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‘Power’ struggles in Mumbai: Informality, institutional work, and the quest for energy justice

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Abstract

India’s commitment to net zero by 2070 has sparked a significant energy transition, prompting policy shifts and infrastructure reconfigurations. This paper explores these transitions within Mumbai’s electricity sector, focusing on the informal settlements, where nearly 41 percent (approx. 9 million people) of the city’s population resides. Two competing narratives are at play here: top-down imaginaries frame slums as infrastructural disruptions, while grassroots movements emphasize energy justice and livelihood security. We use an inductive case study approach to examine institutional work practices in Mumbai’s highly regulated and privatized electricity sector and explore how slum communities resist exclusion and challenge dominant infrastructure narratives. By analysing micro-cases of informal settlements, we show how grassroots action can reshape exclusionary electricity infrastructures and align energy transitions with justice outcomes. Our findings reveal that energy justice for marginalized communities requires creating dynamic spaces for contestation outside of rigid regulatory frameworks. We contribute to the broader understanding of energy transitions as socio-technical processes that intersect with issues of inequality, exclusion, and the risks associated with the twin crises of climate change and energy as an input for development.

Keywords: energy justice; informality; urbanisation; institutional work; energy transition

JEL classification: O1; O17; P18

1. Introduction

Global concerns on climate change risks have foregrounded the need for accelerated mitigation action. While decarbonisation is imperative, emerging economies like India are striving to balance climate action with sustained economic growth (Haldar et al. 2023). Energy sector, while being an essential input for economic growth and urbanisation is also the largest contributor to economy-wide emissions in India (NITI Aayog and Vasudha Foundation 2020). Hence modernising and decarbonising the power sector is not just imperative but also inevitable given India’s ambitious climate commitments of achieving 500 GW of non-conventional energy by 2030, and net zero emissions by 2070 (Bhatia 2023). However, India’s energy transition story is not just limited to moving from fossil to renewable energy (RE) sources. It comprises multiple overlapping shifts in material and non-material artefacts – i.e.,

ownership structures, grid infrastructure, policy and regulatory landscapes, transitions in coupled sectors like transport and industry, land-use, and consumer demand. This multifaceted nature of energy transitions also stems from it being a highly politically entrenched subject (Halдар et al. 2024).

While India has made significant strides in its installed RE capacity (47.1 percent of total installed capacity) (MoP 2024) - even after three decades of reforms post-liberalization (1990s), the electricity sector is still grappling with its 20th Century challenges of theft and non-payment, operational inefficiencies, unreliable supply, access, and distressed finances, while attempting to construct energy imaginaries for the 21st century. The current electricity structure still rests on a historically entrenched constellation of institutional forms including distribution companies (Discoms) and regulators which have significant inertia. Hence, with competing logics and images of future at play at National, State and Local level (DisComs, generators, consumers etc.), India's RE transition is unlikely to be smooth and linear (Dubash and Rajan 2001).

Especially with rapid rates of urbanisation mandating higher energy demand – privatisation of electricity distribution, generation and transmission is proposed as key to increase efficiency through competition, drawing in private investments for infrastructure upgradation, and increase uptake of RE. In such an environment, regulation and policy layout formal mechanisms for governance of energy infrastructure. However, the way this neoliberal logic of electricity and allied infrastructure is planned and implemented has raised concerns regarding exacerbating existing injustices with regards to not just affordability, access and reliability, but also marginalising certain communities in urban settlements. Informality is a characteristic of all Indian cities- and the way top-down urban imaginaries shape electricity infrastructure often proliferates socio-spatial injustices due to the exclusionary nature of infrastructure provisioning. For instance, slum communities are often portrayed as a problematic identity, rendering them most vulnerable to infrastructure brutality and risks (e.g. Rodgers and O'Neill 2012; Peddibhotla et al. 2024). Thus, urban spaces in relation to contentious infrastructure often emerge as political arenas where energy justice outcomes are negotiated through deliberative action or what is called the 'institutional work' of multiple actor groups.

In this context we focus on bottom-up collective action of actor groups in informal settlements of Mumbai – the financial and commercial capital city of India – to investigate *how informal practices and formal institutions interact in contested urban spaces to co-shape justice outcomes from electricity infrastructure?* This is important because, through identifying specific processes and institutional work practices that diverse actor groups engaged in to construct imaginaries of just energy systems and legitimise these imaginaries in policy processes we offer important lessons for trans-local learning and policy. This in-depth case analysis would surface how local agency can be operationalised to leverage energy (and similar public infrastructure and services) to shape more just and equitable societies.

Mumbai is the capital of the state of Maharashtra which is the richest among 33 Indian states and contributes 13.88 percent to India's Gross Domestic Product (GDP). With an estimated population of over 22.1 million, Mumbai is a hub of trade, business, and human and cultural

capital. What makes Mumbai a complex and interesting case is the stark contrast between the various pockets of urban settlements across the city. On one hand the city features a GDP per capita that is twice that of the State and roughly thrice that of the national per capita GDP. While on the other hand, over 9 million people (41.3 percent of the total city population) live in de-notified and notified slums (World Population Review 2025). This urban agglomeration features the highest number of billionaires in any Indian city residing in their high-rise luxurious buildings right next to the largest slum population residing in a cramped stretch of corrugated iron-roofed shanties (Chattaraj 2012). Slums in Mumbai are not merely clusters of temporary shelters but showcase complex economic and ecological systems. Due to the housing inequities and spatial politics in Mumbai, it is not uncommon to observe that many inhabitants of these slums are not the official poor, but are well-educated, middle-class populace. Thus, the case of electricity provisioning (and energy transitions) in Mumbai is of particular interest for our study, as it is a city that explicitly demonstrates the cliched contradictions of the typical Indian urbanization- riddled with socio-spatial inequity, economic dynamism, concentrated and visible poverty, exorbitant real estate prices, dilapidated infrastructure, unplanned- organic urbanization and contested urban identities and spaces. Thus, through an empirical analysis of the institutional work of slum communities led by civil society organisations - we demonstrate how ‘contentious infrastructure’ in itself emerges as a political arena – shaped by the interplay between state policy, market dynamics and informal agency.

In doing so, in the subsequent section we engage with three conceptual blocks - infrastructure risk and brutality and urban informality, energy justice, and institutional work. These themes constitute the analytical framework used to interpret our empirical findings. Following this, the methodology section details our research approach, including the rationale underpinning case selection. Subsequently, in the discussion section - we present our empirical findings and critically analyse them through the aforementioned conceptual tropes. The paper concludes by summarising the insights from our study and proposing avenues for future research.

2. Key concepts

2.1 Infrastructure risk and brutality and urban informality

For long, scholars have argued that infrastructure is not just material in nature and is a socio-technical and political assemblage (Amin 2014; Larkin 2013). Truscello’s (2020) concept of “infrastructural brutality” refers to the ongoing, unrelenting creation of infrastructure regardless of industrial capitalism’s noticed limits of expansion and dominance. This emphasizes the severe, often invisible, effects of modern infrastructures, which extend beyond connectivity and mobility to include ecological, political, and psychological implications (ibid). Truscello contends that, notwithstanding their shortcomings, these infrastructures normalise dependency and contribute to a cycle of socio-ecological degradation. However, what becomes an important question to ask in this context is who this infrastructure is created for and does everyone equally benefit from infrastructure development? This is a central question in the context of informal settlements where infrastructure specifically becomes

contentious - as the lack of infrastructure creates challenges to access basic services like water and electricity.

