

Barefoot Planning



A Pro-Poor
Urban
Development
Model

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THE BAREFOOT PLANNING MODEL: A VIGNETTE

Sarah and John have just arrived in the city, drawn by economic opportunities and fleeing the effects of conflict and climate change in their rural homestead. With few resources, they go to the emerging area where they've heard most migrants go to find a place to stay. When they arrive, the local customary chief tells them to find Alice. He explains that Alice will tell them where they can set up their temporary shelter, and what they need to do to build up their ownership rights over time. When they find Alice, she explains that people used to just settle anywhere, which resulted in overcrowding, a lack of basic amenities like roads, sanitation, schools and clinics, and was prone to risks like fires, floods, and disease outbreaks. But now, as long as people follow the guidelines and settle within the allocated grid, the area can develop in a more balanced way that is healthier and more productive for all. She shows them a few options using a map on her phone and they pick a spot to start building their new home. Alice wishes them luck and says she'll be back to check in with them in the coming weeks and to help connect them with other municipal services over time.



1. Overview of the Barefoot Planning Model

Rapid urban expansion requires a pro-poor model to avoid the creation of new slums. The dysfunctionality of top-down and bottom-up paradigms offers a design space for decentralized, adaptable, and responsive mechanisms that create positive feedback loops between the regulators and regulated.

Barefoot planning proposes to dynamically organize private development and public goods without a static master plan by employing barefoot planners, a new class of community-level planning practitioners. These ground-level planners would allow communities to self-organize while iteratively adapting space reserved for public goods and incrementally granting land rights to encourage investment across scales and income levels.

Barefoot planners are “primary care”-level planning practitioners that lower the threshold for low-income people to engage with formal urban systems. Barefoot planners provide an interface between the city administration and rapidly growing communities, and they possess the decentralized authority to make spatial decisions about public right-of-way, land tenure, and utility provision within bounds set by a central administration. This enables the community’s needs to be met at a granular level while also ensuring that utilities will be able to be installed as the community grows. To accomplish this, barefoot planners are backstopped by a GIS app on a mobile device and are able to elevate difficult cases to secondary and tertiary planning offices.

Rather than using a master plan, the barefoot planning model uses an adaptive mechanism consisting of a combination of a grid, guidelines, soft law, social enforcement, and property rights incentives. This mechanism is designed to generate an iterative urban form using a system of adjustable rules and incentives that can evolve over time to suit the city’s needs. The set bounds alluded to above may include minimum allowable street widths, maximum distances between streets, and allowable parcel configurations. The fundamental focus is organizing the boundary between private development and public space on-the-fly to balance immediate land use needs with future flexibility. This is achieved by providing incentives for communities to reserve space for public goods, including the right-of-way, by offering subsidized utility connections when the mechanism’s criteria are met. The parameters within the mechanism can be adjusted to achieve the city’s performance objectives, such as an efficient private land market and efficient public goods provision. The rules and incentives can also change as the city scales up and as neighborhoods’ socio-economic dynamics evolve.

The mechanism is intended to allow the model to continue operating when the pace of urban expansion overtakes the city administration's capacity to deliver fixed plans at the scale required. In this way, the barefoot planning model is incrementally able to handle both the prevention of new informal settlements at the fringes of urban expansion areas while aligning with any conventional plans for land use and infrastructure expansion.



Photo by Jess Beutler, Humanitarian OpenStreetMap Team, Liberia
Barefoot planning continues operating when the pace of urban expansion overtakes the city administration's capacity to deliver fixed plans at the scale required.

Lastly, the final leg of the model is a land market that grants incrementally higher use and ownership rights commensurate with individual investment and the duration lived on a site to avoid speculation and slum-lordism. Similar to how a country's route to citizenship progresses along the spectrum from visitor visa to permanent resident to passport holder, the mechanism grants additional rights to individuals from basic right to shelter to ownership title to right to rent and redevelop.

