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VITAL INFRASTRUCTURES: PRECARIOUS PRESENCE AND THE CO-CONSTITUTION OF URBAN SPACES, LIVES, AND GOVERNANCE

Sustaining lives in urban environments depends on infrastructures—buildings, water pipes, sewers, energy distribution, and roads among others. Their availability is particularly acute in Africa due to rapid urbanisation, entrenched inequalities, and persistent resource constraints. At the site of my ongoing research, Namibia's capital Windhoek, the legacy of colonial segregation coupled with low incomes and a lack of affordable housing have led 'informal' settlements with insufficient formal infrastructures to mushroom. Under these conditions, the necessity of satisfying one's basic needs, as well as aspirations of improvement, lead residents to rely on improvisational skills, co-presence, and social relationships to innovate do-it-yourself (DIY) solutions as well as to appropriate, bypass, and complement formal infrastructures. These arrangements serve as 'vital infrastructures' in two senses: both by facilitating and regenerating lives in the city and by relying on the energies of residents for their operation (blurring the categories of provider and user). I argue that such vital infrastructures represent a major force in the making of cities and urban lives, in Africa and beyond. While their immediate purpose is to solve practical problems, the social, transactional, and political patterns they entail lead to profoundly relational, co-constructed infrastructures and everyday governance.

Historically, the concept of infrastructure has referred to physico-technological networks and organisations essential to the functioning of societies (Graham and McFarlane 2015). They are relational assemblages of concrete objects, energies, technologies, people, and ideas (Larkin 2013; Appel et al. 2018). Along these lines, recent ethnographies have highlighted the real workings of planned, formal infrastructures, such as water and electricity networks or roads. Such studies have examined how the selected infrastructural assemblages reflect power relations; prompt user adaptations, modifications, and claims; influence living conditions and social organisation; and serve as a nexus between state power and citizenship (for a few examples, see Harvey and Knox 2015; Von Schnitzler 2016; Anand 2017; Fredericks 2018; Degani 2022).

The relational approach evident in the ethnographies of infrastructure is fruitful, but the predominant focus on networked, formal infrastructures remains limited. Fundamentally, infrastructure can be defined as any relatively durable, shared, systemic arrangement that supports societies. What is identified as 'infrastructure' then depends upon what is selected as the primary object (or figure) and its underlying condition (or ground). For example, social relationships might serve as infrastructure in contexts with deficient formal

networks (Simone 2004; Elyachar 2010; De Boeck 2015). From this perspective, the concept of 'infrastructure' does not necessarily refer to the formal infrastructures commonly associated with modern states, such as municipal water (Anand 2017; Von Schnitzler 2016) or electricity (Degani 2022) networks. Instead, infrastructure can refer to any socio-material assemblage—of materials, energy, technology, social relations, norms or routines—catering to the needs and aspirations related to urban dwelling, irrespective of whether these are formal or informal, networked or off the-grid, state or non-state, and conventionally recognised as infrastructures or not.

This is important because vital infra-structures in African cities cross such boundaries on a regular basis (Monstadt and Schramm 2017; Amankwaa and Gough 2021). Relevant actors may differ from city to city, between different neighbourhoods, as well as according to social stratification, but they commonly include family, kin, neighbour and friend networks, savings groups, religious communities, traditional authorities, entrepreneurs, municipal officials, nongovernmental organisations (NGOs), and political party branches (Lund 2006; Blundo and Le Meur 2008). Actors under the 'state' rubric also tend to be diverse. Accordingly, the analysis of political agency and urban citizenship should relate inclusion and access not only to the state, but to any significant institutions in the observed politico-material space.

When migrants—mostly young people in search of better opportunities—first arrive in Windhoek from rural areas, they often settle with relatives, friends or people with a common origin. Informal rental markets represent another option. The unauthorised occupation of municipal land tends to occur when such people later wish to establish their own household.

Such occupation is illegal in principle, but in practice the municipal authorities largely tolerate it. Simultaneously, the uncertainty of tenure directs building practices (for example, a reliance on cooperation in land occupation and construction or the use of relatively cheap, removable materials, such as corrugated iron). Occupants gradually extend their homes over the years as resources allow. Obtaining a house in the city is an important objective as a part of intergenerational, translocal survival and advancement strategies among extended families in which people, money, food, goods, and information flow between rural and urban areas (author's field data; see also Frayne 2007; Greiner 2012; Nord 2022).

Simultaneously, residents seek tenure security, basic services, and better chances of daily survival by cultivating relations in the neighbourhood as well as with municipal authorities. Some participate in savings groups to obtain and subdivide plots together (Delgado et al. 2020; Chitekwe-Biti 2018). Over time, partial, provisional, and evolving recognitions from the municipality, such as enumerations, waiting lists, leaseholds, or certificates of occupation, provide gradual increases in tenure security and condition access to water, electricity, and sanitation (Metsola 2018, 2021, 2022; see also Goodfellow and Owen 2020). Advances in the latter, such as gaining water tokens or toilet keys, in turn, come to signify increasing degrees of recognition and, hence, solidify claims for tenure (Metsola 2018, 2021, 2022; see also Holston 2008; Bayat 2010).

