

Key points

Shift from assets to care infrastructure. Design urban living labs focused on nature-based solutions in a way that builds repeatable practices of noticing risk, convening stakeholders, negotiating responsibilities and sustaining upkeep, not just delivering parks, trees or green corridors.

Fund the strengthening of capability. Treat collective capability as a core adaptation outcome, backed by resourced coordination roles, conflict mediation, and routes to access utilities and municipal support, without offloading responsibility.

Plan for latency through readiness. Assume mobilisation will be intermittent under resource constraints. Invest in 'restart infrastructure', so coordination can resume when conditions shift.

Evaluate what makes adaptation durable. Track negotiated roles, functioning maintenance routines and accountability links over time, alongside physical performance, to avoid successful pilots fading when project cycles end.

From nature-based solutions to naturing infrastructure: towards a care-centred approach for urban living labs

Urban living labs (ULLs) and nature-based solutions (NbS) are often promoted as pragmatic ways to act under uncertain conditions, combining experimentation with co-benefits for climate risk reduction, health and public spaces. Yet many NbS-focused ULLs remain locked in pilot mode. They deliver visible 'assets' while overlooking the harder political work that underpins them, including negotiating responsibility, resourcing maintenance and building accountability. This briefing advances the principle of 'naturing infrastructure': designing ULLs to build 'care infrastructure' around NbS, including capabilities to notice risk, coordinate stakeholders, negotiate power and mobilise external support when needed. It showcases how Doh Eain and the Neighbourhood Network (NN) used small greening interventions in Yangon, Myanmar to strengthen 'restart' capacity, collective voice and the conditions for durable, just adaptation under resource constraints.

ULLs have gained traction as a governance response, enabling experimentation to be used to navigate the dual uncertainty of urban development and accelerating climate pressures.¹ ULLs convene city actors — governments, civil society, the private sector and research organisations — to co-design and test resilience actions. Rather than assuming solutions can be fully designed upfront, ULLs provide a structured way to bring these actors together.² They test approaches in real neighbourhoods and adapt through 'learning-by-doing'.³

NbS are a particularly common focus for ULLs because they can deliver multiple benefits at once — for example, reducing flood and heat

risks while improving public spaces, health and ecological functioning. But also because the effectiveness of NbS depends on how they are used, maintained and governed in everyday life.⁴

However, the same characteristics that make the adoption of NbS through ULLs attractive also reveals ULLs' limitations.⁵ Many ULLs remain locked in pilot mode: they deliver visible outputs within short project cycles, but do not establish the institutional alignment, financing arrangements and accountability needed for wider uptake and longevity. This is closely linked to 'solutionism' — treating adaptation as a sequence of deliverables rather than a sustained public function. For NbS, the risk is well known.⁶

Making risk collectively visible strengthens communities' ability to negotiate

Interventions are installed as 'assets' (parks, trees, green corridors), while the requirements for long-term performance (maintenance routines, conflict mediation, negotiated access and shared responsibility) remain informal or under-

resourced.⁷ When that happens, sustainability weakens and the burden of care often shifts to communities without adequate authority or support.

This briefing argues for a different starting point: 'naturing infrastructure'. Grounded in feminist ethics of care,⁸ this reframes the use of NbS through ULLs as a question of how cities organise responsibility, sustain upkeep and support collective capability over time — not just focusing on what 'assets' are installed. In this approach, NbS are not treated as stand-alone physical interventions, but as sites for cultivating care-oriented practices that build the enabling conditions for transformative adaptation.⁹ The priority becomes the 'care infrastructure' around NbS: capabilities to organise and coordinate stakeholders, negotiate responsibilities and mobilise support when needs exceed local capacity. These are capabilities, not just capacities — transferable forms of collective competence that can be activated to sustain solutions, respond to emerging risks and clarify who is accountable for what.

In other words, co-production is not only a route to creating better projects; it is also a way of building practical and political capabilities that help marginalised and vulnerable groups adapt in an uncertain future.

Four design principles for moving from NbS delivery to naturing infrastructure

Moving from NbS delivery to naturing infrastructure requires a shift in what ULLs are designed to produce. The objective is not only a green asset that reduces climate risk, but the capabilities that enable marginalised groups to keep adapting in contexts where both climate pressures and the social determinants of vulnerability are continually shifting.

This means building the ability to notice emerging issues early, coordinate across actors, negotiate responsibilities and resources, sustain upkeep and mobilise support when needs exceed local capacity — while also shaping who is accountable, who has a voice and whose priorities count.

Cultivate shared attentiveness as a precursor of political capability: design NbS-focused ULLs to cultivate attentiveness and attunement to the risks experienced by different city groups. Engage participants in regular exercises, such as transect walks (observational walks by researchers and participants), along with structured discussion to promote awareness of any risks and possible actions to counter them.

