Abstract

Purpose – While a substantial amount of study of informal settlements has been undertaken, they remain largely unstudied in terms of urban form. In this analysis, the purpose of this paper is to set forth a conceptual framework, which considers the context in which informality takes place, the settlement itself, the houses contained therein, the dwellers of those houses and the process through which a settlement is designed and transformed over time.

Design/methodology/approach – This is a literature review.

Findings – This framework aims to be sufficiently flexible to be deployed across diverse national settings. Its formulation is important because informal settlements are a permanent fixture of the global urban landscape, and are increasing in scale.

Originality/value – Any sustainable strategies to improve informal settlements depend on a better understanding of their urban space, as well as of the producers of this space – the residents themselves. Finally, professional designers may be able to learn from this contemporary urban vernacular grammar – perhaps the only one left in our era of sanitized, contrived, and prosaic urban design.

Keywords Urban design, Informal settlements, Built form, Urban vernacular

Paper type Literature review

Introduction

According to the United Nations, informal settlements house 1 billion people worldwide. More dwellers than ever before are now responsible for creating their own housing environments within a wide range of economic, climatic and cultural circumstances and constraints. The key premise of this article is that informal settlements are a permanent fixture of the global urban landscape, and, as such, their spatial qualities should be recorded (Kellet and Napier 1995). An analysis of the self-built city can reveal as much about a place as a discussion of architectural icons designed by professional architects and prominently displayed in a city center. Moreover, any sustainable strategies to improve informal settlements depend on a better understanding of their space and design, and of their residents who produce this space and design. Finally, professional designers may be able to learn from this contemporary urban vernacular grammar – perhaps the only one left in our era of sanitized, contrived, and prosaic urbanism (Cummings, 2013; De la Hoz, 2013).

Informal settlements have been studied in depth within legal, political, anthropological, sociological and economic frameworks. However, they remain largely unstudied in terms of urban form and architecture. Several explanations have been advanced for this research gap. Some commentators attribute it to the lingering concept of informal settlements as a pathology rather than as a permanent part of the housing supply. Consequently, the specifics of their form and shape are seen as context-dependent or irrelevant (Dovey and King, 2012a; Kellet and Napier, 1995; De la Hoz, 2013). A variation is a conceptualization of informal settlements as fundamentally separate from the formal city, rather than as everyday phenomena which are integral to urban space (Lombard, 2014). Alternately, informality is seen as a transitional step into formality, despite abundant evidence that the line between the two is increasingly blurred and well-consolidated informal settlements are visually indistinguishable from formal ones (Hernandez-Garcia and Lopez, 2011; Pojani, 2013; Kellet, 2011).
Other commentators blame the parochialism and class bias of the design profession, which has radically dismissed non-pedigreed, anonymously-built settlements for not complying with hegemonic professional standards. The design profession tends to view form as fixed whereas engagement with self-built settlements involves an understanding of form as dynamic and adaptive. This perspective precludes formally-trained professionals from recognizing the urban forms produced by the poor as legitimate (Hernandez-Garcia, 2010; Rudofsky, 1964; Elleh, 2011, 2014; Rapoport, 1988; Bernstein-Jacques, 2002).

Finally, potential researchers, especially those based in the Global North, may have been reluctant to conduct studies of slum architecture and urban design for fear of being accused of condoning the “slum chic” – in other words, romanticizing poverty and nostalgically imbuing informal settlements with social, cultural and aesthetic values which these communities’ own residents do not experience (see Roy and Alsayyad, 2004; Cummings, 2013). However, ignoring the study of self-built form on this basis poses its own ethical dilemmas (Dovey and King, 2012b).

This work proposes a conceptual framework to study the urban form and architecture of informal settlements. This framework builds on early (and somewhat romantic) work on the vernacular architecture of informal settlements which focused primarily on visual appearances, and later contributions, which added socio-economic layers to the discussion of the built artifact, and considered process and use in addition to product (Kellet, 2011). The work of Kellet and Napier (1995) has been particularly useful as a foundation upon which to elaborate.

The proposed framework seeks to be as comprehensive, but also as flexible as possible so that it can be deployed across diverse national settings. This approach recognizes the design variety of informal settlements. Inevitably, attempting to engage with such a large-scale phenomenon, some generalizations are made, and some contextual nuance is lost in the interest of synthesizing theory.

This study draws exclusively on the portion of the literature on informal settlements, which has, however, briefly, discussed their urban design and architectural aspects. This type of literature is minimal, as noted. Hence, the analysis is only as systematic as the available literature allows. A thorough discussion of the processes that lead to the production of informality, as well as the current legal, political and socio-economic issues facing informal settlements, are beyond the scope of this paper. As mentioned, those topics have been covered in depth by other authors. Hence, certain seminal studies which are typically included in papers on informal settlements are missing here.

The perspective of this author is sympathetic to a self-built form, and supportive of squatters, who seek to improve their lives in the face of adversity, with little assistance from the public largesse. However, glorifying informal settlements, despite good intentions, can harm local residents in various ways. Veering away from “exoticism, nostalgia, or ‘mere’ aesthetics” (Cummings, 2013, p. 2), this paper seeks to be realistic and provide nuance to the discussion.