In the context of informal urban settlements, scholars have looked at the social and political practices that enable infrastructure to function (e.g., Anand 2017; Bjorkman 2015), and show how infrastructure access is being determined not only by the material infrastructure laid down by the state but also by the sociopolitical relationships and ideologies that operate and define access. These relationships and ideologies get blurrier in the context of urban informality. For example, McFarlane (2008) shows how the city and state governments in Mumbai use ‘cut-off’ date as a qualifier for infrastructure services to ‘informal’ settlements, indicating a regulatory mechanism that dictates access in these contexts.

Infrastructure in informal settlements can be argued to be inherently violent in nature. Specifically, the term ‘infrastructural violence’, is used by Rogers and O’Neill (2012), who trace how structural, instrumental, and even “passive” forms of violence can be tied to how infrastructures are implemented, regulated, and unequally experienced, including “socially harmful effects from infrastructure’s limitations and omissions rather than its direct consequences” (Rodgers and O’Neill 2012: 406). In this way, infrastructure is not just a material embodiment of violence (structural or otherwise) but often is an instrumental medium that reinforces social orders, thereby becoming a contributing factor to reoccurring forms of harm (ibid). Other scholars such as Truelove and O’Reilly (2021) expand the concept further and empirically show how infrastructural violence is mediated and co-produced by differing forms of intersectionality, including caste and gender. As an analytical lens, infrastructural violence also speaks to the environmental sociology theory of social construction of risk (Olofsson et al., 2016; Chavez-Rodriguez, 2014; Wynne, 2002). It becomes particularly useful to unpack the lived experience of living with risk and the violent manner in which infrastructure risk is socially constructed in a society (Beck, 2009) and spatially distributed inequitably (Greenberg et al., 2024).

Infrastructure violence in informal settlements is visible both spatially and temporally. Spatially impacts are largely focused on how infrastructure as a service often excludes different social groups from the benefits of infrastructural services (e.g., Gulyani et al. 2010). Temporally, infrastructure violence unfolds over time through development-induced displacement and resettlement in which infrastructure both violently displaces people and is used for the reconstruction and development of modernity (e.g., Otsuki 2024). Spatial and temporal dimensions of infrastructure access in informal settlements further complicate how individuals interact and negotiate with these services. This interaction is also influenced by their agency and ability to partake in institutional ‘work.’

2.2 Human agency and institutional work

In defining human agency, Battilana and D’Aunno (2009) suggest that human agency should be viewed as a multidimensional concept. Building on the work of Emirbayer and Mische (1998), Battilana and D’Aunno (2009) define agency as “an actor’s engagement with the social world that, through the interplay of habit, imagination, and judgment, can both reproduce and

transform an environment's structures" (p. 46). Further, they illustrate that agency has three primary dimensions - iteration (habit), projection (imagination), and practical evaluation (judgment) and argue how these three dimensions also align with the different types of institutional work: creating, maintaining, and disrupting institutions (Lawrence et al. 2009).

In the context of human agency in energy scholarship, Halder et al. (2024) illustrate transitions as an outcome of contestations of individual or collective agency to transform institutional and technological structures, hence, influencing the direction, pace, and extent of energy transitions. What is important to note here is how collective agency and contestations even exist in the context of energy service provisioning, especially in informal settlements.

In the context of informal settlements, human agency can manifest in numerous ways in people's encounters and negotiations with the formal state and various other actors located in the hierarchy of power relations (Fattah and Walters, 2023). As people in informal settlements in Global South cities are subjected to "ever-present forms of risk" (Appadurai 2001; Banerjee 2018), human agency becomes an important requirement to access infrastructure. In this context, Refstie and Brun (2016) build on Caldwell (2007), to argue that the concept of 'agency' must include not only the capacity to resist or to "act otherwise", but also the possibility of "making a difference" (p. 141). They use 'political agency' to describe ways through which the urban poor engage in a politics of mobilisations to deal with the adversities of everyday life. In this context, the bending and stretching of rules can in turn be interpreted as 'work' to change institutions that enable infrastructure service provisioning.

2.3 Energy justice

Over the past decade, energy justice has emerged as a crosscutting social science research agenda which seeks to apply justice principles to the broader domain of energy studies. (Jenkins et al. 2016). According to Heffron and McCauley (2017), there are two main definitions of energy justice. The first is from 2013 that defined energy justice as having three central tenets (McCauley et al. 2013) and what was referred to as a triumvirate of tenets – distribution, procedural, and recognition justice. Second, a principled approach to energy justice was discussed by Sovacool et al. (2016) and these include: availability, affordability, due process, transparency and accountability, sustainability, intra-generational equity, inter-generational equity, and responsibility.

Prior research has used the three tenets to analyze challenges to access energy in the context of informal settlements (e.g., Peddibhotla et al 2024). Research by Jones (2021) and Yenneti et al (2016) use the distributional lens of energy justice to illustrate how energy insufficiency is not only a clear case of distributional injustice but also generates unjust outcomes that damages a community's well-being and reinforce existing inequalities. Furthermore, lack of recognition of informal settlements and the urban poor advances existing injustices (Peddibhotla et al. 2024). In this context, 'non-recognition' has been argued as recognitional injustice (Jones 2021 Jenkins et al 2016). Lack of recognition can also be understood to negatively influence people's political agency in informal settlements. The core principles defined by et al. Sovacool et al. (2016) also form important analytical lenses when we look at informal settlements. For

example, affordability and availability of electricity is a commonly mobilized issue in informal communities that face challenges related to accessing electricity (e.g., Butera et al. 2015; Winkler et al. 2011)

A significant effort has been made in energy literature to connect the two concepts of agency and justice. Notably, Taiwo and Tozer (2025) outline community energy justice as “an emerging body of literature that emphasizes community-oriented approaches and community-centred lenses as a crucial avenue for studying justice and equity in energy transitions” (p. 5). The overarching objective of this scholarship is to advance distributive, recognition, and procedural justice in energy transitions while respecting and upholding the agency, capability and political power of community groups (Taiwo and Tozer 2025). In this sense, agency and energy justice as concepts go hand in hand, and in the context of informal settlements this gets further complicated as notions of political agency and infrastructure violence become magnified.

3. Research design and methods

Anchored in an interpretivist epistemology, we mobilise an inductive qualitative research design (Creswell and Creswell, 2018) to surface the co-constitution of justice claims (JC) by leveraging energy infrastructure (e.g. Haldar et al. 2024; Lombard 2014; Peddibhotla et al. 2024). Attention is directed to how these JCs are shaped through structure-agency interactions within complex urban environments where informality is not peripheral but constitutive. In doing so we take a deep dive into informal settlements or slums in Malad West region of Mumbai, India navigate infrastructure risks and marginalisation through discursively linking energy grids to broader justice claims around citizenship rights, housing, mobility, and nutrition among others. The dynamic processes of framing and reframing of JCs through grassroots mobilisation and creation of arenas for politicising infrastructure is traced from early 2000s at the onset of the neo-liberalisation era in India to 2022. This enables us to not just identify place specific conditions but also temporal aspects of how multiscale material - non-material and formal- informal interactions shape justice outcomes for actor groups in already splintered urban environments.