Making risk collectively visible is not only technical, but also political. It strengthens communities' ability to negotiate across decision-making levels in contexts where institutions and elites often overlook, or reproduce the conditions that concentrate harm on marginalised groups. Because communities are rarely unified, grounding engagement with lived risks provides a practical entry point to build collective capability from within — recognising each other's struggles, developing empathy and overcoming local differences.

Figure 1. Example of care-based transformation of public space in Yangon



Alley conditions before Doh Eain's intervention (left) and after its community-led transformation (right). Credit: Doh Eain

Treat NbS as a practice space to foster negotiation capacities: consider negotiation a primary output of ULLs, not an informal by-product of delivery. NbS provide a foundation where negotiation becomes unavoidable: access, use, upkeep, safety and responsibility must be worked out in practice.

This capability also extends beyond the neighbourhood. By strengthening internal negotiation, ULLs can support wider engagement for marginalised groups — particularly with public agencies, landowners and local elites — without forcing agreement or suppressing legitimate disagreements. The aim is political capability: organising across differences, negotiating responsibility and resources, and holding those in power to account while keeping adaptation technically functional.

Build networks of care and affective readiness: design NbS-focused ULLs on the assumption that collective action is rarely continuous. Under resource constraints, self-organisation grows unevenly, can pause and disappear from view. The objective is not permanent mobilisation, but latency with readiness — having the capability to reassemble and act when needed.

This requires 'restart infrastructure', with two dimensions. First, **networked infrastructures of care:** relationships and coordination channels that connect community groups, facilitators and municipal counterparts, enabling knowledge, resources and support to circulate when needs exceed what one place can cope with. Second, **affective infrastructure:** the emotional ethos that makes action feel possible and worth returning to — confidence, pride, joy and belonging — built through repeated encounters and small wins. Together, these infrastructures keep adaptive capability 'on standby'.

Start small to build capability: design NbS-focused ULLs to begin with low-stakes, incremental actions that allow participants to test coordination without high social or material exposure. Early small wins create safer conditions to assess cooperation, build trustworthiness and develop basic practice routines.

This matters because experimentation is costly: it requires time, labour, materials and reputational risk in settings where resources are often scarce and political conditions are fragile. Incrementalism helps networks adjust and avoid failures that undermine participation. Over time, it produces a defined capability: the collective ability to calibrate ambition, anticipate pitfalls and recognise when added support is needed before moving to the next stage.

Box 1. Naturing infrastructure under constraints in Yangon

Yangon is a city where climate risk is experienced daily through infrastructure failure. In low-income neighbourhoods and informal settlements, monsoon flooding, heat exposure, waste accumulation and blocked drainage are commonplace. Since the 2021 military coup, weakened public services and a more constrained governance environment have made coordination and maintenance harder. In this context Doh Eain, a Yangon-based social enterprise working on neighbourhood upgrading and public space improvement, has used small interventions in alleyways and micro-spaces where risk concentrates, to demonstrate a different logic for NbS-focused experimentation. These include visible greening and basic fixes to build care practices, coordination capability and negotiated responsibility.

Cultivate shared attentiveness as a precursor of political capability: Doh Eain builds attentiveness through repeat encounters, walk-throughs, shared observation and discussion, where residents identify areas of flood risk, heat-exposed stretches, unsafe surfaces, blocked drainage and waste flows. Residents describe this as an embodied reading of place: "environment includes the things we do", where risk is assessed through lived experience. Noticing also extends to social risks of exclusion: who felt able to speak, who was stigmatised, and which forms of public activity became politically sensitive after the coup?

Treat NbS as a practice space to foster negotiation capacities: NbS become a foundation for communities to practise negotiation — across diverse groups at different levels — building political competence while keeping adaptation workable. After the coup, engagement with ward administrators could not be treated as routine: some officials remained in post, others resigned or were replaced, and the risks attached to visibility and association shifted over time. Doh Eain relied on selective involvement through trusted ward-level contacts, keeping activities framed as low-profile, public space improvements, and adjusting convening styles, messaging and timing as conditions changed.

Build networks of care and affective readiness: restart capacity depends on more than neighbourhood-level motivation. It requires network infrastructure that helps groups stay connected and ready to mobilise again under uncertainty. This is supported through the Neighbourhood Network (NN), a 'network of networks' launched during the COVID-19 pandemic to strengthen community-led response and coordination across Yangon and beyond. For members, NN enables collective resourcing and capability pooling, with access to shared tools and routes to wider support. Restart readiness is also affective: murals and visible beautification reframe neglected alleys as shared spaces worth inhabiting and protecting. One resident described keeping her back door shut for years because of the stench and rats. After the transformation she beamed when she said it was "wonderful" to see the backstreet changed.

