Working with the end of water: Infrastructure, labour, and everyday futures of socio-environmental collapse in Mexico city

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Abstract
This paper analyses how everyday futures of socio-environmental collapse are constituted by the situated interactions of people and infrastructure in Mexico City. I posit that everyday futures emerge at the intersection of infrastructures as accretions of socio-environmental projects, processes, and promises, and the situated practices that specific groups and individuals deploy when engaging with them. Here, I develop this argument by analysing the labour practices through which repair and maintenance workers and engineers at SACMEX, Mexico City’s public water utility, engage with infrastructures that are tensed on the edge of breakdown. To do so, I introduce the notion of ‘modes of everyday futurity’, which holds together the infrastructural conditions that enable the emergence of everyday futures, and the labour practices that enact them differentially. I show how Mexico City’s hydraulic infrastructures are shaped by austerity, the demands to supply and dispose of water to deal with the historical problems of excess and scarcity, and by the specific geological and hydrological conditions of the city. I then look at how workers and engineers engage differently with these infrastructures and show how these interactions produce two distinct modes of everyday futurity: management and displacement. The former enacts a future where catastrophe has already happened but not yet fully unfolded and can only be tactically contained in uneven ways. The latter enacts one where catastrophe might be still displaced spatio-temporally through the construction of new hydraulic infrastructures which promise to reiterate urban modernity not as a dream of equal progress but one of unequal survival. Interrogating the making of everyday futures in Mexico City through these modes, I contribute to literature on futurity, temporality, labour, and infrastructure across the social sciences by theorising the role that infrastructures, and the forms of labour that sustain them, have in making plural, non-linear futures.

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Introduction

“I speak of the city,

a novelty today, tomorrow a ruin from the past, buried and resurrected every day”

–Octavio Paz (1986)

The future of water, or the lack of it, is a matter of great concern for workers at the Mexico City Water System (SACMEX). During the one-year ethnography I conducted there, they would often reflect on this question. The long hours spent whilst driving to fix a leak, repair a broken-down infrastructure, or heading back to the workshop or office were frequently filled with collective speculations on when water would finally run out in the city. Often, this future of scarcity was not framed as a possibility but rather as certainty. Thus, many workers were concerned with when this end of water would finally occur and how this catastrophic future might look like. Field engineers, who supervised the repair and maintenance teams I worked with, shared workers’ concerns with depleting water and impending scarcity but, overall, still envisioned a way to displace this catastrophe. For most of them, the end of water was a problem to be shifted in space and time by the construction of new large-scale infrastructures, in a process characteristic of urban capitalist modernity in Mexico City and beyond (Gandy, 2003; González Reynoso, 2016; Kaika, 2005; Perló Cohen & González Reynoso, 2005; Swyngedouw, 2004).

In this paper, I explore how everyday futures of socio-environmental collapse are constituted by the situated interactions of people and infrastructure in Mexico City. My argument is that everyday futures emerge at the intersection of infrastructures as accretions of socio-environmental projects, processes, and promises, and the situated practices through which specific groups and individuals engage with them. This argument builds on contemporary literature that theorises everyday futures as being made, not given, and contingent upon how different social subjects and groups relate to the future as they act on the present (Mandich, 2020). It contributes to them by theorising the role that infrastructures, and the forms of labour that sustain them, have in making plural, non-linear futures. These everyday futures are simultaneously open and bounded. Their boundedness is produced by the shared materialities and imaginaries that infrastructures constitute; in Mexico City shaped by promises of urban modernity, the effects of historical austerity, and the very hydrology and geology of the city. Their openness is constituted by the specificity of situated practices, experiences, and forms of knowing that workers – and indeed other groups and individuals – deploy to mediate the conflicting rhythms and materialities of contemporary urbanisation (Björkman, 2018), capital accumulation and reproduction (Bear, 2014b), and the very existence of the city in face of socio-environmental collapse.

I suggest that this coming together can be explored through the notion of ‘modes of everyday futurity’. This is a heuristic that allows to simultaneously query the infrastructural conditions that enable the emergence of everyday futures and the range of labour practices that enact them differentially. This concept builds on research that analyses the promises and projects that are enacted through infrastructures (Anand et al., 2018) and their differentiated configurations across urban space (Kemmer & Simone, 2021). It also draws upon contemporary research that highlights the
role of labour in mediating infrastructural imaginaries, materialities, temporalities, and uncertainties (Alda-Vidal et al., 2018; Anand, 2015; Baptista, 2019; Bear, 2014a, 2014b; Björkman, 2018; De Coss-Corzo, 2021; Niranjana, 2021; Ramakrishnan et al., 2021; Zeiderman et al., 2015), as well as on scholarship that shows how infrastructure and practice are co-constituted (Browne, 2015; Shove, 2017). The interrogation of modes of everyday futurity aims to contribute to these literatures and to discussions on futurity across the social sciences (Adam, 2008; Anderson, 2010; Mandich, 2020; Menga & Davies, 2020; Tutton, 2017). It does so by mobilising a conceptual approach that can account for both human labour and infrastructural socio-materialities in enacting everyday futures, and that takes their situated relations as sites to theorise the non-linear temporalities of the contemporary urban moment.

The rest of the article is divided in five sections. The first one elaborates on the theorisation of everyday futures and on the work that the concept of modes of everyday futurity does. The second considers some methodological and historical elements, key in exploring hydraulic futures in Mexico City. The third and fourth sections discuss the specific modes through which workers and engineers enact everyday urban futures: management and displacement. The latter envisions a future that can still be acted upon through infrastructural projects and practices that shift the problem of the end of water both spatially and temporally. The former assumes that these fixes are not possible as the future of water in Mexico City, an unavoidable breakdown, has already happened and can only be tactically contained. Both entail forms of mediating the conflicting temporalities and materialities of austerity, collapse, and urbanisation through labour. The fifth and final section elaborates on how these temporalities and the conceptual vocabulary introduced here contribute to scholarship on temporality, infrastructure, and labour. I conclude by reflecting on potential ways of working not with but against this end of water.

