

Regenerative Urbanism: The Meaning, Challenge, and Promise

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Regenerative urbanism appears to be the emerging, work-in-progress response to sustainability planning's current predicament: it's need for a more effective practice that shifts from project to systems level sustainability planning, from producing net negative mitigation to creating net positive regeneration. This article provides an overview of key points of this emerging response.¹

Regenerative Urbanism Rising

Regenerative urbanism is rising from the familiar arenas of "ecological" planning theory and practice (and design) that stretch back into the 1960s' first-generation environmental movement.² Their roots go further back into the 20th century with the work of Buckminster Fuller, who some might regard as one of the under appreciated pioneers of sustainability. Fast forward to the early 21st century and we see regenerative urbanism beginning to bloom in the work of the Living Future Institute and most recently with EcoDistricts, along with that of a host of other contributing pioneers.

What is Regenerative Urbanism?

Cities that "make" more than they "take," regenerative cities of inclusive prosperity and well being -- *fact or fiction?* Ten years ago, they were fiction. Today, they are an emerging fact, designed as the necessary innovation to scale at the velocity needed to respond to humanity's accelerating unsustainability in an increasingly volatile & complex socio-econ-environmental system.³

Regenerative cities are implied but not explicitly formulated in the world's new U.N. Sustainable Development Goals (SDGs) and Habitat III's New Urban Agenda (NUA),⁴ where cities are finally on the international development policy and planning stage, front and center, for the first time in history.

Regenerative urbanism involves developing cities whose economies and metabolisms no longer simply mitigate damage by slowing the rate of destruction (net negative). Instead, they would eliminate impacts at their source and produce net positive, inclusive abundance through redesign and innovation.⁵

More importantly and as an incidental co-benefit, regenerative urbanism would play a substantial role in creating the sustainability economy that is required as the material basis for a sustainable cities and society. With cities and the built environment being the spatial dimension of our economy, how the built environment is planned and designed fundamentally determines or "locks in" urban sustainability performance levels for the next 50-100+ year period before replacement at the end of the "useful life."

It is important to appreciate this point as a game-changer for good planning and design, and for environmental quality. Investing in creating a regenerative built environment will simultaneously create the needed sustainable spatial economy that is the material basis for a sustainable city and sustainable society. As a result, planning, design, and environmental quality shift from being optional, nice-to-have aesthetic values, to being critical, highest priority, must-have economic values. Thus, investing in, planning, and designing regenerative city-regions becomes a core method and task on the critical path to city/global sustainability. Therein lies the real value of regenerative urbanism: *as a vehicle for shifting our economy from its current net negative, degenerative trajectory to one of net positive, regenerative,*

inclusive abundance. In addition, regenerative urbanism becomes a method for achieving the UN SDGs & NUA.

Fortunately, this approach does not need to be invented anew, but is already “bubbling up” from the spontaneous and uncoordinated innovation across our plan, design, and build professions. We simply need to recognize and advance with understanding and innovative policy and programs.

However, it is in its infancy. Therefore, regenerative urbanism needs attention, care, cultivation, and integration to realize its potential as a powerful method. As a result, inventing this method and putting it into practice quickly enough becomes our core sustainability planning challenge.

Contours of Practice

Emerging practice suggests that regenerative urbanism is the planning and development of vital, vibrant, and inclusive city-regions where the relationship of humans to their environment shifts from net negative to net positive system performance. Furthermore, the nature of the planned and designed built environment and metabolic systems are at the center of producing that systems performance.⁶

The shift will only be accomplished through the method of on-going design innovation (technical, financial, policy, social) so that the built environment (including infrastructure) and larger city system-economy can perform up to the imperatives of sustainable (regenerative) net positive systems.

