Expansion of Global Urbanization: Investigating Land Markets, Land Values, and the Automatic Identification of Subdivided Land

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1. SUMMARY

This paper builds on the 2024 report of the Land Tenure Committee—co-chaired by the French Development Agency and the Ministry of Europe and Foreign Affairs—which examines land-use change in the Global South under rapid urbanization. Urban expansion now extends far beyond builtup areas, as rural land is subdivided into small plots that leave agriculture but remain often undeveloped—so-called "latent urban lands." These plots represent a critical yet largely overlooked stage in contemporary urban growth.

Combining spatial analysis and AI-based plot detection (led by IGN–France International) with ethnographic fieldwork and cadastral and land registry analysis (led by IRD – the French National Research Institute for Sustainable Development), the study both qualifies and quantifies this phenomenon. Findings show that conventional estimates of urbanization significantly underestimate the scale of residential land conversion. Fallow plots signal not only agricultural decline but also substantial latent housing potential. Increasingly, land is acquired not only for construction but also as a means to store value, protect capital, and secure access to finance.

Recognizing the role of latent urban land is essential for anticipating trajectories of urban growth and informing more sustainable planning and land governance strategies.

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2. Introduction

Urbanization today extends far beyond the boundaries of built-up areas. In many regions of the Global South, vast rural territories are being subdivided into small individual plots that leave agricultural use but remain unbuilt for long periods. This process is largely invisible in conventional measurements of urbanization that focus on the extension of built-up areas.

This collective research seeks to more comprehensively document and quantify this phenomenon through an integrated approach that combines spatial analysis, automated parcel detection using remote sensing and artificial intelligence, and the study of land markets via ethnographic fieldwork alongside quantitative analysis of cadastral maps and land registry databases.

We argue that current estimates of urban expansion significantly underestimate the extent of residential land conversion. Fallow or undeveloped land emerges as a crucial indicator of both agricultural decline and the latent potential for future housing developments, calling for renewed attention to the socio-economic and environmental implications of speculative land subdivision.

3. Context

This paper follows up on the research that we presented at the 2024 World Bank Land Conference, where we introduced a report published by the Land Tenure and Development Technical Committee, chaired by the French Development Agency (AFD) and the French Ministry of Europe and Foreign Affairs (Bon et al., 2023). That report was co-authored by a multidisciplinary team of researchers in geography, economic anthropology, demography, and urban planning.
This report considers the ways in which land use is changing in the global South, linked to urbanization. Land commodification has become a fundamental driving force of urban expansion and economic growth but much of the data do not capture the diverse processes at work. Land commodification is not the preserve of institutional actors or private investors with well-established resources. It concerns more modest forms of investment in micro-parcels of land involving actors with much lower capital endowments.

Land is acquired not only for building something through real estate or self-build houses but becomes for all a reserve for protecting capital and a means of accessing money.
The report is accessible online:

https://www.foncier-developpement.fr/wp-content/uploads/Ordinary-changes-in-landuse_WEB.pdf

Building on that previous work, this new contribution deepens the analysis by focusing on a major yet still under-documented phenomenon: the massive subdivision of rural land into small individual plots that exit agricultural use but remain unbuilt for long periods. These "latent urban lands" represent a critical stage in the expansion of urbanization that is often overlooked in conventional metrics.

By combining spatial analysis, automatic parcel identification through remote sensing and AI techniques, and field investigations into land markets and property values, this research highlights the extent to which current measurements of urban growth underestimate the true dynamics of urban land conversion.
We argue that fallow or undeveloped plots emerge as key indicators of both agricultural decline and the speculative expectations that underpin future housing developments. Understanding these dynamics is essential for rethinking land policy frameworks, urban planning instruments, and the management of peri-urban transformations in fast-growing regions.

4. Background and Key Findings from the Previous Report

Two major findings emerged from the report presented at the 2024 World Bank Land Conference. Despite widely differing national and regional contexts, striking similarities can be observed in landscape transformations: the massive subdivision of rural land into small individual plots.

