07

Cities as Real-World Laboratories of the Planetary: From Nairobi to Berlin

Dr. Amollo Ambole, Caroline Paulick-Thiel

Figure 1. A Tale of Two CIties. Illustration by Arianna Smaron.

An analytical, narrative case that follows two cities as they navigate floods, blackouts, river basins, and fragile infrastructures. It shows urban life as a frontline of the planetary condition: coordination without control, improvisation without preparation. Within the Compendium, it is a grounding force; evidence that the planetary is not distant, and that governance emerges as choreography long before it becomes policy.

From Nairobi's Rivers – Amollo's Field Notes

When I was ten years old, a stream passed through my school in Nairobi. It often carried small fish, darting through clear and fresh water. Thirty-five years later, most of Nairobi's rivers and tributaries are choked with pollution. Factories discharge waste, raw sewage flows untreated from residential neighbourhoods, and plastics clog the channels, leaving little visible aquatic life.

My childhood memory of spotting fish in a school stream captures Nairobi's contradictions and its planetary pattern. What happens to a stream in Nairobi is connected to the downstream pollution in Machakos and Makueni towns, and all the way to the Indian Ocean through the Athi–Galana–Sabaki River. The Indian Ocean, in turn, carries this burden onward, folding Nairobi's problems (and hopes) into planetary currents that touch distant shores.

The very name 'Nairobi' has now become a paradox. It comes from the Maasai language phrase "Enkare Nyrobi" which means "cool water." But it should also serve as a reminder of what we have lost and a mission for what we can heal. Recently, at a multi-stakeholder workshop on the regeneration of the Nairobi River Basin, I realized that I have now joined the long line of experts and advocates who have been debating river restoration for decades since my primary school days. Listening to different perspectives at the workshop, it became clear that the basin is more than an environmental issue: its scope and implications are simultaneously planetary and deeply personal. Its meandering rivers and tributaries resemble arteries – clogged and threatening our very lives – but perhaps still carrying the possibility of renewal.

One colleague captured this sense of possibility with a hopeful remark as we wound up the workshop: "If we start now, in ten years, we will be able to swim in Nairobi's rivers."

Unclogging the Arteries

If Nairobi River Basin is the city's circulatory system, then Mukuru's sanitation crisis shows what happens when the arteries are blocked. In Gatope Village in Mukuru informal settlement, residents have for decades lived beside a massive city trunk sewer line, yet not a single household was connected to it. Instead, families relied on public pit latrines that filled quickly and overflowed in rivers during the rainy season. These overflows turn Nairobi's rivers into carriers of disease, ensuring that the problems of Mukuru become problems for the entire city and beyond.

A civil society organization (CSO) known as Akiba Mashinani Trust (AMT) mapped the problem in Mukuru and found that a small intervention could have a transformative effect. Just 1.39 km of lateral sewer lines would be enough to connect the village to the city sewerage system. Working with Nairobi City Water and Sewerage Company (NCWSC) and other partners, AMT facilitated the installation of 670 meters of new lateral lines in the first phase. This unlocked the potential for 2,500 households to connect directly to the sewer network and created employment for local residents who dug trenches, laid pipes, and fabricated manhole covers.[1]

Building on this experience, AMT has expanded its focus to the regeneration of Ngong River, one of Nairobi's three main rivers. Together with other CSOs, they are promoting people-centered planning that aligns with Nairobi's broader vision of transforming riverfronts into non-motorable transport corridors, blending green spaces with urban infrastructure.

At the same time, large-scale efforts are underway. The Nairobi Rivers Commission, established in 2024 has a mandate to coordinate the restoration and sustainable management of the river basin.[2] In March 2025, the President launched the Nairobi River Regeneration and Engineering Works Programme, valued at USD 382 million, to stimulate socio-economic development.[3] The African Development Bank (AfDB) is also supporting the Nairobi Rivers Basin Rehabilitation and Restoration Program: Sewerage Improvement Project Phase II, noting that only 40 percent of the city is connected to the existing sewer system.[4]

Stitching the Severed Arteries

The March–May 2024 floods in Kenya were the worst in decades. Across the country, the floods affected most of the 47 counties, displacing over 55,000 households and leaving nearly 300 people dead (Kenya Red Cross, 2024). These impacts showed how climate shocks quickly overwhelm fragile infrastructures and magnify existing vulnerabilities.