Before proceeding with the analysis, some definitions of the terms employed in this paper are in order. Given the negative connotations of the words “slum” and “slum dweller,” the author has avoided these terms and has used “informal settlement” and “squatter” instead. However, it must be noted that many residents of informal settlements have not invaded land, but have been driven to their plot, directly or indirectly, by governments’ policies or clientelistic practices, or have purchased their land and/or house informally from pirate developers or “landowners.” Also, in some cases, settlements that are technically “formal” are labeled “informal” by the public, due to their character.

**Conceptual framework**

The proposed conceptual framework is depicted in Table I, and its elements are outlined below. The framework considers the context in which informality takes place; the settlement itself; the houses contained therein; the dwellers of those houses; and the process through which a settlement is originally formed and then transformed over time.
Urban design and architecture cannot be separated from the economic interests they reflect, the institutional interactions that shape their expression, and the cultural norms that frame them. Jakarta’s *kampung*, Rio’s *favelas*, Lima’s *barriadas*, Detroit’s *ghettos*, Kolkata’s *bustees*, Istanbul’s *gecekondular*, Bangkok’s *klong* housing, Mexico City’s *colonias populares*, Algier’s *bidonvilles* and Johanesburg’s *shanties* may look visually different, and encompass a variety of cultures. However, the unifying thread is the particular context that has come to underpin the production of these urban spaces since the postwar period (Davis, 2006).

This context has been framed in two different ways. According to the “emancipatory” frame, informal settlements are a spatial manifestation of autonomy and entrepreneurship on part of the poor segments of the population. As such, they can foster social mobility and serve as a fertile ground for bottom-up democratic practices and political participation (Rocco and van Ballegooijen, 2018). A more critical frame views informal housing as a product of over-urbanization, extreme inequality, reproduction of poverty, democratic deficit, political exclusion, precarious livelihoods and a lack of safety nets in case of disease or other catastrophes (Davis, 2006). It is the liberalization of the global economy and the retreat of the state that have helped give rise to informality – not only in housing, but also in economic production and labor practices. Autocratic elites and inefficient bureaucracies which exclude the poor from “formal” housing systems have exacerbated the situation (Rocco and van Ballegooijen, 2018).

Perhaps the answer lies in between these two perspectives. For millions of poor, marginalized, and disenfranchised people, informal “settling” may be both a logical response to the need to survive in face of poverty and inequality and also a cry for recognition, legitimacy, inclusion and repossession of urban rights (Roy and Alsayyad, 2004). While the foregoing issues and debates are undeniably major, the focus of this work is on urban form.

### Settlement

**Size and location.** The range of spatial typologies within which informality develops is characterized by a certain level of marginality compared to the space of the formal city (Dovey and King, 2012a). Dovey and King (2012a, b) identified four main types of informal settlements as determined by topography and circulation paths: First is Waterfronts. These settlements front rivers, lakes, canals or harbors. Typically, this is land considered as unsafe for housing due to flooding or exposure. Not uncommonly, waterfront dwellings are raised on poles or even float in order to offset the risks they face (Plate 1). Residents often have an ecological and/or economic connection to water. Second, Escarpments are formed when squatters appropriate land which is considered too steep to build on, or subject to landslides. Third are Easements. Some informal settlements encroach the easements or buffer zones of major urban infrastructure, such as railways, freeways, power lines and sewer lines (Plate 2). Fourth are Sidewalks. These are shallow, linear settlements which appear where public sidewalks are lined with blank walls or fences; sometimes they are constructed from flimsy materials such as cardboard and plastic (Plate 2).

| Context (social, economic, cultural, political, institutional – national and local) |
| Settlement | House | Dwellers | Process |
| Size and location | Architecture and symbolism | Conditions of existence | Origins |
| Layout and density | Materials and technology | Place attachment | Consolidation |
| Land use | | | Gentrification |
| Public space | | | Redevelopment |

**Table I.** Conceptual framework* 

*Adapted from Kellet and Napier (1995)
Plate 1. Waterfront settlements raised on poles in Bangkok

Source: Photo by author

Note: Residents, especially children, face constant danger from passing trains

Source: Photo by author

Plate 2. Informal settlement in a railway easement in Jakarta

The self-built city
In addition to the foregoing types, Dovey and King’s (2012a) taxonomy includes other manifestations of informality, which are defined based on the public-private interface (Plate 3). These include adherences (informal additions or protrusions to formal public façades onto public space), enclosures (informal settlements contained within a formal building shell, vacant lot or institutional compound) and backstages (urban zones that become more informal the deeper one penetrates behind a relatively formal street frontage).

Another way to classify informal settlements is based on size and location. Some settlements consist of small pockets of a few houses, or even a single house subdivided into
small units. Informal pockets tend to seek those urban spaces which are “leftover,” “abject,” “unsafe,” “unused” and/or “unusable” (Dovey and King, 2012a). Other settlements comprise entire districts that incorporate functions other than residential. It is these larger settlements that are often subject to major upgrading and “formalizing” schemes (Dovey and King, 2012a). While districts may have originally formed in peripheral locations, as a consequence of the rapid urban expansion in the Global South, some now occupy more strategic and central locations (see Dovey and King, 2012a; Mukhija, 2001).

