# Foreword: Sustainability in the City

Julia D. Mahoney

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JULIA D. MAHONEY[*]

INTRODUCTION

"Nature loves to hide," observed ancient Greek philosopher Heraclitus roughly 2,500 years ago,[1] and the worldwide "COVID-19" pandemic that followed the emergence of the novel coronavirus SARS-CoV-2 at the end of 2019 has served as a bracing reminder of humanity's incomplete understanding of the natural world.[2] The COVID-19 crisis has turned out to be more than a public health emergency rooted in natural causes, for the pandemic has revealed significant weaknesses in human-created institutions,[3] including those that govern and influence the urban areas in which most Americans now live.[4]

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[1] JOHN BURNET, EARLY GREEK PHILOSOPHY 134 (Adam & Charles Black, 1892).

[2] *See* David Cyranowski, *Profile of a Killer*, 581 NATURE 22, 22 (2020) (summarizing what scientists have learned about SARS-CoV-2 and cautioning that "there are many crucial unknowns about this virus, including exactly how it kills, whether it will evolve into something more—or less—lethal, and what it can reveal about the next outbreak from the coronavirus family"). "SARS-CoV-2" denotes "severe acute respiratory syndrome coronavirus 2," which is "defined as the causal agent of Coronavirus Disease 2019 (COVID-19)." Stephen Ludwig & Alexander Zarbock, *Coronaviruses and SARS-CoV-2: A Brief Overview*, 131 ANESTHESIA & ANALGESIA 93, 93 (2020).

[3] In this Foreword, "institution" denotes the "humanly devised constraints that structure political, economic and social interaction." Douglass C. North, *Institutions*, 5(1) J. ECON. PERSP. 97, 97 (1991). *See also* AVNER GREIF, INSTITUTIONS AND THE PATH TO THE MODERN ECONOMY 30 (2006) (defining an institution as "a system of social factors that conjointly generate a regularity of behavior"); Douglass C. North, *Economic Performance Through Time*, 84(3) AMER. ECON. REV. 359, 360 (1994) (explaining that institutions are "made up of formal constraints (e.g., laws, rules, constitutions), informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics").

[4] *See U.S. Cities Factsheet*, CTR. FOR SUSTAINABLE SYS., UNIV. OF MICH. (2020), http://css .umich.edu/sites/default/files/US%20Cities_CSS09-06_e2020.pdf [https://perma.cc/WFG7 -YT2S] (reporting that as of 2018 an estimated "83% of the U.S. population lives in urban areas, up from 64% in 1950" and that by "2050, 89% of the U.S. population and 68% of the world population is projected to live in urban areas").

Of course, with crisis comes opportunity, and it seems highly plausible that the institutional failures that fueled the calamity of COVID-19 contain within them the seeds of healthier, more resilient communities. The hope and expectation that it is possible for humans to learn from the past and build a better world inspired the *William & Mary Environmental Law and Policy Review* to sponsor a symposium on "Sustainability in the City." Conducted virtually in February 2021, due to the ongoing pandemic, the symposium brought together law students, policy experts, and scholars with expertise in law, ethics, architecture, urban planning, sociology, business organizations, and economics. The result was a series of rich, fruitful exchanges about institutional design and the interactions of humans with nature, as well as four highly insightful and far-reaching articles, which are published in this issue.

The articles produced for the symposium on "Sustainability in the City" address a range of important and timely issues, including the responsible use of novel technologies in the design and construction of "smart" cities, the challenges and opportunities afforded by innovations in urban agricultural practices, how cities can further biodiversity, and social justice considerations in the face of inequalities in "green and blue" (that is, biotic and aquatic) infrastructure. All offer distinct perspectives on the important role played by cities in preserving, modifying, and making constructive use of the natural world so as to ensure a sustainable future for later generations. The articles also offer a number of thoughtful proposals pertaining to legal reforms and public policy initiatives, as well as ideas for additional research and inquiry.