3.1 Case selection

Mumbai is used as a case to explore how energy and other infrastructure provisioning driven by top-down visions of development become contested and hence can be leveraged to deliver justice outcomes through grassroots collective agency. Mumbai is an interesting case as it is among few of the Indian cities that host a unique mix of private and publicly owned distribution utilities (refer Figure 1). This ownership structure stands on the logic of efficiency and universal access through competition through separation of ‘wires’ i.e. transmission infrastructure from ‘supply’ i.e. distribution. This is enabled through a parallel licencing arrangement- where the distribution utility (Discom) can supply power across the city by paying a wheeling charge to the incumbent infrastructure provider. On one hand it opens up avenues for consumer choice and access, but also raises concerns regarding affordability and

contestations over jurisdiction area - evident through matters of tariffs remaining sub-judice over extended periods (Chitnis and Vaishnav 2017).

The infrastructure risks and marginalisation driven by the imagination of Mumbai as a hyper urban modern city, is most magnified in the informal pockets that are systematically excluded through this form of neo-liberal provisioning. So, we zoom in to informal settlements in Malad West region of the city that houses a mix of notified and de-notified slums¹ providing rich insights into the complexity of structure- agency interactions in contested spaces and their resulting justice outcomes.

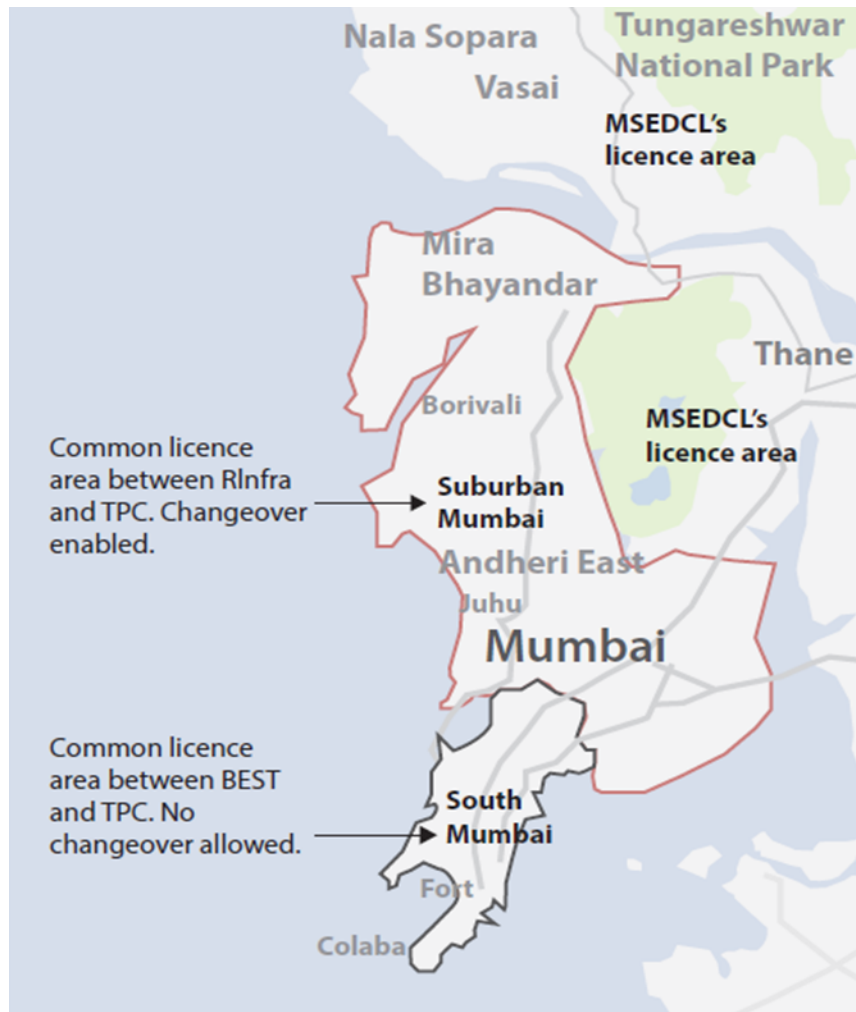


Figure 1. Electricity geography of Mumbai
Source: (Chitnis and Vaishnav 2017)

3.2 Sampling and data collection

Following an interpretivist research philosophy, we first conducted extensive review of scientific literature, policy documents and grey literature including media reports and government notifications. Through this exercise we identified critical moments in Mumbai's infrastructure development and planning and constructed a timeline that followed the process

¹ Notified slums are formally recognized by the government, while de-notified slums do not hold legal status.

of how particularly electricity infrastructure reshaped JC's around informality and equity from early 2000s to 2022. Our initial mapping exercise revealed the multi-scalar processes involved in determining who benefits from energy as a service and who is excluded – alluding towards interlinkages with broader debates of housing justice, citizenship rights and tenancy.

The next step involved mapping key stakeholders involved in negotiating justice outcomes of energy infrastructure in the Malad West informal settlements. These include grassroots organisations including civil societies, slum communities, municipal actors, distribution utility, media, and academic actors (table 1). Using a purposive sampling approach -contacts were established and interviews were conducted in phases to build long term trust-based interactions with actor groups who are often vulnerable. The first phase comprised a preliminary round of interview with each stakeholder group in 2022, to corroborate key national and urban critical moments with major episodes of collective grassroots activities at the local level. We then identified key emergent themes around energy infrastructure and justice from our interactions and conducted another set of personal interviews in early 2023. Each of these interviews lasted around 60-90 minutes. Following this, in-depth personal interviews and focus groups were conducted in late 2023 to gain insights into the specific institutional work and agency of these grassroots actors that enabled them to articulate, mobilise and legitimise JCs related to electricity infrastructure in the Malad West slums. In total our sample comprised 55 respondents.

Table 1. Details of actors surveyed

S.No.	Actor Group	Number of Respondents
1	Civil society organization	3 organizations (12 respondents)
2	Local (informal/slum) community residents	25
3	Government actors	4
4	Public owned discom	9
5	Academic actors	5
	Total	55

5. Findings and analysis

The analysis of the structure-agency dynamic shaping JCs in informal settlements in our selected case entails the timeframe from early 2000s to 2022. Within this longitudinal analysis we identify critical moments at the national and sub-national level that trigger opportunities for bottom-up collective action to articulate and legitimise JCs at the local community level. Critical moments refer to specific instances that led to emergence of a conflict or negotiation, change in nature of interaction, or prior held values and notions became open to reflection, debate, and reframing. Such moments also offer insights into multilevel structure (where conflicts and negotiations unfold) and agency (micro foundations of experience) interactions

in transition processes (Laws 2020). Moving forward we discuss how JCs around energy infrastructure were mediated through institutional work of grassroots actors across multiple critical moments – the neo-liberal reimagination of urban spaces, followed by efficiency driven reforms to leverage privatisation and competition as levers for access, affordability and reliability of electricity supply. It is important to note that, although electricity grid infrastructure is central to this analysis, the contestations around justice did not emerge directly in relation to electricity. Electricity rather emerged as a lever to negotiate broader claims of justice including citizenship rights, livelihoods, and tenancy.

5.1 Phase 1: Neoliberal restructuring of urban infrastructure and early institutional contestations (Early 2000s – 2005)

There were two narratives at play during this period. At the city level, guided by the national undercurrent of globalisation and liberalisation, Mumbai was experiencing a massive shift in its economic and spatial landscape - from a manufacturing driven informal nature to a service led, corporatised financial centre. This imagination was concretised through the 10 year 'Vision Plan' - 2003 leading to a shift in governance and planning priorities from basic infrastructure and service provision to competitive strategies that prioritize cost competition through fiscal conservation, deregulation of land use planning, tax incentives, the increasing role of public-private partnerships (PPPs), consultancies, and ultimately, marketization and privatization of urban infrastructure and spaces (Banerjee-Guha 2009; MacLeod 2002). This also translated to a spurt in infrastructure development following the neoliberal logic of developmentalism (Graham 2010). This new form of infrastructure networks of electricity, water, leisure, transport etc. rendered informal settlements extremely vulnerable to risks of inadequate access, dislocation, and loss of livelihoods, as future source of land for mega infrastructure projects, cultural facilities and commercial complexes.