As a guide, regenerative urbanism uses the integrated processes of living systems to inform on-going design innovation, including shifting from a linear “take, make, waste” metabolism to a circular metabolism and economy.⁷ As a bonus, such innovation adds more value than cost and produces better urban neighborhoods and districts (places). They are more attractive to people and healthier compared to traditional development or ad-hoc greening. As a result, they generate the financial support and new governance stewardship support required to create and maintain them. <<XXX>>

A critical premise of the study—and *regenerative urbanism more generally*--is the need to intentionally design and plan systems integration to achieve sustainable – *regenerative* – urban system performance. This requires urban sustainability planning to shift from the level of projects and plans to the level of “systems” strategies (nested districts, cities, and regions) for urban systems performance, and from subjective goals to sustainable system performance imperatives.⁸

Curiously, practice --*not research*--is leading this path-breaking innovation as shown in these examples:

- *Burnaby, BC*: Full strategic integration planning for a regenerative city
- *Vancouver*: 100% renewable energy supply, including mobile
- *Sydney*: Net positive water reuse
- *Amsterdam*: *Circular local economic development*
- *Shanghai*: Public realm vertical farming systems
- *Kashiwa-no-ha (Japan)*: New governance & smart regenerative city development
- *Vienna, Helsinki, Palo Alto*: Automobile-eliminating, emissions-free transit
- *(Biophilic) Singapore*: Integrating wild nature into the city
- *Chicago*: Managing urban development to achieve health for all
- *Copenhagen*: Redevelopment for the regenerative city

A regenerative approach involves “big,” system-wide integrated moves to set the foundation for easily producing the regenerative systems performance of sustainability, which is often more difficult, costlier, or impossible from an exclusive project-level focus. Four such “Big Moves” are as follows:

1. Installing district water + heat/cooling exchange infrastructure to reuse existing water and energy that is lost otherwise.
2. Developing an extensive system of blue-green, biophilic city Infrastructure⁹ that creates a high-value/high-performance health environment (community, human, habitat) and that also defends against global warming challenges.
3. Connecting and integrating the built environment across scales (district, building, occupant) to easily share resources and costs in a circular metabolism and economy.¹⁰
4. Developing integrative metabolic centers, to create part of the circular economy and reap the benefits of a circular urban metabolism.¹¹

Experience with regenerative planning and design has found that regenerative infrastructure may cost roughly 10% more than traditional development but yield approximately 50-100% more value. The order-of-magnitude estimates indicate that benefit likely exceeds cost, thus warranting further development and assessment. As a bonus, the investment would create the more attractive places that people want.

In addition, experience suggests that new governance concepts and forms of organization are required to “unlock” and produce the value of regenerative urbanism.¹² Instead of traditional developers focused on a parcel or master-plan area of new development, new “district- or city-developer” entities taking responsibility for producing the full regenerative system performance of a district or city are needed. These *sustainability entrepreneur entities* would integrate government, private, educational, and civic functions in new partnerships to create the new needed capacity for sustainable regenerative development. They would then be able to coordinate across the sectors, scales, and phases of development beyond that which any one partner could do alone in the on-going innovation planning, designing, financing, building, and management of regenerative districts. This coordination is essential for securing, increasing, and optimizing the multiple benefits that a regenerative approach produces across.

Promise

If regenerative urbanism’s promise is true, then inventing cities that “make” more than they “take” will lead us out of our present sustainability planning predicament: *current practice incapable of producing the needed systems-level sustainability and producing it quickly enough to avoid current trends passing irreversible systems thresholds*. Such a method capable of producing the urban systems performance needed for inclusive prosperity and community well being will play a key role in achieving the U.N.’s Sustainable Development Goals and Habitat III’s New Urban Agenda (NUA). Such success would usher in the material basis for a new era of human history and habitat arising from cities finally being put “front and center” on the international development policy and planning stage. What a promise! What an opportunity!

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¹ This perspective on regenerative urbanism developed through a number of influences. First, work at SF Planning over the past five years to formulate a sustainability planning program advanced the perspective. Second, work initiated with the APA California Northern Sustainability Committee (founding it in 2011 and directing it for 3 years (<https://norcalapa.org/initiatives/sustainabilityabout-sustainability>), and with this Division's Sustainability Champions Program (<https://apascd.wordpress.com/sustainability-champions>, see Webinars Nos. 8 (Regenerative Urbanism Rising) & 9 (Living Communities) under the 2016 Archives: <https://apascd.wordpress.com/sustainability-champions>), substantially advanced it. An important contributor to the perspective was a collaborative research project that I initiated and managed between SF Planning and the Living Future Institute (LFI) after winning one of LFI's first Living City Grants in 2011; see the web page, <https://living-future.org/lcc/case-studies/living-community-patterns-exploratory-strategies-for-a-sustainable-san-francisco/>, and the technical report, *Living Community Patterns – Exploratory Strategies for a Sustainable San Francisco* (<https://living-future.org/wp-content/uploads/2017/01/Living-Communities-Patterns-SanFrancisco.pdf>). Finally, training in the strategic sustainability of The Natural Step (TNS) provided a powerful foundation, particularly the collaboration between TNS Canada and the Canadian Planning Association that culminated in the method and six-month training in Integrated Community Sustainability Planning based on the law requiring every municipality who received federal gas tax to prepare an integrated community sustainability plan; see, <http://www.naturalstep.ca/integrated-community-sustainability-planning>, and the 128 p. Guide: <http://www.naturalstep.ca/sites/default/files/integrated-community-sustainability-planning.pdf>.