On modes of everyday futurity

The concept of modes of everyday futurity, and the broader understanding of everyday futures as emerging from the interactions between infrastructures and situated practice, draws from recent scholarship on futurity across the social sciences (Adam, 2008, 2011; Adam & Groves, 2007; Anderson, 2010). One key contribution in this regard is Giuliana Mandich’s theorisation of how the future is engaged with on everyday life Mandich (2020). Mandich suggests that the future is not given but rather made through social action (2020: 683). When considering the question of the everyday, the futures that emerge there are contingent upon how social actors engage with the reality that is relevant to them. Mandich highlights four regimes of engagement: the familiar, the plan, exploration, and justification. Each implies different relations with the environment and the future: familiarity flows by unreflexively extending oneself into future; planning sees the future as the realm of probability; exploration discovers “the future while we experience the social world” (2020: 696); and justification accounts for how various potential futures shape our agency in public discussions.

Despite the conceptualisation of the environment as central to the making of futurity, what this environment is and what it does are questions not explored in detail in Mandich’s work. That is, the environment is acknowledged as central to the constitution of the future but a more detailed theorisation of what it is and does is yet to be developed. One potential way to do so is through the entry point of infrastructures. Here, I understand them as complex socio-technical systems that underpin everyday life (Star, 1999), enable flows of matter and people (Larkin, 2013) and ways of inhabiting urban space (Graham & McFarlane, 2014), but also as precarious achievements that must be constantly worked on (Baptista, 2019). This means that infrastructures are not given, but rather co-constituted through practice (Browne, 2015; Shove, 2017; Shove & Trentmann, 2018). This conceptual approach holds together the materialities that enable the emergence of specific
futures, in this case the hydraulic infrastructures of Mexico City, and the practices that enact said futures differentially through ‘doing and saying’ (Shove et al., 2012, p. 7). Distinguishing between materialities and everyday practices enables a discussion of how matter matters (Bakker & Bridge, 2006; Barad, 2003) temporally by ‘locking in’ certain socio-material configurations through infrastructure (Tutton, 2017, p. 484), yet doing so through the materially performative and temporally mediating role of labour (Bear, 2014a; Ramakrishnan et al., 2021).

More specifically, infrastructures matter in configuring everyday futures in at least three interconnected ways. Firstly, they constitute, maintain and reproduce political and economic life as promises of “progress, development and modernity, giving these categories their aesthetics, form and substance.” (Anand et al., 2018, p. 5; see also Larkin, 2018). Secondly, they show the underside of these promises both through their collapse and ruination (Gupta, 2018; Velho & Ureta, 2019; Wakefield, 2018), but also through their role in enabling the emergence of potentially existential threats, including climate change, processes of aquifer depletion and socio-environmental degradation, amongst others (Anderson, 2010; Millington & Scheba, 2021). Finally, infrastructures also allow for the emergence of futures that are amenable to change, hope and the enactment of promises that do not replicate those of modernity and progress. These futures otherwise imply the strategic and anticipatory action of urban dwellers, who constitute provisional configurations (Simone, 2018) that both support the possibilities of living today, whilst holding plural futures open through reflexive, adaptive and often improvisational practices. These include calculating risks and hedging on possibilities in spaces and times other (Newhouse, 2017); wedging futures in the present, reversing the temporal relation between the yet-to-come and the here-and-now (Nielsen, 2014); and holding to, detaching from and challenging promises to carve spaces for urban livelihoods, constituting plural futures through everyday practice (Kemmer & Simone, 2021).

Within the array of practices that enact futures through mutually productive relations with infrastructures, here I wish to focus on the question of labour more specifically. In doing so, I follow Laura Bear’s assertion that temporaliesties are being constantly worked with Bear (2014a). This implies considering labour as a practice that is necessary in the mediation of the disparate rhythms of capital accumulation and socio-environmental flows through a range of technologies, imaginaries, practices, affects and ethics (Bear, 2014b; Ramakrishnan et al., 2021). At the same time, labour mediates conflicting materialities and imaginaries of urban flow, both in the present and in their extension towards differentiated futures (Björkman, 2018). Attention to labour shows both how futures are worked with, against, for and through, and how, amidst proliferating socio-environmental uncertainties, they are enacted and imagined in multiple temporalities that range from the eschatological to the utopian (Tutton, 2017), where “the future is no longer preceded by the present, but it is rather approaching, impacting upon or even becoming the present.” (Menga & Davies, 2020, p. 664)

Building on these contributions, I introduce the concept of ‘modes of everyday futurity’. As mentioned in the introduction, this heuristic seeks to hold together the infrastructural materialities that enable the emergence of specific futures, and the labour practices that enact them differentially. In doing so, this notion takes the positionality of various forms of labour as sites of theorisation, where the particularities of practice entail not only a distinct relation to infrastructure as a matter of present action, but also of futurity. In the case analysed here, the austerity-driven decline of infrastructures, and the entangled histories of water, soil and infrastructure in Mexico City, enable the emergence of futures of socio-environmental collapse. However, the specific labour practices that workers and engineers engage with in the everyday means that these futures are distinct both temporally and materially. That is, their enactment implies not only different present futures (the set of practices and materialities that enact these futures today) and future presents (the set of practices, narratives, and imaginaries of everyday futures) but also a different temporal relation to the future, where it has either already happened, or it can still be deferred and displaced.
On researching everyday futures in Mexico city