On the other hand the national undercurrent of reform acknowledged the centrality of electricity as an input for urbanisation and economic development. Hence policy and regulatory shifts prioritised universal service provisioning and efficiency. The Electricity Act (EA) 2003 marked a critical moment in stabilising this vision of a competitive and efficient electricity sector through privatisation (The Electricity Act 2003), which opened up subnational and local arenas for negotiating JCs.

During 2004-05, over 90,000 slum units were demolished in Mumbai (Banerjee-Guha 2016). Like all other basic services, the slum communities were struggling for access to the electricity grid, which was owned by the municipality showcasing the tensions between the notion of 'formality' and 'informality' in the vision of urban infrastructure. The emergence of urban slum movements to access the grid and challenge the monopolistic control of 'wires' and 'supply' by public utility, resulted from the exclusionary nature of infrastructure provisioning. city authorities and media discursively linked slums to crowded, dilapidated, haphazard and unproductive urban spaces, causing infrastructure interruption for the elite 'formal' city dwellers (OneIndia, 2022; Anthony, 2022; Virani, 2022). The exclusion of almost half of the city populace from the formal electricity network led to forging of social collectives, through 'binding of the space' on the basis of social fragmentation, poverty and state failure (Davis

2017). Particularly the demolition of an estimated 10,000 to 13,000 dwellings in Malad West by the municipal commission, justified through their designation as ‘denotified’ - functioned as a state-sanctioned act of infrastructure violence, reinforcing the precarious governance of informal settlements. This intervention catalyzed a collective rights-based mobilisation, as affected communities, framed by the state as non-citizens, mobilised to contest their exclusion from urban infrastructure. The demolitions prompted significant political organising by international, national and local community and human rights collectives who forged cross-scalar alliances with local corporators, state legislators, distribution utilities, and media. These organisations engaged in knowledge practices - training youth in legal literacy, petitioning, and documentation to navigate and challenge bureaucratic exclusion. In 2005, this culminated in a 1,400-kilometre protest march from Azad Maidan, Mumbai to the Indian Parliament, New Delhi claiming access to electricity, water, roads, and sanitation as foundational entitlements of urban citizenship (Civil Society 2, Interview, 2023). While the central government instructed the state governor to halt demolitions in 2006, the core demand - legal recognition of tenure - remained unmet, illustrating the enduring conditionality of rights within urban governance regimes.

At the same time, slum communities realised that electricity grid access could be linked directly to identity as legal residents of the area – given electricity bills and connection documents served as proof of tenancy. Thus, leveraging the Universal Service Obligation (USO) clause of the EA, 2003 grassroots communities started filing mass applications to the public distribution utility to get grid access. This was also against the backdrop where slum communities in other parts of the city had carried out surveys to demonstrate their economic contribution to the city, hence claiming legitimate consumer rights (Burra and Riley 1999). Few households who were recognised as notified by the municipality got access leading to improvisation through informal renting of electricity to neighbours through payment of a fixed monthly charge. Pilferage was also a common calculated informal practice to navigate infrastructure inadequacy (Civil Society 1, Interview, 2022; Local community residents, Interview, 2022; Civil Society 3, Interview, 2023).

Phase 2: Urban redevelopment, grassroots mobilizations and cross-sectoral linkages (2005-2009)

While the grassroots mobilization aimed at attaining legitimacy of urban citizenship was gaining traction post the 2004 demolitions, another critical moment that shifted the institutional dynamic around the city’s future vision was the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). This 2005 national mission demonstrates how infrastructure development across allied sectors (e.g. housing, water etc.) had spillover effects in terms of energy justice outcomes (e.g. electricity grid access) for slum communities. This mission – financed by World Bank, was deemed as the biggest urban infrastructure development program in India (World Bank, 2009). The Municipal Corporation of Greater Mumbai and Navi Mumbai were financed under this scheme among other cities in Maharashtra. The mission was mandated to implement obligatory and optional reforms at the State level and Urban Local Body (ULB) level, in Mumbai. The City Development Plan (CDP) was devised to address development strategies,

identify infrastructure gaps for the future, and ensure a holistic approach (MoHUA 2005). The sub mission of JNNURM on basic services for urban poor had several objectives focused on slums in Mumbai. These included the integrated development of slums, entailing the provision of housing and development of essential infrastructure projects within the identified slum areas. Projects were initiated to develop, improve, and maintain basic services for the urban poor, focusing on areas such as water supply, sewerage, drainage, community toilets, and baths. The mission also encompassed slum improvement and rehabilitation projects, seeking to enhance living conditions and upgrade the existing slum settlements. Another vital aspect of the sub-mission was the construction of houses at affordable costs, specifically targeting slum dwellers, urban poor, economically weaker sections (EWS), and low-income groups (LIG), with the aim of providing them with sustainable housing solutions and better living conditions. Through these components, the JNNURM endeavoured to uplift the living standards of the urban poor in Mumbai and create a more inclusive and sustainable urban environment (MoHUA 2005). It was under this undercurrent of national reform and the simultaneous grassroots mobilization, and media advocacy against slum demolitions that the State governor was directed by the then ruling party at the center to stop any further demolition in the Malad West slum settlements (Civil Society 1, Interview, 2023; Local community residents, FGD, 2023).

Although electricity was not part of the JNNURM the local community actors, identified the rehabilitation schemes for slum inhabitants to formal low-cost housing units as a window of opportunity to reimagine housing justice as a basket of services- electricity, water and sanitation (Local community residents, FDG, 2023; Civil Society 3, Interview, 2023). As electricity is an input for several basic services including water (through pumping systems) and sanitation civil society led local communities started engaging in informal networking activities and negotiations with private developers of the rehabilitation housing projects to implement housing as a combination of basic services. These developers then engaged in procedures to get clearances from the municipal corporation, acquire land and approach Discoms to secure grid access within the premises of their housing complexes which could be allotted to the slum households (Civil society 2, FGD, 2022). Thus, the period from 2005 with the launch of the slum rehabilitation sub-mission until the advent of parallel licensing in Mumbai in 2009 marked institutional work around reimagining housing justice and leveraging the national reforms and policy shifts to acquire grid access and tenancy rights.

Phase 3: Parallel licensing, competition and intensified local collective agency (2009-2022)

The opening up of the distribution sector to parallel licensing was another critical moment that created windows of opportunities to leverage national and subnational policy to gain grid access in informal settlements. Provisioned by the EA, 2003 private players were licensed to supply electricity in Mumbai, however the grid was owned by the incumbent public Discom. Setting up one's own grid meant huge investments as well as procedural challenges and service disruption due to infrastructure lock-ins especially in the congested, high density, slum areas in the city. It was ultimately reinforcing the power relations in the previous electricity regime by creating private and public monopolies, and crowding out already vulnerable, informal settlements. Post the 2006 the state regulatory commission in response to petitions from

consumer groups and NGOs, pointed out that privatization without competition will not lead to improving consumer choice and service efficiency. In the power distribution segment, the 'wires' were a natural monopoly of the incumbent and can be strictly regulated. The only way to bring in private investment and promote efficiency was to separate 'wires' from 'supply', allowing for competition and thus bringing down tariffs for consumers (Alagh 2010). On these discursive notions the landmark Supreme Court judgement on 8th July 2008, marked the regime of parallel licensing in Mumbai. This meant, in accordance with the provisions of the Electricity Act 2003, private Discoms can use the grid infrastructure of the incumbent to supply electricity to any consumer across Mumbai, by paying a wheeling charge. The cost of changeover would however be borne by the consumer. Following this, regulatory commission's order in September 2009, operationalized parallel licensing in Mumbai which was now being served by two public and two private Discoms. Accompanied by the USO cause under the EA 2003 Discoms were mandated to allow grid access to any consumer who can furnish proof of residence. As a result, private Discoms were actively gaining ground by providing electricity to slums/ informal settlements.

