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Matthijs van Oostrum , Kim Dovey , Elek Pafka & Tanzil Shafique

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Becoming durable—becoming makeshift: An assemblage approach to informal settlement construction

Matthijs van Oostrum ^a, Kim Dovey ^b, Elek Pafka ^b, and Tanzil Shafique ^c

^aUN-Habitat; ^bUniversity of Melbourne; ^cUniversity of Sheffield

ABSTRACT

Non-durable construction is conventionally used as a criterion for identifying “slum” conditions and a proxy for material well-being. While informal settlements often embody makeshift construction, we seek to disentangle durability from formality to show multiple ways in which durability is formally and informally produced, sustained or diminished over time. Durability in informal settlement is part of a complex adaptive process that incorporates a plurality of types and degrees of both becoming durable and becoming makeshift. This approach enables a better understanding of both the production of “slum” conditions and the “improvement” that is embodied in “improvisation.” Makeshift construction can be a means to durability, and formalized housing can become makeshift. At micro-scales this approach reveals the importance of incremental construction, maintenance and repair. At larger scales it enables a more nuanced understanding of how durability is linked to issues of land tenure, governance, density, land-use mix, political economy, forced eviction and livelihoods. It cuts across binary thinking to show how urban development is always an assemblage of informal and formal upgrading strategies, and how they can work in synergy.

KEYWORDS

Durability; informal settlement; housing; morphology; upgrading

Introduction

Non-durable construction of buildings is often considered as a defining feature of informal settlement. The concept of “durability” is conventionally cast in terms of sub-standard construction, as identified by dirt floors, makeshift materials and precarious construction techniques. These conditions provide inadequate protection from climatic extremes, health impacts, and loss of life in the event of natural disaster, such as an earthquake. Lack of durability is one of the four key conditions used in most statistical approaches to define and assess slum conditions (United Nations, 2021). Assessment of the durability of informal settlements therefore focuses almost exclusively on its absence—as a failure of residents to build to formally established standards.

Yet we might equally understand durability as a means of meeting the minimum possible standards to sustain livelihoods—as a continuous process of incremental construction, maintenance, repair and adaptation. “Improvisation” can serve as a generic term for this unwieldy bundle of incremental practices. To improvise is to solve problems with whatever is at-hand, but also carries connotations of spontaneity, flexibility and creativity where neither process nor outcome is ever stable or settled. To improvise is at once to “improve” and to “provide,” but also to experiment, to innovate and to learn (Brand, 1994). While informal planning, governance and construction are often associated with slum conditions, such informal processes are increasingly understood as a self-organized mode of production that allows residents to cope with conditions of limited resources and a restrictive state, and are

CONTACT Elek Pafka  pafkae@unimelb.edu.au  Faculty of Architecture, Building and Planning, University of Melbourne, Parkville, VIC 3010, Australia.

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employed to transition out of slum conditions through improvements in livelihoods and built environment. Informality is thus not a synonym for non-durability or slum conditions (Dovey et al., 2021); rather, it is a process that may or may not produce durable outcomes.

The interrelations between informality and durability are conditioned through the ways in which residents of informal settlements engage with the state. Informal settlement is a “hybrid” form of urbanization that is neither autonomous nor wholly dependent on the state (Bandauko & Finn, 2026). The colonial history and political economy of many cities in the Global South creates structural conditions for informal settlement to emerge and persist (Finn, 2023). Rapid urban growth under conditions of inadequate supply of serviced land is a major contributor to housing informality (United Nations, 2025). Formal housing and land systems often exclude people living in informal settlements, and authorities often turn a blind eye.

Defining durability

Defining the concept of durability reveals a plurality of interconnected aspects. Etymologically, durability derives from the Latin *durare*, meaning “long lasting,” and the longevity and persistence of most forms of informal settlement attests to their long-term socioeconomic durability. More commonly, housing durability is something simple and intuitively understood: most people can distinguish a dilapidated from a sturdy structure. This twofold distinction is readily used in colloquial framing of durability across many contexts in the Global South. For example, the distinction between *pucca* (durable) and *kutchra* (non-durable) housing in the South Asian context is a widely understood shorthand whereby building materials are used to define a lack of durability and therefore “slum” conditions. Similarly, the distinction between *bloco* (cement block housing) and *chapa* (corrugated iron shacks) is used in Angola (Gastrow, 2017), while in Morocco, people refer to *maison en dur* and *baraka* construction (Beier, 2022). This notion that durability is self-evident and readily apparent also permeates much scholarly work and reference to “non-durable” construction of housing is often taken for granted in informal settlement scholarship. Government policy can also fall in this trap, by focusing exclusively on the material expression of non-durable housing, and trying to enhance the “material decency” of residents while failing to understand the ways in which informality provides livelihoods (Beier, 2022).

The hybridity of informal settlement development is mirrored by highly mixed material outcomes and settlements can rarely be characterized as either fully durable or non-durable. Makeshift buildings are often rebuilt or renovated to become semi-durable or durable, yet remain mixed with non-durable buildings. As statistical data improves, we begin to understand almost all informal settlement as mixed, or occupying some position along a durable/non-durable continuum (Patel et al., 2020; Roy et al., 2020). The Indian census now includes a category of *semi-pucca* but data at household scale is rare. The incentive to improve one’s house can be considerable—one study in Nairobi shows that the same size house, in the same location, yields double the rental income if it is durably constructed (Celentano & Habert, 2021). The available census data, however, does not recognize the nuances of change, and sustains the idea of a simple continuum from durable to non-durable, informed by a binary logic that identifies an entire settlement in terms of what it lacks.