Start small to build capability: incrementalism is a capability-building strategy. Low-stakes actions — clean-ups, small repairs, planting, murals and adding basic amenities — enable trust to develop and therefore reduces potential risks. The need to calibrate actions becomes clear when upgrades intersect with livelihood systems. In one case, for example, proposed drainage improvement work included an informal water pipe used by a local retailer, and residents feared disruption would reduce water access and the number of customers. Facilitators negotiated with the retailer, adjusted the sequencing and design, and agreed a phased implementation with shared expectations if problems arose. A local committee provided a channel to flag issues early and renegotiate responsibilities if changes did not work as intended.

Recommendations for policymakers and funders

To strengthen the contribution of ULLs to just and transformative adaptation, policymakers and funders should:

- **Reframe NbS-focused ULLs around naturing infrastructure, not asset delivery:** shift the core purpose of ULLs from producing discrete 'green solutions' to building the care infrastructure that makes adaptation durable — including shared routines of noticing and interpreting risk, convening stakeholders, negotiating responsibilities, doing repairs and returning to ensure upkeep. Treat facilitation, cross-team collaboration, and maintenance coordination as core design objectives, and judge success by whether these practices become durable and transferable alongside the physical improvements.
- **Make capability formation an explicit ULL outcome, without burden shifting:** treat the strengthening of collective capability as a primary adaptation outcome. This includes the ability to self-organise, coordinate across different groups, negotiate responsibilities and resources, and mobilise external support when needed. This must not be framed as 'community ownership', as that offloads responsibilities downwards. Instead, fund the institutional and relational support needed for co-production to build shared power. For example, resourced coordination roles, conflict mediation and decision-making processes, and clear escalation pathways to municipal departments, utilities and technical assistance when support is required.

- **Design for latency through readiness, not continuous mobilisation:** assume collective action will be intermittent. Build ULLs around repeated low-stakes cycles and 'keep-warm' routines (light-touch convening, check-ins, upkeep), supported by a network structure that allows capabilities to pause and restart rather than collapse when a project phase ends. Avoid evaluation metrics that require constant visible activity. Instead track whether coordination channels persist, roles can be reassembled and escalation links remain usable over time.
- **Build the conditions for ongoing collective action:** design ULLs to cultivate the 'care conditions' that make collective action repeatable. Confidence, pride, joy, belonging and the sense that participation is worthwhile occurs as a result of regular shared encounters, respectful conflict mediation and visible improvements that sustain momentum. Evaluation should look beyond participation counts to whether ULLs cultivate 'holding environments' that keep coordination channels open, so self-organisation can be latent and reactivate when needed.

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Neighbourhood Network is a grassroots platform supporting local community organisations with training, resources and collaborative networks to strengthen neighbourhood actions.

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Notes

- ¹ Bulkeley, H, Coenen, L, Hartmann, C, Frantzeskaki, N, Kronsell, A, Mai, L, Marvin, S, McCormick, K, van Steenberg, F and Voytenko Palgan, Y (2016) Urban living labs: governing urban sustainability transitions, *Current Opinion in Environmental Sustainability*, 22, pp.13–17. doi:10.1016/j.cosust.2017.02.003. / ² Bulkeley, H and Castán Broto, V (2013) Government by experiment? Global cities and the governing of climate change, *Transactions of the Institute of British Geographers*, 38(3), pp.361–375. doi:10.1111/j.1475-5661.2012.00535.x. / ³ Voytenko, Y, McCormick, K, Evans, J and Schliwa, G (2016) Urban living labs for sustainability and low carbon cities in Europe: towards a research agenda, *Journal of Cleaner Production*, 123, pp. 45–54. doi:10.1016/j.jclepro.2015.08.053. / ⁴ Cohen-Shacham, E, Walters, G, Janzen, C and Maginnis, S (eds) (2016) Nature-based Solutions to address global societal challenges. IUCN, Gland. doi:10.2305/IUCN.CH.2016.13.EN. / ⁵ Albert, C, Brillinger, M, Guerrero, P, Gottwald, S, Henze, J, Schmidt, S, Ott, E and Schröter, B (2020) Planning nature-based solutions: Principles, steps, and insights, *Ambio*, 50(8), pp.1,446–1,461. doi:10.1007/s13280-020-01365-1. / ⁶ Frantzeskaki, N (2019) Seven lessons for planning nature-based solutions in cities, *Environmental Science & Policy*, 93(1), pp.101–111. doi:10.1016/j.envsci.2018.12.033. / ⁷ See note 6. / ⁸ Tronto, JC (2013) *Caring Democracy: Markets, Equality, and Justice*. NYU Press, New York. / ⁹ Puig de la Bellacasa, M (2017) *Matters of Care: Speculative Ethics in More Than Human Worlds*. University of Minnesota Press.

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