I.      SMART CITIES, SUSTAINABILITY, AND TECHNOLOGY

One important theme of the symposium was the growth in information technologies and the attendant challenges of making effective use of data while respecting privacy rights and other core democratic values. In *Smart Cities and Sustainability: A New Challenge to Accountability?*, Dr. Iria Giuffrida examines issues relating to the development of technologies that promise to make cities "smarter" through the prompt analysis of continually collected data.[5] As Dr. Giuffrida observes, in recent decades "smart cities" have been embraced as a "modern answer to the challenge of improving urban areas for the benefit of their inhabitants while diminishing" environmental costs, in part due to their potential for bringing

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[5] *See generally* Iria Giuffrida, *Smart Cities and Sustainability: A New Challenge to Accountability?*, 45 WM. & MARY ENV'T. L. & POL'Y REV. 739 (2021).

about substantial improvements in transportation infrastructure and energy consumption.[6]

Yet efforts to take advantage of early twenty-first century capabilities to collect and analyze data carry serious dangers, some of which may not, as of yet, be fully appreciated by city residents, government officials, and even experts in information technologies. In addition to the impingements on personal privacy that have already attracted the notice of politicians and academics, "smart" technologies raise formidable governance issues. As *Smart Cities and Sustainability* details, both formal and informal public-private partnerships are a near inevitability as governments are compelled to call on the expertise of the private corporations that develop and maintain "smart" technologies.[7] With the close involvement of the private sector, however, can come confusion about accountability to the public, as authority for decisions that have serious effects on the lives of city residents may be wholly or partially entrusted to corporate actors. This may in turn foment public mistrust in "smart" technologies and the projects that rely on them. The recently abandoned Toronto Quayside Project provides a telling example of how governance problems can undermine innovative projects that seek to exploit new technological capabilities. Spearheaded by Sidewalk Labs, a subsidiary of the global corporate behemoth Alphabet, the Toronto Quayside Project, billed as an "ambitious plan to transform a slice of Toronto's waterfront into a high-tech utopia,"[8] was terminated in May 2020. The project's end followed years of continual criticism from neighborhood residents and others who objected to the nontransparency of Sidewalk Labs' plans as well as its "approach to privacy and intellectual property."[9]

To avoid debacles like the Toronto Quayside Project, concludes *Smart Cities and Accountability*, it is essential to develop a fuller, more nuanced understanding of the concept of accountability, one that integrates considerations of accountability into assessments of governance processes.[10] In offering prescriptions for the construction of the improved

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[6] *Id.* at 741–42.

[7] *See generally id.*

[8] Andrew J. Hawkins, *Alphabet's Sidewalk Labs Shuts Down Toronto Smart City Project*, The Verge (May 7, 2020), https://www.theverge.com/2020/5/7/21250594/alphabet-sidewalk-labs-toronto-quayside-shutting-down [https://perma.cc/XSU5-RX8P].

[9] *Id. See also* Michael Hendrix, *Not Quite Sustainable*, City J. (May 13, 2020), https://www.city-journal.org/sidewalk-labs-abandoning-quayside-project [https://perma.cc/GHR9-7CUV] (reporting that although the project's "1,524-page master plan" called for "'inclusive growth' and a hands-off approach to data, Sidewalk confronted well-publicized fears that it was building a privatized surveillance state").

[10] *See generally* Giuffrida, *supra* note 5.

understanding of accountability she envisions, Dr. Giuffrida draws on her extensive body of previous work on artificial intelligence ("AI") and the law,[11] identifying the various avenues through which information is disseminated and their ramifications for how power may be exercised.[12] As Dr. Giuffrida notes, mechanisms for checking exercises of power are numerous and include not only the electoral franchise and judicial review but also what she terms the "softer" ones of "appraisal by civil society, stakeholders and the scientific community."[13] Taken together, these mechanisms can build public trust and help ensure that "smart cities" are not hijacked to serve the interests of authoritarianism, but instead promote the values of openness, inclusion, and mutual respect that characterize liberal democracies.

