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India's Emergent Urban Formations

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This article reports on a research project on urbanizing India with a bearing on core theoretical and methodological debates in urban studies. These debates refer to the conceptualization and "measurement" of what is urban, the relationship between urbanization and economic development, and the possibilities of comparative urbanism. Our empirical focus is not on India's major cities but on the rural–urban transition where geographically dispersed urban formations are taking shape. The analysis is based on detailed census and other government data in combination with observations from two extended periods of fieldwork in northeastern India. We outline evidence of substantial urban growth at the rural–urban transition, growth that has thus far largely gone unnoticed because of deficient measurement and limited conceptualizations of what constitutes the urban. We present our ideas and hypotheses on these emergent urban formations, along with a methodology that combines observations "from above" and "from below." This research at the proverbial edges of the discipline, we argue, is highly relevant to the theoretical debates that are at its core. *Key Words: emergent urban formations, India, rural–urban transition, urbanization, urban theory.*

本文报导一个有关印度城市化的研究计画，并涉及城市研究中的核心理论与方法论辩论。这些辩论指涉何谓城市的概念化与"测量"、城市化与经济发展之间的关系，以及比较城市主义的可能性。我们的经验焦点并非印度的主要城市，而是在地理上分散的城市形成过程所发生的城乡变迁。该分析是根据详细的人口普查以及其他政府数据，并结合在印度东北部的两段长期田野工作之观察。我们概述城乡变迁中的显着城市成长之证据，该成长因不充分的测量和有关什麼构成城市的有限理论化而大幅受到忽略。我们呈现有关这些浮现中的城市形成之概念与假设，以及结合"由上而下"和"由下而上"的观察之方法论。我们主张，本研究虽位于领域众所週知的边缘，却与位于其核心的理论辩论高度相关。*关键词：浮现的城市形成，印度，城乡变迁，城市化，城市理论。*

Este artículo informa sobre un proyecto de investigación relacionado con la urbanización de la India, con interés particular en los debates teóricos y metodológicos de los estudios urbanos. Estos debates se refieren a la conceptualización y "medición" de lo que se entiende por urbano, la relación que existe entre urbanización y desarrollo económico, y las posibilidades del urbanismo comparativo. Nuestro foco empírico no se ubica en las principales ciudades de la India, sino en la transición rural–urbana donde están apareciendo formaciones urbanas geográficamente dispersas. El análisis está basado en datos censales detallados y otros datos gubernamentales combinados con observaciones de dos períodos extendidos de trabajo de campo en el nordeste de aquel país. Resumimos la evidencia de un sustancial crecimiento urbano en la transición de lo rural a lo urbano, crecimiento que hasta el momento ha pasado desapercibido debido a la deficiente medición y conceptualizaciones limitadas sobre qué constituye lo urbano. Presentamos nuestras ideas e hipótesis sobre estas formaciones urbanas emergentes, junto con una metodología que combina las observaciones hechas "desde arriba" y "desde abajo". Sostenemos que esta investigación, realizada en los bordes proverbiales de la disciplina, es altamente relevante en los debates teóricos que se desenvuelven en su núcleo. *Palabras clave: formaciones urbanas emergentes, India, teoría urbana, transición rural–urbana, urbanización.*

This article reports on a research project on emergent urban formations in India with a bearing on core theoretical debates in urban studies: how we define the urban and urbanization, how we "measure" and identify urban growth, how we conceive of the relationship between

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urbanization and economic development, whether urban theory is portable and applicable in diverse geographical-historical contexts, and how comparative urbanism could offer a way forward.

The empirical focus of the article is away from the major cities, on the lower echelons of the urban system, where new urban formations are taking shape. We present evidence of substantial growth at the rural–urban transition that has thus far largely gone unnoticed and that is poorly understood. We link this to the conceptual challenges facing urban theory and the measurement of urbanization. We outline our approach to this problem and advocate an extended research agenda that is particularly relevant to how we understand urbanization in the South Asia region and perhaps elsewhere in the Global South.

Over the past decades, many governments in the Global South have pushed national urban policies because of the presumed positive economic and societal effects traditionally associated with urban growth.[1] These national urban policies have become standard practice (in a declaratory sense at least) but they tend to be based on shaky premises of how urbanization unfolds and poor urban data and are in some ways missing out on ground realities. Predictions about future urban growth by the United Nations and other agencies and national governments are equally questionable (Cohen 2004; Satterthwaite 2010; Melchiorri et al. 2018).

We can estimate that, in India alone, hundreds of millions of people are eking out a living at the rural–urban transition, seeking to shift their livelihoods out of agriculture and into "urban"-based occupations due to agrarian distress or to improve their well-being. Existing evidence suggests that they are not involved in one-way migration to the big cities but that the transformation is taking shape locally, more in situ. We know little about these circumstances: the nature, precariousness, or sustainability of these new livelihoods and people's living conditions; as we demonstrate, it is unclear how and to what extent this transformation aligns with prevailing theory on urbanization.

In this article, we provide a critical reading of Indian census and other government data and draw on our own fieldwork in northeastern India (West Bengal and Bihar), conducted from February to April 2017 and February to May 2018. We built a geographic information system (GIS) of West Bengal and Bihar that tracks the emergence of so-called new census towns (CTs) and links the 80,000 administrative census units of these two states with primary census data on population size, population density, and nonfarm employment structures. Our empirical analysis builds on recent research in India on the rapid growth of these new CTs: small settlements at the bottom of India's urban hierarchy that conform to the country's threefold urban definition: population size, density, and nonagrarian employment structures (e.g., Denis and Zérah 2017; Pradhan 2017; Jain 2018; S. N. Roy and Pradhan 2018).

The next section provides a discussion of India's urbanization "puzzle": According to official statistics, India's urban population share is very low and, in the past decades, urbanization growth rates have actually declined. This occurred at the same time that economic growth rapidly increased and, as such, it presents a reversed pattern of the urbanization experiences in North America, Western Europe, and East Asia. This "riddle" is relevant because it suggests that we could be misreading India's urbanization levels and that transformations that are occurring at the rural– urban transition go unseen and unreported in census data. It is also relevant to present-day core theoretical debates in urban studies, and these are reviewed. We then present an alternative theoretical framework, one that is sensitive to the Indian context but that retains some fundamental tenets of existing urban theory, particularly in its spatial dimensions. We then lay out our empirical analyses: a critical deciphering of Indian census data complemented with our own observations in West Bengal and Bihar. In the process, we present a methodological approach ("from above and below") and research agenda that we think is particularly suitable to this research. Finally, we circle back to the theoretical debates and present a preliminary typology of India's emergent urban formations. In the conclusions, we highlight the relevance of this research beyond India, particularly for other parts of the Global South.

India's Urbanization Riddle

Contrary to common suggestions in the media that tend to focus on large absolute numbers related to India's megacities, the country's officially recorded urbanization level is actually quite low,

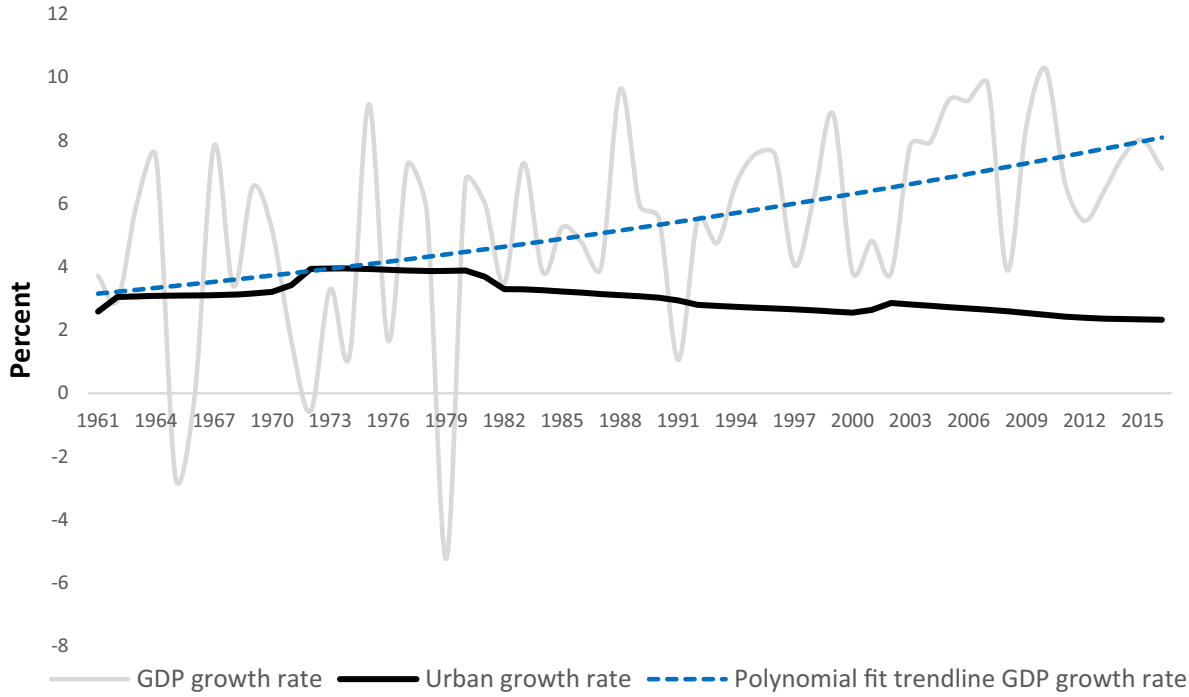

Figure 1. India's economic growth rate (actual annual figures), moving average (GDP growth at constant prices), and urban growth rate. GDP = gross domestic product. *Source:* Indian Census (2011); World Bank (2017, 2018). (Color figure available online.)

reported around just 32 percent. This is far behind China's 52 percent and even behind Africa's 40 percent (United Nations [UN] 2014). Moreover, during the last few decades, urban growth rates have actually declined, and they have done so despite accelerating economic growth. Since the 1980s, rates of urban growth and economic growth have diverged (see Figure 1). This is contrary to conventional understanding in which higher levels of economic growth originate in labor movement from lower to higher productivity economic activities, where more productive activities are primarily urban based. In other words, economic growth and urban growth are expected to move in tandem, as has been the historical experience in North America and Western Europe and also more recently in East Asia (Japan, South Korea, Taiwan, and China).

