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Sustainability transitions in the Global South: a multi-level perspective on urban service delivery

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ABSTRACT

Urban sustainability in low and middle income countries is rarely studied from a sustainability transitions perspective, though 90% of projected population growth between 2018 and 2050 will be in cities of the Global South. Using principles from grounded theory, this paper explores the relevance of the multi-level perspective (MLP) – a prevalent analytical framework in sustainability transitions theory that has primarily been applied in the Global North – for the study of infrastructure in the Global South. It draws on empirical data collected through case study research in the cities of Ahmedabad, India, and Jinja, Uganda, which have adopted innovative socio-technical approaches to service delivery that respond to the challenges presented by urbanization, climate change and inequality. Applying the MLP to these cases shows how niche innovations by non-state actors in waste management (Ahmedabad) and solar energy (Jinja) can increase access to services, reduce ecological footprints and empower socially excluded groups, in spite (or because) of landscape pressures such as poverty, informality and limited institutional capacity. The observed benefits are attributable not only to technological but also to organizational innovation. These findings may help to develop a more flexible understanding of the types of urban transitions needed and the ways in which those transitions could be achieved. Lessons from alternative socio-technical configurations in the South could be informative for any city looking for service delivery models that better serve contemporary environmental and societal needs.

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INTRODUCTION

Urban service delivery exists at the nexus of social and technical systems (Ersoy & Alberto, 2019), and encompasses the (mostly) physical, engineered systems that make a city, as well as the totality of interactions, rules, norms and values that govern these infrastructures. Accordingly, its reconfiguration has been identified as a way to address complex global challenges including poverty, inequality and climate change. The role that urban service delivery could play in the transition to sustainability – and the achievement of the Sustainable Development Goals (SDGs) – is thus an increasingly important area of scientific enquiry.

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A sustainability transition is a 'fundamental transformation towards more sustainable modes of consumption and production' (Markard et al., 2012, p. 955). Originating in the study of large technical systems, the multi-level perspective (MLP) is a transitions framework that is often used for exploring the sustainability of infrastructure configurations (Geels, 2002). Put simply, the MLP posits that a transition may be brought about through interactions between three different levels: niches, regimes and landscapes. Niches are protected spaces where innovative activity takes place; a socio-technical regime is an established set of rules, norms and institutions that guides the use of particular technologies and practices; and landscape refers to exogenous events and trends such as political developments, social relationships, demographic changes and climate change, which may exert pressure on or generate opportunities within the incumbent regime.

The MLP and transitions theory more generally have been developed and applied predominantly in Northern Europe, where urban services are largely provided via formal, large-scale, centralized infrastructure regimes. Conversely, its use in non-Organisation for Economic Co-operation and Development (OECD) countries has been relatively limited (Markard et al., 2012).¹ However, the majority of growth between now and 2050 will take place in the towns and cities of the so-called Global South, a term most often used to refer to countries classified by the World Bank as low and middle income.²

Large parts of the population in Southern cities live in poverty. At least 881 million people worldwide live in slums,³ where access to basic urban services is inadequate or non-existent. Due in part to limited human and financial capacity, and motivated by modernist visions of the city, government authorities seek to attract private and donor financing for the construction and maintenance of 'modern' infrastructure. The resulting trend towards the privatization and financialization of municipal service delivery leads to differentiated access, where only those who can afford to pay for a service experience its benefits. These inequalities manifest in the development of 'heterogeneous infrastructure configurations' (Lawhon et al., 2017), where a variety of non-state actors play a significant role in the local delivery of urban services.

The extent to which the analytical constructs of the MLP are applicable to the socio-technical conditions of urban service delivery in the Global South is unclear. For example, it is difficult to identify a coherent, uniform infrastructure regime where significant tensions exist between top-down and bottom-up service delivery (Furlong, 2014). Despite this, Wieczorek (2018) finds that studying sustainability in the Global South with a transitions lens can constructively highlight the interplay between macro-, meso- and micro-scale dynamics in developing contexts.

This paper applies principles from the MLP in two Southern cities – Ahmedabad, India, and Jinja, Uganda – to case studies of innovative urban service delivery that generate economic, social and environmental benefits. In doing so, it contributes to diversifying the range of case studies in transition studies, and to the further development of the MLP framework. The paper closes by reflecting on how such models can contribute to the achievement of the SDGs.