The government responded with drastic measures. Public security (vacation or mandatory evacuation) orders were issued on the 2nd of May 2024 at 4:41pm:

> *"All persons residing contiguous to the dams and water reservoirs are ordered to vacate the said areas immediately and in any case, within 24 Hours effective today, failing which they will be subjected to mandatory evacuation for their safety."*[6]

In Nairobi, more than 40,000 families living in riparian reserves were required to vacate their homes. Some were forcibly evicted and lost their homes, belongings, and livelihoods in a matter of hours.[7] These compounding crises transformed Nairobi's rivers from a source of life into an instrument of death, disruption, and violence.

I too know something about the city's violence. I was in a car accident in January 2024 that cost

---

1 Akiba Mashinani Trust. *What's Cooking in Gatope Village, Mukuru Kwa Reuben? A Quiet Sanitation Revolution.* Nairobi: AMT, 2024. https://akibamashinanitrust.org/whats-cooking-in-gatope-village-mukuru-kwa-reuben-a-quiet-sanitation-revolution.

2 Nairobi Rivers Commission. *Our Mandate.* 2025. https://www.nrc.go.ke/our-mandate. (Accessed September 2025.)

3 Office of the President of the Republic of Kenya. "President Ruto Launches KSh 50 Billion Nairobi River Regeneration Programme." 2025. https://www.president.go.ke/president-ruto-launches-ksh50-billion-nairobi-river-regeneration-project. (Accessed September 2025.)

4 African Development Bank (AfDB). *Kenya: Nairobi Rivers Basin Rehabilitation and Restoration Program – Sewerage Improvement Project Phase II (ESIA Summary).* Abidjan, Côte d'Ivoire: AfDB, 2024. (Accessed September 2025.)

5 Kenya Red Cross Society (KRCS). *March–April–May (MAM) 2024 Floods Situation Report.* Nairobi: KRCS, June 18, 2024. https://www.redcross.or.ke/images/MAM-Floods-SitRep-18th-June-2024.pdf.

6 Ministry of Interior and National Administration (Kenya). "Public Security (Vacation or Mandatory Evacuation) Orders." Government of Kenya, May 2, 2024. https://www.interior.go.ke/public-security-vacation-or-mandatory-evacuation-orders.

7 Citizen Digital. "Eviction from Nairobi Rivers Corridor to Continue, Says Interior Ministry." May 7, 2024. https://www.citizen.digital/news/eviction-from-nairobi-rivers-corridor-to-continue-says-interior-ministry-n342903.

me my left eye, likely due to a potholed road and an overworked driver who smashed into our taxi. Healing for me has been about finding new ways to navigate the city with permanent partial blindness. I can no longer dash through heavy downtown traffic, so I move slowly, finding refuge in places like Karura Forest, a surprisingly rich pocket of flora and fauna in the heart of the bustling city.

Many others in Nairobi are also finding ways to move beyond the violence. In Mathare, the "Freed to Heal" youth group provides free mental health care for residents, including families displaced after the floods, persons living with disabilities, and those dealing with drug addiction.[8] These grassroots efforts tell us that healing is psychological and social as much as it is physical.

The Healers

At the workshop, I listened as one organization after another presented its vision for regenerating the Nairobi River Basin. Each voice spoke from its own vantage point: meteorologists asked why their weather data was underused, civil society organizations promoted their neighborhood projects as the most viable option. International agencies calculated the millions of dollars required to restore the basin in phases, researchers showcased with pride their academic papers published in prestigious journals, while multiple government agencies struggled to reconcile their overlapping mandates. Again and again, the same Nairobi map appeared, divided into clusters, zones, or communities depending on who was presenting. The Nairobi Rivers Commission concluded with its own master plan.

I found myself wondering: who truly holds mastery over this river basin?

Perhaps no one does. What we might need are: actors who do not cling too tightly to their maps or data, allowing them to move across institutional boundaries, listen deeply, and layer insights so that they complement one another – individuals Jon Soske refers to as "unbound agents".[9] Unbound agents also hold us accountable to the future, showing us that what we stitch together today is for those who come after us.

In the section that follows, Caroline describes these necessities and other critical possibilities, in greater detail.

Berlin's Reflective Turn — Caroline's Reflections

Where Nairobi's resilience emerges from necessity, Berlin's fragility arises from abundance. Both cities inhabit the same planetary metabolism but speak different dialects of risk.

From Nairobi's perspective where adaptive infrastructures arise from necessity rather than regulation, Berlin's approach reveals a contrasting fragility: dependence on inherited systems of presupposed order. While Nairobi's resilience is often improvised in motion, Europe remains entangled in its architectures of control. Both conditions expose different forms of vulnerability, and different potentials for learning.