This slow urban growth and apparent "decoupling" of urban and economic trends in India led the World Bank (2013) to observe that "India's [economic] growth without significant urbanization poses a major puzzle" (23). It is a problem that begs attention, not just to understand developments in India but also to ascertain the implications for urban theory. We suggest there are two complementary explanations to the puzzle. The first accepts, at least partially, the validity of India's official urban growth statistics and seeks to explain them; the second questions the full validity of the measurements and argues that part of India's urbanization goes unseen and unreported with existing measurements. The latter argument gives way to an alternative approach to research on Indian urbanization, as we elaborate in most of the rest of this article.

First, though, let us summarize the explanation that takes the official urbanization statistics at face value. We can understand India's relatively slow urban growth in view of its particular urban economy, which is increasingly capital intensive and labor extensive. As such, it does not generate sufficient urban employment and hampers urban population growth (Chandrasekhar 2017). The World Bank (2013) estimates that, between 1993 and 2006, the seven biggest metro areas in India failed to increase their overall shares in national employment. The rapid rise of India's urban-based information technology (IT) sector is known for its relatively minor contribution to overall employment (Luce 2006).[2] Indeed, recent developments suggest that the IT industry has even begun laying off substantial numbers of workers due to advanced automation ("IT Sector" 2017; "Just the Job" 2017; Bhagat 2018). IT contributes substantially to economic

growth, but its employment contribution is only minor.

The manufacturing sector was essential in the urbanization experience of western countries of East Asia but it is far less significant in India's economy. Kannan and Raveendran (2009) showed that the urban-based organized manufacturing sector did not contribute to any substantial employment growth between 1980 and 2005, even while the gross added value of manufacturing to the overall economy increased. The authors spoke of a "quarter century of jobless [economic] growth" (Kannan and Raveendran 2009, 80; see also Bhalotra 1998; Thomas 2012; Chandrasekhar 2017).

The situation could be compounded by diseconomies of scale and negative externalities that are affecting the largest cities (e.g., Tripathi and Kaur 2017; "Traffic Congestion" 2018). Negative externalities and inefficiencies are associated with excessive densities that increase the cost of doing business, such as overcrowding, rising congestion, higher labor costs, and higher costs of living (also see Turok and McGranahan 2013). Mitra (2000) showed that, in India, agglomeration economies contribute to overall productivity growth up to a certain size and density of the urban population; once these thresholds are crossed, inefficiencies and negative externalities of agglomeration start to outweigh the benefits.

At any rate, according to the Indian census, all of India's major cities have seen declining population growth rates over the past two decades. The inner areas of these agglomerations have been particularly affected (Parthasarathy 2011; Kundu and Saraswati 2012). Central districts of Delhi, Chennai, Hyderabad, Ahmedabad, and other major cities have reported the lowest population growth rates in census history (Kundu 2011), and certain parts of Mumbai and Kolkata have even begun to lose population (Shaw 2015).

The second explanation for India's urbanization riddle, and the more important one for our purpose, is that India's official statistics on urbanization are deficient and conceal some major trends. What if we fail to see India's urban growth because we are too focused on large central agglomerations when measuring and conceptualizing India's urban population? We elaborate this point later, where we argue that considerable urban growth in India goes underreported, growth that takes place at the lowest echelons of the urban system, at the rural–urban transition. We show that some of this growth is detected through the so-called new census towns, but much of it remains out of view. The reasons have to do with current measures and prevailing understanding of what constitutes urban. Before we turn to our empirical evidence, we first elaborate on this from a theoretical point of view.

Positioning Indian Urbanization in Theoretical Debates in Urban Studies

In recent years, the fields of urban studies and urban geography have been flurried by two major, interrelated, debates that are relevant to our research on emergent urban formations in India. We limit ourselves here to a concise overview. The first debate is about the global portability of urban theory and the emergent paradigm of comparative urbanism. It highlights the tensions between aims of theoretical generalization and claims of place particularity; it also concerns questions about the importance of comparative approaches in urban research. The second debate is closely associated with the first and centers on questions about what is urban and what constitutes a city, engaging notions of spatiality, agglomeration, and urbanism as a way of life.

Debates on comparative urbanism and the portability of what is mainly "Northern" urban theory reflect the influence of globalization and are inspired by renewed emphases on the particularities of place. The latter stem, at least in part, from the globalization of urban research itself and especially from growing attention to the Global South (Grant and Nijman 2002; Nijman 2007; Smith 2009; McFarlane 2010; Obeng-Odoom 2010; Robinson 2011; McFarlane and Robinson 2012; Schmid 2012; Ernstson, Lawhon, and Duminy 2014; Nijman 2015b; Peck 2015).

On the one hand, there are calls for a decentering and contextualization of urban theory that is commensurate with the increased attention to developments in a growing range of localities around the world. Parnell and Robinson (2012) posited that "the available stock of urban and planning theory is largely unsuited to help us understand and navigate the complex lived realities of citizens in the Global South" (598). In a similar vein, Sheppard, Leitner, and Maringanti (2013) advocated a "provincializing global urbanism [that] creates space from which to

challenge urban theories that treat Northern urbanization as the norm, to incorporate the expertise and perspectives of urban majorities, and to imagine and enact alternative urban futures" (893; see also A. Roy 2009; A. Roy and Ong 2011).

Others emphasized the risks of particularism, even empiricism, and a hollowing out of existing general theory. Blokland and Harding (2014) expressed apprehension about the field of urban studies becoming a "theory-free zone," and Peck (2015) deplored the theoretically averse "exceptionalism" of, for example, literatures on postcolonial cities. This debate seems to have acquired ideological overtones and, ironically, is still accompanied by a dearth of theoretically engaged comparative empirical research outside the Global North and across North and South.

These tensions around a geographic decentering of urban theory have combined with debates on the thematic essence of the field of urban studies. In a set of papers, Brenner and Schmid (2014, 2015) argued that current theory fails to recognize urbanization as a dynamic historical process that constantly produces new differentiations. Conventional definitions and measurement of "urban," they said, are "theoretically incoherent" and "empirically untenable" (Brenner and Schmid 2014, 731). They pleaded for a "new epistemology of the urban" as the world is facing new forms of urbanization that seem incompatible with inherited conceptions of the urban as a "fixed, bounded and universally generalizable settlement type. … The contemporary urban phenomenon cannot be understood as a singular condition derived from the serial replication of a specific socio-spatial condition (e.g. agglomeration) or settlement type (e.g. places with large, dense and/or heterogeneous populations) across the territory" (Brenner and Schmid 2015, 151–52).

The debate reflects unease about the essence of the field of urban studies (and, especially, it seems, urban geography). If the world at large is becoming "urban," it raises questions about what is urban and what is not; whether the urban–rural distinction has outlived its usefulness; and what the precise meaning is of ongoing processes of urbanization (for a lucid overview of the "planetary urbanization" debate, see Keil 2018). It is not void of disciplinary anxiety, either. As Walker (2015) noted, "If nothing is outside the urban, then the urban is everything; and if it is everything, it is nothing in particular and therefore not an interesting problem" (185).

The response from established urban economic theorists has been swift. Scott and Storper (2015), although acknowledging an increasingly diverse and complex urban palette, maintained as the essence of urban theory that

> all cities can be understood in terms of a theoretical framework that combines two main processes, namely, the dynamics of agglomeration/polarization, and the unfolding of an associated nexus of locations, land uses and human interactions. This same framework can be used to identify many different varieties of cities, and to distinguish intrinsically urban phenomena from the rest of social reality. (1)

Critical for our research on the emergence of new urban formations in India, this line of reasoning implies that urbanization might no longer involve neatly defined (expanding) cities but that it must entail a spatial logic that results in urbanizing areas that can be distinguished as material/empirical entities from non-urbanizing areas: "All cities consist of dense agglomerations of people and economic activities" (Scott and Storper 2015, 4; see also Scott 2011, 2017).

Spatial form is critically important to this debate but it also, naturally, involves economic and social processes.[3] Traditionally, urbanization is associated with economic growth and development (e.g., Renaud 1979; World Bank 2009). A recent UN report states, "The process of urbanization historically has been associated with other important economic and social transformations, which have brought greater geographic mobility, lower fertility, longer life expectancy and population ageing. … Urban living is associated with higher levels of literacy and education, better health, greater access to social services, and enhanced opportunities for cultural and political participation" (UN 2014, 3). The basic explanation for this positive relationship between urbanization and development lies in economies of scale, which are in turn a function of agglomeration and density (see, also, e.g., Henderson 2010). In their recent reprise on the nexus between urban and economic geography, Scott and Storper (2015) referred to the "consistently positive empirical relationship between national rates of urbanization … and GDP per capita" (6).

It is not so clear, though, whether this applies in the same way to India or other parts of the Global South. There, urban growth and economic growth appear not to necessarily move in tandem

(Figure 1). India's urbanization experience warrants close attention not just because it is itself so poorly understood but also because it forces us to consider key theoretical notions about what is urban, what constitutes a city, what drives urban growth, and how urbanization relates to economic development.

Our theoretical position recognizes the need for a "decentered planetary" urban perspective but also adheres to fundamental notions of urbanization as a process of spatial agglomeration of some sort. We acknowledge the significance of the complexity of a wide range of urban transformations, urban forms, and urban processes that do not necessarily fit existing concepts or definitions. Indeed, we argue that the transformations at India's rural–urban transition are a case in point. At the same time, our approach is guided by a basic understanding of urbanization as dynamic processes of spatial concentration and growth, or agglomeration. These processes are not necessarily uniform and they are likely to diverge in different geographical and historical contexts—but we employ the theoretical premise that they still adhere to a basic spatial logic.

An Alternative Theoretical Framework

How can we come to a theoretical understanding of what is happening at the lower echelons of India's urban hierarchy? How can the "urban" be conceptualized in a way that opens up exploration of emergent urban formations at India's rural–urban transition? This requires an open mind about the nature of these formations' spatial, economic, and social dimensions and acknowledgment that they might not conform to conventional understandings of urban form or process. At the same time, any empirical observation, even of an exploratory sort, requires some elementary conceptual guidance of what we think constitutes the urban and what defines urbanization in the broadest sense (cf. Scott 2017). In this research, we choose to build on existing urban theory rather than depart from it entirely (cf. Hassink, Klaerding, and Marques 2014).

We also find ourselves in agreement with Schmid et al. (2018), who invoked Lefebvre's notion of *transduction*. This refers to a research strategy that prioritizes a dialectical relationship between theoretical formulation and empirical observation—one that we believe is an essential disposition in all exploratory research. In the words of Lefebvre, "Transduction assumes an incessant feedback between the conceptual framework used and empirical observations" (Lefebvre, as cited in Schmid et al. 2018).