APPROACH

The methodological approach combines principles from grounded theory with case study research conducted between May and August 2018, which included key informant interviews with stakeholders from national and local government, local firms, academia, and civil society (16 in India, 23 in Uganda), site visits and document analysis. A grounded theory approach is useful for interrogating bias in existing theoretical frameworks – namely to explore the relevance of the MLP outside of Northern Europe – and linking to illustrative empirical data allows insights to emerge deductively. Two case studies of innovative non-state-led urban service delivery are investigated, pragmatically selected to represent geographically, culturally and

technologically different settings: a waste picker trade union and cooperative in Ahmedabad; and a solar streetlight project in an informal settlement in Jinja. The purpose of this paper is not to study these cases in detail,⁴ but to link theorizations of sustainability transitions, and the MLP specifically, to observations based on the realities of urban service delivery in the Global South.

SOLID WASTE AND SOLIDARITY: SEWA, INDIA

The Self Employed Women's Association (SEWA), established in 1972 in Ahmedabad in the state of Gujarat, is a trade union of 1.5 million informal women workers from across 16 states in India. Women pay an annual membership fee of 5 rupees (US\$0.07) to join the organization, which advocates for improvements in its members' wages and working conditions. Members also form trade-specific cooperatives that provide developmental benefits, including childcare facilities, access to credit and social security.

Waste picking is one of many occupations supported by SEWA. The International Labour Organisation (ILO) estimates that India's informal waste sector employs around 1.7 million waste pickers who recover around 20% of recyclable waste (ILO & WIEGO, 2017), making them a vital component of the nation's waste management regime. Despite this, waste picking is performed by some of the most marginalized citizens and waste pickers are frequently discriminated against based on their caste, gender and income status.

Between 2004 and 2009, the Vejalpur district government in Ahmedabad employed informal waste pickers organized by SEWA to provide recycling services for more than 45,000 households. This had the dual effect of increasing the women's earnings from around 1500 rupees (US\$21) to 6000 rupees (US\$84) per month and achieving recycling rates of up to 70%.

In 2009, Vejalpur was incorporated into the jurisdiction of the Ahmedabad Municipal Council (AMC), which issued a strict tender for municipal solid waste management and awarded the contract to private companies in place of SEWA's members. The redirection of work away from the informal sector and towards private operators is emblematic of a wider national policy shift towards more technology-intensive solutions, driven by national programmes such as the Swachh Bharat ('Clean India') Mission and the Smart Cities Mission. Both offer incentives for the use of smart solutions to urban infrastructure challenges such as waste-to-energy technologies, despite the fact that such strategies in India have dramatically under-delivered, and they overlook opportunities for recycling, value creation and poverty reduction.⁵

Social benefits such as poverty reduction and inclusion must be considered alongside the technical aspects of service delivery. The initial success of the Vejalpur model demonstrates how easily this can be done when governments ensure that regulations include social as well as economic and environmental values. The state should also consider replicating and upscaling emerging good practices as well as emerging technologies, such as organizing informal workers into cooperatives and including them in public-private partnerships.

SOLAR POWER AND EMPOWERMENT: MDF JINJA, UGANDA

Jinja in eastern Uganda is one of five cities included in the Government of Uganda's Transforming the Settlements of the Urban Poor in Uganda (TSUPU) programme. As part of TSUPU, a municipal development forum (MDF) was established in the city, with the intention of bringing together local government, the urban poor and other stakeholders to align urban development priorities.

Together with the National Slum Dwellers Federation of Uganda (NSDFU), the MDF conducted participatory enumeration in the informal settlement of Kibugumbata, home to

6000 people. The mapping exercise generated discussions about the settlement's challenges with both income generation activities and safety after dark, prompting deliberations on the solar streetlights that were being rolled out in the centre of Jinja.⁶ Despite initial reluctance from Jinja Municipal Council (JMC) to implement solar streetlights in a less central location, the MDF was able to earmark 20 solar streetlights for Kibugumbata, with financial contributions from Slum/Shack Dwellers International and JMC itself.

Uganda's national energy mix consists primarily of hydropower for electricity, meaning the climate benefits of solar-powered streetlights are less significant than in countries with more carbon-intensive grids.⁷ However, the societal benefits are evident. Five local youths were trained as solar technicians and led the project installation in March 2018. Since then, local residents report feeling safer, and business owners are able to operate for up to an additional five hours per day. The solar technicians receive a stipend from JMC for maintaining the streetlights, and have also found work with domestic clients elsewhere in the city. The municipality's willingness to invest in the informal settlement has generated a perceived increase in tenure security.