Changes in durability are not just the replacement of one part for another. Repair and maintenance can be used to reconfigure space and spatial relations within the dwelling, affording residents new opportunities. The desire to add or modify a house may be used to upgrade standards or necessitate makeshift additions (Manalang et al., 2002). Graham and Thrift (2007, p. 6) argue that everyday practices of maintenance and repair deserve particular attention in the context of informal settlement upgrading: “what starts out as repair may soon become improvement, innovation, even growth.”

Durability is increasingly understood as a dependent property. The definition of durability used within the framework of the Sustainable Development Goals (UNDESA, n.d.) and the Right to Adequate Housing (OHCHR & UN-Habitat, 2009) for example combines material features with hazardous locations and weather protection to assess the degree to which the house protects its

inhabitants from extreme climate conditions and threats to health. Durability is at once an assessment *internal* to the building (materials, permanency and dilapidation) as well as aspects *external* to the dwelling (compliance with building codes and outside shocks). These complexities get to the heart of what is difficult to define about durability: as conditions of culture and climate differ across the world, what is considered a durable construction in one context may be deficient in another.

Rethinking durability

The question of how durability is produced, sustained and eroded over time in informal settlements matters because it fundamentally changes what it means to “upgrade” or “improve” a neighborhood. An intergovernmental expert working group on housing (United Nations, 2025) recommended that public upgrading programs should focus on enhancing housing durability—but what does that look like in practice? We argue that enhanced durability is about more than structural integrity to maintain the existing functions of the house in the face of shocks, and that durability is a dynamic property that residents of informal settlement actively modify to extend the capabilities and functions of their built environment—ultimately contributing to the long-term socioeconomic sustainability of the community.

While there is a considerable body of work identifying entire settlements that might be considered non-durable, and identifying locations and settlements at risk of catastrophe, there is very little research that focuses on the production or erosion of durability. An emergent body of urban scholarship considers relations between durability and sustainable indigenous materials used in informal settlements (Galmarini et al., 2022; Iweka & Adebayo, 2010), but this excludes the most common ways in which land is informally settled and governed. Different ways of producing durability shape what kinds of urban regulations are appropriate to govern a neighborhood (van Oostrum & Shafique, 2023). The level of durability at the ground level of a building affects the capacity to add additional stories, which has implications for building typologies and rental income, as well as the viability of formal upgrading strategies. The durability of upgrading interventions relies on the local capacity of communities to sustain and maintain them (Wang, 2023). Secure tenure has also been linked to processes of building durability (De Soto, 1990; Nakamura, 2016; Van Gelder, 2010). While it is generally agreed that tenure security is important in providing incentive for investments in housing, much debate remains on the degree to which legal, *de facto*, or perceived tenure security impact the upgrading process (Van Gelder, 2010). Perceived tenure security has been shown to be a sufficient condition for some level of upgrading (Handzic, 2010), but legal tenure may be a condition to accessing formal finance for housing upgrades.

The focus of this paper is to conceptualize a more nuanced understanding of the ways in which material durability is both produced and eroded in informal settlements. Research has shown how informal settlement has both generative possibilities, such as community cohesion and service innovation, as well as structural constraints, including regulatory exclusion and uneven forms of state engagement (Bandaiko & Finn, 2026). We seek to understand how increasing durability is both constrained and enabled by the possibilities and constraints of informal settlement, and how durability is itself constraining and enabling of different transformations and adaptations. A dynamic view of durability contributes to an important theoretical shift, by offering a more nuanced framework to understand how informality intersects with the socioeconomic and material conditions to sustain and improve livelihoods (Soma, 2026). We make the case that durability is more than a proxy for material well-being, but that most makeshift construction offers solutions that can contribute to the longevity and viability of urban neighborhoods. Such an understanding has the potential to enhance the types of intervention and support offered by urban authorities to informal settlement communities.

The research approach here is best understood as assemblage thinking (Deleuze & Guattari, 1987) where the focus is on relations rather than things in themselves, on morphogenic processes of transformation rather than stable conditions, where “becoming” is the pre-condition for “being.” In our case this involves a focus on complex and adaptive relations between material forms and socio-

spatial practices—cities are complex adaptive assemblages (Dovey, 2012). Assemblage is a multi-scalar concept that is always a part of larger geo-political assemblage but without any presumed priority of the large over the small scale. It is non-reductionist in that it seeks to expose a multiplicity of interconnections, tensions, alliances and synergies. Assemblage thinking is an engagement with practices of power that flow bottom-up and laterally as well as top-down. Assemblage thinking is particularly suited to studies of urban informality because it embodies the idea of non-binary twofold concepts such as rhizomic/tree-like thinking that resonate with the informal/formal framework.

Drawing on a broader study of informal settlement morphologies (Dovey et al., 2023), we show multiple ways in which durability is sustained or changed over time. We first present a diagrammatic conceptual model for re-thinking the dynamics of durability beyond a simple continuum. We then demonstrate these plural processes within the model through a sequential series of case studies, complemented with sequences of images from street view that demonstrate changes in durability over time. In these, we acknowledge the wider political-economy of each settlement, but our focus is on understanding changes in materiality and their relation to the socio-spatial functioning of the settlement. The paper concludes with a discussion on the various ways through which durability generates affordances for livelihoods and affects the long-term socioeconomic sustainability of communities. We also return to the role of the state and local authorities, and of inclusive land tenure and housing policy, as key drivers of change in the dynamics of durability.