2. How Barefoot Planning Compares to Other Approaches

Existing urban planning models have severe limitations that prevent them from keeping up with rapid urban population expansion. This creates a strong likelihood that many of the [950 million new urban dwellers](#) in sub-Saharan Africa over the next 30 years may end up living in informal settlements. The resulting gaps in the provision of basic services like water, sanitation, and transport are not visible from the center but have severe negative impacts on the lives of the urban poor.

In rapidly growing cities, long-range top-down spatial planning has been ineffective, inflexible, and unenforceable. Regulations like land use requirements, maximum density, and minimum lot sizes create inefficient land and housing markets and propagate demand for informal settlements. Long-range planning is often a form of [isomorphic mimicry](#), as institutions fall into a capacity trap of trying to take the form of developed country institutions but lack the functional ability to actually execute. This is perhaps best captured in the concept of an urban master plan, dozens of which are produced for fast-growing cities across the Global South every year despite few being implemented in practice.

Unregulated “bottom-up” informal development tends to not provide (and even obstruct the delivery of) basic services to residents, including transportation and security. This results in habitation that is precarious in economic, social, health, and safety respects, with people compelled to live in communities unable to fulfill basic conditions for a dignified life. Various studies have shown not only that informal settlement residents have lower health, education, nutrition, and other indicators of wellbeing [than other urban residents](#), but sometimes these are even worse than [people living in rural areas](#). In many cases, the imperfect and informal tenure arrangements also create conditions for seizure and control by criminal organizations and comparatively wealthy landlords with little incentive to improve living conditions for residents.

Table 1: Key features of barefoot planning in relation to other land use management models

	Top-down and bureaucratic	Bottom-up and informal	Barefoot planning model
Land use allocation	Central master plan; rigid; long time frame	De facto power structures; ineffective and suboptimal; lack of public space	A mechanism for emergent spatial structure; iterative cycle
Infrastructure provision	Infrastructure typically precedes land use; infrastructure expansion can be costly and difficult; infrastructure is often denied to 'informal' areas	Existing neighborhoods may be upgraded; difficult and costly due to lack of available space	Infrastructure may precede land use, or land use can be shaped by incentives to reserve right-of-way for infrastructure expansion
Conflict resolution	Planning department and courts; enforcement and exclusion including forced clearances	De facto power structures which may or may not be pro-poor; risk of 'capture' by elites and/or criminal groups	Barefoot planner practitioners on the ground; escalate issues to city manager; community-based and participatory approach
Ownership rights	Linked to a parcel, the city administration has a monopoly over eminent domain; often inflexible (all or nothing); de-linked from actual occupation	Lack of secure tenure	Incremental use rights (i.e. conditional freehold titles in Rwanda with upgradable use rights); eminent domain by the city
Utility management	Bureaucratic control; slow to identify and resolve problems; centralized	General lack of provision; strikes, protest, and other civil disobedience a common tool to seek redress; poor often pay more for informal basic utilities	Brokered relationship; rapid user reporting of problems; mutual accountability between residents and utility providers

Planning administration	A small number of well-educated planners; strict laws and regulations	No planners; informal; spatial dynamics dictated by informal processes which are often exclusionary, discriminatory, and sub-optimal	A larger number of grassroots-level planners; application of soft law adaptability; incremental application of standards, norms, and flexible 'rules of thumb'
Private construction	Regulated; expensive	Unregulated; inexpensive	Incremental regulations; affordability spectrum
Data and socio-economic-demographic legibility	Limited data, primarily top-down, inaccessible, out-of-date; low-income areas often are 'blank' on the map physically and metaphorically	Informal, rich community data is often inaccessible to municipal authorities/planners	Blend of formal and informal data, and use of GIS, remote sensing, and other technologies for enhanced real-time data generation; data is co-owned, co-produced , and co-used by residents and municipality

3. Inspirations and Antecedents



Barefoot planning is grounded in existing practice, including a wide variety of conceptual and practical antecedents. Below, the model is situated within a historical context, highlighting the elements that are drawn from previous movements.