In order to maximize the co-benefits of transitions, cities must look beyond the environmental aspects of sustainability to trigger wider organizational and institutional change. The spillover effects of the energy transition can go far beyond emissions reductions: linking distributed technologies to new forms of social organization can offer new ways of meeting energy demand, whilst simultaneously empowering marginalized groups and creating meaningful multistakeholder partnerships to tackle urban development challenges. This case is particularly relevant for Ugandan cities since the devolution of service delivery to city authorities has led to irregularities in electricity supply,⁸ meaning municipalities must look for new ways to both meet the basic needs of residents and power municipal infrastructure.

RETHINKING NICHE, REGIME AND LANDSCAPE

Through the lens of the MLP, the cases described in the previous sections can be conceptualized as niche innovations. SEWA's cooperative model offers a protected space for informal workers to organize effectively, controverting the drive for privatization and mechanization under the existing waste management regime. The MDF has built a socio-political network that supports innovation in both technology (solar powered streetlights) and process (participatory identification of urban planning priorities). Applying the MLP to these cases helps to expose the ways in which niche, regime and landscape dynamics interact to bring about specific policy preferences and service delivery models, yet the analysis has also highlighted areas where the framework may require further refinement.

Conventionally, a niche is a safe space for actors to engage around a new and novel technology (Geels, 2002). However, activities like those practiced in the case studies could be expected to contribute to regime change not (only) by developing novel technologies, but by demonstrating new ways of organizing for social change. By forming a trade union of informal workers, SEWA exemplifies how service delivery arrangements can become settings of 'social struggle' by exposing inequalities and promoting social inclusion (Addie et al., 2020, p. 13). The MDF, while centring its attentions on a specific infrastructure intervention, targets injustices by giving a voice to those who are often excluded from urban planning processes. This substantiates claims that it is innovation in governance as well as discrete technologies that will lead to broader patterns of transformation (Markard et al., 2012).

A regime is typically understood as a *uniform* set of technologies linked to established regulations, infrastructure, user practices, etc. (Geels, 2002). While it is important to note that the cases presented here are not necessarily wholly aspirational futures – waste picking, for example, is dangerous, stigmatized and poorly paid work in its current form (Dias, 2016) – they do

highlight the coexistence of multiple, overlapping service delivery mechanisms within the regime (Furlong, 2014). For portions of the population that are unable to access formal infrastructure, an array of non-state, informal and community-based providers like SEWA and the MDF offer crucial services, often at little or no extra cost to the state. Engaging with the *non-uniform* and hybrid reality of service delivery in many cities of the world requires some flexibility in the way regimes are understood, but would significantly strengthen the analytical value of the MLP in the Global South.

More broadly, explicitly recognizing and leveraging the institutional heterogeneity of urban service delivery in the Global South could generate insights on alternative, post-capitalist forms of organizing in landscapes where (political) power is currently centralized and social relationships are primarily exclusionary and oppressive (Ramos-Mejía et al., 2018). These findings would also be relevant in the North, where cities are increasingly seeking alternatives to the 'modern infrastructural ideal' (Graham & Marvin, 2001, p. 387) that better serve contemporary environmental and societal needs. This is illustrated by the energy transition, with the pathway to net-zero expected to involve a structural shift from centralized to distributed energy generation.

The success of SEWA and the MDF would not have been possible without support from municipal government, while SEWA's subsequent troubles after 2009 show how having that support withdrawn can immobilize environmentally and socially promising niche activities that do not conform to existing regimes. Like India, many states exhibit policy level commitment to reconfiguring infrastructure regimes based on environmental needs, but this often competes with developmental priorities of an economic nature. Driven by the desire to attract private and donor financing, and further influenced by modernist development ideals, this results in a tendency towards large-scale infrastructure interventions linked to privatization, financialization and (ecological) modernization. Failing to address corresponding socioeconomic challenges can severely disadvantage already marginalized groups – as evidenced by the AMC's dismissal of SEWA in favour of partnerships with private operators – and lead to an unjust transition (Swilling & Annecke, 2012).