In light of this major policy and infrastructure reconfiguration, slum communities in Malad West were engaging in regular meetings to deliberate how to legitimize their tenancy and get access to formalized basic services. The 2009 parallel licensing created space to negotiate access concerns with private Discoms, often characterized by lower levels of bureaucracy. It was realised that if slum residents can get access to the grid, that would automatically mean that they can use the documentation as proof of residence in the area. So, in 2012, civil society actors mobilized the youth to file mass applications asking for grid access to the local Discoms. The private Discom was convinced and along with civil society actors negotiated with local legislators. A postcard campaign was organized to convince the collector and ward officer of the municipality to grant permission for creating grid infrastructure in the area. Social audit reports was prepared by civil societies to demonstrate that lack of electricity access resulted in increased incidence of crime among youth and women safety issues. Following this, in 2014 the collector's office issued a no objection certificate (NOC) to the private Discom to provide metered connections to slum houses in this area (Local community residents, FGD, 2023; Civil society 1, Interview, 2023). An electricity substation was set up by the private Discom which allowed entry to other private players as well.

However, these communities were still susceptible to infrastructure risks and marginalized due to their identity as an unsafe area, and in adequate roads, water and sanitation access. Discom officials were unable to visit each household regularly to register meter readings especially during monsoon when the area is prone to water logging. This led to affordability concerns as bills were mainly based on approximation rather than actual figures. Many residents were unable to pay their overdue also during the pandemic in 2020, leading to electricity infrastructure disruptions. Thus, in 2020 another social audit report was presented by the slum communities and civil society to the ward officer and pressure was created on local politicians to provide access to water, public toilets, sewage, and roads. Between 2020 to 2022, the municipal corporation installed solar streetlights and water connection in the area, solidifying

the resident's claim to the land (Civil society 1, Interview, 2023; Local community residents, Interview, 2023).

Meanwhile, as the cost of new grid infrastructure was being transferred to consumers, this led to increase in per unit tariffs. Many of the respondents reported that this was leading to crowding out of expenditure from food and education. Thus, in 2020 the slum dwellers along approached the private Discom to negotiate for lower tariffs. As a result, many of the overdue bills were exempted by the Discom (Local community residents, FGD, 2023). Documentation camps led by civil society actors also become central to gaining legitimacy in these contested informal spaces during this period.

Calculated informality is also evident in improvisation carried out by grassroots communities around grid access. Some of the respondents who could not produce documentation for proof of residence, reported that they were able to access meter connections through informal channels but instead of residential, commercial meters were installed. This leads to relatively higher per unit costs for them. As electricity connection also serves as proof of residency, many of the households get a meter but still resort to pilferage for their electricity consumption (Civil society 3, Interview, 2023). Another practice through which they get around the need to pay higher per unit charges, is by installing more than one meter by accessing supply through different Discoms. This helps them to remain in the lowest tariff slab based on per unit monthly consumption (Civil society 3, Interview, 2023; Local community residents, Interview, 2023).

6. Discussion

Our analysis reveals that the unfolding of infrastructure risks and brutalities in Mumbai's informal settlements did not simply reproduce marginality but catalysed the emergence of collective agency that actively problematised dominant configurations of energy and allied urban infrastructures. In confronting these injustices, slum communities and their intermediaries articulated alternative imaginaries of infrastructural justice, recasting electricity not as a commodified service but as a material claim to urban belonging. This reimagination, rooted in lived experiences of infrastructural violence, gave rise to calculated and situated practices to strategically navigate and contest institutional constraints. Through these locally embedded interventions, slum communities enacted partial but significant shifts across distributive, procedural, and recognitional dimensions of justice.

During Phase 1 (2000–2005), the large-scale demolition of slum settlements, rooted in the city's pursuit of a hyper-modern infrastructural future, rendered informal settlements as illegitimate and antithetical to dominant urban development imaginaries (Table 2). This form of infrastructure brutality not only displaced residents but also systematically denied them access to electricity and other essential public services, thereby exacerbating their socio-material marginalisation and intensifying precarity through risks to livelihood and well-being. Such state sanctioned infrastructure brutality instigated grassroots mobilization drawing the attention of multiple actors including civil societies (local, national and international), media groups, and national, state and municipal policy actors. Electricity soon emerged as a lever for claiming urban citizenship and legitimize tenure. The national EA, 2003 provided framework

conditions where, grassroots actors discursively established such exclusion as violation of the USO clause. Hence offering them regulatory grounding for problematizing the prevalent infrastructure injustices. The collective agency rendered through a shared sense of marginalization and vulnerability was channeled in the form of often informal, strategic and anticipatory practices.

Table 2 Dynamics of infrastructure risks and brutality – problematization, institutional work and justice.

Timescale	Form of Infrastructure Brutality/Risk	Problematization & Reimagination	Enabling framework conditions (enable collective agency)	Institutional Work Practices	Primary Justice Dimensions
Phase 1 <i>Neoliberal restructuring & contestation (2000–2005)</i>	Mass demolitions (90,000+ units) targeting ‘illegal’ settlements; Denial of electricity as a public good; Discursive portrayal of slums as spatial disruptions	Brutality problematised as state-sanctioned dispossession and infrastructure violence; Electricity reimagined as an anchor of <i>urban citizenship</i> and <i>tenure security</i> ; Exclusion interpreted as violation of universal service obligations	National undercurrent of reform (urban redevelopment and modernising electricity infrastructure) Emerging actor configurations fostering social and knowledge networks – civil societies, media, community-based organisations,	Filing of mass applications to public utility using EA,2003 USO clause; Legal literacy camps & documentation training; Tactical pilferage and informal resale of electricity; March to Parliament asserting infrastructure as citizenship right	<i>Recognition</i> : Exclusion problematised as rights denial <i>Procedural</i> : Increased visibility in civil society, media, and regulatory arenas following demolition-led mobilisation.
Phase 2 <i>Urban redevelopment & mobilisation (2005–2009)</i>	JNNURM excluded electricity from slum rehabilitation; Risk of displacement via redevelopment logics	Exclusion from electricity access reframed as fragmented infrastructure violence; Electricity problematised as inseparable from the right to adequate housing and basic urban life; Housing reimagined as an integrated infrastructure bundle	municipal corporators, collector’s office, Discoms (private and public), private slum developers, judiciary.	Calculated Informal negotiation with developers to integrate grid access; Strategic bundling of claims (housing + electricity + water); Use of media advocacy to expose limits of JNNURM	Distributive: Grid access integrated into housing through developer negotiations. <i>Recognition</i> : State acknowledgement of slum legitimacy; demolitions halted.