## II.     URBAN AGRICULTURE AND THE FUTURE OF FOOD

The perils and promises of emerging technologies are also addressed in Professor Michael Carolan's contribution to the symposium, *Digital Urban Agriculture as Disparate Development: The Future of Food in Three U.S. Cities Through the Lens of Stakeholder Perceptions, Networks, and Resource Flows*.[14] Although in the popular imagination "urban agriculture" is often associated with simple and familiar practices like raised garden beds and hoop houses, today's urban farming efforts are increasingly making use of automation and other quintessentially early twenty-first century innovations.[15] In *Digital Urban Agriculture as Disparate Development*, Professor Carolan delineates the tensions that have arisen as the result of shifting urban agricultural practices, which include class frictions as the "digital" farming methods identified by many

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[11] *See generally* Iria Giuffrida & Taylor Treece, *Keeping AI Under Observation: Anticipated Impacts on Physicians' Standard of Care*, 22 TUL. J. TECH. & INTELL. PROP. (2020); *see also* Iria Giuffrida, *Liability for AI Decision-Making: Some Legal and Ethical Considerations*, 88 FORD. L. REV. (2019); Iria Giuffrida, Fredric Lederer & Nicolas Vermerys, *A Legal Perspective on the Trials and Tribulations of AI: How Artificial Intelligence, the Internet of Things, Smart Contracts and Other Technologies Will Affect the Law,* 68 CASE WEST. RES. L. REV. 747 (2018).

[12] *See generally* Giuffrida, *supra* note 5.

[13] *Id.* at 731.

[14] *See generally* Michael Carolan, *Digital Urban Agriculture as Disparate Development: The Future of Food in Three U.S. Cities Through the Lens of Stakeholder Perceptions, Networks, and Resources Flows*, 45 WM. & MARY ENV'T. L. & POL'Y REV. 637 (2021).

[15] *See* Michael Carolan, *Urban Farming is Going High Tech: Digital Urban Agriculture's Links to Gentrification and Land Use*, 86(1) J. AM. PLAN. ASS'N. 47, 47 (2020).

with gentrification and elite preferences have become more salient features of the urban landscape.[16]

To explore the tensions between what he terms "traditional urban agriculture" (or "TUA") and "digital urban agriculture" (or "DUA"), Professor Carolan draws on eighty-two semi-structured interviews with individuals involved in urban agriculture in various capacities.[17] The interviewees reside in three different cities (Denver, New York City, and San Francisco) and include investors, city planners, real estate developers, and community partners.[18] Professor Carolan supplements these interviews with analyses of the websites of the organizations for which the respondents work as well as notes from public meetings about urban agricultural issues. The result of these efforts is a detailed consideration of how TUA and DUA appear to their adherents and detractors, along with an examination of the social networks associated with urban agriculture. *Digital Urban Agriculture as Disparate Development* also examines the flow of financial, social, and human capital resources among the participants in the social networks that are indispensable to organizing and carrying out urban agriculture.

A key finding of *Digital Urban Agriculture as Disparate Development* is the "bifurcation" between TUA and DUA that "appears to be taking shape in urban food systems."[19] As Professor Carolan explains, the emergence of DUA has meant "highly capitalized farming platforms" along with, in many instances, the use of land zoned for non-agricultural purposes.[20] The upshot is that many DUA enterprises are "noticeably disconnected to local, nonfinancial organizations," at least when compared with their TUA counterparts.[21] The possibility that DUA enterprises have weaker community ties may help explain why TUA and DUA are commonly regarded as not only quantitatively different—with DUA systems able to produce far more food per acre than TUA ones, although the precise multiple is a matter of controversy—but *qualitatively* different. DUA's comparative lack of engagement with its surroundings may contribute to its being seen as a set of novel technologies that together constitute a hard break with agriculture's traditional past. "I don't even like to call it 'agriculture,'" remarks one of the interviewees, a New York

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[16] *See generally* Carolan, *supra* note 14.
[17] *Id.* at 639.
[18] *Id.*
[19] *Id.* at 661.
[20] *Id.*
[21] *Id.*

real estate agent who describes herself as eager to "push the idea that it [DUA] has more in common with Silicon Valley than, oh, I don't know, the Corn Belt."[22] Yet as Professor Carolan's analysis makes clear, there is nothing inevitable about the widespread perception that DUA is qualitatively distinct from TUA. After all, throughout human history significant technological innovations in agriculture have been the rule, not the exception.[23] It is the social networks and the meanings with which humans imbue their relationships with one another, not the bare fact that new methods have emerged for raising food, that have led to DUA's being regarded as revolutionary in character.