Dynamics of durability

Informal settlement can both be a process in which buildings become more durable—but also less durable, becoming “makeshift.” We choose the word “makeshift” as the other to durable for several reasons. First, as an adjective it captures the everyday meaning of temporary, possibly unsustainable, stopgap solutions. Second, because it embodies the verbs of both “making” (designing and building houses) and “shifting” (adapting to circumstance). Finally, because informal settlement often occurs in an unsettling context of eviction, demolition and re-settlement where residents are made to shift (van Oostrum, 2025), and where there are many other agents involved in making and shifting, from state authorities to land traffickers, land mafias and local slumlords. The diagram in Figure 1 cuts across such complexities, by suggesting a double dynamic of both becoming durable and becoming makeshift. This is a theoretical framework for thinking about material durability in a dynamic and non-binary manner.

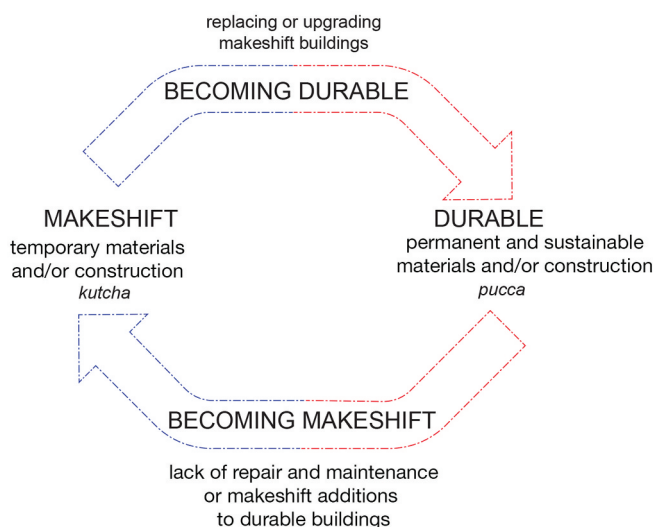


Figure 1. Dynamics of durability.

Some informal settlements are built and maintained in a durable condition, others may begin with makeshift construction and are upgraded over time. Some durably built settlements become makeshift due to a lack of maintenance and repair, or as a result of makeshift additions. Some settlements never achieve durability. Of course, no entire settlement can be contained within any single category: the diagram serves as a tool for thinking about the motivations and drivers responsible for changes in durability, and the ways buildings are designed and built to accommodate expected future adaptations.

The upper dynamic of this diagram—*becoming durable*—is a large part of settlement upgrading, and the overwhelming bulk of upgrading is informal. This process was first described in detail by Turner (1967, 1968) who showed how informal settlements in the Latin American context are characterized by “progressive development by which families build their housing and their community in stages as their resources permit . . .” (1967, p. 167). Through incremental investments, buildings are upgraded to become more permanent and durable. Since this early work, a wide range of sources across many regional contexts, have shown time and again how residents settle land informally, gradually improve their habitats and become durable (Baptista, 2019; Gough & Kellett, 2001; Marais & Ntema, 2013; Reyes et al., 2024). Becoming durable involves both the replacement of temporary buildings with more permanent ones, and the incremental improvement of makeshift construction. This process also involves settlement consolidation, both by filling in open spaces and by adding upper floors. Policies that advocate for community-based *in situ* upgrading of informal settlement are premised on the notion that, when supported with the right conditions—including secure tenure, employment opportunity and access to finance—residents can enhance the durability of their dwelling and adjacent infrastructure over time.

The reality of contemporary urban development is that most urban expansion in Global South cities involves the informal, unauthorized and incremental subdivision of agricultural or peripheral land, and most such settlement is built in a *durable* way from the first instance (Caldeira, 2017; Inostroza, 2017). Tenure is typically more secure on agricultural land (Soliman, 2010), and often involves the expansion of preexisting villages, which is one of the most widespread forms of urban informality in India, China, Vietnam and Indonesia (van Oostrum & Dovey, 2024). The durability of such buildings, even if formally unauthorized, can be an important factor in securing long-term *de facto* tenure security and attract higher rental incomes. The durable outcome of these informal settlements means they are often left out of urban informality theory—a dynamic model of durability on the other hand integrates them as a key mode of informal urbanization. The fact that they begin durable does not mean they will remain so.

The lower dynamic in Figure 1 takes place as buildings *become makeshift*. Any building degrades over time without adequate maintenance (Baptista, 2019). The gradual deterioration of housing is one of the key drivers for slum conditions to emerge (Azhar et al., 2021). Disasters such as floods, earthquakes or conflict leave formerly durable buildings in a state of disrepair, and repairs are often makeshift. The process of becoming makeshift also incorporates informal additions to durable formal buildings; yet what may seem merely deterioration by formal authorities is seen by residents as a form of improvement (Graham & Thrift, 2007). Makeshift construction can save costs and avoid bureaucratic approval processes (Asibey et al., 2025). Tiplle’s seminal book *Extending Themselves* (2000), shows how user-initiated extensions to existing dwellings can help adapt these dwellings to the social and cultural needs of the residents, new urban conditions and open up new economic opportunities. Adaptations are often made to generate income through rental or home-based enterprises (Gough & Kellett, 2001). This form of informality extends to many cities in the Global North, where dwellings are informally adapted to changing conditions with makeshift additions or internal subdivisions (Gurran et al., 2021).