Phase 3 <i>Parallel licensing & infrastructural negotiation (2009–2022)</i>	Commercial metering & high tariffs for slum dwellers; Approximate billing; lack of meter readings during monsoon/flooding; Infrastructure neglect exacerbated by pandemic	Problematised as layered infrastructural neglect that deepens economic and spatial precarity; Electricity reframed as an anchor of <i>urban safety</i> , <i>affordability</i> , and <i>residency legitimacy</i>		Mass applications to private Discoms leveraging parallel licensing; Postcard campaign to secure NOC from collector; Social audits highlighting safety risks and impeded mobility; Calculated informality: meter stacking; accessing supply from multiple Discoms; commercial meters as workaround; COVID-era negotiations for tariff exemption	Distributive: Access via private Discoms; affordability through meter stacking. Procedural: Stronger embedding in decision making networks and wider actor participation Recognition: Infrastructure documents enabled residency claims; slum communities as key stakeholders.
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This so called ‘calculated informality’ constitutes an important, situated mode of human agency, purposively enacted under conditions of structural exclusion and infrastructure brutality - to tactically manipulate and navigate formal- informal boundaries in pursuit of better justice outcomes. Specific instances of such institutional work among others (refer table 2) include pilferage and informal sale of electricity during this period. By the end of 2005 some ground was covered in terms of recognition of communities as legitimate consumers and tenants. While on the procedural front the slum communities were starting to gain visibility in wider local and national networks including civil societies, media, and policy actors as an aftermath of the injustices of mass slum demolition by the city authorities.

In Phase 2 (2005-2009), under the national reformist agenda of urban redevelopment there was risk of displacement of slum communities and fragmented infrastructure provisioning- as electricity was left outside the purview of the JNNURM. In this regard collective agency was exerted to position electricity as integral to housing and basic urban life. This led to a reimagination of housing justice as a basket of services including water, electricity and sanitation. Calculated informal institutional work here included negotiating with private slum rehabilitation developers to integrate grid access in their housing plans. This meant they would be responsible to negotiate with Discoms and municipal authorities to provide electricity access within their housing premises. This ties directly to better distributive justice outcomes by reframing housing as a combination of multiple basic infrastructural services. Recognition justice was also furthered through strategic community action in collaboration with other actors by gaining legitimacy as urban citizens (refer Table 2). This was evidenced by the then state Chief Minister’s orders to stop any further slum demolitions in Mumbai.

The Phase 3 (2009-2022) in our analysis depicts the onset of parallel licensing and opening up of the distribution sector to private competition. This was perceived as windows of opportunities for local slum actors to gain access to the grid outside the bureaucratic and regulatory hassles of the public Discoms. Although getting access through negotiations with private Discoms allowed for documentary evidence of tenancy for slum residents in the area, it also came with challenges like higher costs and risks of disconnections. Such layered infrastructural neglect was problematized, as it led to deepening of spatial and economic precarity. To mitigate these infrastructure risks, among other institutional work practices, an interesting one was meter stacking, i.e. installing multiple meters to stay within the lowest consumption slab (refer Table 2). Commercial meters were often installed as workarounds to overcome documentation gaps. By the end of this phase progress was made on distributive, procedural and recognition dimensions of justice. Over 75 percent of the slum households in Malad West now have grid access through private Discoms along with formal water supply access. Procedural and recognition dimensions entail embedding in local policy and governance networks and recognition as key stakeholders in city infrastructure planning.

7. Centering human agency in (infra)structural brutality and risk dynamics

Conceptually, drawing on evidence from how infrastructure led development narratives become problematized through a shared imagination of justice we surface the strategic

intermediary role played by a multi-scalar actor network (Peddibhotla et.al, 2024). Although the focus of their ‘institutional work’ is to legitimize justice claims in localized contexts their network relation and intermediation strategy is multi-scalar in nature. This is also supported by insights from sociotechnical transition processes, that suggests that although innovation might merge at microlevel niches they cannot gain legitimacy and destabilise regime structures without building multilevel networks of support (Kivimaa et al., 2019).

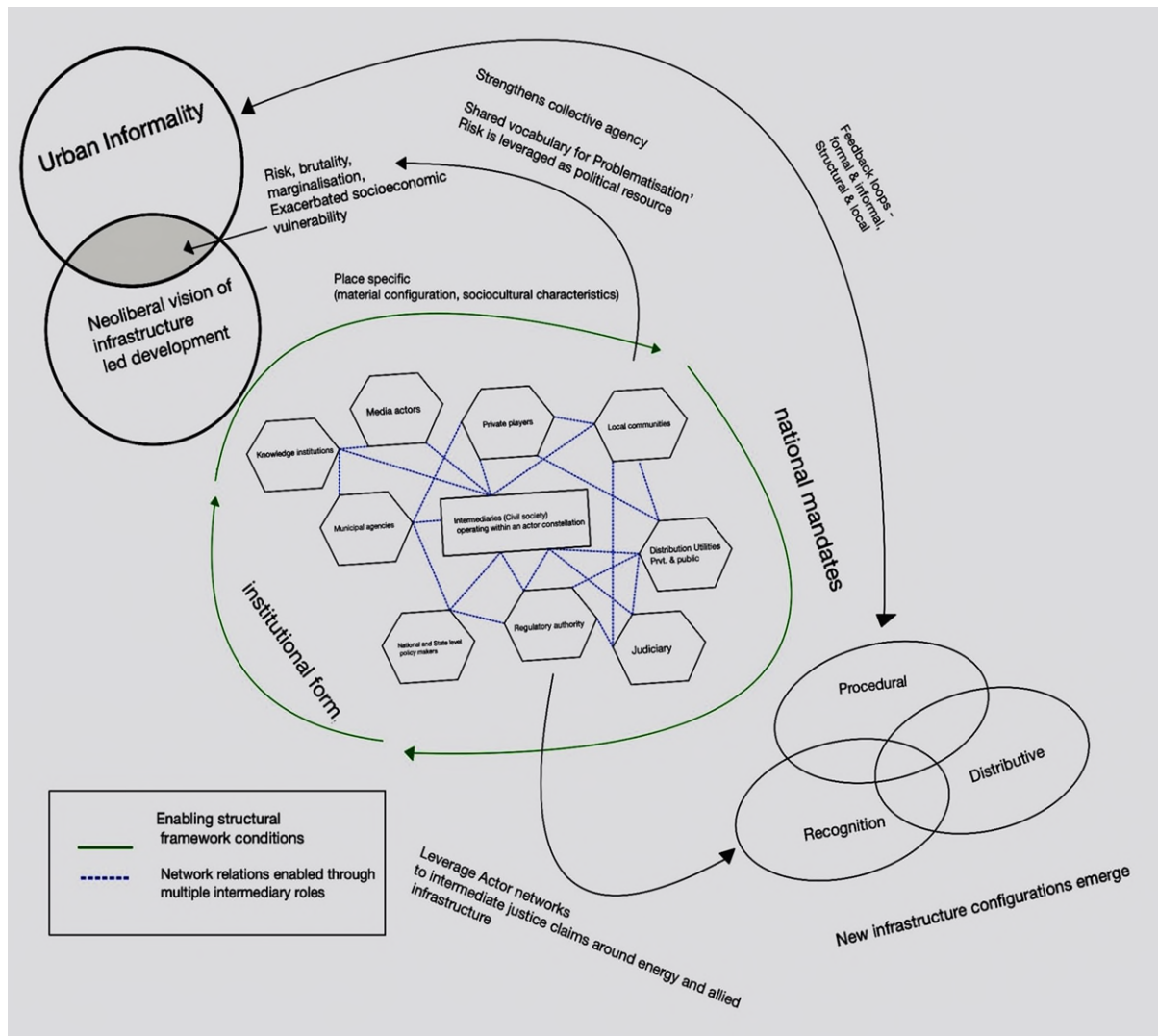


Figure 2. Justice claims enabled through collective agency emerging from multi-actor network configurations

