

## How Slum Architecture Impacts Informal Entrepreneurs

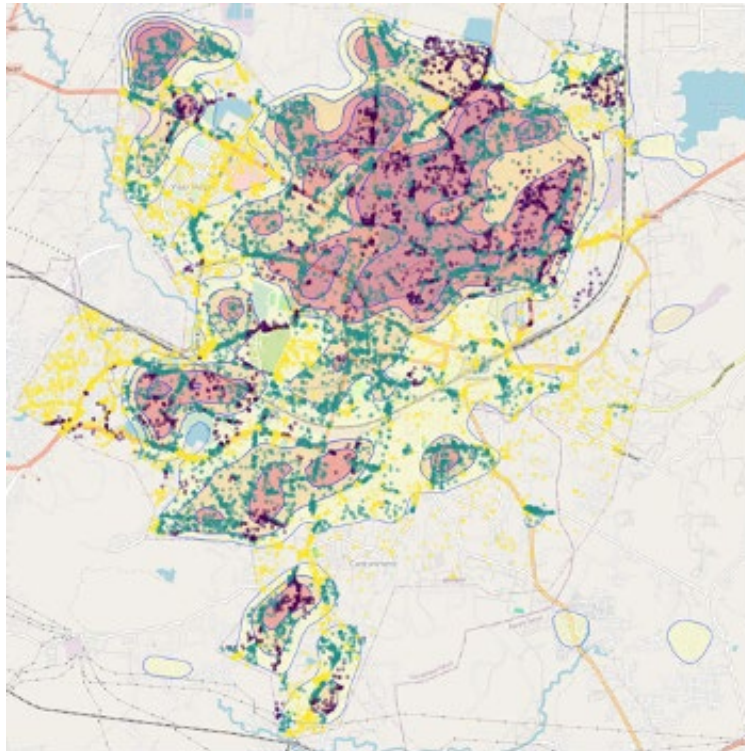
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*“Earlier we used to work from home in our village, so there were not many customers, hence we used to make less money. But now we have a shop on the roadside, so now we get more customers, and we also get customers from the neighbourhood villages.”*

– Informal Entrepreneur living in an Indian Slum (March 2024)

Over one billion people currently live in slums. With current trends for extreme poverty continually increasing, informal entrepreneurship is often the only source of income for many people living in these communities. Informal entrepreneurship refers to unregistered entrepreneurial activity. It ranges from small service provisions, such as selling food from street carts to larger retail endeavors. Although informal entrepreneurship is a key mechanism in poverty reduction in slums, governments lack accurate data on it. For example, in India – a country with one of the largest concentrations of slums globally – the government does not have statistical data on the number, location, or stage of the slum developments. Without objective and accurate data, developing policies to promote entrepreneurship to facilitate poverty reduction becomes impossible. But how can policy makers support informal entrepreneurs in slums through policies and appropriate urban planning?

To study how informal entrepreneurship evolves in slums, we first applied an AI model for analyzing images on high-resolution satellite images. This allowed us to identify detailed building outlines for around 100K buildings in the Indian city of Jabalpur. Based on certain architectural features and information on districts identified as slums by the government, we mapped former slum regions and created a map of how much slum architecture was present in different parts of the city. Using Google Places API and OpenStreetMap, we identified roughly 19K business establishments and almost 500 public institutions such as police stations, schools, and hospitals throughout the city. Finally, we identified the transit times required to travel from different city regions to these public institutions. We then tested how different building types and transit times to formal institutions affect informal entrepreneurship levels in slums.



Business establishments in slum (black), former slum (green), and non-slum (yellow) locations.

This research project is one of the first to build a comprehensive understanding of the level of informal entrepreneurship in slums and how different formal institutions support or hinder it. It becomes possible by using satellite data in combination with other data sources to develop a measure of informal entrepreneurial activity in slums. The results inform improved public policy strategies developed jointly with our Indian research partners to alleviate poverty in slums and provide guidance on how to best support the development of informal entrepreneurship in India.

Our results show a strong association between slum architecture and the density of informal entrepreneurship establishments:

- Slums and former slums had 72% and 114% more business establishments for any given km<sup>2</sup> than non-slum regions.
- Former slum regions had significantly higher densities of informal entrepreneurship establishments than current slums.
- Informal entrepreneurship is more prevalent in regions with less institutional control through the presence of police stations and more institutional support through schools, universities, and state-funded hospitals.

Modernization and the related architecture types thus lead to more informal entrepreneurial establishments. These building types started and grew with urban migration and feature for example bottom floor spaces used for retail spaces. This lowers the barriers of entry for entrepreneurial

undertakings and remains in demand and used by the local population even when regions transition from slums to former slum regions. We also find that the presence of institutional control and services strongly affects the level of informal entrepreneurial activities. Even though most entrepreneurs in India operate informally, their partially unregistered businesses remain illegal by state regulations. This explains why police control negatively affects informal entrepreneurship. Institutional support services however support economic and social improvements and thereby facilitate emerging entrepreneurship.

Overall, to facilitate economic development, decision-makers should:

- Support the preservation of buildings with bottom floor spaces, dual-purpose rooms, and vendor opportunities that promote informal entrepreneurial businesses.
- Avoid the displacement of informal businesses, which are vital economic income opportunities for slum inhabitants.
- Ensure that policing aims to support the formalization of extant informal businesses, rather than suppress their emergence.

Without these businesses, the sole viable income opportunity for slum populations is eradicated. Future initiatives should therefore recognize and support the invaluable contributions informal establishments make to poverty alleviation and the improvement of livelihoods in former and current slum areas.

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