Finally, *makeshift* architecture can be intentional when it is used for the specific purpose of claiming land, providing temporary shelter, or to afford residents mobility. In some cases, restrictive or punitive governance prevents upgrading, in which urban authorities allow residents to stay on the premise that if they remain makeshift they will not be made to shift. Long-term temporariness can thus be a deliberate tactic to maintain legality (Moatasim, 2019), and buildings may be secretly upgraded beneath the cover of a makeshift cladding (Ascensão, 2015). Settlements can become stuck in a makeshift condition for reasons that can vary from extreme vulnerability to natural disasters, eviction threats, state regulation or extreme poverty.

In the following sections, we present a sequence of five cases that illustrate the conditions framed in Figure 1, from “becoming durable” to “durable,” through “becoming makeshift” to “makeshift” and a return to “becoming durable.” These cases are selected from a more expansive database (Dovey et al., 2023) to best exemplify each process within the scope of this paper. While there is a broad spread from Latin America and Africa to East and Southeast Asia, this is not a random sample, and we are not suggesting that settlements might fall neatly into such types. While there are other modes of becoming makeshift or durable, these cases are chosen because they are typical, and in order to add depth and breadth to the ways we think about durability.

Becoming durable I

All informal settlement of land is a process of becoming durable as it is turning underutilized land into a human habitat. We therefore start in the upper part of the diagram in Figure 1, using a settlement in the Ferroviário district in Salvador, Brazil to exemplify this common upgrading process. Brazil has had a long history of informal settlement regularization and incremental upgrading. The Ferroviário district contains primarily working-class neighborhoods, with a large Afro-descendant population and relatively high levels social vulnerability (Oliveira & Teixeira, 2023). Figure 2 shows how a patch of land along Rua Iriguaçu was gradually settled between 2007 and 2020. Initially, the houses were mostly small and makeshift, but in less than two decades were gradually improved, upgraded, extended and consolidated to become durable. While the settlement starts out with one-room shacks between 10–20 m², by 2020, the typical parcel in the consolidated settlement is around 6 by 15 meters (90 m²) and multi-room and multi-story houses are the norm. This process of informal upgrading is coupled to a thriving market in land and housing, with evidence of plotting, and fences used to demarcate land parcels. The sale of land and housing is heavily advertised throughout the settlement: “Vende-se ou troco uma casa” [House for sale].

Figure 3 shows a sequence of images along the main east/west street of this settlement from 2012 to 2026 as the smaller makeshift shelters develop into durable two-story construction. The common construction practice of concrete frame and brick infill allows floors to be added over time and the facades of buildings are tiled or plastered and painted. The least durable part of the dwelling typically remains the roof, made of simple wooden rafters and corrugated steel. This allows it to be quickly dismantled when a new floor is added, after which the materials can be re-used for the new roof. Makeshift solutions are specific design



Figure 2. Iriguaçu, morphogenesis 2007–2020: incremental emergence of buildings and street/lane network. Source: Dovey et al. (2023), based on Google Earth imagery.



Figure 3. Irguaçu, 2012–2026: becoming durable incrementally. Source: Google Street View (2012–2014), Aétio Barbosa Almeida Filho (2026).

choices that are geared to capacities to make shifts in building types and access structures. The central building in [Figure 3](#) begins with a single entry and an internal stair once the upper floor is added. By 2019, a part of the facade is demolished to create a second street entry to enable direct access to the upper floor of the house—the main entry advertises church services and hot dogs. This steep side entry remains makeshift until it is demolished, rebuilt and realigned, perpendicular to the original ([Figure 3](#) lower). A small encroachment onto the street reduces the steepness of the stairs.

During this 14-year transformation, the settlement has become much more durable, and in ways that are integrated with changes in building form and type that correspond to different stages of improvement. This capacity to combine makeshift and durable solutions, designs and materials is geared in turn to flows of income, including rental income that is often produced by a second floor. Upgrades in housing are paralleled by improvements in the public domain, visible in the paving of the street between 2014 and 2019.

Durable

We now turn to neighborhoods that develop relatively informally yet quite durably from the first instance. The informal expansion of rural villages onto former farmland as they become enveloped by expanding cities provide many examples. Such “urban villages” have been the main source of affordable housing for migrants and the urban poor during China’s rapid urbanization. Xuecun is an urban village located in southern Haikou that provides one such case. The maps in [Figure 4](#) show how former rural features of the landscape, including lanes and former field boundaries are incorporated into the layout of the settlement as it expands and is gradually filled in.

The photos in [Figure 5](#) show the typical building types that accompanies this process—multi-story apartment buildings of up to six or seven stories, constructed in reinforced concrete with tiled facades on plots of around 100–150 m² in size. While these seemingly formal buildings emerge incrementally, their expanding density is anticipated in the central staircases that are built durably from the beginning. This a community-based process through which farmers become developers and then landlords. The ground floor is mostly leased as retail or production space with residential apartments cantilevered about a meter on upper floors; some buildings are enclosed in walled compounds. Many are constructed and occupied one floor at a time, with rental income funding additional floors, improvements in infrastructure and the replacement of older, often dilapidated buildings in the old village core (van Oostrum & Dovey, 2024).

While durable, the construction process in Xuecun remains informal. The extensions are not planned by local municipal authorities, but are built incrementally and emerge through negotiations among the villagers. The plots that frame these buildings often derive from traditional plot sizes for courtyard houses. The informality of the settlement is also apparent in the emergent laneway network that has no overarching formal logic, but reflects the traditional “comb” layout (*shushi buju*) that characterizes villages in this part of Southern China (Hall, 2008).