**Layout and density.** Despite a typically chaotic and impermeable external appearance, many settlements, especially those on flat topography, have a clearly laid out internal structure. Most follow a proximate gridiron pattern (Mukhija, 2001; Mills, 1992), especially when land invasions are strategically organized, led by either community leaders or “pirate” developers (Dovey and King, 2012a). Other informal settlements, particularly those on escarpments, are irregularly laid out – through still permeable at the local level. “A main road wide enough for one car to pass is usually centrally located, while the rest of the homes – layered behind each other – are separated by narrow paths and alleyways” (De la Hoz, 2013, p. 10).

Notwithstanding their particular layout (grid or organic), informal settlements are often pedestrian-friendly (Plate 4) – unless, of course, located on a sidewalk along a major traffic road, as noted earlier. Informal districts embody the intensity of the labyrinth, gradually revealing their interior, with surprising vistas awaiting at every turn. In view of these qualities, a number of observers lovingly describe informal settlements as “honeycombs” or “rhizomes” (Bernstein-Jacques, 2002; De la Hoz, 2013).

However, street layouts cannot be simply analyzed in aesthetic terms. They constitute a spatial expression of specific social ideas and ideologies. For example, one commentator notes that the dense mosaic of an informal settlement in Cape Town serves “as a mechanism both for maintaining a tightly integrated community and for cutting that community off from its wider urban context” (Mills, 1992, p. 16). On the other hand, an irregular physical structure has been criticized as dysfunctional in that it makes service and infrastructure provision quite difficult (Mukhija, 2001).

In terms of density, housing may be single or multi-family but given squatters’ financial and technological constraints, it is rarely more than a few storeys tall. In exurban informal settlements, lots may be sufficiently large to provide opportunities for incremental housing expansion and infrastructure provision. A portion of the literature has suggested lot sizes larger than 50 m² meet this objective, although sizes over 100 m² are not uncommon (Mukhija, 2001; Pojani, 2013). However, such large sizes are likely unsustainable over time as commercial pressures amount and land entrepreneurs become involved in land subdivision. Some settlements – poorer, centrally-located and more consolidated ones – have smaller and even tiny lot sizes (Figure 1). In one extreme case in Mumbai, lots range between 9 and 11 m² (Mukhija, 2001). South Africa’s Gauteng City-Region Observatory (2018) illustrated in maps dramatic differences in lot sizes and configurations within a 15-year time period, between 2001 and 2016. (Gauteng comprises Johannesburg and Pretoria.) Residential densities in Kolkata slums “range between 800 and 1,000 people per hectare compared with some 70 in most North American cities” (Pugh, 2000, p. 326, based on WRI data).

**Land use.** Some informal settlements have very mixed land-use, and act as major employment and wealth creation centers (Benjamin, cited in Mukhija, 2001). “The poor residents not only live in these settlements but also depend on activities within the settlements for their livelihood” (Mukhija, 2001, p. 215). Public spaces (such as streets and alleys) are intensely used for economic production and consumption, which spills out from the homes (Dovey and King, 2012b; De la Hoz, 2013). Other informal settlements, or pockets therein, are largely residential with residents working in manual labor or service sector jobs.
in the “formal” city. For example, in Mumbai, only 10–15 percent of slum residents work within their settlements (Mukhija, 2001).

However, commercial activities are nearly always mixed in with residences within informal settlements, thus benefitting the community by providing supplies within walking distance.
One commentator writes about Rio de Janeiro’s informal settlements: “Each favela is a mini city, comprised of homes, schools, small businesses, eateries, and in recent years, a permanent police station. As a city that has developed in section, the urban fabric of the favela does not follow the pattern of traditional zoning, with districts or quarters sanctioned as residential, commercial, business, etc. Instead, various building types have sprung up due to demand and the entrepreneurship of residents. Whereas in traditional planning zoning is a priori, imposed upon the inhabitants of the formal city, the design and land use in the hillside favelas is implemented posteriori, based on necessity” (De la Hoz, 2013, p. 15). The ways in which unplanned storefronts and micro-enterprises appear in informal settlements – e.g. in areas where there are strong flows of pedestrians, usually between two points of intense daily activity such as a school or bus stop – have much to teach architects and planners about the appropriate location and threshold of commercial establishments (Tames, 2004).