First finding:

Existing research has largely focused on large-scale projects—special economic zones, new towns, and infrastructure corridors—often linked to expropriation and large land acquisitions by transnational investors. Yet, urban land production is often incremental and locally driven, involving diverse actors - landholders, developers, local investors, cooperatives, and households – whose access to capital and strategies differ. These actors secure or enhance their assets through property mortgages, resale after varying holding periods, or construction projects on their plots aimed at long term household stability. Such dynamics highlight the complexity of local land markets, which require fine-grained, context-specific analysis.

Second finding:

Rural land is being subdivided into individual plots that, in many cases, remain unbuilt for extended periods. These subdivisions often take years to materialize, resulting in a landscape of long-term fallow or plots that are merely fenced and provided with access roads subject to repeated market transactions. Some retain residual agricultural or grazing uses, and occasionally, boreholes are drilled for small-scale water sales. Yet these are temporary arrangements: the plots remain "in waiting,"

ready to be built upon or valorized through self-construction or real estate promotion. They represent a latent form of urbanization, a dynamic potential rather than a fixed state, shaped by

the absence - sometimes prolonged - of construction, productive agriculture, or integration into formal planning and land tenure frameworks.

While the magnitude and modalities of urban sprawl in the Global South have been widely studied, current **measurements of global urbanization based solely on built-up expansion significantly underestimate the impact of residential land conversion**. **This urban perspective - driven as much by individual households as by speculative investors - produces vast areas of fallow land that are withdrawn from intensive agriculture, grazing, or natural ecosystems such as forests and wetlands, without immediately resulting in built-up development**. This generates barren spaces that no longer contribute to the territory's productive dynamics and are diverted from their original purpose.

5. Continuation and Deepening of Previous Work

This new paper extends and deepens the reflections through two complementary research initiatives:

• The **METROLAND Research Program** – *Commodifying Land: Capital, Inequalities and Conflicts in Sub-Saharan African Metropolitan Peripheries* – **funded by the French National Research Agency (ANR)**. Partners include the French National Research Institute for Sustainable Development (IRD), Gustave Eiffel University (Paris, France), Cheikh Anta Diop University (Dakar, Senegal), University of Social Sciences (Bamako, Mali), and Kenyatta University (Nairobi, Kenya).

• A research project initiated by **IGN France International** in collaboration with IRD, aims at developing automated methods for the detection and monitoring of land subdivisions in African metropolitan peripheries. IGN France International (IGN FI) is the international branch of France's national mapping agency, providing expertise in geospatial data, mapping, and geographic information systems worldwide.

6. Research Focus

Our paper explores contemporary urbanization dynamics through the lens of land markets and land use changes in metropolitan peripheries. It focuses on three interrelated dimensions of change:

1. Changes in property ownership – the shift toward more individualized land rights and the

gradual registration of titles, calling for a sociological understanding of property and tenure transitions.

2. Changes in land use – the economic valorization of land through self-construction, real-estate promotion, or, conversely, its withdrawal from agriculture without immediate construction, resulting in long-term fallow plots.

3. Changes in land size and configuration – the fragmentation of rural holdings into smaller residential parcels that often enter chains of transactions before being built upon.

By reconstructing the chronology of these conversion processes - changes in ownership, title acquisition, land transactions, subdivision, and eventual development or prolonged fallow – the research highlights the complex temporalities that structure peri-urban growth in African cities and South Asia.

Local and national authorities require effective tools to measure, visualize, anticipate, and mitigate both the visible and the less visible impacts of urban sprawl. This research also examines the potential of developing automated or semi-automated solutions to identify land subdivisions and speculative vacant plots in peri-urban areas. These technical solutions will be informed and enriched by expertise on land-market dynamics and political contexts, drawing on national datasets. The objective is to provide public decision-makers with relevant, timely indicators and high-resolution data, fostering a deeper understanding of urban expansion dynamics and enabling more sustainable and inclusive territorial planning.