Innovative service delivery models such as those practiced by SEWA and the MDF, on the other hand, offer an opportunity to move beyond seeing infrastructure as having a single purpose, to seeing it as aiding a range of social, environmental and economic objectives that represent multiple values. Such an approach aligns with that of the SDGs, which were designed to bypass siloed solutions and move towards tackling environmental and developmental challenges in a more integrated and holistic way.

CONCLUSIONS

This paper has considered the value of using the MLP to understand sustainability transitions in the Global South by engaging with two case studies of innovative non-state-led urban service delivery: a waste picker cooperative in Ahmedabad, India; and a solar streetlight project in Jinja, Uganda. Analysing these cases through the lens of the MLP has usefully highlighted the ways in which niche service delivery models can contribute to the transition towards a more socially and environmentally sustainable urban future, in spite of – or perhaps in response to – landscape pressures such as poverty and inequality.

Results also suggest, however, that the framework requires some refinement, particularly with regard to the key analytical concepts of niche, regime and landscape. Deepening our interpretations of these concepts – for example, through a greater engagement with organizational as well as technological niche innovation, and by elaborating upon the coexistence of multiple, overlapping systems within regimes – could significantly increase the value of the MLP, not only in the Global South. This would allow the MLP and the field of sustainability

transitions as a whole to better respond to the intersecting global challenges of urbanization, infrastructure access, climate change and inequality.

Though not its main intention, the paper also highlights policy implications for the sustainable delivery of urban services, most notably that national and regional governments must encourage and empower local authorities to systematically partner with the full range of stakeholders, including and especially the urban poor, to realize the co-benefits that transitions in urban service delivery can generate.

It is important to note that the cases explored here reflect the conditions of the spatial, temporal and socio-political context in which they originated. There is a need for further research to reflect on the value of the MLP for Southern cities, as well as the wider region. More broadly, this links to discussions on 'worlding' urban theory, a concept which speaks to the need to 'recover and restore the vast array of global strategies that are being staged at the urban scale around the world' (Roy, 2011, p. 10). Indeed, the challenges of overstretched utilities, public budget cuts, and environmental degradation are not unique to any one city, nor region. In this sense, studying infrastructure transitions in the Global South could both prompt greater theoretical reflection, and inspire urban service delivery models that better meet not only environmental but also societal needs, globally.

NOTES

¹ For exceptions, see Ockwell et al. (2018).

² Increasingly, the term 'Global South' is also understood as a way to conceptualize a deterritorialized political economy of the uneven processes of economic development generated by capitalism and colonialism (for a full discussion on this, see Mahler, 2018).

³ In reality, this number is likely to be even higher due to data deficiencies and the thresholds for the assessment of certain criteria being set too low (for further details, see Satterthwaite, 2016).

⁴ For more detail on the specific case studies, see the policy briefs published at [https://urbantransitions.global/publications/?select-publication-series\[\]=frontrunners](https://urbantransitions.global/publications/?select-publication-series[]=frontrunners).

⁵ Many existing waste incineration plants in India are operating below capacity due to the relatively low calorific value and high moisture content of urban waste. This means that net energy recovery is often negative, a problem that operators sometimes attempt to overcome by substituting recyclable waste such as plastic, which emits harmful pollutants when incinerated. Waste-to-energy plants, designed to reduce greenhouse gas emissions from both the waste and energy sectors, may in fact produce more emissions than they save, and at the same time deny the informal sector access to recyclable materials.

⁶ At the time, Jinja's city centre roads and roadside infrastructure were being updated as part of the World Bank-funded Uganda Support to Municipal Infrastructure Development (USMID) programme, which commissioned solar-powered streetlights.

⁷ Hydropower currently generates 450 MW of the 600 MW of electricity consumed nationwide per annum. However, hydropower stations in Uganda (and East Africa more widely) are concentrated in the Nile River basin, where an expected impact of climate change is significant rainfall variability. This may threaten Uganda's future energy generation capacity.

⁸ Municipalities in Uganda remain reliant on central government transfers for revenue, yet opposition parties control a number of Ugandan cities, a situation known as vertically divided authority (Resnick, 2014). Partisan struggles thus further weaken the already insubstantial capacity of the state. In Jinja, streetlights were turned off in 2017 when the city's debt to its electricity provider exceeded 1 billion Ugandan shillings (US\$268,000).

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