Public space. Typically, land is efficiently and creatively used in informal settlements, especially more consolidated ones. In most cases, this means that there are no representational public spaces, such as main squares and open plazas, as there might be in the “formal” city. In the absence of public sector interventions, this would be considered as “wasted” land which could be used for private residential functions. Landmarks consist of local stores or other functional elements rather than statues and obelisks. In some informal settlements, especially in Latin America and South/Southeast Asia, the boundaries between public and private space (or even between homes) are fluid and involve innovative tradeoffs: residents congregate and bond in the streets, on roofs, in alleys, at corners and in private yards (De la Hoz, 2013). This shared understanding and sophistication comes from many years of trial and error but also from a need to minimize waste (Dovey and King, 2012a; Hernandez-Garcia, 2010; Petonnet, 1972; Tames, 2004; Bernstein-Jacques, 2002).
While in some settlements residents might not perceive a lack of public space, there is much to be said for the benefits of parks and sport fields for youth, which may also act as community centers (Hernandez-Garcia, 2010). At the same time, these pose a maintenance problem and can fall victims to the “tragedy of the commons.” While community spirit and collectivism is often highlighted or even glorified as a positive characteristic of informal settlements (see later), in reality, collaboration for public space maintenance can be quite low (Lastra and Pojani, 2018). Therefore, any public programs which seek to insert open space must take account of the socio-economic realities of residents (De la Hoz, 2013; Hernandez-Garcia, 2010; Tames, 2004).

In some informal settlements, space is less efficiently utilized, and there are clear demarcations of defensible, private spaces. In Sub-Saharan Africa and parts of Latin America, where security is a main concern, not only are burglar bars provisioned around doors and windows, but fencing or concrete walls are also built around each lot. In case studies of Tanzanian and Brazilian informal settlements, such protective walls are reported to be as tall as three meters, blocking all view – and even air circulation (Kowaltowski, 1998; Nguluma, 2003). There are also cases where, due to poor site planning, minute spaces are left over between buildings or lots, which cannot be utilized and become rubbish-dumping areas (Nguluma, 2003).

**Image and identity.** Informal settlements in more visible locations, e.g. escarpments, waterfronts and railway easements, are particularly exposed to public view – and, perhaps, scrutiny (Dovey and King, 2012a, b). In some cases, these settlements are identified as pitiful improvisations by the poor and undesirable (Peattie, 1992). For local middle classes, these are eyesores or loci of crime; they equate to visual and social pollution (Kellet and Napier, 1995). In reality, security issues and level of crime in informal settlements vary greatly from country to country, city to city, or even between parts of the same city – e.g. center vs periphery. A study based in Medellin concludes that here, it is the high density of informal settlements which has led to the fragmentation of social ties, erosion of resilience, and co-optation by criminal or violent factions (Samper, 2017).

Whether security is a problem or not, designating the informal city as “other” is essential to establish the identity of the formal city. This “otherness” is informed by “untested stereotypes and prejudices about the morals, abilities, and values of the residents” (Kellet and Napier, 1995, p. 8), and explains why informal areas continue to be stigmatized even after physical conditions and tenure are upgraded (Dovey and King, 2012b).

However, informal settlements are usually only visible from a distance or from the air. As such, they often remain impenetrable or unknown to outsiders from different social classes, even if they live nearby (Dovey and King, 2012a). Some settlements may indeed be informally gated or guarded, and their streets and lanes may not appear on official street maps. This is convenient for the urban leaders of the new entrepreneurial city, who seek to win the globalization race by concealing any signs of failure or blight (Dovey and King, 2012a, b).

But the image of informality is not uniformly negative, while dystopic, poor settlements simultaneously attracts and repels Western visitors (be they researchers or “slum tourists”). Confronted with the extreme dereliction of some areas (especially in South and Southeast Asia and Sub-Saharan Africa), visitors often report both a reality shock and a strong appeal to their exotic, authentic and labyrinthine nature. This may even border on unethical voyeurism (Dovey and King, 2012b).

Other commentators (especially those writing from the perspective of Latin America or the Maghreb) praise the physical order of informal settlements as picturesque, ingenious, porous and full of vitality – qualities which the “formal,” streamlined city governed by straight lines and wide roads no longer possesses (Hernandez-Garcia and Lopez, 2011; Çelik, 2003; Petonnet, 1972). There is much fascination with the “informal” rhizomic structure and
idiosyncratic order of accretion, which is in conceptual opposition to the hierarchical, tree-like controls of the “formal” city. The unique spatiality of informal settlements has been likened to a “collage,” comprised of loosely overlapping layers and governed by an “organized chaos” (De la Hoz, 2013).

The positive urban imagery promoted by this set of commentators has helped foster place identity and legitimize squatting (Peattie, 1992; Perlman, 1976; Turner, 1968). In Latin America, paintings of favelas and barrios, musical styles such as samba and funk carioca, and other artwork produced in informal settlements, now accompany the natural and cultural iconographies of the “formal” cities (Cummings, 2013; Hernandez-Garcia and Lopez, 2011). Similarly, in the USA, the UK and parts of the Caribbean, musical styles such as rap, grime, hip hop and raggamuffin, originally tied to the identity of black urban ghettoes, are now in the mainstream.

At the same time, as noted, a focus on aesthetics and image has been criticized for romanticizing poverty and relying on misplaced nostalgia for traditional rural or urban settlements, which were produced under entirely different socio-economic conditions compared to contemporary urban informal settlements. Depoliticized, images of poverty direct attention away from deeper political and economic issues – inequality, injustice, exploitation – that lead to informality (Roy and Alsayyad, 2004; Huque, cited in Kellet and Napier, 1995).