Mexico City’s history is marked by its complex relationship with water, produced through various forms of urban infrastructure and infrastructural labour (Legorreta Gutiérrez, 2006; Perló Cohen, 1989; Vitz, 2018). Whilst too rich to fully explore in this paper, considering some elements of it is necessary to better understand how everyday futures emerge in the relations between hydraulic infrastructure and labour as practice. First, and on a broad historical perspective, water has been a twofold problem for Mexico City’s governments and inhabitants. One the one hand, as a matter of excess, and, on the other, as one of scarcity (Romero Lankao, 2008, 2010). This contradictory and paradoxical relationship precedes the Spanish conquest, destruction, and reconstruction of the city after the 16th Century, but its scale, unfolding and direction cannot be understood without it. It was during the colonial period that the infrastructural projects that ultimately desiccated the lagoon system that existed where the city today stands were put in motion (Candiani, 2014). In a process that spans from the 17th Century until today, the city has been shaped by the demand to drain the water that still flows from the mountains that surround it, facilitated by gargantuan infrastructures that enable urban life whilst creating the conditions for its own demise (Chahim, 2018; Perló Cohen, 1999).

Water drainage enabled urban expansion as lagoons were, and indeed still are, turned into land. It also became a central element in urbanisation, capital accumulation, state formation, and the constitution of urban elites (Candiani, 2014; Romero Lankao, 2008). Drainage, and the process of urbanisation it enabled, became linked materially and historically with the need to supply water to a growing city. Supply today depends on a range of hydraulic infrastructures. These include artesian wells within the boundaries of the Mexico Valley, which amount for approximately 44% of the total daily water that flows in the city; two interbasin transfers – the Lerma and the Cutzamala – that supply around 42%; and other sources such as springs and wells beyond the boundaries of the city (SACMEX, 2018). The task of supplying water faces numerous challenges, including losses, which amount to 40–50% of the total daily flow. This water is not necessarily lost to leaks, as some of it can be attributed to informal and unmetered takes. However, leaks remain a central concern (SACMEX, 2020), fuelled in great degree by the fact that Mexico City is sinking, as the extraction of water from the underground aquifer has led to a widespread soil subsidence process that can fracture hydraulic infrastructures (Sosa-Rodriguez, 2010).

Despite this, Mexico City boasts a 98% connection to the grid (SACMEX, 2018) – even if this number hides many inequalities regarding water quality, continuity of supply and pressure, amongst others (Schwarz, 2017). In numbers, this means that there are over 1274 kilometres in the main supply lines and over 11,972 kilometres on the secondary ones. To that, we can add at least 732 kilometres of aqueducts, 884 wells and 268 pumping stations, amongst other infrastructures (SACMEX, 2018, p. 53). These infrastructures range from decades-old metal pipes to relatively new plastic ones, although the latter are still less common than the former. The grid is also under major pressure after decades of systematic and unequal underfunding (Kloster & De Alba, 2007; Rosales García, 2015), fuelled by a privatisation process, formally concluded in 2018, that failed to fulfil its promises of increased efficiency and improved maintenance and repair (Marañón, 2005; Martínez Omaña, 2002, 2018). Moreover, many urban dwellers in Mexico City access water not through the formal grid but through alternative sources such as water tankers (De Alba, 2017) or forms of rainwater collection (Ímaz Gispert et al., 2018). These questions show Mexico City as being one that does not match the infrastructural trajectories of the Global North, inviting questions of how hydraulic futures are made amidst heterogeneity and disrepair (Furlong, 2014).

The variegated futures of water that engineers and workers enact and envision are constituted by and constitutive of this city and its hydraulic histories and infrastructures. I distinguish between
workers and engineers as this is a difference that matters in their everyday practices, and therefore in their ways of enacting futures, although certainly both are forms of infrastructural labour. In this paper, workers refer to those that carry out infrastructure maintenance and repair activities in SACMEX. The engineers whose practices and narratives I analyse here were mostly working in the field, supervising the repair and maintenance teams I worked with, but also surveying various infrastructures across the city. The fieldwork that underpins this article took place over a year, when I worked alongside two repair and maintenance teams, each composed of five to seven workers, and accompanied three groups of field engineers in their everyday tasks, who are here identified through pseudonyms. I did this work three to four days a week, with periods of increased and decreased participation. It was in these moments and spaces where the question of the future emerged not only as a topic of discussion, but also as matter of practice.

Importantly, these everyday futures often echo but do not necessarily follow scholarly analyses of what hydraulic futures in Mexico City might look like. These analyses (Romero Lankao, 2010; Sosa-Rodríguez, 2020) highlight the decrease of water availability due to increased consumption and changes in climate patterns. Changes in the climate, mainly in the form of more intense and frequent storms and downpours (Romero Lankao, 2010: 158) might lead to floods, although the risk of droughts also increases as rain patterns change (Sosa-Rodríguez, 2020: 82). As mentioned before, the city is sinking due to land subsidence problems triggered by the extraction of water from the aquifer, the urbanisation of the mountainous zones where water infiltrated this aquifer, and due to the very geological constitution of the city’s soil (Cigna & Tapete, 2021). This leads not only to the breakdown of hydraulic infrastructures, but also to the contamination of the very same aquifer, and to increased demands for SACMEX workers, who deal with leaks and their consequences constantly. As I will show in this paper, workers and engineers are already living and enacting these futures differently through their everyday interactions with hydraulic infrastructures.