Accordingly, our approach is guided by the following basic theoretical premises:

- Urbanization involves a shift from the primary sector (especially agriculture) to economic activities in the secondary and tertiary sectors, activities that rely on spatial proximity.
- Urbanization involves some form of economic (spatial) agglomeration and population concentration, with the latter closely related to employment conditions.
- In the absence of significant increases in urban employment opportunities (as in India), overall urbanization is likely to be relatively restrained. Importantly, if combined with rapid decreases in agricultural employment, this can give way to alternative spatial urban formations that are more dispersed, organized around a relatively large number of relatively small urban centers in predominantly rural areas.
- The notion of the rural–urban transition, as a process, refers to a shift from rural to urban economic activity, livelihoods, and lifestyles, and accompanying changes in social organization. It is far from a neat shift from one social order (rural) to the next (urban). It can be a messy, fragmented, and intricate process that combines historical continuity and change. Although livelihoods at the rural–urban transition are shifting, they are also complex and can be multisectoral and multilocational; farming and other agrarian work can possibly still remain a substantial (but declining) part of a household's livelihood portfolio. Agrarian work at the rural–urban transition can be a fallback option for household members or additional source of household income to secure a sustainable livelihood at the rural–urban transition.
- The rural–urban transition is also used as a regional descriptor to refer to the physical spaces in which these transformations unfold. It signifies both wide-ranging social transformation and a reconfiguration of space, with complex spatial signatures.
- Socially, this dispersed urbanization likely involves (potentially) significant transformations in terms of class, communal identity (and caste), gender, spatial mobility, and social mobility. These transformations, however, do not necessarily conform to conventional (Northern) definitions of urbanization.
- The notion of in situ urbanization is key to the rural–urban transition and refers to (incipient) urban growth that is generated locally; that is, it is not urban growth associated with spillover from existing

central agglomerations or suburbanization. In situ urban growth can be typical of dispersed urbanization in hitherto rural areas.

- In general, urbanization processes unfold at multiple scales. In the case of India's emergent urban formations at the rural–urban transition, it is important to understand local drivers of growth; the possibility of polycentrism within emerging formations; the possibility of amalgamation of various dispersed, small-scale growth centers; and the wider regional context (e.g., connections to larger existing agglomerations) that conditions urban growth.

In the next two sections, we employ this conceptual framework to reinterpret India's urbanization.

Deciphering the Indian Census: Empirical Observations

There is considerable evidence that India is experiencing urbanization at the lower echelons of the urban hierarchy but only part of this is reflected in official statistics. According to conventional measures, India's urban population increased by 91 million people between 2001 and 2011, and about a third of this growth (30 million people) is attributed to the emergence of more than 2,500 new CTs. CTs are small settlements at the bottom of India's urban hierarchy that conform to the country's threefold urban definition: they have at least 5,000 inhabitants and a minimum density of 400 people per square kilometer and at least 75 percent of the male workforce is engaged in nonfarm work. New CTs are settlements that meet these three criteria for the first time.

Figure 2 shows the development in the total number of CTs based on the censuses from 1961 to 2011. Nationwide, in the last decade, the total number of CTs jumped to 3,894, a clear break from the past. Regional variations across India in the emergence of CTs are considerable. West Bengal was among the states with the highest absolute increases: There, the number of CTs went from 300 to 800, accounting for approximately 70 percent of the state's officially recorded total urban growth. In contrast, the state of Bihar showed little absolute CT growth, with sixty CTs in 2011.

To evaluate these census numbers, to better understand the spatiality of these smaller urbanizing environs, and to study the differences in the emergence of CTs between states, we constructed a GIS

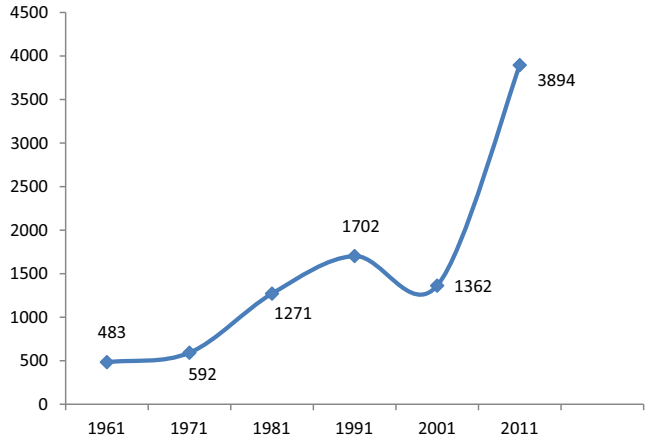

Figure 2. Number of census towns recorded in each Indian census from 1961 to 2011. *Source:* Indian census (2011, n.d.). (Color figure available online.)

of West Bengal and Bihar. The GIS incorporates data on old and new CTs (before and after 2001) in the context of these states' overall regional urban systems, main highways, and administrative structures. As far as we know, it is the first GIS of its kind. The GIS of West Bengal includes all 41,131 administrative census units (denoted as towns/villages) of the state, which we linked up with boundary files and historical data on population size, population density, and nonagrarian employment structure per unit. The data are compiled from the Indian census, Primary Census Abstract Data Tables (PCA) and extracted from West Bengal's nineteen District Census Handbooks. Data on population size and density per administrative unit are given in the population enumeration data, but nonagrarian employment structures had to be calculated separately.[4] Country-, state-, and district-level boundary files were acquired via the open Database of Global Administrative Areas (GADM). Boundary files for microcensus units were provided by the Centre National de la Recherche Scientifique (CNRS).[5] The GIS of Bihar is built in a similar way but is even more intricate due to the size of the state and administrative divisions (Bihar has thirty-eight districts and 45,073 administrative census units).

The GIS allows us to pinpoint and examine the locations of old (2001) and new (2011) CTs in their geographical contexts and in relation to demographic and economic developments in their surroundings; that is, across administrative boundaries. It allows investigation of the possible amalgamation with other CTs or "rural" villages (with high

nonfarm employment structures) and the influence of administrative boundaries in the shortcomings of official census reports.

The accompanying fieldwork was conducted during February to April 2017 and February to May 2018 in remote parts of the two states. Field sites were selected on the basis of our GIS (i.e., where we observed contiguous urban growth across administrative boundaries). Primary data collection on the ground consisted of reconnaissance and interviews. We conducted nine in-depth, semistructured interviews with key informants including government officials at various levels and village leaders, plus dozens of longer informal conversations with various local actors (e.g., long-term residents, shopkeepers, recent migrants). We also systematically gathered observational data (photos, videos, field notes). In the remainder of this section we present our findings from West Bengal and Bihar. We elaborate on four reasons why Indian urbanization at the rural–urban transition is misread in the Indian census and present supporting empirical observations.

First, there is a tendency for CTs to go underreported; that is, there are numerous administrative units that have actually met the three criteria mentioned earlier but are not identified as CTs. This is partially due to local resistance from village leaders to becoming "urban" and partially due to administrative divisions that are at the basis of the census. In India, "rural" settlements are governed under *gram panchayats* (village councils or assemblies) and, as such, qualify for rural development grants from central and state government, whereas "urban" settlements cannot. An important example is the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which ensures at least 100 days of work for people in "rural" areas. Once a *gram panchayat* becomes urban, this government program is no longer available. Other examples are grants used for development programs on water, sanitation, school projects, and the development of roads and adequate health care. Central and state funding is much higher in rural areas, and *gram panchayats* are financially highly dependent on these grants. They generate few resources of their own (see also Aziz 1998; Mukhopadhyay 2017a). Moreover, tax rates are lower in rural areas, water supply is free, and electricity and telephone charges and tariffs are lower (Sivaramakrishnan 2002; Jain 2018).[6]

Financial incentives and the inner workings of allocation principles via central and state funds are especially likely to influence settlement classification in less developed, rural states where dependency on rural development grants is highest.[7] The state of Bihar is a pertinent example. Bihar is often singled out as the country's poorest state. It is also one of India's most populous, has very high overall densities, and has recorded substantial employment shifts out of agriculture and rapid growth in the secondary and tertiary economic sectors over the past ten years (Gupta 2010; Government of Bihar 2017). The state's official "urban" population is, however, extremely low (around 10 percent), and official urban growth rates have been close to zero for more than fifty years. It makes for a particularly implausible scenario and Bihar is very likely (much) more urbanized than the census reports.

Figure 3 is an excerpt from the Bihar GIS and gives a general overview of the state's geography of CTs, district boundaries (finer scale administrative boundaries would make the maps unreadable), main roads, and urban system. In addition, the red dots[8] show all units that are not considered CTs because their population is less than 5,000 (they are officially considered rural villages). They do, however, have over 75 percent nonfarm employment and very high population densities (on average 3,600 people per square kilometer, well above the official threshold of 400). As Figure 3 shows, many of these settlements appear spatially clustered and this indicates a high probability of amalgamation into larger urbanizing formations across administrative boundaries. In addition, many of these units are located in close proximity to existing urban centers (e.g., near the cities of Muzaffarpur or Samastipur; see Figure 3), suggesting that these cities are bigger than the census reports. Others are located in more remote areas, away from major existing agglomerations. At any rate, these administrative units meet the demographic and economic criteria to be considered "urban" but are not included in the official urban count, nor are they recognized as CTs.