Thus, in Xuecun, durable construction is both enabled by governance and urban form, as well as itself being an enabler of denser built form which fuels further improvements of durability. Despite their durability, the residents in such settlements can still find themselves as the subject of “slum clearance” and urban renewal drives. While the original villagers are often well compensated by local authorities, this puts the migrant rental population at risk. Both durability and images of formality can be crucial to the politics of saving these buildings from the bulldozer. Compensation for demolished buildings can depend on both durability and the number of floors, thus villagers have incentive to build durably and extensively regardless of rental income (Yuan et al., 2019).



Figure 4. Xuecun, morphogenesis 2007–2020. Source: based on Dovey et al. (2023) and Google Earth imagery.



Figure 5. Xuecun: informal and durable (Source: Baidu Maps, 2014).

Becoming makeshift

Many neighborhoods start out durable but become makeshift through conscious adaptation by residents. Starting during colonial rule and extending into the post-independence period, local authorities in Nairobi, Kenya built a large range of social housing estates (Harris & Hay, 2007). The settlement of Mbotela is one such estate. The original modernist morphology built in 1955 during British colonial rule largely consists of a series of row house strips; each house is 30 m² with single-side access, built from stone masonry with tiled roofs, and surrounded by large areas of public open space. This settlement has become makeshift primarily through makeshift additions made from wooden frames and metal sheeting, as shown in Figures 6 and 7.

From the viewpoint of authorities, these makeshift additions contribute to “slumification,” an increase in fire risk, and erosion of public open space (van Oostrum, 2023). From the residents’



Figure 6. Mbotela, morphogenesis 2002–2023. Source: based on Dovey et al. (2023) and Google Earth imagery.



Figure 7. Mbotela: formal row houses and informal additions. Source: van Oostrum.

perspective, the extensions can expand interior space, produce rental income and enable new enterprises. [Figure 7](#) (upper and center) shows the original row houses and the typical informal additions. While built as social rental housing, residents often sublet the original units and assert informal ownership claims on the adjacent public land (Smith, 2019), through which they build extensions. The new makeshift extensions therefore generally align with the boundary of the original units and are developed as extensions of those units on either side of the entryway. As more rooms are added, closing off erstwhile windows, ventilation and natural light, the entry to the durable house disappears behind a narrow makeshift corridor. Residents hold relative secure tenure on the formal house but not the additions which tend to remain makeshift over time. They are extended, repaired or replaced but not upgraded. The primary value of these makeshift extensions lies in their capacity to generate rental income. Since durability impacts income, the original units rent out at more than double the price of the makeshift rooms (Smith, 2019).

At the larger scale this case also shows evidence of makeshift urban design. [Figure 6](#) shows how the makeshift additions to row houses have consumed much of the open space that was part of the original scheme, more than doubling the density. Some of these spaces have become self-organized gated communities with makeshift fences and gates, converting the modernist typology of large uncontrolled open spaces into private or semi-private courtyards. The monofunctional housing scheme has also become mixed through the addition of makeshift buildings along main roads with shops and amenities ([Figure 7](#) lower). This process of makeshift additions has enabled a significant socio-spatial and economic transformation with new enterprises, higher density and a more effective functional mix. The makeshift additions are added initially for their capacity to generate rental income, but they also produce an urbanity that is more socially and economically sustainable than the formerly monofunctional estate.

Makeshift

There are many examples of settlements that are constructed in a makeshift manner and do not become durable over time. Nowhere is this pattern more pervasive than in South African shack settlements where the legacy of apartheid policies remains evident. The post-apartheid state has embedded the right to durable housing in the constitution, but lacks the land and resources to meet demand (Tomlinson, 2017). Angelo is an informal settlement covering about 40 ha on the outskirts of Johannesburg, first settled in the late 20th century on a privately-owned former mining site (Rondanger, 2005). The immediate adjacency to a railway station makes it an attractive place to settle as a form of do-it-yourself transit-oriented development. Angelo consists largely of single-room shacks with timber frame and sheet metal cladding often with a dirt floor. These buildings are mostly constructed from prefabricated walls and roofs, sold by informal workshops within the settlement. They are fast to build and easy to move or reassemble. Horizontal additions are common and land coverage is high, but vertical additions are rarely possible due to the makeshift construction of the ground floor; the settlement remains almost entirely single story. [Figure 8](#) shows the settlement from above. It reveals that while there have been many changes to the buildings, the broad morphology and low level of durability has not changed (Geo-location 26°11'55.37" S 28°12'58.43" E). Some shops along this frontage are shack-shops, selling prefabricated panels for new shacks. Such maintenance of non-durable construction through cycles of change are typical in all major South African cities.

In June 2005, residents on a large part of this settlement were forcibly evicted and the site was bulldozed (Rondanger, 2005). After 2010, enabled by the same quick-to-construct makeshift buildings, these sites were re-settled informally, as shown in [Figure 9](#). This new settlement, however, is produced in a more regular pattern that allows more homes to be built on the same land. Without solid foundations, and with prefab panels, it is much easier for residents to reorganize their dwellings into new layouts. Indeed, the adaptability of the shack as a building type—the capacity to move (with enough hands) or to be disassembled and reassembled in a new location is a key to their resilience.



Figure 8. Angelo: things change but remain the same. Source: Gallo Images (2023).



Figure 9. Angelo: demolition and resettlement at higher density but low durability. Source: Dovey et al. (2023), based on Google Earth imagery.