3.1 Barefoot Doctor

The [barefoot doctor](#) movement in China was based on the realization that in order to expand the provision of healthcare rapidly to a large, underserved population, traditional models of healthcare and medical training would take too long and be too costly for the Chinese state. More recently, the [mental health field](#) has also recognized the need to deploy para-professionals in order to rapidly expand access to service. China was not trying to replace the secondary and higher levels of the healthcare system, it was trying to extend the service down to the community level and increase access to preventative care.

As the name suggests, there are numerous elements of this approach from which the barefoot planning model draws, including extending planning principles in an accessible way, at lower cost, and aligned with the realities on the ground. The development of a new cadre of practitioners at the base of the professional pyramid (ideally drawn from the same communities they seek to serve) will have a link with higher level planning offices and urban management. Thus, barefoot doctors and planners both enhance the interface between populations and the formal service provider system, and do so at much lower costs to more effectively deliver public services (in our case urban planning and management).

The barefoot planners would receive training in disciplines like community mobilization, negotiation and conflict resolution, simple spatial planning, and analysis, use, and communication of data from various sources. Importantly, they would be provided with GIS-based digital tools on mobile devices to simplify and facilitate bottom-up planning and community data generation and analysis. Using these tools the barefoot planners can communicate the opportunities to newly forming communities and fill an important technical and administrative capacity gap in low-income cities, such as in sub-Saharan Africa, where there are currently very few trained planners per capita and very little data on settlement conditions for utility providers.

3.2 Schiphol Airport's Landscape-Generating Mechanism

When landscape architecture firm West 8 was asked to design [Schiphol Airport](#), the question emerged of whether it was actually possible, as the airport is literally under construction every day. No long-term plan drawing would ever be effective. Instead, West 8 developed a landscape system with four schemes for different conditions. For example, one of the schemes plants soft birches with clover groundcover on leftover, open areas such as along roads. With this mechanism, the airport's landscape budget was halved and the need for coordination meetings between the planners and maintenance staff was eliminated.

An important inspiration for barefoot planning is how the responsibility for a complex and dynamic landscape was decentralized to the practitioners on the ground who apply a simple set of rules to create an emergent system. While appreciating that urban environments are more complex and require more nuanced solutions than an airport, the development of simple rules and decentralization of authority are important inspirations for the barefoot planning model.

3.3 Cooperative Co-development Between Informal Communities and Municipalities

While in many cities the dynamic between municipal authorities and slum populations is confrontational, there are many examples of more positive relationships. While examples exist around the world, some of the most successful models come from Southeast Asia. The [Community Organizations Development Institute](#) in Thailand demonstrates how government financing for basic services and infrastructure combined with facilitated bottom-up resident-driven planning processes can be used to re-develop slum communities in an inclusive manner. Similarly, the interface between the neighborhood (kampung) leadership and the government in [Surabaya, Indonesia](#), allows for self-built neighborhoods that do not comply with conventional regulations to upgrade with municipal infrastructure.

These models draw on common elements that include the use of government-financed infrastructure as an incentive for upgrading of existing residential occupation; a strong emphasis on community mobilization, negotiation, and consensus-building; and built-in flexibility in the application of rules and regulations, particularly around zoning and land use.

3.4 Infrastructure Extension as a Planning Approach

While the Nairobi Integrated Development Master Plan is so complex that implementation had barely begun over [four years after finalization](#), the [Ethiopia Urban Expansion Initiative](#) is a simple mechanism that was able to be deployed by regional practitioners. The initiative uses a 1-by-1 kilometer grid of 30-meter wide arterial roads around the periphery of expanding cities. This grid was implemented while the land was still inexpensive and before other land uses could be established that would interrupt the pattern. The directness and decentralized nature of the approach empowered local planners who had previously struggled to create long-term plans as it allows most decisions to be taken without resorting to higher government offices or external consultants. Bottlenecks of this approach have been the upfront cost of the infrastructure, a government-led approach to housing design and construction, and the lack of well-designed public spaces in some locations. Despite these drawbacks, the approach to planning leveraged by the Ethiopian Urban Expansion Initiative is rooted firmly in the realm of the possible (whereas the Nairobi plan is a master class in isomorphic mimicry that prioritizes form over function).