Managing collapse

Maintenance and repair workers often encounter infrastructures at the moment of breakdown. That they do so is hardly a surprising fact. Quite the contrary: it is part of the very definition of their work. However, a closer look at how these breakdowns come to be and how they are mediated through labour can offer relevant insights into how everyday futures of socio-environmental collapse are made in contemporary Mexico City. To analyse this, I focus on the mode of everyday futurity that I call management. This refers to the ongoing efforts through which workers seek to contain a hydraulic catastrophe that has already happened but has not yet completely unfolded. This mode is enacted through practices of maintaining, repairing and operating infrastructures whose potential and actual breakdowns occur as a result not only of the socio-environmental effects of water exploitation, such as soil subsidence, but also due to their systematic underfunding. In turn, these austerity conditions shape the practices through which workers contain collapse, as tools, materials and training are not sufficient, and lead to various forms of improvisation and incrementality that shape everyday infrastructural labour in the city, creating also concrete limits for their reach, both temporal and spatial.

During my time in Mexico City, I worked with teams that were located mainly in the western boroughs of Cuajimalpa and Álvaro Obregón. These boroughs are less affected by ongoing processes of soil subsidence – which can lead to infrastructure breakdowns, damages to the built environment, and other socio-environmental issues – than central and eastern ones (Cigna & Tapete, 2021). This certainly does not mean that infrastructure breakdowns were not frequent, but rather than the explanations workers gave for them were not necessarily related to the fact that city is sinking, although this is indeed central for the future of water in Mexico City (Romero Lankao, 2010). Instead, workers highlighted austerity as one of the key processes that was behind the
deepening and constant breakdown of hydraulic infrastructures. Moctezuma, an office worker in one of SACMEX offices in west Mexico City, located the onset of austerity in 1997, when the PRD, an opposition party, first came to power in the city. Other workers, like Manuel, a driver in one of the repair and maintenance squads I worked with, told me that this austerity went even further back in time. This is consistent with academic literature that argues that austerity rose in the early 90s, as an outcome of widespread financial changes in the Mexican state associated to the rise of neoliberalism (De Alba, 2017).

Austerity becomes material in many ways: the lack of tools and spare pieces to repair breaks; the impossibility of hiring sufficient workers to carry out preventative maintenance; and the many botched modernisation and automatization projects that exist in SACMEX, laying incomplete as funds ran out before they could be finished. For many workers I spoke and worked with, like Moctezuma and Manuel, austerity and deficit have become key registers through which they relate to the future: it is how things have been and will be. Paired with widespread corruption, austerity often appears as a future fact that cannot be avoided and that is always shaping present action. Crucially, this constitutive role is not only relevant when thinking of the materiality of infrastructures. It is also central in understanding how workers carry out their daily labour. As tools and pieces are insufficient, workers fix broken down infrastructures through what I have conceptualised elsewhere as ‘patchwork’ (De Coss-Corzo, 2021). This is a form of improvisational and incremental repair practice that seeks to adapt infrastructure to ongoing change through the repurposing of often ill-fitting spare pieces, the fashioning of tools from discarded materials, and other forms of creative practice.

It is also relevant to consider that the leaks that repair and maintenance workers fix daily are but a fraction of the total occurring at any given point in Mexico City. Leaks can go unnoticed for a variety of reasons. Water flowing from pipes broken by the effects of ground subsidence, or indeed other issues, might not be surfacing, but instead infiltrating the underground, often damaging infrastructures, buildings and polluting the aquifers. Reports made to SACMEX about poor water pressure in a given quarter of the city might not have the necessary political pressure (Anand, 2011) to command sufficient attention from senior engineers and officials, leading to their neglect. Leakages might be occurring in informal and non-networked infrastructures, which are vital for the survival of many beyond the confines of the grid and its political relations (Meehan, 2014). The impossibility of knowing how much water is being lost daily in the city, both due to technical and political reasons, was a well-known fact to SACMEX workers. Taken together, these issues speak not only about the inevitability of breakdown and the limits to institutional knowledge about its possibilities, but about its specific constitution in Mexico City. Workers often spoke of the many of the breakdowns they had to work as perhaps already ongoing, silently creating the conditions through which their labour might one day be called upon.

However, austerity is not the only process at play in the making of infrastructures, practice, and their modes of enacting the future. The uneven urban development of Mexico City also plays a central role in this. The western boroughs in which I worked include steep hillsides and deep ravines. Many of these have been urbanised informally, in what used to be communally owned ejido land (Jones & Ward, 1998). This is true not only for self-built neighbourhoods, but also for some of the elite urban enclaves that exist in the city, like Bosques de las Lomas (Calderón Cockburn, 1987). This was a part of the city to which workers were constantly called. Normally, issues there had to do with poor water pressure, often caused by air being trapped in the pipes due to failures in pumping mechanisms. Problems in those areas were responded to quickly, often commanded by more senior engineers and officials, who had been in turn pressured by neighbours from those areas. These responses implied what engineer (ingeniero) Garza called ‘detectives’ work’ – detailed, exhaustive physical surveys of infrastructures that might be malfunctioning, seeking to pinpoint where specific problems, such as trapped air, might be located.
These surveys demand time, and often stopped workers from attending to issues in other parts of the city. It was not uncommon to be travelling to respond to a complaint that had been made in advance only to be called by a senior engineer, like Garza, to prioritise fixing a problem in neighbourhoods not unlike Bosques de las Lomas. It was in this context where many conversations about the future of water in the city took place. Reflecting on the unfair distribution not only of water, but also of infrastructural labour, workers often expressed doubts about futures where more water would be available for those who need it the most José, a driver in a different maintenance and repair team than the one in which Manuel worked, articulated this view when affirming that ‘as long as city officials refused to do what is needed – to limit the size of new developments – the water problem would continue’ (mientras los funcionarios no hagan lo que se necesita – limitar el tamaño de los desarrollos – el problema del agua va a seguir). These developments consume large quantities of water through everyday use, and crucially, through cisterns. These facilities secure water for those who could afford them, but imply that those who could not, would receive less water. Importantly, these infrastructures imply differentiated possibilities of enduring present and future scarcity.