Today, urban settlements are interfaces of a planetary metabolism – places where feedback, crises and learning processes can be experienced directly. Heat, flooding and migration pressure make it clear that urban systems are not stable, but highly fragile. Many cities have therefore long been acting beyond national borders. Global networks such as UN-Habitat Safer Cities, ICLEI and the Resilient Cities Network, as well as European regulations such as CER, NIS2 and KRITIS, form a multi-layered fabric of urban security and resilience. However, experience in recent years has shown that continuity alone is not enough.

Efforts to restore control may briefly stabilise the status quo but increase systemic vulnerability in the long term. This 'dynamic stabilisation'[10] performs security through continued acceleration, exhausting resources and attention instead of building resilience.

Urban stability is therefore not a property, but a costly state.[11] Every city pays daily in energy, labour and attention to maintain its 'small equilibrium'. The price of this extractive stability usually remains invisible: the overload of care professions, energy

8 Ambole, Amollo. "Freed to Heal: Lessons from Mathare." Personal site. September 24, 2025. https://www.amollo.com/post/24b028c9.

9 Soske, Jon, Tomas Maly, Prateek Shankar, Christina Sequeira, Laura Kermode, Sandeep Kumar, Amy Brown, Caroline Paulick-Thiel, and I. Wang, with T. Shadlyn. *Systems Thinking from the Margins – Stability Is a Temporary Illusion.* Unpublished work, 2025.

10 Rosa, Hartmut. "Appropriation, Activation and Acceleration: The Escalatory Logics of Capitalist Modernity and the Crises of Dynamic Stabilization." *Theory, Culture & Society* 34, no. 1 (2017): 53–73. https://doi.org/10.1177/0263276416657600.

11 Soske, Jon, Tim Maly, Prateek Shankar, Christina Sequeira, Laura Kermode, Sandeep Kumar, Amy Brown, Caroline Paulick-Thiel, and I. Wang, with T. Shadlyn. *Systems Thinking from the Margins – Stability Is a Temporary Illusion.* Unpublished work, 2025.

12 Kemp, Luke. *Goliath's Curse: The History and Future of Societal Collapse*. London: Penguin Books, 2025.

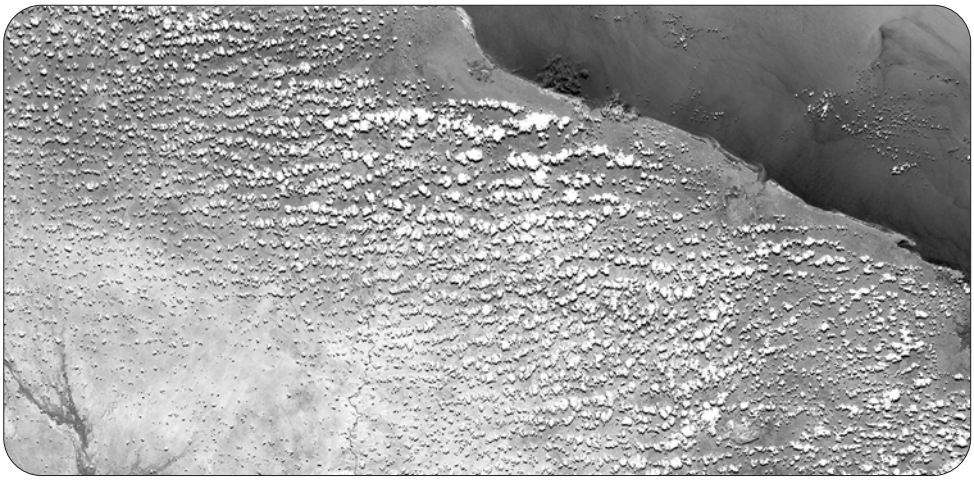

Figure 2. Open source picture of the coast of Nigeria.

consumption, mental exhaustion, the externalisation of ecological costs. Resilience begins when cities confront rather than outsource these consequences, integrating them into their developmental logic.

Governance and Reflexivity

Modern governance, built on control, efficiency, and scaling, functions only while conditions remain predictable; under planetary volatility – water shortages, energy stress, supply disruptions – it collapses. Instead of fixing this dynamic, linear goals and missions produce a spiral of overload: more planning breeds complexity, complexity consumes energy, until systems degenerate in a 'civilisation paradox'[12]

A planetary understanding of governance treats uncertainty not as a problem to manage but as a point of orientation. This relates to the principles of double-loop learning,[13] where institutions learn not only to adapt their actions but to question their governing assumptions. Navigating the unknown is then about perceiving boundaries, recognising feedback loops and adapting courses of action before ruptures occur. Such governance replaces the pursuit of control with the search for coherence – for coordination between technical, social and ecological dynamics.