A series of interviews with village leaders in Bihar (known as *mukhiyas*), in the Samastipur district, central Bihar, illustrated the local resistance against acquiring CT status. The objections relate principally to much higher levels of taxation for urban areas, which raises concerns about the rural poor; to fears of a loss of democratic representation for the

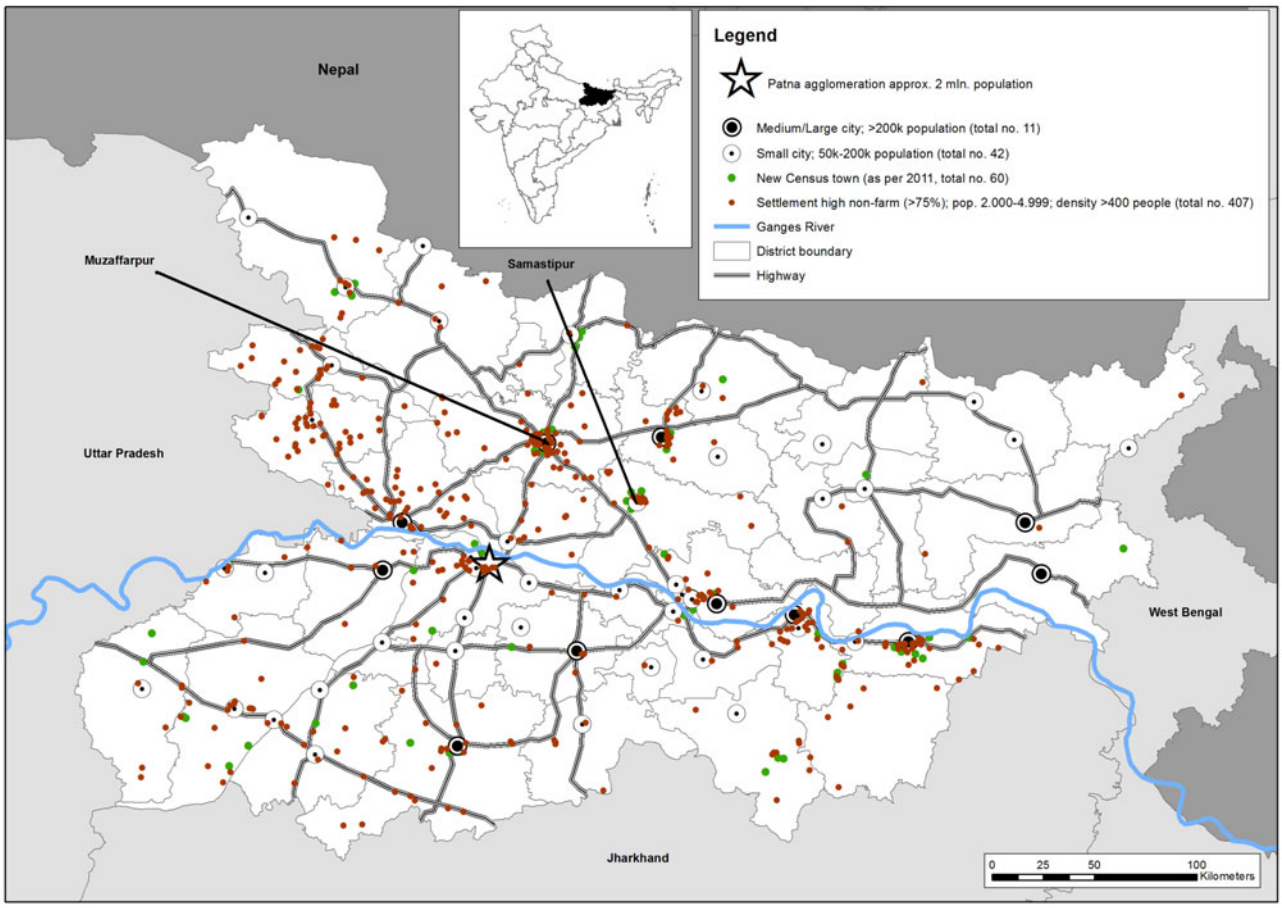

Figure 3. "Invisible" urbanization in Bihar: The map shows the sixty new census towns (green dots) recorded by the census but also amalgamating "rural" villages with densities >400 and >75 percent nonfarm employment (red dots). *Source:* Indian Census (2011a, 2011b, n.d.); Centre National de la Recherche's Scientifique (n.d.); Database of Global Administrative Areas (Version 3.6). (Color figure available online.)

people of the village; to uncertainties surrounding the ownership of land and the loss thereof once the *gram panchayat* is dissolved and the settlement becomes part of an urban administration; and, finally, to losing the socioculturally prestigious post of village *mukhiya*.

The second reason for underreporting of urbanization at the rural–urban transition relates to the tendency in the literature and in census reports to consider CTs as small urban settlements that barely pass the 5,000 population threshold, although in fact some are much bigger than that. Figure 4 is extracted from our GIS of West Bengal's urban regional system and shows the amalgamation of discrete CTs beyond the census boundaries. For instance, in the middle of the map, along the Dhulian–Malda corridor (National Highway 12), we observe the amalgamation of eleven CTs. Through our GIS, we examined these settlements along the corridor and their individual boundaries and found that they are also morphologically contiguous with countless other settlements that are officially categorized as "rural" villages. Further analyses of the population totals and overall employment structure of this agglomeration indicated that this corridor "hides" a contiguous built-up area of more than 250,000 people and has an apparently polycentric urban form but is without any form of urban governance (the area is governed by dozens of individual *gram panchayats*). According to our calculations, economic activity in this agglomeration is over 85 percent nonagricultural.

Through reconnaissance fieldwork along the Dhulian–Malda corridor, we collected preliminary observations on the evolving economic geography of the area and indeed found diversifying economic activities with people principally engaged in service industries, auto repair, trade, metalwork, commerce, transport, and construction. Sujapur CT, for instance,

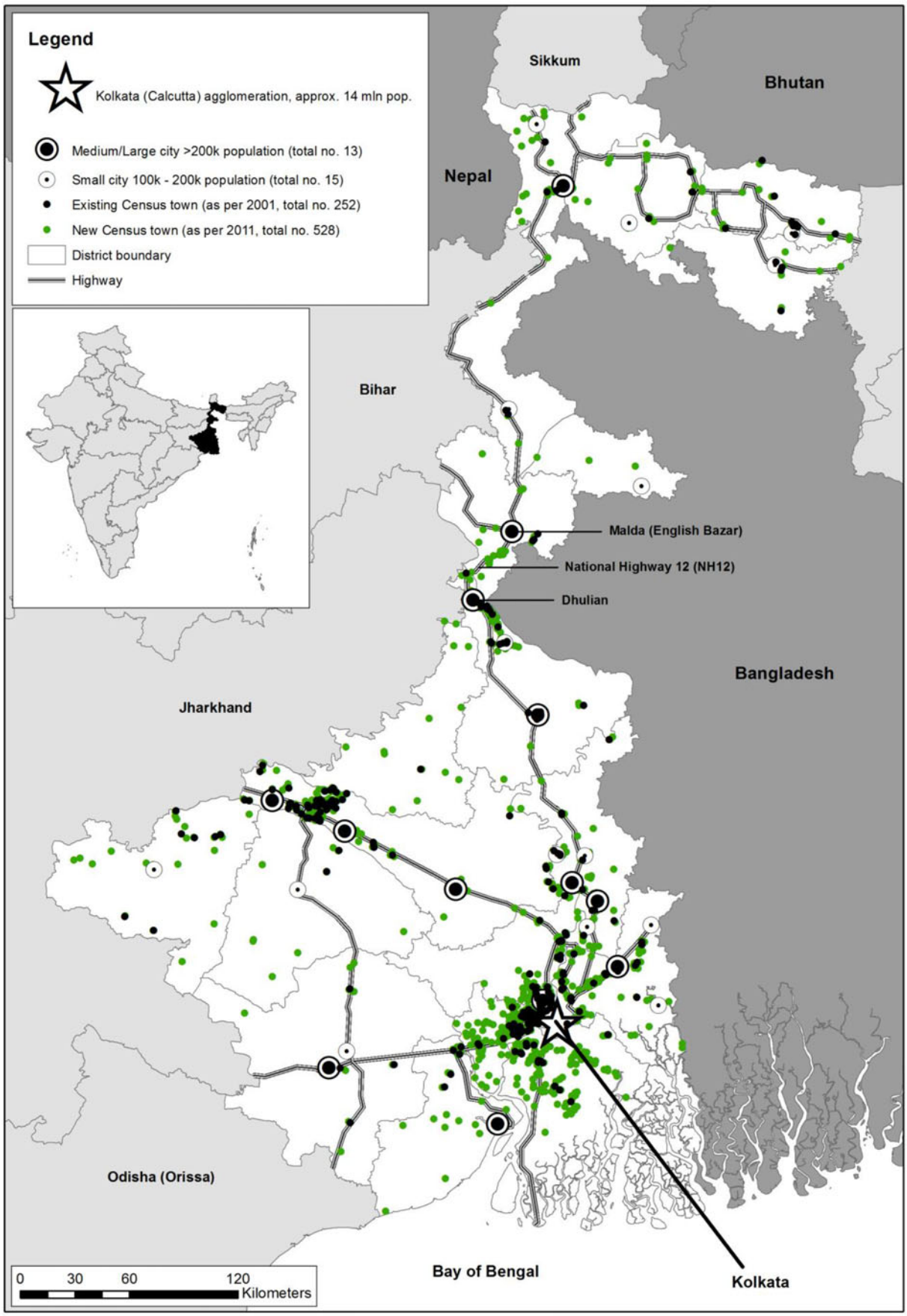

Figure 4. West Bengal's urban regional system with locations of old and new census towns per 2011. *Source:* Indian Census (2011b, n.d.); Database of Global Adminstrative Areas (Version 3.6); Centre National de la Recherche Scientifique. (Color figure available online.)

in the northeast of the corridor, harbors a massive plastic and waste recycling industry, which now has more than 100 waste processing units (also see Government of India 2017). Jadupur CT, a little to the southeast of Sujapur and part of the same amalgamated urban formation, has growing numbers of furniture makers, metalworkers, and woodworkers. About 1.5 km further south is the strategically located, fast-growing intersection between Kalia Chak and Alipur CT that connects north and southwest Bengal. The intersection is part of the same amalgamation as Sujapur CT and Jadupur CT and functions as a transport hub for both the state and the agglomeration; from here hundreds of buses and trucks depart every hour to deliver goods and people all over the district and state. National Highway 12, which connects all of these areas, is becoming so busy that it is being expanded to four lanes, and Indian Oil is setting up new petrol pumps along the corridor. In all, this section in the middle part of West Bengal is one example of an area where we find strong evidence of a larger urban formation, yet its population is officially largely designated as "rural" by the census and urban government is entirely nonexistent (of the thirty administrative units, eleven are CTs and nineteen are rural villages).

A third indication that the Indian census appears to underestimate urbanization trends at the rural–urban transition is that it does not adequately account for the significant and consistent shift of employment out of agriculture. The agricultural sector generated 52 percent of Indian gross domestic product in the 1950s but it has declined to 14 percent in recent years. In 2016, an estimated 250 million people still depended on agricultural work for their livelihood (Government of India 2016), but that number is declining rapidly. According to various estimates, between 2004 and 2016, there was a net loss of about 40 million jobs in agriculture (Himanshu 2011; Mehrotra et al. 2014; Abraham 2017).[9] The numbers of jobs lost in agriculture in combination with wide-ranging media reports of agrarian distress (e.g., Sainath 2011a, 2011b) suggest a major shift of people out of their agrarian existence and toward "urban" livelihoods.