Echoing concerns with corruption, José saw no clear path out of this, and instead imagined a future city in which present inequalities were magnified, with consequences he could not foresee. He was not alone in this, as many other workers imagined these catastrophic futures as being extensions of the present city, with the added pressures associated to decreasing water availability and increased water stress (Romero Lankao, 2010; Sosa-Rodríguez, 2020), ongoing infrastructural ruination, and the unequal distribution of infrastructural labour. Here, the end of water is not equal for all. This political ecology of the future is characterised by the radicalisation of the political ecology of the present, where inequalities, daily forms of violence, and quotidian struggles are enhanced and made even more pressing. However, it is also an everyday future where present political action is often rendered powerless, as it becomes easier to imagine the end of water than a profound technical, political and economic change in how the city, and its hydraulic infrastructures, are run. I cannot affirm that all workers subscribe to this analysis of present hydraulic politics in Mexico City, but this view, where future distributions of power are identical to present ones, and overdetermine them, was widespread and often articulated when discussing the matter of how future presents might look like.

Regarding its temporalities, management as a form of everyday mode of futurity is characterised by its non-linearity. It is carried out through practices that bring together known futures, unknown pasts, and uncertain presents. Stories of leaks that went unnoticed for decades, slowly loosening soils until they became a matter of present action through spectacular collapses such as landslides, depict the past as shaping future labour in ways that are simultaneously known and unknown in the present. Certainty of breakdown does not imply a clear knowledge of the moment or place in which it will occur. Being that these breakdowns can surface at any point, workers aim to be ready to act upon them when the time comes. To that end, they carry with them materials that can be shaped into provisional solutions that contain leaks, keep pumps working, and sustain water flow through constant adaptation of the grid, or prepare potential patchwork solutions that can be deployed in a wide array of hydraulic problems. This implies a way of thinking and doing that makes the future present in preparing for a breakdown that might have already happened without being yet visible. Time here appears as an extended present, where the future is related to as already happened and unfolding in ways unseen, uneven and unpredictable. In contrast with Mandich’s (2020) conceptualisation, this is a future that necessitates familiarity without implying unreflective extension.

Crucially, the temporal and spatial horizons of management as a mode of everyday futurity do not extend limitlessly. Instead of that, the becoming present of a future of socio-environmental collapse implies that labour practices shall seize being sufficient to contain it. This is also a future fact that is already unfolding today, even if unevenly, and that is visible in the many instances in which
SACMEX workers’ labour is unable to mediate collapse and survival in the present city. This future after collapse does not necessarily imply the end of urban living. Instead, it suggests limits to present forms of producing, maintaining, and repairing hydraulic infrastructures, urban water flow and forms of governing these materialities, flows and their spatial configurations. It suggests that producing the public grid through austerity and aiming to contain its collapse through everyday labour is a way of working with the end of water and not against it. In the future after collapse, the state, its organisations and the workers employed by them cannot perform the mediating labour that sustains not only water flow but the forms of authority and power that flow with it (Barnes, 2014, 2017; Meehan, 2014). In that space, the inequalities that characterise today continue shaping the future city, as people try to live among the ruins of modern infrastructural life (Wakefield, 2018).

**Displacement**

If for workers the future had already happened, even if its consequences were felt unevenly across the city, for engineers the future could still be displaced, both temporally and spatially (Chahim, 2018). This disparate view of what the future could be and how it could be enacted today is related to the forms of practice that each group mobilises when engaging with infrastructures. If for workers their everyday labour consists of dealing with a collapse that is already unfolding, for field engineers much of their work is finding ways to postpone collapse until new infrastructural projects could be built. In enacting this future, engineers did not deny the tangible pressures over the grid, which include the depletion of aquifers, urban sprawl, and rising consumption across wealthy enclaves in the city (Romero Lankao, 2010; Schwarz, 2017). Instead, they relied on the same logic that has been guiding the growth of the Mexico City water network: an expansion that requires ever more distant inter-basin transfers to meet increasing demand (González Reynoso, 2016; Perló Cohen, 1989; Perló Cohen & González Reynoso, 2005).

As a mode of everyday futurity, displacement mobilises at least two infrastructural materialities, simultaneously future and present. The first one holds on to the promises of capitalist urbanisation, modernity and progress (Anand et al., 2018), namely through the possibilities of continued hydraulic expansion through infrastructural projects (Gandy, 2014; Kaika, 2005; Swyngedouw, 2004). This promise constitutes displacement as a form of recursive linearity. Linear as the future is knowable on account of past experiences. New projects will be built when they become necessary to guarantee the survival of the city. Recursive, insofar these projects do not offer a solution to the end of water but merely displace it in a way that makes the future an expanded repetition of present and past This recursive temporality is complicated by the presence of a second infrastructural materiality which is not promised but lived: that of austerity and deficit. Austerity, and associated processes of infrastructural ruination, are the underbelly of previous promises of modernisation and progress which have not materialised presents of abundant water and equal access for all (Marañón, 2005; Martínez Omaña, 2002, 2018; see Velho & Ureta, 2019 for a discussion on infrastructural ruination and modern promises in Latin America).