Squatters’ own position toward exposure to outsiders is ambivalent. In some cases, they may want to “be left alone” or forgotten for fear of legal repercussions. They might even be determined to exclude visitors from “formal” parts of the city or tourists, reflecting a real politics of resistance. In other cases, residents might seek exposure for specific political purposes but this may be coupled with pride and resentment (Dovey and King, 2012b; De la Hoz, 2013).

Views on the recent hype of designer interventions in informal settlements are also split. On the one hand, designers’ seduction by, and even obsession with, improving underserved communities, even if only through colorful murals, has been seen as contributing to the common good. It has helped instill pride and heighten morale among residents, and bring media attention to the needs of the community. One the other hand, critics have wondered whether designers are “praying” on impoverished communities because they provide easy access to experimental work and self-promotion, and constitute a “blank canvass” on which to project eccentric ideas and agendas (De la Hoz, 2013). There is also concern that beautification and notoriety convert informal settlements into an iconic art image and thus camouflage the abject poverty and the real human beings that exists behind painted walls (De la Hoz, 2013).

*House*

*Architecture and symbolism.* In many settings, handcrafted informal settlement typologies have “shown tremendous resilience in withstanding the tests of time” (De la Hoz, 2013, p. 1), although, or perhaps precisely because, they reflect “communal enterprise” rather than the work of individual architects (Rudofsky, 1964). Residents build their homes in evolutionary fashion, without having to comply with formalities such as drafts, permits, and approvals (Turner, 1968; De la Hoz, 2013; Bernstein-Jacques, 2002). As in vernacular settlements, squatters in a particular cultural and climatic context tend to rely on a shared architectural model which is then varied from house to house based on an “ideal life” envisaged by users (Rapoport, 1988; Kowaltowski, 1998).

For example, early case studies from Maghreb found that squatters’ designs were entirely reliant on traditional (Islamic) styles (Petonnet, 1972; Çelik, 2003). A later study set in Tanzania found that many homes in an informal settlement were based on the traditional Swahili house type, which was altered to convert bedrooms into kitchens or to add indoor bathrooms (Nguluma, 2003). A study set in Brazil found that residents drew inspiration not only from
traditional residential styles but also from local church architecture: triple arch window frames were commonly employed to bestow sacredness to the home (Kowaltowski, 1998).

Notwithstanding a base in local heritage, squatters aspire to modernization, aesthetics and personal expression in their architectural choices. While modest, squatter homes are part of a struggle for more than bare survival (Peattie, 1992). Small-scale symbols of pride and dignity, in the form of flower arrangements, shrines, mosaics and decorative statues, can be found even in the poorest settlements (Dovey and King, 2012b). Through their design choices and their efforts to hide visible signs of material poverty, squatters seek to assert themselves as full participants in the building of the city and society. The claim to modernity and even beauty is “a claim for respect and for citizenship” (Peattie, 1992, p. 29). It is a way for squatters to demonstrate permanence and a long-term commitment to their settlement (De la Hoz, 2013; Kellet and Napier, 1995; Lombard, 2014; Kowaltowski, 1998; Klaufus, 2012; Pugh, 2000).

One observer writing about Venezuela notes that “any family with a regular source of income would try as rapidly as possible to replace the bamboo and earth walls with cement block, and the existing style, with its overhanging roof shading a paved corridor, with an ornamental façade something like the false-front architecture of old Western towns. A little more economic leeway and there would be a front garden with ornamental fencing and metal grilles over the windows. Such a house would no longer be called by the rather deprecating term of rancho, but could be called a quintica, a poor man’s imitation of the rich man’s quinta. The theme of modern aspirations, which made the street front of the quintica so important, could rarely be carried all the way through the house from front to back, but people would do what they could… But this gradient from front to back, from modern and commercial to the more traditional, was thought of by the barrio people as a gradient also from better to inferior” (Peattie, 1992).

A desire for upward mobility, expressed though mimicry of the design features and motifs of middle- and upper-class architecture is a constant, despite the difference in pedigree and mode of production in “informal” and “formal” housing. In an informal settlement in Campinas, Brazil, residents refer to their homes as being built in “colonial” or “Mediterranean” style – terms which are used to define present-day house designs in wealthier portions of the city, and have little “in common with the colonial vernacular in Brazil and the traditional buildings of the Mediterranean region” (Kowaltowski, 1998, p. 304). Bright colors – once strong elements of Brazilian colonial architecture – are replaced by brick veneer commonly employed in middle-class housing (Kowaltowski, 1998).

In Colombian barrios, the aspirational language in house décor, which mixes and matches formal elements, is captured by the term engalle, which can be described as “the more, the better.” Façade engalle – a “penurious kitsch” (Kowaltowski, 1998) – is employed not only as an expression of individuality, but also to show others that one is achieving economic success (Hernandez-Garcia, 2010). Similarly, in Tanzanian slums, residents pay much attention to the public interface of their homes while interior amenities which are hidden from view are not taken into account resulting in unhygienic, inconvenient, and congested toilets and kitchens (Nguluma, 2003).