Source: Authors' composition

This intermediation is shaped by structural framework conditions including material (eg. infrastructure marginalization and risks) and non-material (eg. policy and regulatory reforms at national and subnational levels). Thus, the spatial nature of justice becomes evident through our analysis as we look at infrastructure development from a human agency lens (Figure 2). This means for infrastructure development to deliver on better justice outcomes there is need to advance localized arenas for problematizing, and politicizing infrastructure itself. Collective

agency here plays a key role by mediating a shared vocabulary for ‘problematizing’ certain forms of infrastructure while also enabling ‘institutional work’ required to embed justice considerations in planning and policy processes. This is also not a linear process and occurs through reiterative mechanisms that reinforce each other through feedback loops. This intermediation role results from multiple actor configurations leveraging multiple modes (Hernberg & Hyysalo, 2024) dependent on the place specific and time specific windows of opportunity available to disposal. For instance, as we observe from our case, brokering (advancing collaboration, and alignment etc.), structural negotiating (shared strategies and visions, negotiating operational practices etc.), facilitating capacity (forging spaces for dialogue and participation etc.) and configuring (configuring actors, spatial and ownership structures etc.) are some modes of intermediation deployed to align energy infrastructure with localized collectively held visions of justice.

8. Conclusion

Our description and subsequent analysis, presented above, provide three important insights in the context of the infrastructure-led modernization agenda. First, we argue that such infrastructural imposition, accompanied by material heavy violent struggle, leads to structural inequalities that create unsustainable physical spaces. We argue that to reverse these injustices, primacy of human agency and associated institutional work needs to be reclaimed. By bringing in human agency as a primate analytical perspective, we argue that the risks imposed, and its experience highlight the presence of vulnerable groups, the injustices inherently triggered, the inability of these groups to discover a vocabulary that counters these risks and the inability of systemic spaces to tackle those (procedural dimensions with direct distributional impacts).

Second, we establish a code to analyse transmission of ‘brutality’ through infrastructure and subsequent localized bottom-up ‘institutional work’ to negate its impact. This code, illustrated above in Table 2, enables establishing a clear link between the need for articulation of risks and violence transmitted (problematization) and the response it should, normatively, generate (bottom-up institutional work). Our analysis decodes and rearticulates the schema in a way that it primes the importance of justice as a normative goal and establishes a mechanism to reclaim it. In doing so we emphasize collective agency and its activation as a legitimate planning and implementation tool.

Finally, our analysis documents an operational manifesto for collective agency. We identify key strategies, and we argue that these strategies should be operationalized within the framework of socio-spatial networks and actor configurations. We believe that such a sociological location of a response framework needs to be locally strategized but would require interpretive powers and agency to ‘problematise’ and activate an ‘institutional’ response.

We believe that our analysis emphasizes the importance of collective yet iterative struggle towards dissipating violent impacts of infrastructure-led economic development. The challenge, however, is to develop an ability to ‘problematise’ the infrastructure and prepare an institutional response to it. While several actors play an important role in the process of decoding and recoding the process but it is the universal ideas of rights, economic precarity and constitutional legitimacies that provide the strong scaffolding to the processes of struggle. Social processes should, we believe, enable simplification of these basic ideas as tropes of resistance. Although it is not certain how these social processes are institutionalized but it appears that the everyday struggles and lived experiences of vulnerable groups enable them to develop a shared vocabulary, allowing them to negotiate and contest technocratic and

bureaucratic ‘violence’. We surface that the sociological unit as a counterpoint to individuals enables an iterative space of ‘institutional work’. We believe that the collective process of struggle, individual and shared knowledge and awareness adds up to creating a powerful response through strategic iterative action, the multiple examples of which we have identified in this study.

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Disclosure statement

The authors report there are no competing interests to declare.

9. References

- Alagh, Y. (2010). Transmission and Distribution of Electricity in India Regulation, Investment and Efficiency. Accessed from Organization for Economic Cooperation and Development (OECD): <https://www.oecd.org/development/development-philanthropy/46235043.pdf>.
- Amin, A. (2014). Lively infrastructure. *Theory, Culture & Society*, 31(7-8), 137-161.
- Anand, N. (2017). *Hydraulic city: Water and the infrastructures of citizenship in Mumbai*. Duke University Press.
- Anthony, H. (2022). GIS mapping in Mumbai will now track illegal encroachments. *Citizen Matters*. <https://citizenmatters.in/gis-mapping-system-mumbai-illegal-encroachments/>.
- Appadurai, A. (2014). “Deep Democracy: Urban Governmentality and the Horizon of Politics”: Environment and Urbanization (2001). In *Cities of the Global South Reader* (pp. 242-247). Routledge.
- Banerjee, P. (2018). *Dwelling by persistence: an ethnography of everyday practices of footpath dwellers in Mumbai* (Doctoral dissertation, London School of Economics and Political Science).

- Banerjee-Guha, S. (2009). Neoliberalising the “Urban”: New Geographies of Power and Injustice in Indian Cities. *Economic and Political Weekly*, 44(22), 95–107. <http://www.jstor.org/stable/40279062>
- Battilana, J., & D’unno, T. (2009). Institutional work and the paradox of embedded agency. *Institutional work: Actors and agency in institutional studies of organizations*, 31, 58.
- Beck, U. (2009). World risk society and manufactured uncertainties. *Iris: european journal of Philosophy and Public Debate*: 1, 2, 2009, 291-299.
- Bhatia, P. (2023). India’s state-led electricity transition: A review of techno-economic, socio-technical and political perspectives. *Energy Research & Social Science*, 102, 103184. <https://doi.org/10.1016/j.erss.2023.103184>
- Björkman, L. (2015). *Pipe politics, contested waters: Embedded infrastructures of millennial Mumbai*. Duke University Press.
- Burra, S., & Riley, L. (1999). *Electricity to pavement dwellers in Mumbai*. Development Planning Unit, University College London.
- Butera, F. M., Adhikari, R. S., Caputo, P., & Facchini, A. (2015). The challenge of energy in informal settlements. A review of the literature for Latin America and Africa. *Analysis of Energy Consumption and Energy Efficiency in Informal Settlements of Developing Countries*; Politecnico di Milano: Milan, Italy, 1-32.
- Caldwell, R. (2007). Agency and change: Re-evaluating Foucault's legacy. *Organization*, 14(6), 769-791.
- Chattaraj, S. (2012). *Shanghai dreams: Urban restructuring in globalizing Mumbai*.
- Chavez-Rodriguez, L. (2014). *Klimawandel und Gender: Zur Bedeutung von Intersektionalität für die soziale Vulnerabilität in überflutungsgefährdeten Gebieten*. Verlag Barbara Budrich.
- Chitnis, A., & Vaishnava, S. (2017). In the Name of Competition: The annals of ‘cost-plus competition’ in the electricity sector in Mumbai. https://energy.prayaspune.org/images/pdf/in_the_name_of_competition.pdf

- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Sage Publications.
- Davis, S. (2017). Apparatuses of occupation: translocal social movements, states and the archipelagic spatialities of power. *Transactions of the Institute of British Geographers*, 42(1), 110–122.
- Dubash, N. K., & Rajan, S. C. (2001). Power politics: process of power sector reform in India. *Economic and Political Weekly*, 3367–3390.
- Emirbayer, M., & Mische, A. (1998). What is agency?. *American journal of sociology*, 103(4), 962-1023.
- Fattah, K. N., & Walters, P. (2024). Engaging with informality and the subaltern in overlooked cities: towards an agenda for climate change research in the Global South. *Climate and Development*, 16(7), 625-632.
- Graham, S. (2010). *Disrupted cities. When Infrastructure Fails*. New York/London.
- Greenberg, P., Wishart, R., & Danielsen, S. (2024). Driving environmental inequality: the unequal harms and benefits of highways. *Environmental Sociology*, 10(4), 443-456.
- Gulyani, S., Talukdar, D., & Jack, D. (2010). Poverty, living conditions, and infrastructure access: A comparison of slums in Dakar, Johannesburg, and Nairobi. *World Bank Policy Research Working Paper*, (5388).
- Haldar, S., Hoffman, J., Verma, M., Peddibhotla, A., & Bazaz, A. (2024). Reimagining energy infrastructure for justice: Power, politics, and institutional work in India's 2.05 GW Pavagada solar park. *Energy Research & Social Science*, 116, 103645. <https://doi.org/10.1016/j.erss.2024.103645>
- Haldar, S., Peddibhotla, A., & Bazaz, A. (2023). Analysing intersections of justice with energy transitions in India - A systematic literature review. *Energy Research & Social Science*, 98, 103010. <https://doi.org/10.1016/J.ERSS.2023.103010>
- Heffron, R. J., & McCauley, D. (2017). The concept of energy justice across the disciplines. *Energy policy*, 105, 658-667.

- Hernberg, H., & Hyysalo, S. (2024). Modes of intermediation: How intermediaries engage in advancing local bottom-up experimentation. *Environmental Innovation and Societal Transitions*, 51, 100849.
- Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. *Energy research & social science*, 11, 174-182.
- Jones, M. L. G. (2021). *Energy Justice in Dhaka's Slums* (Doctoral dissertation, UCL (University College London)).
- Kivimaa, P., Hyysalo, S., Boon, W., Klerkx, L., Martiskainen, M., & Schot, J. (2019). Passing the baton: How intermediaries advance sustainability transitions in different phases. *Environmental Innovation and Societal Transitions*, 31, 110-125.
- Larkin, B. (2013). The politics and poetics of infrastructure. *Annual review of anthropology*, 42(2013), 327-343.
- Lawrence, T., Suddaby, R. and Leca, B. (2009). Introduction: Theorizing and studying institutional work. TB Lawrence, R. suddaby & B. Leca (eds.), *Institutional work: actors and Agency in Institutional Studies of Organizations*, 1-27.
- Laws, D. (2020). What Use is a Critical Moment? *Negotiation Journal*, 36(2), 107–126. <https://doi.org/10.1111/nejo.12323>
- Lombard, M. (2014). Constructing ordinary places: Place-making in urban informal settlements in Mexico. *Progress in Planning*, 94, 1–53. <https://doi.org/10.1016/j.progress.2013.05.003>
- MacLeod, G. (2002). From urban entrepreneurialism to a “revanchist city”? On the spatial injustices of Glasgow’s renaissance. *Antipode*, 34(3), 602–624.
- McCauley, D. A., Heffron, R. J., Stephan, H., & Jenkins, K. (2013). Advancing energy justice: the triumvirate of tenets. *International Energy Law Review*, 32(3), 107-110.
- McFarlane, C. (2008). Sanitation in Mumbai's informal settlements: State, ‘slum’, and infrastructure. *Environment and planning A*, 40(1), 88-107.

- MoHUA. (2005). Guidelines for Basic Services to the Urban Poor (BSUP). Ministry of Housing and Urban Poverty Alleviation (MoHUA), Government of India. <https://mohua.gov.in/upload/uploadfiles/files/14Guidelines-JNNURM-English.pdf>.
- MoP. (2024). Power Sector at a Glance “ALL INDIA.” https://Powermin.Gov.in/Sites/Default/Files/Uploads/Power_sector_at_a_glance.Pdf.
- NITI Aayog, & Vasudha Foundation. (2020). India Climate & Energy Dashboard: Economy - wide Emissions. <https://Iced.Niti.Gov.in/Climate-and-Environment/Ghg-Emissions/Economy-Wide>.
- Olofsson, A., Öhman, S., & Nygren, K. G. (2016). An intersectional risk approach for environmental sociology. *Environmental Sociology*, 2(4), 346-354.
- OneIndia. (2022). Geeta Nagar slum in Mumbai a security threat: Indian Navy. OneIndia. <https://www.oneindia.com/india/geeta-nagar-slum-in-mumbai-a-security-threat-indian-navy-3495660.html>
- Otsuki, K. (2024). Infrastructural violence and its temporalities. In *Handbook of Infrastructures and Cities* (pp. 240-254). Edward Elgar Publishing.
- Peddibhotla, A., Haldar, S., & Bazaz, A. (2024). Watt’s fair in Mumbai: intermediaries’ impact on energy justice in informal settlements. *Environmental Research: Energy*, 1(4), 045006. <https://doi.org/10.1088/2753-3751/ad7ebe>
- Refstie, H., & Brun, C. (2016). Voicing noise: Political agency and the trialectics of participation in urban Malawi. *Geoforum*, 74, 136-146.
- Rodgers, D., & O’neill, B. (2012). Infrastructural violence: Introduction to the special issue. *Ethnography*, 13(4), 401-412.
- Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy decisions reframed as justice and ethical concerns. *Nature Energy*, 1(5), 1-6.
- Taiwo, E. O., & Tozer, L. (2025). Community energy justice: A review of origins, convergence, and a research agenda. *Energy Research & Social Science*, 123, 104036.

- The Electricity Act. (2003). The Electricity Act, 2003. Government of India. Available at: www.powermin.nic.in/acts_notification/electricity_act2003/pdf/
- Truelove, Y., & O'Reilly, K. (2021). Making India's cleanest city: Sanitation, intersectionality, and infrastructural violence. *Environment and Planning E: Nature and space*, 4(3), 718-735.
- Truscello, M. (2020). *Infrastructural brutality: Art and the necropolitics of infrastructure*. MIT Press.
- Virani, S. (2022). A history of the attempts at slum clearance in Mumbai. *Citizen Matters*. <https://citizenmatters.in/mumbai-slum-clearance-development-plan/>.
- Winkler, H., Simões, A. F., La Rovere, E. L., Alam, M., Rahman, A., & Mwakasonda, S. (2011). Access and affordability of electricity in developing countries. *World development*, 39(6), 1037-1050.
- World Bank. (2009). *Jawaharlal Nehru National Urban Renewal Mission (JNNURM) Institutional Strengthening and Capacity Building Program Project (English)*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/503261468267358772>
- World Population Review (2025). Mumbai Population 2025. (2025-06-23). *World Population Review*. <https://worldpopulationreview.com/cities/india/mumbai>
- Wynne, B. (2002). Risk and environment as legitimacy discourses of technology: reflexivity inside out?. *Current sociology*, 50(3), 459-477.
- Yenneti, K., Day, R., & Golubchikov, O. (2016). Spatial justice and the land politics of renewables: Dispossessing vulnerable communities through solar energy mega-projects. *Geoforum*, 76, 90-99.