Underpinning the promises of increased supply is the specific technical knowledge that constitutes hydraulic engineering. For SACMEX engineers I worked with, the question of temporally averting the end of water by expanding the hydraulic reach of Mexico City (or the expansion of its hydropolitan region, see: González Reynoso, 2016) was, above all, a technical one. Locations for new water sources have been long identified, and include the expansion of the Lerma-Cutzamala System, which already supplies 42% of the total water in Mexico City (SACMEX, 2018), and the tapping of water from the Tecolutla and the Amacuzac Rivers, to the west and south of Mexico City, respectively. The Lerma-Cutzamala expansion has been planned and projected for decades now but has not proceeded due to socio-environmental conflicts in the area (Gómez-Fuentes, 2009). The Amacuzac and Tecolutla ones are present in several plans and
projects, even if just as distant possibilities (SACMEX, 2012, pp. 164–165, 2018, pp. 84–87). Given that these rivers are much lower in altitude than Mexico City – 1180 metres in the case of the Tecolutla and 1578 metres in that of the Amacuzac – the amount of electricity that would be required to pump water to break the steep incline is extremely high, resulting in high financial and operational costs, and potentially significant socio-environmental impacts (Escolero Fuentes et al., 2009; Tortajada, 2006).

These future infrastructures, and the forms of engineering knowledge that make them possible both as desires and projects, have been mobilised before. Arguments made when discussing the construction of the Lerma inter-basin transfer (also known as Phase 1 of the Lerma-Cutzamala system) operated in a similar fashion, presenting the matter of water supply for a city with infinite thirst as one of technical imagination and budgetary determination (DDF, 1949, 1951). However, present imaginaries of futures of increased supply also differ significantly from past ones. Where those imagined and enacted in the 1940s and 50s, when the Lerma was built, hoped for a final resolution for Mexico City’s water woes (Arenas-Valdés, 1948; Campos Bravo, 1948; Vizcaino & Bistraín, 1952), the present ones cannot promise such a thing. Instead, they merely offer the modest hope of making the end of water a problem of others, both temporally and spatially. This is what constitutes the recursiveness of displacement as a mode of everyday futurity. Promises of progress and modernity are no longer utopic but the dim afterlives of utopia.

The entrenched forms of austerity and deficit that shape the production, maintenance and repair of infrastructure also come to matter in shaping displacement as a mode of everyday futurity. On top of problems of insufficient materials and budget, engineers must also deal with manual labour shortages. These imply that some infrastructures that should be constantly supervised by workers are not, leading to a series of problems such as overflowing water deposits, lack of compliance with water supply rationing schedules, or the impossibility of corroborating whether reports of problems or potential breakdowns are truthful as there are no personnel in various facilities that can do this task. In practice, labour shortages mean that engineers must often deal with these issues themselves. On many occasions, I accompanied engineers as they travelled long distances to figure out why a certain quarter in the city was without water or facing problems with pressure and to attempt sorting this out. They often mentioned that these infrastructures had been staffed full-time in the past, but this had changed as a result of ongoing austerity. In some cases, systems to control valves and monitor flows at a distance had been designed and installed. However, these ‘modernisation projects’, as they are called at SACMEX, had many times been left unfinished or had stopped working and not been repaired.

In their place, engineers themselves had to manipulate valves and deposits to make water flow or stop flowing. This practice considers not only the need to restore flow, but also the unequal geographies of the city, present there as perceptions about how much water any given area needs, might demand, and deserves. Much like repair and maintenance workers’ labour, the decisions and practices that make water flow were not made beyond politics but were themselves a technopolitical practice. That is, in opening and closing valves to increase supply to a certain quarter of the city, engineers were often diminishing flow elsewhere. In doing so, they were already displacing water scarcity in uneven and unequal ways. Engineers I worked with were often aware of this, and expressed it in conversations amongst themselves and with me, but saw their actions as being constrained by the oversight of engineers higher up in the organisational chart, and by the very constitution of infrastructures and their unequal reach, maintenance and operational capacity. These everyday displacements, which create differentiated patterns of access in the city (Schwarz, 2017), were often portrayed as solutions that enabled urban life even in face of scarcity and widespread disrepair, and that were put in practice whilst waiting for a bigger change.

Reflecting on this, I suggest that austerity and deficit produce infrastructures in a way that hollows out the promises of modernity and progress without them fully crumbling. Like the
rusty pipes and valves that engineers and workers must tend to, they still do their work, even if partially and always in risk of breakdown. Where workers upkeeps these promises through constant patchwork, engineers hold on to them through the hope that the threat of collapse provides. This hope is that the end of water, and the catastrophe that it would entail, will one day make city officials and elected politicians realise that without massive investment not only in repair and maintenance, but in the expansion of the grid, Mexico City would run out of water. Facing the prospect of the end of water and environmental collapse, officials and politicians would finally find a way to invest in the grid, SACMEX and its workers and engineers. Politicians would finally heed the word of technics and disaster could be averted, at least for the time being. The everyday displacements they carry out today would give way to a different one, operating at a hydropolitan (González Reynoso, 2016) scale.

Displacement as a mode of everyday futurity requires engineers to hold on to the promise (Kemmer & Simone, 2021) of a new expansion of Mexico City’s hydraulic infrastructures not as an image of a better future but as a repetition of projects and desires past. Scarcity, for them, is not a problem of apocalyptic collapse, like it was for some workers who compared the future of Mexico City with the mythical demise of Mayan cities due to resource depletion, or with the fictional accounts of post-apocalyptic worlds, such as those seen on Mad Max (see Menga & Davies, 2020 for a discussion on non-linear temporalities in the Anthropocene as read through comics, including Mad Max - although the workers I spoke to about this referred not to the comic but to the various films in the franchise). It was instead one that could be solved by shifting it spatio-temporally. However, for this solution to emerge, then the risk of collapse would have to be so pressing and unavoidable that it would finally elicit a response that was still beyond reach today. Collapse here plays a productive role, in which its increased likeliness is directly related to the possibilities of displacing it.