² See also, *Regenerative Urbanism – A Preliminary Draft Bibliography*.
https://www.dropbox.com/s/so7ho4yb3kf643u/0_WP2016.1_v1.1_ste_RegenUrbBiblioPRELIM_122216_011518.pdf?dl=0.

³ This formulation is developed most recently in, Mason, Pamela, William C. Clark, Krister Andersson, *Pursuing Sustainability--A Guide to the Science and Practice*, Princeton University Press, 2016; and earlier in a variety of seminal works, including: Senge, Peter (et. al), *The Necessary Revolution – How Individuals and Organizations are Working Together to Create a Sustainable World*, Doubleday, 2008; Donella Meadows, *Beyond the Limits-Confronting Global Collapse and Envisioning a Sustainable Future*, Chelsea Green, 1992; Jeffrey Sachs, *Common Wealth – Economics for a Crowded Planet*, Penguin, 2008; and Lester Brown, *Plan B*, EPI. On the regenerative front, there is Lyle Tillman Lyle's 1996 classic, *Regenerative Design for Sustainable Development* (<https://www.wiley.com/en-us/Regenerative+Design+for+Sustainable+Development-p-9780471178439>), and Patricia Man, Regensis Group, *Regenerative Development & Design*, 2017 (https://www.researchgate.net/publication/273379786_Regenerative_Development_and_Design).

⁴ UN, 17 Sustainable Development Goals to Transform the World (<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>) and Habitat III's New Urban Agenda (<http://habitat3.org/the-new-urban-agenda>).

⁵ McDonough was the first to popularize and develop the concept and propose it as a cross-scale design method, from products to policy to planning. See, McDonough, William, *The Upcycle: Beyond Sustainability-Designing for Abundance*, Northpoint Press, 2013. This shift is also central to Buckminster Fuller's comprehensive anticipatory design science and to the long thread of ecological planning theory and practice, as it is to the Living Future Institute and EcoDistricts.

⁶ For one short and inspiring early articulation of this point, see . . . XXXXXX

⁷ Ibid. See also [Biomimicry Institute](http://biomimicryinstitute.org/). This move for regenerative urbanism might be termed bio-systems-mimicry! See also, the planners' approach to the circular economy:

⁸ A recent example of the shift to a systems focus is Stanford Engineering Program's Sustainable Urban System Initiative, <http://sus.stanford.edu/>. Also, a beginning discussion of regenerative sustainability systems performance imperatives is here: https://www.dropbox.com/s/h5artt4bcctx2ht/WP_2017.1_Regenerative_Sustainability_Imperatives.docx?dl=0; also on pages 8-10 of the SF report on Living Community Patterns (endnote No. 1, above).

⁹ SF Planning and the Living Future Institute. See in particular: *Living Community Patterns – Exploratory Strategies for a Sustainable San Francisco* (<https://living-future.org/wp-content/uploads/2017/01/Living-Communities-Patterns-SanFrancisco.pdf>). Patterns 01-Rewilding, 04-Blue-Green Streets, and 05-Streets to Table. Also, Biophilic Cities Network, <http://biophiliccities.org/about/>.

¹⁰ ZGF Architects, [Environmental Stewardship--Building Across Scales](http://www.zgf.com/en/Environmental-Stewardship--Building-Across-Scales).

¹¹ See Regenerative Urbanism Rising APA Webinar in Note No. 1. Also, <https://www.ellenmacarthurfoundation.org/>.

¹² See Urban Design Center Kashiwa-no-ha (UDCK), the new sustainable district development entity of Kashiwa-no-ha Smart City, Japan. <http://www.kashiwanoha-smartcity.com/en/concept/makekashiwa.html>.