Reflexivity is not a theoretical ideal, but a structural prerequisite for societies that are caught in a degenerative cycle of growth, acceleration and control. Without institutionalised forms of self-observation, systems lose their ability to perceive and overheat in their own efforts. Cities then become nodes of a global superorganism[14] that exhausts its base instead of renewing it.

Reflexive governance opens up the possibility of interrupting this path dependency. Planetarily, this type of governance can be experienced where action and observation intertwine – where learning processes are documented, evaluated and iteratively improved, from data analysis to citizen participation.

Blackouts as Learning Moments

In September 2025, Berlin experienced its longest power outage since the Second World War. Around 50,000 people were without electricity for almost three days.[15] The expected panic did not materialise. Instead, improvised networks of mutual aid emerged: cafés distributed supplies, neighbourhoods organised charging points, local initiatives took over communication.

At the same time, in another part of the city, an experiment was underway: Kiezbox, a solar-powered communication module developed under Gemeinsam Digital: Berlin, which set up an autonomous mesh network that is functional even when mobile phone masts had long since failed. Residents can use an app to make emergency calls, coordinate help or exchange information.

---

13 Argyris, Chris, and Donald A. Schön. *Organizational Learning II: Theory, Method, and Practice.* Reading, MA: Addison-Wesley, 1996.

14 Hagens, Nate. *The Great Simplification: Energy, Economy, Environment, and the Future of Civilization.* Minneapolis: University of Minnesota, Institute on the Environment, 2021.

15 *Tagesspiegel Background.* "Längster Stromausfall der Nachkriegszeit laut Betreiber beendet." September 12, 2025. (Accessed September 30, 2025.)

16 Holling, C. S. "Resilience and Stability of Ecological Systems." *Annual Review of Ecology and Systematics* 4 (1973): 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245.

These responses, spontaneous self-organisation and tested micro-infrastructure, illustrate a paradigm shift where resilience arises not from restoring central control but from maintaining decentralised coherence. The event thus became a governance test, Berlin's river moment: It was not the technical disruption that was decisive, but the question of which actors were able to combine perception, communication and adaptation, and why.

Blackouts – whether electrical, institutional, or moral – reveal how urban systems depend on relational capabilities. They show that security arises less from control than from relationships: from trust, attentiveness and shared knowledge in moments of uncertainty.

In this sense, such events mark the transition to a new mode of urban governance. They are zones of friction between old and new operating system logic: between control and choreography, between hierarchy and field, between reaction and maturation.

Institutions as Choreographies

From Nairobi's rivers to Berlin's grids, moments of crisis reveal the same lesson: resilience is not a characteristic, but an ability to coordinate. The reactions in the neighbourhood – improvised help, newly established communication routines, shared responsibility – resembled less an emergency plan than a spontaneous choreography. Different actors moved towards each other, responded to signals, and formed handovers. From this perspective, institutions appear not as static structures, but as systems of movement whose stability arises through coordination. Governance thus becomes a question of rhythm – how feedback, responsibility and action flow between levels without the whole becoming rigid or disintegrating.

A key challenge is to balance stability and adaptability within the same organisation. One approach to this, briefly introduced by Amollo earlier in the essay, is the division of labour between model-bound and model-unbound agents.[17]

Model-bound agents, such as professionals in administrations or medical institutions, secure continuity through structured procedures and accountability. Unbound agents, including emergency services or civic networks, navigate uncertainty by adapting and translating across boundaries. The coordination between both forms the foundation of institutional resilience.

So instead of playing stability off against change, institutional maturity is evident where bound and unbound action is choreographed – as a continuous movement between rule and exception, between protocol and improvisation.

Institutions that work in this way understand reform not as reorganisation, but as the shaping of transitions: the ability to allow movement without losing connection. Governance becomes a choreographic practice and craft of keeping tensions between order and adaptation productive.

This attitude shifts the institutional understanding of time. Every decision, every regulation, every routine is part of a longer movement that links the present and the future. As feminist theorists emphasise, this can be understood as *matriarchitecture*[19]: an architecture of care that supports both continuity and renewal.

Fielding Organisation

If institutions can be understood as choreographies, then fielding forms their expanded organisational form. While choreography describes how movement arises within institutions, fielding is about the relationship between movements; the dynamics through which many actors, places and times relate to each other without the need for a common centre.

Fielding is neither hierarchy nor network in the classical sense. It describes a field logic: a relational organisational principle that coordinates perception, action and meaning in overlapping spaces. A field arises when several actors perceive the same reality but react to it from different perspectives and make their observations mutually relevant.