Indeed, much in situ upgrading in South Africa consists of “re-blocking”—moving existing houses to produce a more efficient street/lane network, along with the addition of water and sanitation services. Yet these are considered temporary arrangements while residents wait in anticipation of formal public housing provision—“waiting for the state” (Amin & Cirolia, 2017). While there are examples in South Africa where informal upgrading to durable standards is taking place (Cirolia et al., 2017), such practices remain broadly paralyzed.

Becoming durable II

Following the arrows of Figure 1, we now return to the category of becoming durable, with a different example in Southeast Asia that demonstrates the plurality of settlements becoming durable. Sitio Pajo is a state-subsidized upgrading project in Manila that was initiated in 2007 as part of a community mortgage program which enabled organized residents of informal settlements to borrow funds for land purchase and redevelopment (Shatkin, 2007). The site lies about 2 km west of the main shopping and business district of Quezon City in north-eastern Metro Manila. In 2004 this was an irregular morphology, built from cement block walls and corrugated iron roofs, with very high coverage and an informally developed lane network. The low-lying land has creeks that occasionally flood, and lack of vehicular access means that fires occasionally get out of control. From 2008 a particularly vulnerable strip of the settlement between two creeks was progressively demolished and replaced with two-story row housing. The project was a community initiative undertaken with support from local government and an NGO, residents who had previously squatted on privately owned land became formal owners of the new plots (Dovey & Recio, 2024).

The new houses were durably built in blocks of two-story row houses, each comprising two 4×4 m rooms (32 m^2) stacked vertically on 4×7 m plots with a small rear yard. Figure 10 shows the morphogenic sequence as the original settlement (2004) was incrementally demolished and replaced with a grid of 5 m wide lanes providing access to the row houses (2010). It also shows that even before the formal housing was complete, many of the rear yards were informally enclosed for additional rooms, often fully covering the plot. The final map (2017) shows that a number of houses have been also extended vertically and that laneways have been incrementally encroached. The same construction techniques from the informal morphology that still surrounds the site, were used to add these vertical extensions.

Figure 11 (upper) shows a streetscape of formal housing with informal additions up to four stories. The view from a roof terrace (lower left) shows the 3–4 story additions emerging from the formal base. Building frontages have also been informally extended with shopfronts, balconies, and a wide range of appropriations. All of these additions have led to a settlement with much greater spatial efficiency, far better access and more public space than the original informal morphology. There appear to be two



Figure 10. Sitio Pajo, morphogenesis: demolition, formalization and re-informalization Source: Dovey et al. (2023), based on Google Earth imagery.