Sites and services, another approach to leading with infrastructure, is effectively a top-down planning model that allows for bottom-up construction within a planned subdivision. While it has been successful in delivering small amounts of moderately affordable developable land, it is inherently a one-off approach to delivering housing that is driven by central command and not a market-based mechanism. In [Tanzania](#) and [India](#), individual projects were successful, but the model has proven to be unsuccessful in preventing informal settlements due to scale limitations. While sites and services may offer a partial solution in some contexts, when cities of the Global South are growing rapidly, it is rare for pre-planned and pre-installed infrastructure to keep pace with the fluidity and rapidity of emerging settlements.

Barefoot planning incorporates the effective elements of these models in thinking ahead about urban growth on a grid while also devising ways to create a system for the effective and decentralized provision of other public spaces. It also incorporates a leaner approach to infrastructure for “just-in-time” deployment rather than massive capital outlays years in advance of development. Barefoot planning thereby extends past the limitations of a top-down plan by allowing neighborhoods to achieve market fit regardless of how rapid urbanization proceeds.

3.5 Crowdsourced Urban Data

Remote monitoring and user-generated data have the power to create faster feedback cycles. Frequently updated satellite imagery is used by analysts at [Orbital Insight](#), [Global Forest Watch](#), and [Google AI Maps](#). Programs like [Humanitarian OpenStreetMap](#) and [Dar Ramani Huria](#) employ field workers with basic training to map informal settlements, including the location of public amenities. In other models, it is the residents of informal settlements (or urban residents in general) that take the lead in generating and updating data, which gives them more power over the use of the data. Examples include work by [Centre for Urban and Regional Excellence](#) and [Transparent Chennai](#) in India, [Spatial Collective](#)’s work on different types of data across sub-Saharan Africa, and Slumdweller International’s [Know your City](#) initiative.



Photo by David Luswata, Humanitarian OpenStreetMap Team, Botswana
Barefoot planners would be provided with GIS-based tools on mobile devices to facilitate bottom-up planning and community data generation.

Barefoot planning aims to be lighter and faster than a central (static) master plan. It can then better leverage live data to dynamically address rapid waves of development and procedurally shape neighborhoods around parameters like an optimal distribution of road widths and open space metrics. Being responsive to live data will also improve urban service performance, accountability, and transparency. Finally, the model is informed by the importance of understanding the ethics and power dynamics of urban data. The model seeks to ensure that data processes are not extractive or exclusionary but rather inclusive, empowering, and strengthen mutual accountability between residents and municipal authorities.

3.6 Soft Law

[Soft law](#) is gaining traction as an approach to regulating rapidly developing technologies. The formation of the concept introduces a pathway from adaptable guidelines to a fixed regulatory system by using several iterations and stakeholder engagement. Many cities already have some degree of soft law in the statutory authority of planning boards to make discretionary decisions regarding development applications. However, soft law principles could be more broadly applicable in city-making, especially in the case of rapid urbanization. To effectively take root in low-income countries that often lack the capabilities of their high-income counterparts, soft law may need to be paired with a [try, learn, adapt](#) approach to building institutional capacity.

The barefoot planning mechanism relies on the application of finely tuned parameters throughout the development process in order to arrive at a high-performing urban form. These parameters will have to be adjusted from context to context and as a city grows by orders of magnitude. More is different: an adult is not a scaled-up infant and a metropolis is not a scaled-up village.

