了更完整的判断基础。生态与空间状态需要同实际使用、主体参与和长期管护结合起来考察，保留、调整和新增等判断也应结合既有场所关系。对于中国社区绿色空间更新实践，项目建成并不意味着人–自然关系就此固定，空间仍会在日常使用和持续管护中变化。文化也不宜作为附加内容单独处理，而应从不同群体使用、理解和管护自然的过程中认识。

因此，UBCD对中国社区绿色空间更新的启示，并非要求以新的综合评价指标取代现有生态评价与规划管理方法，而是进一步改变问题的提出方式：在判断空间中应当保留、调整或新增什么的同时，追问这些判断依据哪些知识与经验、影响怎样的人–自然关系，以及由谁参与实施并承担长期责任。综上，本文将UBCD定位为连接生态认识、地方生活与治理反思的补充性分析视角，而非一套独立、完整的治理理论。受WoS英语文献范围和现有UBCD研究地域分布的限制，这一视角在中国不同城市与社区更新情境中的适用性仍有待进一步检验。

图 1. BCD 相关国际政策与合作实践的主要进程（IPBES 为“生物多样性和生态系统服务政府间科学政策平台”的缩写）
图 2. 基于 WoS 的 BCD 研究关键词共现网络
图 3. 1 180 篇总体语料 HistCite 关键引文路径。图中的节点为 HistCite 按本地引用次数选取的前 100 篇文献，节点数字为 HistCite 记录编号，连线表示总体语料内部的直接引文关系。
图 4. 71 篇城市主题语料共被引网络
图 5. GREEN SURGE 推动下相关研究的代表性发展脉络。图中 D2.1、D2.2 和 D2.3 分别指 GREEN SURGE 工作包 2 的交付成果 2.1、2.2 和 2.3；MS22 指里程碑成果 22；M-L-S 为 materialized-lived-stewardship 的缩写。
图 6. UBCD 的物质呈现–生活经验–管护实践分析框架
图 7. CBI 与 UBCD 框架的典型用途及分析侧重比较