The reported recent growth in rural self-employment (other than farming) seems indicative of the precariousness of traditional livelihoods (Chatterjee, Murgai, and Rama 2015; S. N. Roy and Pradhan 2018). Although Bihar's official urban population share hovers around only 10 percent and has barely shown an increase over the last twenty years, the state's latest economic survey indicates a substantial increase of 40 percent in the number of "nonfarm economic enterprises" between 2005 and 2013, reaching 1.6 million such enterprises. Significantly, about three quarters of these new nonfarm enterprises were located in areas classified as rural. The number of workers engaged in these nonfarm rural enterprises doubled over the same period (Chakravarty 2014). These data coincide with the Bihar GIS, where we find high nonfarm environs all over the state.

It should be pointed out that rural livelihood shifts, away from farming, can be complicated and dynamic; shifts in rural employment are often not straightforward from agrarian to urban based. For India's rural households, livelihoods now seem increasingly multisectoral and multilocational, as they try to eke out a living by taking on nonagrarian work in urban environs, often seasonally. India's Infrastructure Development Finance Company (IDFC) wrote in its rural development report, "Overlapping livelihoods have become a marked feature of rural life as smallholder farmers are forced to combine different occupations in a desperate bid to survive" (7). Farming and related activities, although declining in importance in India's rural households' livelihood portfolios, can thus still be part of a household's income. Nonetheless, the number of agrarian workers and employment available in agriculture is rapidly dwindling, suggesting a push toward more nonfarm and urban-based occupations, but very little is known about how and where such new nonfarm livelihoods materialize. From Indian census data, it is clear that these complex shifts are not adequately captured in measurements of urbanization.

The fourth and final reason for underreporting of urbanization at the rural–urban transition is related to rural–urban circular migration, where urban workers retain their main home (as recorded in the census) in the village. Choithani (2017) argued that "official data … barely capture the true extent of temporary moves" (195). Rough estimates put the yearly number of rural-based circular migrants between 40 and 100 million and growing (e.g., Deshingkar and Farrington 2009). Importantly, recent research indicates that India's big cities have become increasingly exclusionary, attracting mainly relatively skilled and better-off migrants and becoming more hostile to the (less skilled) rural poor

(Kundu and Saraswati 2012; Kundu 2014). The notion of the right to the city (Lefebvre 1968), which in North America and Western Europe is often invoked in relation to disadvantaged city dwellers, here refers to the option for rural folk to move to existing cities in the first place. In these circumstances—push from the countryside but less pull from the bigger cities—circular migration becomes more prominent at a regional scale, at shorter distances from the village (e.g., Chandrasekhar 2011; I. Roy 2016). None of this circular migration, which involves movement between existing villages and newly forming urban nodes, is reflected in or picked up by the census in its measurement of urbanization.

A final aspect of circular migration and its complex relationship with local processes of urbanization relates to remittances. Rural-based circular migrants maintain close links with their areas of origin and bring back savings from the city (or abroad), where expenditure is often minimized, leading to asset accumulation and substantial socioeconomic rural change (De Haan 2002). Capital is often invested in real estate and construction or to set up a small shop, thereby improving living conditions and changing local livelihoods (Datta 2016). These capital flows are known to be substantial (Deshingkar and Farrington 2009) and spark "localized urbanization in the form of new settlements" (Iyer 2017, 106) at the rural–urban transition. This, too, however, remains largely unaccounted for in official urban statistics.

Observing India's Rural–Urban Transition from Above and Below

More empirical research is needed, in various locations and at multiple scales, to qualify and capture the extent of transformations at India's rural–urban transition. We suggest that this research requires a dual methodological approach: a combined methodology "from above and from below" that relies on advanced GIS and remote sensing (RS) imagery and on systematic data collection and analysis on the ground. The former is essential to the initial detection of spatial patterns of dispersed urbanization. The latter is critical to understanding the economic and social processes involved in these changing morphologies; processes that can be interpreted (or not) as forms of urbanization. In this section, we advocate an extended research agenda on this topic and discuss the kinds of empirical analyses to follow.

The usefulness of RS for our purpose lies in the tentative identification—longitudinally—of dispersed urban growth in predominantly rural regions and coming to a better understanding of the spatiality of urban change. The remoteness and extent of these regions is obviously very considerable in a country the size of India, even if selected RS loci can be guided with existing census data on new CTs in combination with more fine-grained GIS analyses as illustrated earlier. The potential of RS applications for this purpose has improved notably in recent years due to technological advances that allow for better data and because of methodological advances to support more sophisticated analysis. Increased technical capabilities of satellites and RS sensors now render data at unprecedented spatial resolution. As revisit times of current satellites have increased, morphological change can be monitored with much higher frequency than in the past. The development of RS methodologies allows finer measurement of land-use patterns and change, which is particularly useful in the detection of suspected dispersed urbanization (e.g., Denis and Marius-Gnanou 2011; Conrad et al. 2015; Pandey and Seto 2015; Reis, Silva, and Pinho 2016; Kleemann et al. 2017; Vanderhaegen and Canters 2017).[10]

Figure 5 shows a remotely sensed image taken over National Highway 12, the Dhulian–Malda corridor in West Bengal, which we discussed earlier. It is a high-resolution (10 m) true color composite image from the European Space Agency's Sentinel-2A mission and captures the string of newly sprung up CTs that can be discerned in the middle of the West Bengal map (Figure 4). Built-up area is displayed in grayish hue, and the gray line that zigzags through the area is National Highway 12. Drawn in yellow are the official administrative boundaries of each separate census unit. As noted previously, none of the thirty administrative units in the corridor has an urban government, eleven are new CTs, and nineteen are considered rural villages. The RS image clearly shows cross-boundary built-up contiguity, especially in the three settlements that seem to form the "core" of the polycentric area: in Sujapur, Jadupur, and Kalia Chak. All thirty units have over 75 percent nonagrarian employment structures and for the area as a whole the percentage is around 85 percent. Importantly, settlements just beyond the

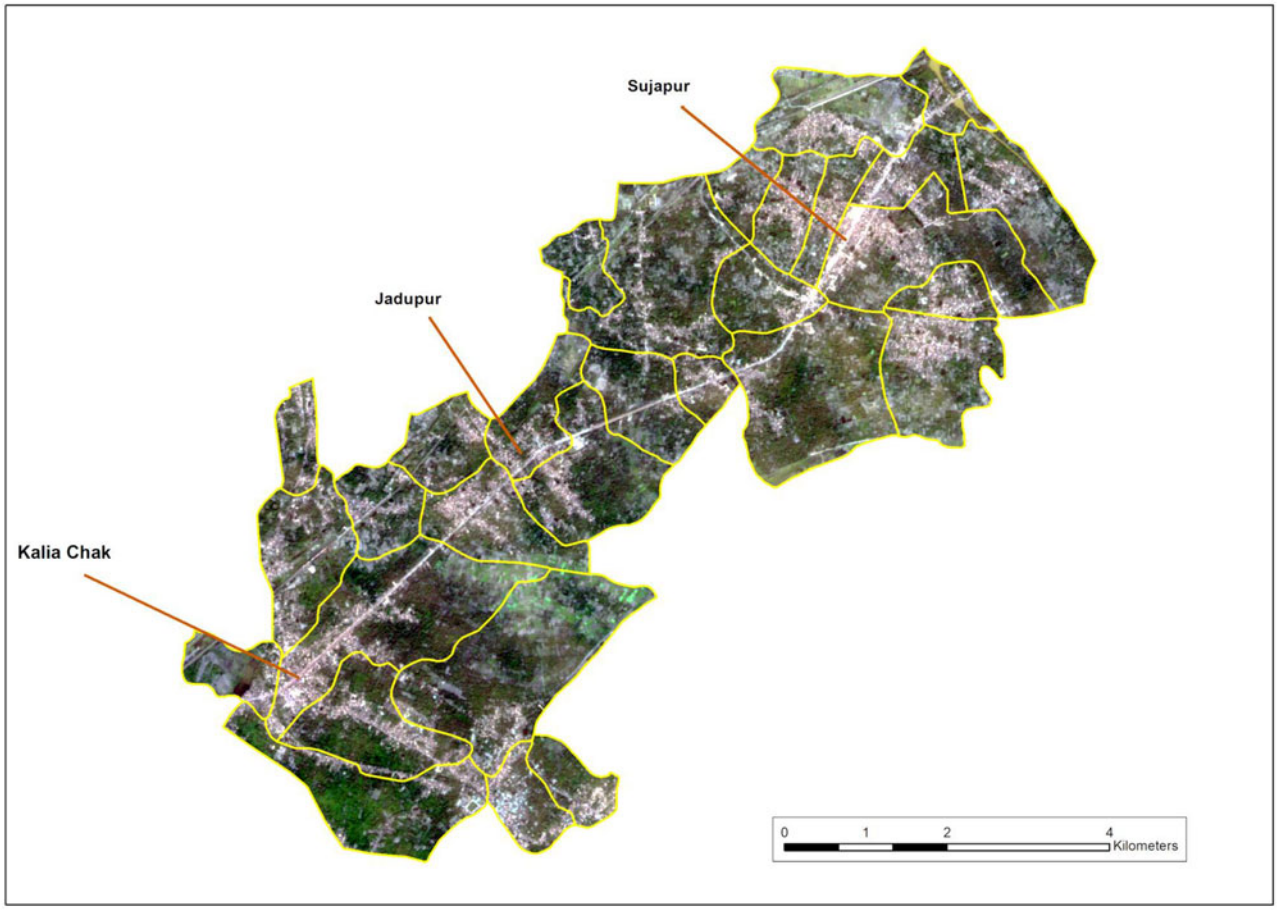

Figure 5. High-resolution (10 m) Sentinel-2A satellite imagery taken over National Highway 12, the Dhulian–Malda corridor in West Bengal, on 16 December 2016. All thirty administrative census units (in yellow) have very high (>75 percent) nonfarm employment; eleven of these are census towns and nineteen are considered "rural villages." None have urban governments. Cross-boundary urban growth is clearly visible, and the area functions as one large polycentric urban agglomeration with 256,707 inhabitants. *Source:* Copernicus Open Access Hub (n.d.); Indian Census (2011a). (Color figure available online.)

yellow administrative boundaries displayed here have a predominantly agrarian employment structure (suggesting some form of spatial delineation of the urban formation). Figure 5 presents additional evidence of a larger urban formation of around 250,000 people and it underscores the significant potential of RS imagery in the detection of (suspected) emergent urban formations. It also illustrates the usefulness of our GIS (Figures 3 and 4) in guiding the RS analyses.