In consolidated Ecuadorian informal settlements, a clean and ordered home signifies “decency,” “respectability” and “civilization” (virtues which are typically associated with urban upper classes). Aiming for social recognition and self-esteem, rural migrants symbolically express their embracing of these values by painting home façades in white or light pastel colors, and even prioritizing façade décor over home furnishing. Moreover, residents make an effort to make their homes appear “American” or “Spanish” (overruling individual taste) in order to suggest that they have relatives abroad, who not only send home remittances but also expose the family to cosmopolitan lifestyles. These design
strategies serve to attenuate the stigma of poverty, but also perpetuate urban myths about peri-urban squatters owning large “remittance” homes, which lead to resentment on part of the middle classes (Klaufus, 2012).

Generally, the houses of squatters with more financial means are not only larger but also have more functional separation – which is considered part of a “modern” lifestyle – whereas poorer households, especially renters, tend to share multifunctional spaces (Nguluma, 2003; Petonnet, 1972). However, in high-crime settings, security concerns prevail over the desire to display status. Residents limit the external ornaments of their home to the basics for fear of appearing ostentatious and becoming a target of burglars (Kowaltowski, 1998).

Materials and technology. Houses in informal settlements are usually built by a combination of self-help and paid labor – e.g. of the Tanzanian mafundi (Nguluma, 2003) or the Brazilian pedreiro (De la Hoz, 2013) – most often without a pre-determined plan drawn on paper. Collaboration in house construction requires emotional investment and solidarity among family members (Kellet and Napier, 1995; Lombard, 2014). Construction materials range across plastic, timber, steel, concrete, canvas, rubber, bamboo and brick. They vary with culture, climate, economy, density and geography but generally must meet two basic criteria: be low cost and easily transportable (Dovey and King, 2012a). For example, in much of Latin America, the typical landscape of informal settlements comprises unfinished houses of brick and mortar located on hills in the urban outskirts, whereas, in Southeast Asia, bamboo and corrugated metal sheets prevail. In the case of very dense settlements, materials must also be small enough to pass through narrow streets and alleys (Dovey and King, 2012a). In some cases, materials are recycled and natural while in others they are industrially-produced and purchased from small-scale (sometimes informal) suppliers (Kellet and Napier, 1995). In some places, with increasing depletion of natural materials near building sites, newer settlements must rely on industrial materials or materials transported from far away sources (Nguluma, 2003).

Squatters have been alternatively praised for their inventively appropriate building technology and their cost-effective use of meager resources or stigmatized for the poor appearance of their dwellings and the diseconomies of scale involved in brick-by-crick construction (Peattie, 1992; Çelik, 2003). For example, in a settlement in Tanzania, the plot coverage is so high and site planning so poorly thought-out that cross-ventilation is dramatically reduced creating a major problem in a hot and humid climate (Nguluma, 2003). In poorer settlements, every scrap of material finds a use (Dovey and King, 2012a; Çelik, 2003) whereas, in more consolidated settlements, amateur builders tend to “overdo” construction – e.g. by doubling the amount of structural supports for “extra-sturdy” homes. This is incredibly inefficient and causes residents to pay for more material than necessary (De la Hoz, 2013).

Depending on the economic level of squatters, materials can be durable or perishable, but only a limited range is used, which bestows visual coherence to the settlement. Visual unity may also be achieved through exuberant, tropical vegetation or building heights, as the typical house is only a few storeys tall owing to technological prerequisites (Kellet and Napier, 1995; Nguluma, 2003). While an informal urban morphology is produced through repetition, every house and lane is individualized and different; monotony is avoided (De la Hoz, 2013; Tames, 2004).

Most often informal builders work with nature rather attempting to conquer it: for example, Medellin’s barrios cling to hillslopes, Lago’s slums float on the bay (Plate 5), Rio’s favela houses have small windows to protect from harsh sun and torrid rains, and Algiers bidonvilles feature enclosed courtyards and trees (Çelik, 2003). But, sometimes, the desire to appear modern trumps nature’s imperatives. In a case study from Tanzania, squatters derogatorily refer to older mud and pole houses as “ribs of a malnourished and
starving dog.” These are increasingly replaced by concrete clocks which are unsuitable for a tropical local climate (Nguluma, 2003; Elleh, 2011). Similarly, a case study in a Brazilian settlement found that residents do not appreciate the importance of landscaping beyond rural agricultural value and rarely employ it for shading and cooling (Kowaltowski, 1998).

Some informal dwellings bear testimony to the rural building traditions that squatters may have imported from their villages of origin. This is mainly dictated by practicality and least-cost rather than a notion that the fragile, rural or traditional is more beautiful (Peattie, 1992; Dovey and King, 2012b). However, the architectural tastes of squatters can rarely be “established as part of a “folk” tradition separate from the tastes of the elite” (Peattie, 1992, p. 28). Generally, the logic of “conspicuous consumption” is at play in informal settlements too. There is evidence that squatters, just like the middle-classes, admire pricey-looking, shiny, industrially-produced materials – e.g. plastic sheets or concrete rather than soil blocks or bamboo – as these signify progress, durability, health and financial means (Dovey and King, 2012b; Nguluma, 2003; De la Hoz, 2013; Elleh, 2011). In contemporary urban design, an elite preference for historical materials – brick, ceramic, cobblestones, wood – might trickle down to informal settlements also.