III.     Biophilic Cities and the Promotion of Biodiversity

In addition to providing spaces to raise food, modern cities are major contributors to biodiversity, both inside and beyond the borders of urban areas.[24] In *The Half-Earth City*, Timothy Beatley and JD Brown analyze the laws, regulations, and social practices that enable municipal decision makers to pursue ambitious biodiversity goals. These goals include contributing "to the larger global effort to regenerate lost migratory pathways" and "halting the decline of global biodiversity."[25] Throughout their article, the authors urge cities to make use of their global economic powers and serve as leaders in efforts to "conserve and restore half the Earth, to sustain remaining biodiversity," in substantial measure through the pursuit of "more sustainable" consumption practices.[26]

As the authors of *The Half-Earth City* note, although wilderness and other uninhabited areas provide the most obvious examples of biodiverse environments, cities and other densely populated venues also teem with nature.[27] To take full advantage of opportunities to further

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[22] Carolan, *supra* note 14, at 663.

[23] *See* Paul K. Conklin, A Revolution Down on the Farm: The Transformation of American Agriculture since 1929 201–05 (2008); Marcel Mazoyer & Laurence Roudart, A History of World Agriculture: From the Neolithic Age to the Current Crisis 25 (James H. Membrez trans., 2006).

[24] *See* Robert McDonald & Timothy Beatley, Biophilic Cities for an Urban Century 4 (2020); Timothy Beatley, Biophilic Cities: Integrating Nature into Urban Design and Planning 30, 33 (2011).

[25] *See* Timothy Beatley & JD Brown, *The Half-Earth City*, 45 Wm. & Mary Env't L. & Pol'y Rev. 775, 777 (2021).

[26] *Id.* at 775.

[27] *Id.* at 776; *see generally* Julia D. Mahoney, *Land Preservation and Institutional Design*, 23 J. Env't L. & Litig. 433 (2008); Julia D. Mahoney, *The Illusion of Perpetuity and the*

biodiversity within urban areas, it is essential for planners to assess existing habitats, along with their size and qualitative aspects, and to be prepared to deploy the legal and policy tools available to them. In addition, city planners can build public support for their biodiversity objectives by working to connect residents with nature, thereby inspiring a "conservation ethic through engagement with and education about nature as a part of daily life."[28]

To promote biodiversity beyond city boundaries, argue Professors Beatley and Brown, those in charge of cities need to make effective use of "city diplomacy," which entails cooperation and negotiation with a wide range of constituencies, including other cities, foreign nations, nongovernmental organizations (both international and domestic), and for-profit firms.[29] Increasingly, cities are doing precisely that, entering into international agreements such as the Ramsar Convention on Wetlands[30] and joining groups such as the Biophilic Cities Network.[31] In addition, a number of cities are taking steps designed to promote global biodiversity by implementing ambitious climate action plans that call for significant reductions in greenhouse gas emissions,[32] embracing "green procurement" protocols,[33] and making investment (and divestment) decisions grounded in part on global biodiversity impacts.

## IV.	JUSTICE, RESILIENCE, AND COMMUNITY

Since its inception, the environmental movement has been subject to the charge that it is excessively focused on the needs and preferences

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*Preservation of Privately Owned Lands*, 44 NAT. RES. J. 573 (2004); Julia D. Mahoney, *Perpetual Restrictions on Land and the Problem of the Future*, 88 VA. L. REV. 739 (2002).

[28] Beatley & Brown, *supra* note 25, at 792.

[29] *Id.* at 815–16.

[30] *See 18 Cities Recognized for Safeguarding Urban Wetlands*, RAMSAR (Oct. 25, 2018), https://www.ramsar.org/news/18-cities-recognized-for-safeguarding-urban-wetlands [https://perma.cc/L5ZZ-S8C8].

[31] Beatley & Brown, *supra* note 25, at 819.

[32] *See, e.g.*, *Climate*, D.C. GOV'T, https://sustainable.dc.gov/sites/default/files/dc/sites/sustainable/page_content/attachments/SDC2%20Climate.pdf [https://perma.cc/V88H-XLR6] (stating that the "District of Columbia government is approaching climate change from two sides, mitigation and adaptation" and that it has devised a plan to reduce carbon dioxide, methane, and nitric oxide by fifty percent by 2032 as well as to become "carbon neutral" by 2050).