Between Berlin and Nairobi, this field logic becomes tangible. Both cities are exposed to planetary pressures yet inhabit opposite ends of the infrastructural spectrum. In Nairobi, relational density compensates for material precarity; in Berlin, material stability often conceals social disconnection. Recognising these contrasts as part of a shared field allows intercity networks to learn across asymmetry rather than in spite of it.

In an urban context, this logic can be seen wherever cities, administrations, companies and civil society are connected not by structures but by shared

17 Paulick-Thiel, Caroline, and Jon Soske. *Institutional Resilience and Choreography.* Unpublished manuscript, 2025.

18 Federici, Silvia. *Revolution at Point Zero: Housework, Reproduction, and Feminist Struggle.* Oakland, CA: PM Press, 2012.

19. 10×100 Converter. *Cross-Scale Organising for Transformative Regeneration between Cities and Bioregions.* 2025. (Accessed September 30, 2025.)

20 Luke Kemp, 2025.

tensions: climate adaptation, land conflicts, supply bottlenecks, etc. Coordination in such fields relies on mutual perception and on recognising where actions touch, overlap or contradict each other.

Fielding arises between micro and macro scales – where local experiments generate situational knowledge and political programmes translate it into long-term learning.[19] It builds on shared frames of reference, resonant learning across places, and flexible mandates that encourage exploration. Rather than multiplying projects, it cultivates continuity — maintaining connections between places, learning cycles and responsibilities. Such an orientation signals a new level of institutional maturity: the capacity to remain coherent while in motion.

As an organisational practice, fielding transforms coordination into attentiveness. It keeps relational fields open, allowing perception and responsibility to circulate. In this sense, planetary governance becomes tangible not through new hierarchies, but through the ability to relate diverse realities in ways that are both learning and binding.

Towards Planetary Maturity

Building on this relational logic, maturation describes how relationships, perceptions, and practices deepen and endure across levels. To have political impact, this process requires forms of anchoring: translating situational learning into structural responsibility. Mature institutions are defined not by efficiency or control, but by their ability to sustain relationships over time.

Orientation in the Anthropocene is not a target state but a continuous balancing act between past, present and future, each decision redefining what remains, changes, or is released. This temporal awareness is visible in Nairobi's urban movements such as in Mukuru, where community networks working alongside government agencies are connecting homes to the city's trunk sewerage system through simplified, locally fabricated networks. These modest yet ingenious infrastructures are acts of collaborative city-making: they translate global debates on circularity and resilience into lived, affordable systems of care. In Mathare, youth groups extend this ethos by tending to the social and psychological wounds left by floods and evictions. Across these initiatives, technical adaptation becomes planetary practice that link ecological recovery to the relational work of maintaining life amid uncertainty. Europe's cities could take inspiration from these practices of maintaining continuity while transforming, developing legitimacy through renewal rather than repetition.

Mandating takes on a new meaning in this context. In classical governance, it is linked to jurisdiction. From a planetary perspective, it is less about jurisdiction than about reasonableness: who can actually bear, maintain and pass on responsibility? Such mandates arise where actors take on responsibility without owning it – where the ability to act arises from relationships, not from ownership.

A mature city no longer attempts to control change, but to process it. Maturity begins when it abandons the illusion of control and internalises fielding as a form of organisation: bringing together actors, tensions and currents without striving for complete control. It is a civic attitude that favours responsiveness over certainty and resonance over hierarchy.

The pursuit of maturity reorganises power around the capacity for care: translating breakdowns into maintenance, data into empathy, and technological, ecological and social currents into relationships.

The blackouts of the 21st century – electrical, institutional, moral – will continue. But the cost of ignoring them is higher than the cost of transforming ourselves within them. Early investment in decentralised capacities is 'cheaper' (economically, ecologically and socially) than rebuilding fragile systems when they break.

The task ahead is to develop institutions that learn as quickly as crises change and that turn preparation into practice: resilience into relationship. When urban networks anticipate volatility and process shocks, cities and their inhabitants can do more than just recover – they can evolve.

Today's cities are the real-world laboratories of the planetary. Their networks can achieve what national structures can hardly accomplish: shared action amid uncertainty. But for these efforts to evolve into a new model of governance, they need to be reflexive – capable of committed learning, honest adaptation, and transparent feedback.

Planetary thinking in an urban context can be applied as an organisational principle: the art of acting in a shared field that affects us all. The planetary city is a reality that calls for relational practices. It will determine whether humanity can bend into maturity or remains trapped in its architectures of dominance.[20]