**Dwellers**

*Conditions of existence.* The term “conditions of existence” (borrowed by Stea and Turan, cited in Kellet, 2011) includes a squatter household’s relations with various social groupings, such as neighbors, labor associations and the wider society, and that household’s material conditions and access to resources. A household is described in terms of qualities such as the age, lifecycle, gender, opinions, beliefs and skills of its members.
Incremental changes in the conditions of existence of a household (e.g. family growth or a job promotion) are usually reflected in house design – in the form of alterations, improvements or extensions (Nguluma, 2003; Tames, 2004). To accommodate and respond to change, squatters make the most of their main (or sole) asset: their home (Perlman, 1976). “Expansion, modulation, and personalization are signature qualities of the [slum] vernacular” (De la Hoz, 2013, p. 68). While plot sharing with kin is very common practice, and helps alleviate housing stress, lower living costs and share household chores, it is not always welcomed by new families, especially when sharing a plot with in-laws (Tames, 2004).

In some informal settlements, upward mobility is planned and/or expected (Lombard, 2014). This is indeed the aspiration of most squatters. For example, an observer writing about Venezuela in the 1980s notes that “people’s plans for their children did not involve staying in place but getting educated, moving up” (Peattie, 1992, p. 28). Other commentators on Durban around the same time note that squatters’ strategy was to “live informally in order to acquire, or increase one’s chances of acquiring, formal housing later” (Kellet and Napier, 1995, p. 20).

However, in many places, the social mobility of squatters is severely hindered by extreme poverty and inequality. The optimistically termed “slums of hope” (in the initial stages of urbanization) have turned into “human dumps” of perpetual misery and despair, and squatters have remained a permanent urban underclass (Davis, 2006). While dreams of moving up the social ladder may have been realized or thwarted, the expectation of social mobility affects the level of consolidation of a settlement, the house form, and the manner in which people apportion their effort and limited resources (Kellet and Napier, 1995; De la Hoz, 2013; Lombard, 2014).

Place attachment. Place-making and attachment processes are characterized by, and depend on, people’s piecemeal, physical and emotional investment in their home and neighborhoods. As such, place attachment in informal settlements varies by the level of consolidation. For example, a study set in a Venezuelan site in the late 1980s found that “among the less than five hundred residents, many were recent arrivals, and it was not the case that everyone knew everyone else. The collective endeavors to build this or that ‘community’ project never in any instance engaged the participation of more than a tiny fraction of local residents. Political allegiances reached outside the local” (Peattie, 1992, p. 28).

In contrast, longer-standing informal settlements, such as Rio’s favelas, are characterized by collectivism and “neighborhood feeling,” but one which is necessitated by hardship, marginalization, and a need for security (Cummings, 2013). Collectivism is part of the authenticity and place attachment of these spaces but this quality “presents a contradiction: the very things most […] dwellers desperately need – freedom from violence and equal access to services and opportunities the middle class enjoy – are the very things that threaten their ‘authenticity’” (Cummings, 2013, p. 47).

Process

Origins. Dovey and King (2012a) identify three primary modes through which informal settlements come about. The first is simply settling on unclaimed land, often in urban peripheries. The second is inserting into uninhabited, abandoned, or leftover fragments of space or even buildings spread around a city. In these first two modes, if land belongs to others (de jure or de facto), land acquisition can be a prolonged and political process, and may involve informal sales through intermediaries. The third mode is attaching to the structures of the formal city, for example, in the form of vertical or lateral extensions of existing buildings (Dovey and King, 2012a).
Despite different origins, once consolidated informal settlements usually add up to a recognizable whole. They constitute “cultural landscapes” which represent the decisions of many individuals over periods of time, and as such are similar to traditional vernacular environments (Rapoport, 1988). The difference is that, in contrast to the “relatively stable context and slow Darwinian evolution of traditional vernacular environments, spontaneous settlements by definition have emerged and continue to expand in conditions of considerable instability and are often subject to uncertain rapid change” (Kellet and Napier, 1995, p. 15).

Consolidation. Globally, the dominant growth and consolidation process in informal settlements is incremental, often contiguous (Figure 2). In poorer settlements (e.g. in Southeast Asia) accretion takes place room-by-room (Kamalipour, 2016), whereas in more consolidated settlements (e.g. in the Balkan Peninsula), accretion is house-by-house (Pojani, 2013). However, houses are upgraded over time as residents slowly accumulate scarce financial resources – savings from salaries, small businesses or remittances (Dovey and King, 2012a; Bernstein-Jacques, 2002). Pojani (2013) documents in pictures how a house in an informal settlement in Albania is transformed, in the course of a decade, from a simple wooden shack into a brick and mortar, two-story house. Additions and extensions serve to increase the living comfort of a household but can also provide rental income; sometimes tenants financially contribute to house improvements (Nguluma, 2003).

Aesthetically, the typology of single-room or single-house increments sets up a horizontal and/or vertical rhythm (Plate 6) (Dovey and King, 2012b). A settlement may expand first horizontally and then vertically, or vice versa, depending on space availability (Nguluma, 2003). An inventive architecture of singular solutions produces housing which has both consistency and myriad variations (Dovey and King, 2012b). Over time, some consolidated informal settlements may come to visually resemble middle-class housing (Pojani, 2013).