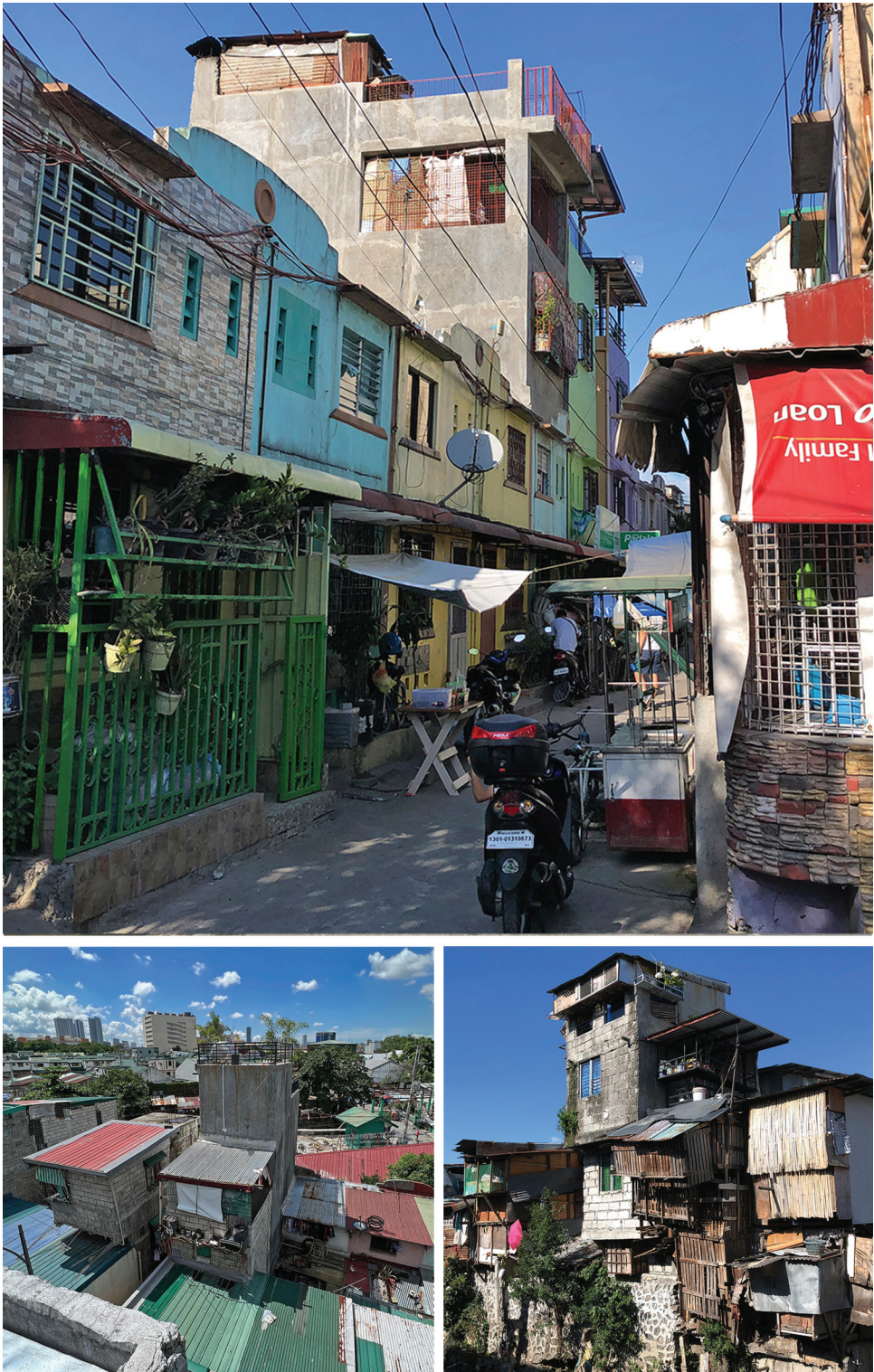


Figure 11. Sitio Pajo: formal housing (upper), with informal additions (lower). Source: Dovey (2022).

keys to this outcome. First, the limited laneway width of 5 m, produces a lively and adaptable public space where vehicular access is possible but requires negotiation. Second, the small plot size has ensured that all habitable space is within close proximity to light and air, even when the plot is fully covered. This enables a high density while protecting the open space. While this project is a mixed success, the contrast with the undeveloped parts of the settlement across the creek is stark (Figure 11 lower right); it shows a process of becoming durable through community-based formalization which has become the basis of durable informal additions.

Discussion

This paper has demonstrated many ways in which durability is produced, sustained or diminished over time. We have first tried to separate issues of durability from stereotypes of “slums” or informal settlement and to cut across any binary dualism between durable/non-durable. We have sought to unpack the concept of “durability,” to rethink it as part of a dynamic assemblage where stable outcomes of “durable” and “makeshift” are augmented with dynamic conditions of “becoming durable” and “becoming makeshift.” We have presented five cases that roughly follow the model presented in Figure 1 from becoming durable (Iriguaçu) to durable (Xuecun), through becoming makeshift (Mbotela) to makeshift (Angelo) and again becoming durable (Sitio Pajo). The motivations of residents to invest in durable buildings are many: amenity, safety, well-being, rental income and livelihoods, but also the anticipation of formalization or compensation. There are also motivations to build or maintain makeshift buildings and infrastructure. These include a lack of land tenure, but also the imperative to establish land claims, to build affordably with access to jobs and rental income. The makeshift is often strategic and can be a means to durability.

Durability as affordance

Durability is conventionally thought of as a condition for well-being and a proxy for living standards, but the cases demonstrate that most makeshift construction is also a solution for those who build it. The existential desire for a secure livelihood in the city, and for a home that can sustain such livelihoods, is the key driver. Makeshift solutions can contribute to the longevity and viability of the neighborhood through the affordances they generate: makeshift shacks in Angelo make adaptation and replacement easier; makeshift roofs in Iriguaçu allow easier vertical extensions, and makeshift additions in Mbotela enable rental income, new enterprises and a mixed-use neighborhood. Where land tenure is more secure, as in Xuecun and Sitio Pajo, there is incentive to invest in durable construction. In some cases durable construction can reduce adaptive capacities and may increase the risk of eviction (Angelo and Mbotela). Rather than thinking about housing simply in terms of higher or lower standards, durable and makeshift construction should be looked at through the affordances they generate. Durability is not only an outcome that meets a particular standard but also operates as agency for livelihood improvement.

This paper demonstrates that processes of durability—whether becoming durable or becoming makeshift—are about much more than material change, they are actively used to reconfigure socio-economic conditions. This is both a design process and a learning process where what has been learned in a temporary phase is applied in a more permanent form. It involves adapting to new conditions at scales from the building interior to the streetscape. In Iriguaçu, the process of becoming durable is linked to the design of a new vertical access, transforming single-family houses, into multi-functional and multi-story buildings. In Xuecun, traditional spatial models are adapted for a new urban reality. In Mbotela, the makeshift extensions have transformed the settlement into a courtyard typology that allows more privacy, security and functional mix. In Sitio Pajo, a more formalized urban design framework has enabled durable informal housing. The incremental adaptability of informal settlement can contribute to long-term durability, whereas the formal enforcement of durability standards is often

blind to local knowledge and dynamic change. Both makeshift and durable change at the house and household level, can productively contribute to community development at the neighborhood level.

Durability is a dynamic process. Many settlements go through several parts of the cycle in [Figure 1](#), as settlements start out makeshift, and become durable (like Iriguaçu), or start durable and become makeshift (like Mbotela). It is important to note that this is not a repetitive cycle as settlements rarely return to former conditions: rather each transformation changes the affordances. This is a process that is evident in a much more muted form in most parts of the formally organized city where durable buildings become incrementally makeshift or derelict over time, and are adapted to fill a market for affordable accommodation. This dynamic was part of Jacobs (1961) call for the retention of “old buildings” as one of four key principles of urban vitality. Old buildings deteriorate as they lose their original functions and rental values; they are adapted to makeshift functions with makeshift materials and designs. We are not suggesting that we should lower standards, or that makeshift construction cannot be a problem. Rather, we should raise our standards of thinking about the issue, and recognize that most makeshift construction is also a solution for those who build it.

One of the implications of this dynamic and incremental model of durability is renewed attention to maintenance and repair. UN-Habitat (2023) has called for the need to champion maintenance to prevent sliding back on SDG targets, and the World Bank (Vorisek & Yu, 2020) has pointed to the way in which project budgets rarely account for the recurring expense of maintenance. Maintenance and repair need to become a more central part of thinking on how we can achieve sustainable urban development (Graham & Thrift, 2007). Dynamic shifts in durability also point to the need for policy and practice that is better aligned with incremental housing approaches (Greene & Rojas, 2008).