The dense co-presence of residents facili-tates their everyday off-the-grid arrangements as well as ways of appropriating formal infrastructures. This co-presence also generates the space for informal markets for a wide array of goods and services. Apart from commercial transactions, exchanges often

involve expectations of mutual obligations and reciprocity, and are described as sharing, assistance or support (author's field data; see also Tvedten and Nangulah 1999; Spiegel 2018). For instance, many settlements have pre-paid communal water taps, which residents who are recognised by the municipality can use with rechargeable water tokens. However, unrecognised residents who do not possess their own tokens might use their neighbours' and contribute towards recharging them. For energy, residents use gas and paraffin, install solar panels, and fetch firewood on the outskirts of the city. In principle, electricity connections are only available to those on formal plots. In practice, it is quite common for those residents who are sufficiently close to the grid to tap into it illegally, mostly from houses with official connections. In these (and other) cases of shared access, I have learned about both making a profit by reselling and about terms and prices being determined not solely by demand and supply, but also by other considerations such as need, decency, and fairness.

Apart from solving practical problems and constituting a socioeconomic field, vital infrastructuring carries political significance. First, it reflects the interests of participating social actors and the distribution of power between them. The literature on urban politics tends to focus either on domination and resistance (e.g., Harvey 2008) or on the ways in which these poor residents' mundane efforts towards practical improvement carve out space for autonomy and rights (Holston 2008; Bayat 2010). Such antagonisms are certainly important. From a critical perspective, the urban fringes serve as an environment for reproducing the labour necessary for the running of a formal city, while outsourcing the burden of its reproduction to the residents themselves (Metsola 2022). However, the

shared experiences of precarity do not always appear to solidify into an organised 'resistance', but rather incubate a broad spectrum of political energies, orientations, and relations, most of which rely on the aforementioned co-presence. In Windhoek, these include moments of collective protest and land occupation, but also mediatised pressure, pleading with political representatives, mutual co-optation through 'participation', the exchange of improvements for political allegiance, the appropriation of formal infrastructures, and generalised expectations of a responsive and caring public authority (Metsola 2022:46–50). Thus, apart from resistance and autonomy, infrastructuring also constructs various co-dependent relations. In particular, expectations of mutual obligation play a role in how people establish themselves as residents through institutions of kinship, shared origins, and co-habitation as well as through the local state, which is expected to tolerate and improve neighbourhoods (Metsola 2021; see also Ferguson 2013).

Second, infrastructuring can be viewed as a dispersed relational field with constitutive effects on the entities that participate in it. Infrastructural practices contribute to the very formation of urban residents as political subjects, along with their conceivable modes of action and coexistence, from dispositions of exercising authority to the making of urban space (von Schnitzler 2016; Fredericks 2018; Degani 2022). Such processes can only be understood diachronically over time. This means scrutinising how the interaction between various participating entities produces vital infrastructures, while simultaneously taking into account the historical emergence and transformation of these participating entities in relational entanglements over time (Strathern 2020: 17–18; Harvey et al. 2017: 12). For example, in Windhoek, people have learned

to operate in a multi-logic environment—improvising but also resorting to expected patterns of obligation; utilising 'traditional' ties as well as new opportunities of engagement; and seeking both personal advancement and mutual support. The vital infrastructures and claims of residents have prompted governmental responses in the form of informal settlement upgrading policies, extending services, local leadership structures for administering the urban fringes, and legislative changes that provide for intermediate forms of tenure (Metsola 2022; Delgado et al. 2020). At the same time, resident claims often reflect the promises of policies and officials (Metsola 2022). These interactions produce specific ways of being an urban citizen. They have resulted in co-produced urban fringes and a practical regime for their everyday governance which is partially formalised and partially informalised. It consists of tolerating unauthorised land occupation, autoconstruction (Holston 2008) and DIY solutions, combined with formal provision of services, mechanisms of 'participation' as a governmental device, and partial increases in tenure security. These cannot be understood as solely bottom–up or simply top–down, but only as evolving incrementally and relationally.

To summarise, I have argued that vital infrastructures arise out of a need to survive and aspire in precarious conditions. They are constellations of social relationships, trans-actional logics, political relations, materials, and technologies, and cut across the divides of formal/informal, networked/off-the-grid, and state/non-state. Such diverse, plural regimes of vital infrastructuring have major effects on the making of cities, urban lives, and everyday governance, and, therefore, deserve systematic analytical attention.

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