7. Land as Capital and Monetary Substitute

Beyond its residential function, land plays multiple economic roles. It operates as a form of savings, a guarantee for access to credit, and a substitute currency in contexts characterized by liquidity shortages and economic uncertainty. In West and East African contexts, where traditional forms of wealth accumulation (such as gold or livestock) remain embedded in kinship networks, land has increasingly become a reserve currency for commercial activities - supporting credit access, enabling the rebuilding of stock, and serving as an alternative means of payment in times of financial instability.

This research therefore investigates the financial circuits linked to land ownership and their contribution to urbanization dynamics and local urban economies.

8. Methodological Advances

This new presentation focuses on methodological advances achieved in measuring and characterizing this under-documented form of urbanization.

The study first combines **longitudinal approaches - both quantitative and qualitative - to capture the temporal dynamics of land subdivision, property transactions, and land-use conversion**.

These analyses rely on original datasets.

Ethnographic surveys have been conducted since 2020 in the selected study sites on the urban peripheries of Dakar, Bamako, Nairobi, Porto-Novo, and several Indian cities.

For some of our study sites, we had access to **original databases compiled from land registries and cadastral data**.

The land registries contain information on the subdivisions of mother titles (the original land titles), their creation dates, the names and socio-professional categories of the owners of both the mother titles and the subdivided parcel titles, as well as any credits attached to these titles.

The cadastral data have been digitized, along with the information contained in the maps indicating the creation dates of mother titles and the dates of subdivision into parcel titles.

These data allow for long-term measurements of rural areas thus subdivided, the establishment of chronological milestones (when land subdivisions occurred), the volume of titled parcels created, and finer economic categorization of the actors involved in these transactions and the use of land titles as collateral for accessing credit.

In addition, **the project integrates remote sensing and artificial intelligence methods**, **developed by IGN France International**, **to automatically identify and monitor land subdivision patterns in peri-urban areas**. It introduces a machine-learning-based approach for the automatic identification of land subdivision in peri-urban areas of African cities with populations above 500,000, using high resolution satellite imagery. This technique aims to measure and map the extent of latent urbanization - large areas subdivided and withdrawn from agriculture but not yet built up - currently overlooked in most global urbanization metrics.

By combining these methodological approaches, the research provides new tools for assessing the true magnitude of urban expansion processes that remain invisible in conventional built-up area metrics.

It aims to define key indicators that will strengthen the implementation of several Sustainable Development Goals (SDGs 1, 2, 6, 9, and 11), and to develop a dashboard designed to assess the effectiveness of public urban planning policies. This dashboard will make it possible to monitor indicators such as urban expansion, the fragmentation of natural areas, accessibility to infrastructure, and changes in land use. Such information is crucial to support informed decision-making regarding competitiveness, environmental sustainability, land transparency, and the management of urban territories.

Policy Relevance

By combining quantitative and spatial analysis with field-based investigation, the research provides a refined understanding of land dynamics in African metropolitan peripheries.

These findings have major policy implications. Local and national authorities urgently need tools to anticipate and manage urban sprawl, improve land governance, and address the growing social and environmental risks of speculative land development. The project aims to produce robust, spatially referenced indicators that can inform policy decisions.

Indeed, the project seeks to automatically and semi-automatically detect early pre-urbanisation signals and to develop indicators that could ultimately form a dashboard for use by public authorities.

The objective is to provide decision-makers with tools they can appropriate over time.

Capturing these weak signals - although subtle, they are highly informative - makes it possible to understand what may unfold: whether they generate major urbanisation flows, trigger new urban dynamics, or accelerate or transform existing trajectories.

In this sense, the project seeks to reveal the invisible: the weak signals that nonetheless constitute relevant indicators for understanding and anticipating the driving forces behind spatial and land development, forces that shape future patterns of metropolitan growth, sometimes contradicting formal planning choices and, in the long run, potentially undermining the city's competitiveness.

The results will be made available to regional organizations such as ECOWAS, SADC, CEMAC, WAEMU, COMESA, CEN-SAD, IGAD, and the EAC. In a second phase, this methodology can be adapted to the major metropolitan areas of the continent.

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