The durability assemblage

The dynamics of durability do not sit in isolation, but within broader issues of land tenure, governance and political economy. The cases that are briefly presented above were chosen to reflect typical global patterns. Iriguaçu is typical for much informal settlement in Latin America, where settlement formalization is common, and a makeshift early phase is a tactic for achieving durability. Xuecun is a somewhat typical Chinese “urban village” development where the recognition of customary collective land tenure and significant autonomy for local communities is geared to high durability. Different but similar systems are found in peri-urban areas of many regions, particularly South Asia and Sub-Saharan Africa, even as the state remains keen to erase both the practice and the settlements. Mbotela in Nairobi typifies the many formal public housing estates that have become progressively makeshift with informal additions after formal construction. These additions remain makeshift primarily because of insecure land tenure; a blind eye is turned on the condition that they remain makeshift. The modernist urban design ideology with its broad setbacks of ambiguous and underutilized space plays a key role in enabling these informal additions. Angelo in Johannesburg is a settlement where makeshift conditions are maintained and even reproduced after demolition. The threat of eviction remains high for many settlements around the world, and plays a key role paralyzing upgrading practices. Sitio Pajo in Manila returns us to a different process of becoming durable—first formally then informally. Both the community-based process and the urban design play key roles in enabling changes in durability to happen sustainably.

The cases in this paper make clear that durability can be closely connected state policies in both enabling and constraining processes of self-organized upgrading. The state can enhance the upgrading process by providing durable public infrastructure (Iriguaçu) and subsidizing housing production (Sitio Pajo), or they can paralyze it with state policy (Angelo). Formal urban design can produce a framework which enables informal additions, and the tenure framework is crucial in establishing whether they become durable (Sitio Pajo) or makeshift (Mbotela).

Issues of durability are also strongly linked to the politics of forced eviction, demolition and displacement. When authorities erase such settlements without concern for livelihoods, displaced residents will settle wherever they can sustain a livelihood; new and often makeshift settlements will emerge to meet this market. Since the state is responsible for law and order; the visibility of

makeshift conditions will signify a lack of legitimacy of the state. This is why states often focus on erasing, screening or upgrading the most visible of non-durable informal settlements. In the cases that are durable or becoming durable, tenure is relatively secure and risk of eviction is low. In Mbotela, tenure in the social rental unit is secure enough to extend claims of ownership, but too insecure to catalyze investments in more durable dwellings. In Angelo, tenure is much more insecure, and a history of forced evictions reinforces this condition. As settlements are upgraded and become durable, it becomes more difficult for the state to justify their demolition. Informal modes of upgrading are incremental and not particularly noticeable, but the accumulated sum can be transformative.

In the end, durability is a much larger concept than we have allowed here with our focus on construction. The etymology of “durable” suggests “long-lasting”—a concept that connects building construction to livelihoods and sustainable development, slippages that have been evident in this paper from the start. The “durability” of informal construction depends on the durability of land tenure, which depends in turn on the durability of economic and political regimes and of the land and housing policies that are implemented. There are many things an effective state can do to assist the upgrading of informal settlements, but the first imperative is to upgrade the thinking, to make a conceptual shift. The policy challenge is one of how to effectively govern a complex adaptive assemblage; how to upgrade and regulate informal settlements in a manner that does not paralyze incremental upgrading. Any such approach needs to be both community-based and experimental. However, the key point of this paper is not to change any specific policy but to change a mode of thought. It is to stop thinking about durability in fixed, singular or binary terms but to ask whether a settlement is becoming durable, becoming makeshift, or both, in what ways and with what effects on the livelihoods of residents. The challenge is not to choose between durable and makeshift, it is to shift our thinking.

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Author contributions

CRedit: **Matthijs van Oostrum**: Conceptualization, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing; **Kim Dovey**: Conceptualization, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing; **Elek Pafka**: Investigation, Methodology, Writing – review & editing; **Tanzil Shafique**: Investigation, Methodology, Writing – review & editing.

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About the authors

Matthijs van Oostrum is a researcher with experience across India, China, Europe, and Africa. He has a PhD from the University of Melbourne on the informal urbanization of urban villages, and an MSc in Urbanism from Delft University of Technology. He currently works with the Global Research and Analytics Section at UN-Habitat, Nairobi.

Kim Dovey is professor of Architecture and Urban Design at the University of Melbourne where he also co-directs the Informal Urbanism Research Hub known as *InfUr-*. He has published and broadcast widely on social issues in architecture, urban design and urban planning.

Elek Pafka is senior lecturer in Urban Planning and Urban Design at the University of Melbourne. His research focuses on the relationship between material density, urban form and the intensity of urban life, as well as methods of mapping the “pulse” of the city.

Tanzil Shafique is a senior lecturer of Urban Design at the University of Sheffield. He is an associate of the Urban Institute and co-lead of the Sheffield Design Lab. His research focuses on informal housing and livelihoods in Global South cities, particularly where these are shaped by climate change, extractivist development, and colonial-capitalist legacies.

ORCID

Matthijs van Oostrum  <http://orcid.org/0000-0002-6126-8815>

Kim Dovey  <http://orcid.org/0000-0003-2492-8607>

Elek Pafka  <http://orcid.org/0000-0001-5095-4206>

Tanzil Shafique  <http://orcid.org/0000-0002-6315-4539>

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