In combination with RS analysis, more extensive systematic observation on the ground is necessary to investigate the nature of economic activities and (potential) ongoing social processes in these formations. Qualitative and quantitative data collection will serve to answer questions about the nature of agglomeration processes, shifts out of agriculture and into nonprimary activities, the type of new nonfarm activities and more exact enumeration of this economic activity, whether new nonfarm livelihoods are sustainable (or born out of necessity), infrastructure development, the magnitude and importance of (circular) migration and remittances, and the regional economic context. Currently, such data do not exist and baseline data must be collected in carefully selected research sites. Systematic observation "from below" is also needed to examine the social dynamics at the rural–urban transition. Are emergent urban formations changing or reproducing livelihoods, social fabric, ways of life (from village life to city life), or communal identities? Such on-the-ground investigations should allow for consideration of

observed transformations as constituting urbanization.

Very little is known about the spatial, social, cultural, and economic transformations that are occurring in these and other newly emergent urban formations and more research is needed to arrive at any generalizations about India's rural–urban transition. Key questions guiding this research agenda are as follows: What are the prevailing types of urban morphologies and agglomeration processes? What is the scale, spatial configuration, and density of these formations? How is this type of urban growth related to economic development, and what is the nature of economic activity and employment? How sustainable are livelihoods in these emergent urban formations? How do these urbanizing areas fit in broader regional economies and what is the role of infrastructure development? What is the role and magnitude of migration versus in situ growth? How are emergent urban formations in India reflecting and affecting social change at the urban–rural nexus? In the following section we present our hypotheses on these formations and outline the subsequent steps of this research agenda.

Back to Theory: India's Emergent Urban Formations

On the basis of the foregoing analyses and our ongoing work and observations at selected sites, we hypothesize three types of emergent urban formations at the lower echelons of the Indian urban system.[11] This typology is helpful in framing case studies of emergent urbanization through a comparative lens. The three types of emergent urban formations are distinguished primarily on the basis of (relative) location and wider regional dynamics.

First, *emergent periurban formations* are located in relative proximity to existing major agglomerations (Figure 6A). They tend to be situated beyond suburbia or what is generally denoted as the periurban zone that meshes urban and rural characteristics, within a range up to about 50 km. Figure 4 (West Bengal) shows a large number of new CTs within that range around Kolkata. Critically, most of this growth is not due to suburbanization of people or economic activity but likely results from in situ growth, shifting livelihoods out of agriculture, and an economic orientation toward the large, nearby agglomeration that serves as a market for labor or produce. Thus, these formations shape up in situ and do not conform to existing notions of the suburban, periurban, or exurban (all of which relate to the dynamics and outward movement of large central agglomerations), but they are likely to be functionally connected to the nearby agglomeration (e.g., through seasonal or circular migration).

Second, *emergent highway urbanization* takes the form of in situ, linear-type growth along recently constructed highways across India (Figure 6B), which can also be discerned in the map of West Bengal (Figure 4). The Dhulian–Malda corridor, as discussed earlier, is exemplary of this type of formation. The Indian government has in the past decade made substantial investments in infrastructure and is continuing to do so. Current plans, known as the *Bharatmala* initiative, aim at adding additional tens of thousands of kilometers of highways and rural roads over the next few years (Mukhopadhyay 2017b), and this will further stimulate emergent urbanization of this kind.

The third type of hypothesized urban formations refers to *emergent remote urbanization*: the development of in situ urban growth in isolated areas, apparently disconnected from existing cities and not visibly proximate to major roads or other transportation arteries (Figure 6C). The maps of Bihar and West Bengal appear to show these kinds of formations dispersed throughout the states. Here again, urban growth seems to result from employment shifts out of agriculture. Emergent remote urbanization does not involve long-distance migration but more likely movement between existing villages and newly forming urban nodes.

All three types of emergent urban formations are predominantly in situ; that is, not resulting from outward projected growth or spillover from existing urban agglomerations but rather from self-generated growth (also see Saxena and Vijayakumar 2014). Traditional one-way, rural–urban migration is probably not significant but short-distance circular migration or commuting is likely to play a vital part in these formations. Finally, it should be noted that all three types evolve at multiple scales: They could involve single, small, urbanizing settlements (officially identified as CTs by the census or not) but there could also be clustering or amalgamation of settlements, resulting in larger urbanizing formations, possibly polycentric, with variable densities and economic geographies.

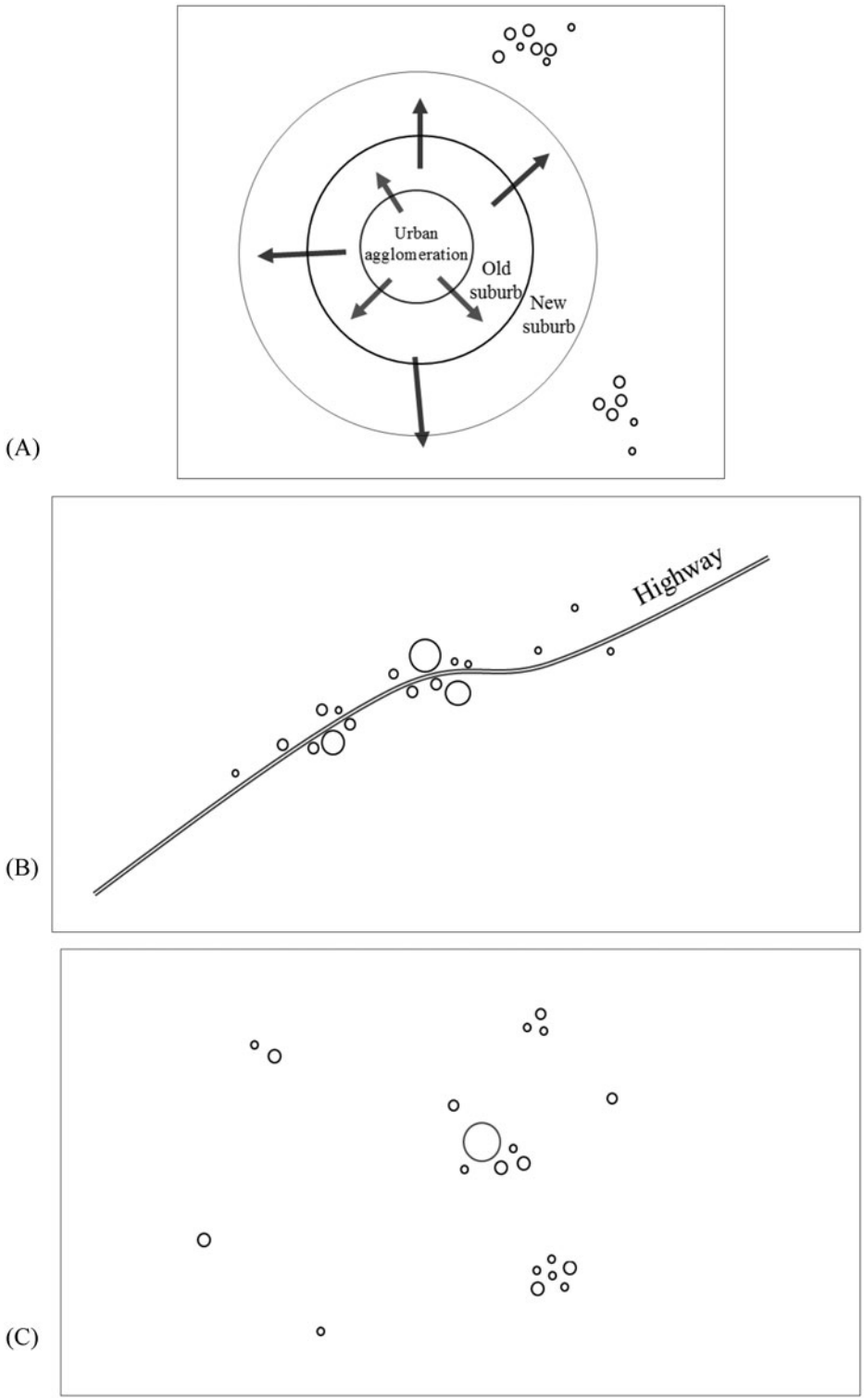

Figure 6. Schematic representation of three types of emergent urban formations: (A) emergent periurban formations, (B) emergent highway urbanization, and (C) emergent remote urbanization.

Concluding Remarks

In this article, through an empirical focus on India's rural–urban transition, we engage with debates at the theoretical core of the field of urban studies. One concerns the portability of urban theory in an era of planetary urbanization, and the other revolves around the very meaning (and

measurement) of urban and urbanization in an increasingly complex and differentiated urban world—or, at least, a world that we are increasingly understanding for its complexity and diversity. A third debate, generally more implicit but particularly relevant to the Global South, regards the relationship between urbanization and economic development. We acknowledge the northern bias of existing theory and we appreciate the need for a decentering of theoretical perspectives. We also suggest, however, that it does not make sense to wholly discard some of the fundamentals of conventional theory—if only because it would leave us without any conceptual guidance in our empirical observation.

Based on our analyses and fieldwork from West Bengal and Bihar, we assume a theoretical position that specifies and conceptualizes urbanization processes at India's rural–urban transition—urban growth that has gone largely unrecorded in official statistics. Our preliminary observations suggest that the basic logic of agglomeration holds, along with a shift in the prevailing mode of production, away from agriculture. The emergent urban formations appear in situ, mostly dispersed, and smaller in size compared to conventional models, however. The rural–urban transition is less firm and less settled, with the resulting urban formations largely embedded in rural environs. How exactly we will come to understand and characterize these emergent urban formations remains to be seen, but it appears beyond doubt that major transformations are taking place, largely unnoticed or understood by government agencies and researchers.

If one of the main drivers of these emergent urban formations is related to structural employment shifts out of agriculture, in the absence of sufficient employment opportunities in major cities, then we can expect that similar types of in situ urbanization will take place in other parts of the Global South, particularly elsewhere in South Asia and in parts of sub-Saharan Africa. Tanzania and Ethiopia, for example, seem to follow the same pattern as India in that they witness rapid economic growth combined with declining urbanization rates, according to general World Bank figures.[12] There, too, urbanization might proceed unseen at the rural–urban transition.

At any rate, beyond the Indian case we foresee interesting and useful comparative studies of this kind across the Global South. Most important, from a theoretical perspective, is how this research can help us rethink and perhaps redefine what is urban and what constitutes urbanization. There is a need for intensive, theoretically informed, empirical work in what are sometimes challenging, remote, and poorly known environs. Explorations at the edges of the discipline could well serve to better define its core.