[33] *See* Danielle M. Conway, *Sustainable Procurement Policies and Practices at the State and Local Government Level*, *in* GREENING LOC. GOV'T: LEGAL STRATEGIES FOR PROMOTING SUSTAINABILITY, EFFICIENCY, AND FISCAL SAVINGS (Keith H. Hirokawa & Patricia E. Salkin eds., 2012).

of the educated and affluent, to the exclusion of the less politically powerful and well-connected.[34] In *Resilience Justice and Community-Based Green and Blue Infrastructure*, a team of authors led by Craig Anthony Arnold[35] document how the "environmental conditions of marginalized communities, particularly low-income communities of color, make those communities disproportionately more vulnerable to major disturbances and changes, such as climate change, health crises, pollution releases, disasters, economic shocks, and social and political upheaval."[36] Deficiencies in "green-blue" infrastructure such as wetlands, waterways, and vegetation are pervasive and have devastating consequences for the physical and mental health of residents of affected neighborhoods.[37] To date, many "top down" government initiatives intended to remediate these problems have proved disappointing, in part because the programs in question failed to build adequate social capital or empower residents. Even more troubling, a number of programs billed as remedies for environmental inequalities have had the perverse effect of displacing their putative beneficiaries by bringing about "green gentrification."[38]

Clearly, solutions to the problems posed by inadequate green and blue infrastructure will not be simple. The authors of *Resilience Justice and Community-Based Green and Blue Infrastructure* lay out a complex agenda designed to create the institutional infrastructure necessary to achieve greater equity in the provision of crucial environmental resources. Harnessing concepts of resilience justice and shared governance, the authors advocate a series of measures to allow government agencies and grassroots organizations to jointly exercise power to build flourishing, resilient communities and achieve shared goals. *Resilience Justice and Community-Based Green and Blue Infrastructure* distinguishes its

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[34] *See* Neil Gross, *Is Environmentalism Just for Rich People?*, N.Y. Times (Dec. 14, 2018).
[35] Craig Anthony (Tony) Arnold et al., *Resilience Justice and Community-Based Green and Blue Infrastructure*, 45 Wm. & Mary Env't. L. & Pol'y Rev 665 (2021) (In addition to Craig Anthony Arnold, the authors are Ra'Desha Williams; Holden Pederson; Andrew Schuhmann; Audrey Ernstberger; Tiago de Melo Cartaxo; Connor Cafferty; Taylor Gore; James Mains; Kirk Mattingly; Leanna Banda-Cruz; Payton Klatt; Elizabeth Roseman; Elijah Beau Eisert; John Garvey; Henna Khan; Pierce Stevenson; Charles Michael Szot; Tim Mok; Briana Lathon; Luisa Trujillo; Henry Nieberg; Frank Bencomo-Suárez; Christine Calacsan; Lauren Freeman; Taylor Ichinose; Demitri Johnson-Cantu; Margaret Lawrence; Natalie Nassar; Lauren Neal; Sarah Pennington; Maximillian Schweiger; Margaret Sites; and Logan Wood).
[36] *See id.* at 665–66.
[37] *Id.* at 706, 717.
[38] *See* Kenneth A. Gould & Tammy L. Lewis, Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice 23, 24 (2017).

envisioned "co-governance" institutions from standard "top-down hierar-chical" and "bottom-up self-governance" structures, emphasizing that "co-governance directly involves citizens in governance in interactive and responsive structures."[39] Co-governance is also contrasted with standard public-private partnerships, which do not create frameworks for active participation for citizens, and "market bureaucracy," which tends to regard individuals as "clients, consumers, and individual rights-holders" rather than builders of communities.[40]

*Resilience Justice and Community-Based Green and Blue Infra-structure* emphasizes that the "co-governance" institutions it endorses are very much works in progress, and that a great deal of work lies ahead. Nevertheless, the article succeeds in laying down a solid foundation for future efforts.

CONCLUSION

The symposium on "Sustainability in the City" examined how cities can become healthier, more vibrant communities that afford ample oppor-tunities for their residents to flourish and participate fully in civic life. "Sustainability in the City" also underscored the key role of cities in shap-ing nature, as cities are increasingly recognized as sources of biodiversity and the technological innovations that affect the natural world. In the years to come, the proceedings of "Sustainability in the City" will serve as an invaluable resource for students, scholars, community members, and policymakers—in short, all who seek to comprehend and improve both cities and the world that surrounds them.

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[39] Arnold et al., *supra* note 35, at 694.
[40] *Id.*