In their everyday practices, engineers constantly mediate between the rhythms of electoral politics, ongoing austerity and ruination, and increased water scarcity, all whilst waiting for collapse to play its predicted role. Regarding the first rhythm, engineers constantly demarcate their work from the messy one of politics, where electoral calculations lead to granting permissions for housing developments that might not comply with various regulations, waving fees and tariffs, or providing services to informal housing. Despite their verbal opposition, and the certainty that what they see as an intrusion of politics in the world of hydraulics is exacerbating many of the issues faced by the grid, engineers must collaborate with bureaucrats and elected officials. This means that they either ignore or potentially participate in these technopolitical strategies, even if they are careful not to disclose it. In relation to austerity, deficit and ruination, engineers purposefully overlook the proliferation of patchwork solutions or partake in their making. These do not comply with rules and regulations yet are frequently the only ways of ensuring supply amidst continuous breakdowns.

Waiting for collapse to play its predicted part enables engineers to enact a future in which their formal hydraulic knowledge not only allows for the endurance of the city, but also of their own positionality within SACMEX and of the broader forms of power that are associated to institutionalised hydraulic knowledge and the state. Even when recognising that patchwork is better suited for conditions of deficit and austerity, engineers hold on to the usefulness of currently existing norms and the solidity of their formal knowledge as these would be the tools that would enable the displacement of collapse, instead of its mere containment. In displacing catastrophe, engineers are carving spaces for their own forms of practice, expertise, and knowledge to remain perceived and enacted as better than those of workers, which are seen as stand-ins for the bigger interventions that will inevitably come. Implied in these future interventions is the endurance of the forms of power that are entangled with presently existing infrastructural relations. In displacing collapse by expanding the hydraulic reach of Mexico City, engineers imagine the future as one in which state power, engineering knowledge, urban flows, and the inequalities associated to them, are
made and maintained in the image of present ones. When that expanded configuration reaches its limits, a new form of displacement would emerge, reproducing and expanding these very forms of power again.

**Working with the end of water**

The previous two sections have discussed how modes of everyday futurity are co-constituted through the interplay between infrastructures and practices. I have argued that infrastructural materialities are what enables the emergence of futures of scarcity, collapse, and catastrophe. Water pumps, pipes, aqueducts, reservoirs and other objects and sites, shaped by process of ruination, constitute the infrastructures of everyday futurity. However, their infrastructural condition does not amount to a determination of possible futures. Futures are enacted through the array of practices that SACMEX workers and engineers carry out on the everyday. Here I have highlighted the tactical performance of practices that can foreground futures of collapse, manage their unfolding, or withhold them until the possibility of displacing catastrophe emerges. This implies the existence of multiple temporalities, which range from the becoming present of the future through everyday breakdowns that are caused by a catastrophe that has already happened but has not yet fully unfolded, to recursive linearities where future infrastructural projects promise to displace the end of water both in space and time. In what follows, I briefly elaborate on how the study of these modes can contribute to scholarship on temporality and futurity, labour, and infrastructure, continuing the discussion presented in the first section of this article.

**Collapse, modernity, and everyday futurity**

Socio-environmental collapse has become infrastructural in everyday enactments and imaginaries of the future at SACMEX. By this, I mean that it has become entangled with the hydraulic infrastructures of Mexico City, enabling the emergence of specific modes of everyday futurity there. This comprises infrastructures as materiality, their uneven configurations and their histories, their relation to ongoing austerity and its future presence, and the various labour practices that sustain them quotidianly. Collapse and hydraulic infrastructures have then become entangled both as matter and meaning in the diverse modes of everyday futurity analysed here. The infrastructural quality of collapse has at least two implications for modernity and the promises made and unmade through hydraulic infrastructures in contemporary and future Mexico City. On the one hand, these promises are punctured, as possibilities of indefinite growth, abundant resources, and universal access to them appear fleetingly possible but already doomed to fail. On the other, the emergence and enactment of non-linear temporalities in relation to the sustainment and unmaking of these promises poses profound questions to modern temporal and material horizons and practices.

The hollowing out of modern promises as nominally universal claims on progress and urban development does not mean that they become irrelevant for all. The everyday futures imagined and enacted by workers and engineers imply a continuity in forms of living for urban elites, who shall continue to use as much water as they use today. For those who live with insufficient water, the future imagined is either one of continued lack or even worsening conditions, sustained by forms of violence and exclusion. This is both the case in futures of displacement and management. In the former, new cycles of dispossession, violence and water depletion begin, following the path and consequences of those that took place in the past. In the latter, tactical containment is not performed equally, as diverse forms of pressure and unequal infrastructural configurations shield elites from the unfolding catastrophe, even after it has fully occurred. In futures where displacement was not achieved, and management has reached its limits, hydraulic inequalities and injustices not
only persist but worsen. These hydraulic futures promise not a future of equal development but one of unequal survival after catastrophe.

The enactment of these modes of everyday futurity poses profound questions for the future in a moment in which uncertainties, threats and potential catastrophes proliferate (Anderson, 2010; Menga & Davies, 2020). Here, I have highlighted how progressive linearity is not the temporal relation through which SACMEX workers and engineers enact and imagine the future. Instead, the future is rapidly collapsing into the present, whether as the catalyst for reiterating modernity not as promise of emancipation but as its already assumed recursive failure, or as a moment beyond its reach in which the management of catastrophe is no longer possible. In contrast to relatively open-ended futures, where actions taken (or non-taken) today can create opportunities to live in spaces and times otherwise (Kemmer & Simone, 2021; Newhouse, 2017; Nielsen, 2014), here the future appears, if not foreclosed, at least shaped by this threat. Catastrophe cannot be avoided, only displaced or managed. This resonates with futures emerging elsewhere. The end of water concerns other cities as patterns of resource urbanisation and appropriation reach their limits (Millington, 2018; Millington & Scheba, 2021), amidst ongoing austerity as a form of producing, maintaining and repairing urban infrastructures in the age of climate change (Bigger & Millington, 2020).