Acknowledgments

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Notes

1. Although urbanization undoubtedly creates opportunities on the basis of fundamental economies of scale and connectivity (e.g., Glaeser 2012), it also brings fundamental challenges in terms of efficiency and equity, and India is no exception (e.g., Nijman 2015a). In this article, as elsewhere, we subscribe to the notion that urbanization is a necessary but not sufficient condition for economic development in general. We are critical of national policies that are based on promoting urban growth without consideration of negative externalities of urbanization and without attention to inherent questions of inequity. Elsewhere in this article, we note the exclusionary nature of India's large cities that in fact contributes to the emergence of new urban formations in heretofore rural areas.
2. Evidence of a near stagnation of urban employment in bigger cities is largely based on statistics from the formal sector (Li and Rama 2015). It can be argued that informal slum economies and entrepreneurship have developed in response to the lack of opportunities in the organized sector (e.g., Nijman 2015a).

3. In this article, for the sake of brevity and conciseness of our argument, we concentrate on the spatial and economic dimensions of urbanization.
4. Calculating the nonagrarian employment structure per unit was a somewhat complex process. In classifying urban areas, the Indian census only looks at male nonagricultural work and only looks at workers who were engaged in this type of work for most of the year (more than six out of twelve months; these are called main workers; others are called marginal workers). The percentage of male nonfarm employment is calculated by adding the male main workers in household industry (males engaged in production, processing, servicing, repairing, or making and selling of goods from home) to the male main workers in other works (all government servants, municipal employees, teachers, factory workers, plantation workers; those engaged in trade, commerce, business, transport, banking, mining, construction, political or social work; priests; entertainment artists; etc.). Also see Government of India (2011) for census metadata.
5. CNRS previously used these boundaries in the e-Geopolis project. In this project, urbanization was studied using a uniform, twofold global definition of what constitutes the urban: (1) a simple morphological criterion, in which individual buildings should be less than 200 m apart, and (2) a population threshold of at least 10,000 inhabitants. For more information see http://e-geopolis.org/.
6. Although CTs are urban according to India's threefold definition, they are still governed by *gram panchayats* and, as such, still qualify for rural development grants. CT status, however, is a first step toward official urban recognition, which is followed by the replacing of the *gram panchayat* with an urban local body (in India also referred to as a statutory town) and thus the loss of access to rural development funding.
7. This is not the place for an elaboration on the role of the state in Indian urbanization but it is worth pointing out, briefly, its apparent contradictions. Central and state governments, since the beginning of liberalization policies in the 1990s, have effectively stimulated investment and growth in major urban regions (e.g., Maharashtra's "golden triangle" between Mumbai, Pune, and Nasik), whereas the workings of local and state governments have impeded formal urbanization at the lower echelons of the urban system. In the meantime, major infrastructural investments by the central and state governments, especially in highways and other main roads, appear to have contributed to new urban growth along these newly constructed corridors. We return to this "highway urbanization" later in the article.
8. Note that the Bihar and West Bengal GIS is only used to gain a better understanding of the spatial patterning and trends in urban formations. The dots on the map (black for existing CTs, green for new CTs, red for high nonfarm environs) are not necessarily indicative of the true size of settlements. The Bihar and West Bengal GIS do not show built-up morphology. Remotely sensed imagery should be used to study built-up morphology in areas of interest. We elaborate on this methodology later.
9. The introduction of land reforms and excessive landholding fragmentation has played an important part in rural distress. In India today, 85 percent of agrarian land is held by small farmers (less than 2 ha; IDFC 2013). As farmers have increasingly moved away from subsistence farming and toward commercial farming, their indebtedness has risen. Small farmers often do not have access to institutional credit and have to rely on the dubious practices of moneylenders (with higher interest rates and coercive payment practices). Occasional crop failures due to flooding or droughts lead to high indebtedness and confiscation of land by moneylenders, which is the main reason for the rapid rise in farmer suicides in recent years (IDFC 2013).
10. We are under no "illusion" (Schmid et al. 2018, 31) that these advanced RS methods somehow render a simple solution to the exact identification or measurement of "the" urban. We do think, however, that very high-resolution RS provides a valuable means of empirical observation, particularly in the context of India's rural–urban transition and, clearly, as part of a mixed methods, transductive study design.
11. A somewhat comparable typology was discussed by S. N. Roy and Pradhan (2018). Ours is different because, in accordance with our proposed theoretical framework, it focuses consistently on emergent urban formations at the rural–urban transition (excluding forms of suburbanization and periurban growth) and we recognize highway urbanization as a specific type.
12. Interestingly, some important recent research in other parts of Africa also points to a decoupling of urban growth and economic growth, but there the interpretations suggest a reversed pattern: accelerating urbanization without substantial economic development (e.g., Obeng-Odoom 2010; Fox 2012, 2017; Turok and McGranahan 2013; Potts 2018a, 2018b; Turok 2018). India, of course, is not an exception when it comes to questionable official data on urbanization. A good part of the debate on African countries relates to the likely misreading of urban growth. In a recent contribution, Potts (2018a, 2018b) observed that urbanization levels and rates of growth in parts of sub-Saharan Africa might be overestimated because census definitions tend to include smaller settlements at the bottom of the urban hierarchy even though their local economies do not show any signs of structural shifts away from agriculture.

References

Abraham, V. 2017. Stagnant employment growth: Last three years may have been the worst. *Economic and Political Weekly* 52 (38):13–17.

Aziz, A. 1998. Income structure of rural local governments: The Karnataka experience. Paper presented at the Conference Emerging Trends in Indian Local Government Finances, Hyderabad, India, October 24–25.
Bhagat, C. 2018. "More jobs, please!" Indian youth don't want to be just pakodawallas. *Times of India*. Accessed April 1, 2018. https://timesofindia.indiatimes.com/blogs/The-underage-optimist/more-jobs-please-indian-youth-dont-want-to-be-just-pakodawallas/
Bhalotra, S. R. 1998. The puzzle of jobless growth in Indian manufacturing. *Oxford Bulletin of Economics and Statistics* 60 (1):5–32. doi: 10.1111/1468-0084.00084.
Blokland, T., and A. Harding. 2014. *Urban theory: A critical introduction to power, cities and urbanism in the 21st century*. London: Sage.
Brenner, N. 2015. Towards a new epistemology of the urban? *City* 19 (2–3):151–82. doi: 10.1080/13604813.2015.1014712.
Brenner, N., and C. Schmid. 2014. The "urban age" in question. *International Journal of Urban and Regional Research* 38 (3):731–55. doi: 10.1111/1468-2427.12115.
Centre National de la Recherche Scientifique (CNRS). n.d. [Non-public source; spatial boundary file of all of Bihar's 41,000 administrative settlements]. Available by author's notes.
Chakravarty, M. 2014. What the economic census really tells us. *Livemint*, August 14. Accessed February 15, 2018. https://www.livemint.com/Opinion/VrXt0XflHkdtKiZKOcQa1J/What-the-economic-census-really-tells-us.htm
Chandrasekhar, S. 2011. Workers commuting between the rural and urban: Estimates from NSSO data. *Economic and Political Weekly* 46 (46):22–25.
———. 2017. Urbanisation in a decade of near jobless growth. In *Subaltern urbanisation in India: Exploring urban change in South Asia*, ed. E. Denis and M. H. Zérah, 119–40. New Delhi: Springer.
Chatterjee, U., R. Murgai, and M. Rama. 2015. Employment outcomes along the rural–urban gradation. *Economic and Political Weekly* 50 (26):5–10.
Choithani, C. 2017. Understanding the linkages between migration and household food security in India. *Geographical Research* 55 (2):192–205. doi: 10.1111/1745-5871.12223.
Cohen, B. 2004. Urban growth in developing countries: A review of current trends and a caution regarding existing forecasts. *World Development* 32 (1):23–51. doi: 10.1016/j.worlddev.2003.04.008.
Conrad, C., M. Rudloff, I. Abdullaev, M. Thiel, F. Löw, and J. P. A. Lamers. 2015. Measuring rural settlement expansion in Uzbekistan using remote sensing to support spatial planning. *Applied Geography* 62:29–43. doi: 10.1016/j.apgeog.2015.03.017.
Copernicus Open Access Hub. n.d. Accessed April 30, 2018. https://scihub.copernicus.eu/dhus/
Database of Global Administrative Areas (GADM), version 3.6. Accessed June 5, 2018. https://gadm.org/data.html
Datta, A. 2016. Migration, remittances and changing sources of income in rural Bihar (1999–2011). *Economic and Political Weekly* 51 (31):7–8.
De Haan, A. 2002. Migration and livelihoods in historical perspective: A case study of Bihar, India. *Journal of Development Studies* 38 (5):115–42. doi: 10.1080/00220380412331322531.
Denis, E., and K. Marius-Gnanou. 2011. Toward a better appraisal of urbanisation in India. Paper No. 569, Centre National de la Recherche Scientifique, Paris.
Denis, E., and M. H. Zérah. 2017. *Subaltern urbanisation in India: An introduction to the dynamics of ordinary towns*. New Delhi: Springer.
Deshingkar, P., and J. Farrington. 2009. *Circular migration and multilocational livelihood strategies in rural India*. Oxford, UK: Oxford University Press.
Ernstson, H., M. Lawhon, and J. Duminy. 2014. Conceptual vectors of African urbanism: "Engaged theory-making" and "platforms of engagement." *Regional Studies* 48 (9):1563–77. doi: 10.1080/00343404.2014.892573.
Fox, S. 2012. Urbanization as a global historical process: Theory and evidence from sub-Saharan Africa. *Population and Development Review* 38 (2):285–310. doi: 10.1111/j.1728-4457.2012.00493.x.
———. 2017. Mortality, migration and rural transformation in sub-Saharan Africa's urban transition. *Journal of Demographic Economics* 83 (1):13–30. doi: 10.1017/dem.2016.29.
Glaeser, E. 2012. *Triumph of the city: How our greatest invention makes us richer, smarter, greener, healthier, and happier*. New York: Penguin.
Government of Bihar. 2017. *Economic survey 2016–17*. Patna, India: Government of Bihar.
Government of India. 2011. *Census of India, metadata*. New Delhi: Office of the Registrar General and Census Commissioner.
———. 2016. *State of Indian agriculture 2015–16*. New Delhi: Ministry of Agriculture & Farmers Welfare.
———. 2017. *Activity wise cluster in West Bengal*. New Delhi: Ministry of Micro, Small and Medium Enterprises.
Grant, R., and J. Nijman. 2002. Globalization and the corporate geography of cities in the less-developed world. *Annals of the Association of American Geographers* 92 (2):320–40. doi: 10.1111/1467-8306.00293.
Gupta, C. D. 2010. Unravelling Bihar's "growth miracle." *Economic and Political Weekly* 45 (52):50–62.
Hassink, R., C. Klaerding, and P. Marques. 2014. Advancing evolutionary economic geography by engaged pluralism. *Regional Studies* 48 (7):1295–1307. doi: 10.1080/00343404.2014.889815.
Henderson, J. V. 2010. Cities and development. *Journal of Regional Science* 50 (1):515–40. doi: 10.1111/j.1467-9787.2009.00636.x.
Himanshu, H. 2011. Employment trends in India: A re-examination. *Economic and Political Weekly* 46 (37):43–59.
India's Infrastructure Development Finance Company (IDFC). 2013. *India rural development report 2012–2013*. Hyderabad, India: IDFC Foundation.
Indian Census. 2011a. Primary Census Abstract Data Tables, Population Enumeration Data. Accessed