3.7 Urban Land Market Reform

One of the biggest barriers preventing investment into low-income cities is [the lack of a formal land market](#). Charter cities and reform zones would be well-positioned to establish a functional market, including providing security of tenure to low-income residents. Addressability and ownership can be a win-win for both city managers and residents who are escaping poverty and seeking housing security.

While focusing on just land titling in the manner of Hernando de Soto has a mixed track record of both [successes and failures](#) for existing urban and rural residents, the barefoot planning model takes establishing a land market within urban expansion areas as a fundamental principle. The model offers self-built communities incentives to collaboratively participate in land registration beyond the security of tenure, most notably subsidized connections to utilities. By using these carrots, the model generates an effective cadastre registration system, property taxation, nuisance avoidance, and provision of rights-of-way. Depending on the context, the barefoot planning model may also provide a spectrum of land occupancy and use rights in order to create ongoing incentives for compliance with minimum standards and to discourage exclusionary tendencies that have emerged in some informal settlements (particularly absentee landlordism, slum-lordism, and criminal syndicates).

4. The Model in Theory and Practice

4.1 Assumptions

The model is focused on the planning and development of de novo neighborhoods with two major assumptions. First, the city will have authority over urban planning regulations and policies including land use, transportation, and taxation (among others). Second, the city will be growing rapidly due to economic opportunity within the region and the new residents will have a wide range of incomes and educational backgrounds, including the “poorest of the poor.” Reform zones on the periphery of existing cities or new charter cities could meet these requirements. While the approach presented here can also be applied in existing (non-de novo) settlements, certain adjustments would be needed to take into account the greater constraints in those contexts.

4.2 Theory

The two main goals are for (i) urban managers to efficiently provide basic services, including roads, education, security, health care, waste disposal, water provision, power, and public lighting; and (ii) urban residents to achieve secure, affordable, and decent standards of housing and communities with increasing levels of social and economic capital. Barefoot planning aims to accomplish this without a central master plan, thereby enabling locally-adapted, creative, and cost-effective shelter construction and community organization.

Within the barefoot planners model, households, businesses, and communities have the agency to self-organize based on their needs. And, in that process, interface with a barefoot planner with a series of conditional mechanisms like those used at Schiphol Airport that nudge communities towards a preferred urban development pattern with infrastructure provision incentives. By not applying a fixed urban plan or static regulations for what happens on the private land, this approach allows for a wider diversity in lot sizes that can meet the needs of the community and more efficiently conform to the context’s topography while still having a mechanism to ensure public right-of-way and other public amenities.



Photo by Sila Alici, Humanitarian OpenStreetMap Team, Tanzania

Within the barefoot planners model, households, businesses, and communities have the agency to self-organize based on their needs.

Achieving both a pro-poor and pro-social urban structure in the absence of a master plan is managed by incentivizing the community to establish public commons, including rights-of-way, with subsidized connections to public utilities. The subsidy should be priced to be competitive with self-supply and adjusted to encourage compact growth rather than far-flung disconnected settlements. Additional incentives may take the form of incremental formal recognition of land occupancy and use, culminating in full land tenure. This incremental recognition may be conditioned on various factors including continuing compliance with public commons land use, as well as other indicators designed to build inclusive and dynamic communities including, for example, length of occupancy, limits on the proportion of renters, community inclusion criteria, and pre-specified development levels. As any single criteria can create perverse incentives, care will need to be taken in devising these criteria as a package that takes into account local socio-economic and cultural factors, and these should be devised and agreed upon jointly between community members and the city.

The model expects that there will be vast differences between communities, stages of development, and inhabitants' needs and abilities to pay for city services. As such, an important characteristic of the model is the flexibility to provide an adjustable spectrum of options to residents. At the most basic, a 3-meter wide footpath, shared water tap, shared power bank, and other amenities that at a minimum meet the [SPHERE Standards](#) could be all that is possible to support initially given the neighborhood's income. The model should also be able to meet the needs at the other end of the spectrum, providing rights-of-way with complete streets and individual connections to power, water, sewer, and telecom where there is demand from businesses or residents.