Conclusion

This article has analysed the everyday futures that workers and engineers at SACMEX, Mexico City’s public water utility, enact through their daily work practices and Mexico City’s hydraulic infrastructures. In doing so, I have followed Richard Tutton’s definition of the future as an ‘entanglement of matter and meaning’ (Tutton, 2017). More specifically, I have shown that everyday futures appear in the situated interactions between infrastructure as accreted socio-material history and labour as a practice that mediates space, materiality, and time. In Mexico City, this implies considering the entangled histories of water drainage and supply; of soil subsidence and aquifer depletion; of deepening austerity and failed privatisation; and of unequal survival in the present and future city. However, futures are not merely given by infrastructures. Rather, they are laboured (Bear, 2014b), being enacted through the everyday practices (Mandich, 2020) of workers and engineers at SACMEX. To hold these multiple relations together, I have introduced the heuristic of everyday modes of futurity, which seeks to interrogate how specific forms of labour enact and imagine futures that are different not only in their content but also in their temporal relation to the present.

I have identified two distinct modes of everyday futurity: management and displacement. The former presupposes a catastrophe that has already happened but has not yet fully unfolded and can only be tactically contained. The latter assumes that environmental collapse can be temporarily avoided by displacing it spatiotemporally through an expansion of already existing hydraulic infrastructures. These modes of everyday futurity, enacted through infrastructural labour, mobilise different temporal relations between past and present, and are contingent upon specific forms of working with infrastructure today. Management implies the becoming present of the future (Menga & Davies, 2020), where containment of its effects can delay its total unfolding but cannot stop it completely. Displacement implies a recursive temporality, where the construction of new hydraulic infrastructures would repeat previous cycles of hydropolitan expansion (González Reynoso, 2016) in the mould of modern practices of urbanisation and nature production and appropriation (Gandy, 2014; Kaika, 2005; Swyngedouw, 2004). Both modes of everyday futurity stand in a conflictive relationship to modernity, as they cannot offer equality, abundance and progress as universal rights but instead can only mobilise them as unequal and uneven promises (Anand et al., 2018) which mirror and expand present inequalities and injustices.
In these modes of everyday futurity, collapse itself has become infrastructural as austerity has driven processes of ruination and disrepair (Velho & Ureta, 2019), shaping futures emerging and enacted, and becoming productive both of temporal and material horizons and the practices that seek to defer or delay them. The infrastructural quality of socio-environmental collapse is, I suggest, one of the reasons why the everyday futures enacted by workers and engineers at SACMEX do not resemble those analysed by scholars in other urban spaces, particularly in what we can call the Global South or the majority world. Whilst these are open, predicated on the opportunity of being or becoming otherwise (Kemmer & Simone, 2021; Newhouse, 2017; Nielsen, 2014), the ones analysed here are closed, whether as unavoidable collapse or as repetition of the same. This does not imply that conditions elsewhere are in themselves more hopeful, as this infrastructural condition is not self-producing and is contingent upon those labour practices that it stands in relation with (Shove, 2017). In the case of Mexico City, this means that the austerity-driven decline of infrastructures is constitutive of engineers’ and workers’ modes of enacting everyday futures in ways that are specific to their labour practices.

It is here where the specificity of labour might become a useful standpoint to interrogate futurity. As Laura Bear, following Ernst Bloch, has suggested, labour might generate understandings of the world that are not mediated by ideology (2014b, p. 74). If that is indeed the case, the modes of everyday futurity enacted and imagined by workers and engineers at SACMEX might point to a generalised becoming infrastructural of socio-environmental collapse in the pursue of promises of modern capitalist urban development (Wakefield, 2018). This is certainly visible in analogous urban processes elsewhere in the world, where water scarcity and its potential end have led to growing anxieties and to the replication of the strategies that first caused the current predicament (Millington, 2018; Millington & Scheba, 2021). The modes of futurity enacted through everyday infrastructural labour in Mexico City suggest that spatiotemporal fixes will not offer a lasting solution as they only promise recursiveness. They also imply that labour practices that mediate the conflicting rhythms of austerity, ruination, scarcity, demand, capital, and urbanisation have concrete limits to their action. Under current conditions of urban living and growth, there is only space to work with the end of water. Working against it asks of us to enact other ways of future collective being through practices and infrastructures otherwise.

**Highlights**

This article:

- Analyses how everyday futures are constituted by the situated interactions between people and infrastructure in Mexico City.
- Shows how austerity and the socio-environmental history of water supply and drainage in Mexico City have produced infrastructures in a way that enables the emergence of futures of socio-environmental collapse.
- Highlights the constitutive role of labour in producing everyday futures.
- Argues that everyday futures imply plural, non-linear temporalities, which problematise practices and imaginaries of urban modernity.
- Suggests that everyday futures of socio-environmental collapse enacted in Mexico City might be relevant to understand similar processes elsewhere.

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1. Translation from the original, in Spanish, by the author.

References


DDF (1949) *Las Obras de Lerma: Trabajos presentados al Primer Congreso Internacional de Ingeniería Civil, celebrado en la Ciudad de México en abril-mayo de 1949*. Mexico City: DDF.

DDF (1951). *Obras Para Provisión de Agua Potable en la Ciudad de México*. Mexico City: DDF.


González EA (2016) *La Región Hidropolitana de la Ciudad de México: Conflicto Gubernamental y Social por los Trasvases Lerma y Cutzamala*. Mexico City: Instituto Mora - CONACyT.


SACMEX. (2012). El gran reto del agua en la Ciudad de México. Pasado, presente y prospectivas de solución para una de las ciudades más complejas del mundo. Mexico City: SACMEX