The first to popularize the idea of informal settlements as essentially an activity or process – “housing as a verb” rather than a mere physical object – was John Turner (1968). Many other commentators since have commended squatters’ locally controlled and autonomous approaches which can achieve high use values and a closer fit between dweller, dwelling and settlement (Plate 7). They have noted that the adaptability of space and structure to the changing needs and behavior patterns of the family is the most important

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**Figure 2.**
Stages of development in Santo Domingo Savio, a settlement in Medellin, Colombia

**Sources:** Maps by Jota Samper (2017). CC-BY-NC-ND 4.0 international license
architectural advantage of squatters’ procedure (Bernstein-Jacques, 2002; De la Hoz, 2013; Dovey and King, 2012b).

_Gentrification._ Based on the location logic of neo-classical economics, the poor live on poor land (Gilbert and Ward, cited in Mukhija, 2001). However, as a consequence of the rapid
urban expansion of many developing cities, many informal settlements “in once peripheral and marginal locations may now occupy a more strategic and central location in the geography of the city” (Mukhija, 2001, p. 215). Better locations (and slum upgrading programs) are leading to large increases in land values and are providing potential for gentrification, densification, overcrowding and redevelopment (Mukhija, 2001).

The gentrifiers can be members of the local middle classes (as in American ghettos) or foreign expatriates (as in Brazilian favelas). Either way, gentrification leads to a loss of affordable housing, economic displacement, community disintegration and cultural homogenization. It erodes the role of slums as incubators of ethnic culture (or counterculture), and laboratories of flexible and configurable building typologies (Cummings, 2013). At the same time, squatters in more centrally located settlements within easy reach of jobs are more motivated to defend, improve and expand their existing housing (for owner-occupancy or rent) rather than move elsewhere (Nguluma, 2003). Economic interest, homeownership and strong community ties can serve as “a bulwark against outright gentrification” and displacement (Cummings, 2013, p. 51).

Redevelopment. Slum redevelopment was in vogue in the first half of the twentieth century. The proponents of the early Modernist Movement, such as architect Le Corbusier and others, advocated demolition of old and crowded housing – to be replaced by new, mass-produced towers. But rather than providing a solution, the ensuing urban renewal and slum clearance programs (which ignored the physical preferences of beneficiaries) led to displacement and a loss in the total number of housing units, thus aggravating the housing shortage (Mukhija, 2001).

Since John Turner (1968) popularized the idea of self-help housing in the 1960s and 1970s, urban renewal and slum clearance fell out of favor. Gradually, demolition of informal settlements, accompanied by public redevelopment of the same land or relocation to public housing elsewhere, came to be considered as contrary to the interests of squatters. Most policies shifted focus to in situ infrastructural upgrading and legalization of land tenure (Mukhija, 2001).

Many interventions now aim to improve access and movement within settlements, sometimes for security and control purposes. They also aim to facilitate connections to the “formal” city (through new bus lines or even cable cars), create more open space and insert public services (clinics, libraries, schools and the like). Such projects begin to blur the distinction between the formal and informal. However, some commentators still note that in settlements which are severely dilapidated (Plate 8), overcrowded, inaccessible, poorly ventilated and dangerously sited, “slum dwellers may find redevelopment more attractive than in situ consolidation” especially if they “expect to receive a more valuable real estate asset after demolition” (Mukhija, 2001, p. 214).

Conclusion
To summarize, the framework set forth in this paper takes into consideration the context in which informality takes place; the settlement itself; the houses contained therein; the dwellers of those houses; and the process through which a settlement is formed and transformed over time (see Kellet and Napier, 1995). As evident from the analysis, the elements of informal settlements vary substantially from place to place. However, there are enough similarities to allow for theorization of the urban design and architecture of informal settlements.

To the extent that public interventions, or other assistance, is considered for informal settlements, it is essential to understand that one is not building upon a blank form. Instead, the form and architecture of the settlement reflects carefully thought out strategies of experienced inhabitants to deal with their resource limitations and needs and to serve
their aspirations. Perhaps the biggest shortcoming of the informal settlements is a lack of non-commercial communal space due to the absence or minimization of public intervention. On the other hand, the lack of public intervention may provide freedom from building requirements and/or spatial prerequisites that are unaffordable and/or serve to block possibilities of the poor. In any case, the self-built city should be a starting point, rather than an obstacle, for planning efforts in informal settlements.

A theory on the urban design of the self-built city is not fully crystallized by any measure. Evidence from many more case studies and a variety of national settings is needed for a complete picture. Meanwhile, it is hoped that this (imperfect) theorization will be of use to researchers, practitioners and students who seek to understand and improve all human settlements – formal, informal or, increasingly, hybrid (Kellet, 2011). However, helping squatters in the face of socio-economic and political pressures does not necessarily involve preserving the materiality of informal settlements. Outer shells and physical forms can change as long as safety and security are promoted, and valuable urban functions such as affordable housing, place attachment and flexibility are supported (Cummings, 2013).

References


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