4.3 A Practical Example

This illustrative example shows how the model might be applied in a rapidly growing city:

1. The municipality or charter city administration partners with local NGOs, residents' associations, universities, or other similar institutions to identify candidates for the barefoot planner cadre. These cadres receive a short training in various disciplines as well as in the use of mobile technology solutions and ideally participate in existing barefoot planning sessions with existing communities to gain on-the-job experience. Barefoot planners would receive a stipend from the municipality for their work, which could be full-time or part-time depending on the needs and context.
2. A patch of land on the current outskirts of the city is starting to attract people due to the availability of a nearby road providing access to areas with employment. A few dozen families have already arrived and have constructed temporary basic shacks.
3. The city administration assigns a barefoot planner to the zone. The barefoot planner goes to meet with the newly arrived occupants on-site to explain the basic tenets of the approach, outlining the benefits to them in terms of tenure security, access to services, and subsidized connection to basic infrastructure. They also explain the commitments, requirements, and responsibilities that will need to be fulfilled, as well as share examples of other communities that have done this. If feasible, residents of this newly emergent settlement are invited to visit an existing settlement that has successfully applied the approach to learn from their experience. Seeing is believing, whether a demonstration farm project or the creation of up-and-coming communities.
4. In a series of follow-up visits, residents and planners work together using a satellite map of the area with a regular grid superimposed to mark out existing shacks, facilities, and natural elements. Then they block out parcels based on existing occupation (with adjustments as needed) following the soft law approach to a set of guidelines—including rights-of-way and future public facilities (daycares, schools, clinics, water supply, sewer connection, waste disposal, cobblestone paving of the street)—to be committed by the city administration subject to the community fulfilling certain criteria such as a population threshold and continued avoidance of building in established public areas. This process continues as newly arrived residents are incorporated into the scheme. The plans/maps are updated dynamically and can be checked by more formally trained urban planners, engineers, and other municipal authorities if and when required for more complex infrastructure issues. The first line of defence against informal settlements, including squatting in identified public rights-of-way, would be community self-regulation as the infrastructure connection subsidies would be contingent upon following the agreed-upon land use map.
5. Inhabitants registered on the land grid accrue rights to ownership and uses over time (such as the right to let or sublet) and with increased investment. Land registration is linked to a digital identification system that the city uses to also track utility fees and payments.
6. The city grows over time, and the land that the low-income settlement is on becomes more valuable as the cumulative number of employment opportunities and amenities accessible from the neighborhood increases. The residents are able to respond to this market pressure through a formal land market tied to the regular grid that has clear ownership definitions and geometric properties that facilitate consolidation of the initial settlers' modestly-sized parcels. Regulations may be in place that have incentives for new higher-density construction by the community themselves (similar to [Shenzhen's urban villages](#)) or outside developers to maintain the community fabric by requiring that opportunities be offered to the existing residents.
7. The neighborhood redevelops over time and the barefoot planner incrementally shifts their emphasis from planning expansion areas to effective management of urban services and infrastructure, serving as an interface between the community and municipal service providers. In this they are aided by the community-generated data on service quality and functionality, ensuring that any issues are promptly addressed by both users and service providers.

5. Next Steps



There are several avenues that could be taken to get to a pilot program, including reform zones within rapidly-growing existing cities or within de novo charter cities. With sufficient lead time, we would take the opportunity to develop a regulatory framework with input from relevant experts, an empirical study of urban performance to derive parameters, and participatory input from individuals in the expected demographic profile of the new urban area. We would also use the lead time to devise a training curriculum for barefoot planners and address the technology platform and land rights configuration. Alternatively, in the case that an area is already being overwhelmed by informal settlements, we would work with the municipal administration to pilot through practice, developing the model in an iterative fashion during implementation.

We believe this model holds a lot of promise for getting ahead of slum development in rapidly urbanizing areas over the next 50 years. Get in touch and we'll talk about your city.

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