October 10, 2017. http://www.censusindia.gov.in/2011census/population_enumeration.html
———. 2011b. District Census Handbook (DCHB) Town Amenities, Village Amenities, 38 District Census Handbooks, for Bihar. Accessed October 10, 2017. http://censusindia.gov.in/2011census/dchb/DCHB.html
———. n.d. Indian Census Digital Library, Table Archives for 1991, 2001 and 2011. Accessed February 2, 2018. http://www.censusindia.gov.in/DigitalLibrary/Tables.aspx
IT sector to lay off up to 2 lakh engineers annually for next 3 years. 2017. *Hindustan Times*, Accessed May 15, 2017. http://www.hindustantimes.com/business-news/it-to-layoff-up-to-2-lakh-engineersannually-for-next-3-yrs/story-fQynHm4YRo2oEXFp79KYhL.html
Iyer, S. 2017. Circular migration and localized urbanization in rural India. *Environment and Urbanization Asia* 8 (1):105–19. doi: 10.1177/0975425316683866.
Jain, M. 2018. Contemporary urbanization as unregulated growth in India: The story of census towns. *Cities* 73:117–27. doi: 10.1016/j.cities.2017.10.017.
Just the job: Ever more Indians are struggling to find work. 2017. *The Economist*. Accessed September 14, 2017. https://www.economist.com/asia/2017/09/14/ever-more-indians-are-struggling-to-find-work
Kannan, K. P., and G. Raveendran. 2009. Growth sans employment: A quarter century of jobless growth in India's organised manufacturing. *Economic and Political Weekly* 44 (10):80–91.
Keil, R. 2018. Extended urbanization, "disjunct fragments" and global suburbanisms. *Environment and Planning D: Society and Space* 36 (3):494–511. doi: 10.1177/0263775817749594.
Kleemann, J., J. Inkoom, M. Thiel, S. Shankar, S. Lautenbach, and C. Fürst. 2017. Peri-urban land use pattern and its relation to land use planning in Ghana, West Africa. *Landscape and Urban Planning* 165:280–94. doi: 10.1016/j.landurbplan.2017.02.004.
Kundu, A. 2011. Politics and economics of urban growth. *Economic and Political Weekly* 46 (20):10–12.
———. 2014. Exclusionary growth, poverty and India's emerging urban structure. *Social Change* 44 (4):541–66. doi: 10.1177/0049085714548538.
Kundu, A., and L. R. Saraswati. 2012. Migration and exclusionary urbanisation in India. *Economic and Political Weekly* 47 (26–27):219–27.
Lefebvre, H. 1968. *Le droit a la ville* [The right to the city]. Paris: Anthropos.
Li, Y., and M. Rama. 2015. Firm dynamics, productivity growth, and job creation in developing countries: The role of micro- and small enterprises. *World Bank Research Observer* 30 (1):3–38. doi: 10.1093/wbro/lkv002.
Luce, E. 2006. *In spite of the gods: The strange rise of modern India*. New York: Little, Brown.
McFarlane, C. 2010. The comparative city: Knowledge, learning, urbanism. *International Journal of Urban and Regional Research* 34 (4):725–42. doi: 10.1111/j.1468-2427.2010.00917.x.
McFarlane, C., and J. Robinson. 2012. Introduction—Experiments in comparative urbanism. *Urban Geography* 33 (6):765–73. doi: 10.2747/0272-3638.33.6.765.
Mehrotra, S., J. Parida, S. Sinha, and A. Gandhi. 2014. Explaining employment trends in the Indian economy: 1993–94 to 2011–12. *Economic and Political Weekly* 49 (32):49–57.
Melchiorri, M., A. J. Florczyk, S. Freire, M. Schiavina, M. Pesaresi, and T. Kemper. 2018. Unveiling 25 years of planetary urbanization with remote sensing: Perspectives from the global human settlement layer. *Remote Sensing* 10 (5):768. doi: 10.3390/rs10050768.
Mitra, A. 2000. Total factor productivity growth and urbanization economies: A case of Indian industries. *Review of Urban and Regional Development Studies* 12 (2):97–108. doi: 10.1111/1467-940X.00023.
Mukhopadhyay, P. 2017a. Does administrative status matter for small towns in India? In *Subaltern urbanisation in India: An introduction to the dynamics of ordinary towns*, ed. E. Denis and M. H. Zerah, 443–69. New Delhi: Springer.
———. 2017b. Smoothening Bharatmala's bumps. *Livemint*. Accessed November 1, 2018. https://www.livemint.com/Opinion/iChbHLqKqbdSKw3AgXiKkM/Smoothening-Bharatmalas-bumps.html
Nijman, J. 2007. Introduction—Comparative urbanism. *Urban Geography* 28 (1):1–6. doi: 10.2747/0272-3638.28.1.1.
———. 2015a. India's urban future: Views from the slum. *American Behavioral Scientist* 59 (3):406–23. doi: 10.1177/0002764214550304.
———. 2015b. The theoretical imperative of comparative urbanism: A commentary on "Cities beyond compare?" by Jamie Peck. *Regional Studies* 49 (1):183–86. doi: 10.1080/00343404.2014.986908.
Obeng-Odoom, F. 2010. "Abnormal" urbanization in Africa: A dissenting view. *African Geographical Review* 29 (2):13–40.
Pandey, B., and K. C. Seto. 2015. Urbanization and agricultural land loss in India: Comparing satellite estimates with census data. *Journal of Environmental Management* 148:53–66. doi: 10.1016/j.jenvman.2014.05.014.
Parnell, S., and J. Robinson. 2012. (Re)theorizing cities from the Global South: Looking beyond neoliberalism. *Urban Geography* 33 (4):593–617. doi: 10.2747/0272-3638.33.4.593.
Parthasarathy, D. 2011. Hunters, gatherers and foragers in a metropolis: Commonising the private and public in Mumbai. *Economic and Political Weekly* 46 (50):54–63.
Peck, J. 2015. Cities beyond compare? *Regional Studies* 49 (1):160–82. doi: 10.1080/00343404.2014.980801.
Potts, D. 2018a. Analysing African urban data: Refining the arguments and the (mis)understandings of end users: A response to Turok. *Urban Studies* 55 (5):994–96. doi: 10.1177/0042098017713576.
———. 2018b. Urban data and definitions in sub-Saharan Africa: Mismatches between the pace of urbanisation and employment and livelihood change. *Urban Studies* 55 (5):965–86. doi: 10.1177/0042098017712689.
Pradhan, K. C. 2017. Unacknowledged urbanisation: The new census towns in India. In *Subaltern urbanisation in*

India: An introduction to the dynamics of ordinary towns, ed. E. Denis and M. H. Zerah, 39–66. New Delhi: Springer.
Reis, J. P., E. A. Silva, and P. Pinho. 2016. Spatial metrics to study urban patterns in growing and shrinking cities. *Urban Geography* 37 (2):246–71. doi: 10.1080/02723638.2015.1096118.
Renaud, B. M. 1979. *National urbanization policies in developing countries*. Washington, DC: World Bank.
Robinson, J. 2011. Cities in a world of cities: The comparative gesture. *International Journal of Urban and Regional Research* 35 (1):1–23. doi: 10.1111/j.1468-2427.2010.00982.x.
Roy, A. 2009. The 21st-century metropolis: New geographies of theory. *Regional Studies* 43 (6):819–30. doi: 10.1080/00343400701809665.
Roy, A., and A. Ong. 2011. *Worlding cities: Asian experiments and the art of being global*. London: Wiley-Blackwell.
Roy, I. 2016. *Labour migration from (and in) Bihar: Continuities and change*. London: International Growth Centre, London School of Economics and Political Science.
Roy, S. N., and K. Pradhan. 2018. *Census towns in India—Current patterns and future discourses*. New Delhi: Centre for Policy Research.
Sainath, P. 2011a. Census findings point to decade of rural distress. *The Hindu*, September 25. Accessed August 20, 2017. https://www.thehindu.com/opinion/columns/sainath/census-findings-point-to-decade-of-rural-distress/article2484996.ece
———. 2011b. Decadal journeys: Debt and despair spur urban growth. *The Hindu*, September 26. Accessed August 20, 2017. https://www.thehindu.com/opinion/columns/sainath/decadal-journeys-debt-and-despair-spur-urban-growth/article2487670.ece
Satterthwaite, D. 2010. Urban myths and the mis-use of data that underpin them. In *Urbanization and development*, ed. J. Beall, B. Guha-Khasnobis, and R. Kanbur, 83–99. Oxford, UK: Oxford University Press.
Saxena, S. B., and G. Vijayakumar. 2014. Thinking about the 21st century Indian city. *Economic and Political Weekly* 49 (18):11–21.
Schmid, C. 2012. Patterns and pathways of global urbanization: Towards comparative analysis. In *Globalization of urbanity*, ed. J. Acebillo, J. Lévy, and C. Schmid, 51–77. Mendrisio, Switzerland: Università della Svizzera italiana.
Schmid, C., O. Karaman, N. C. Hanakata, P. Kallenberger, A. Kockelkorn, L. Sawyer, M. Streule, and K. P. Wong. 2018. Towards a new vocabulary of urbanisation processes: A comparative approach. *Urban Studies* 55 (1):19–52. doi: 10.1177/0042098017739750.
Scott, A. J. 2011. A world in emergence: Notes toward a resynthesis of urban-economic geography for the 21st century. *Urban Geography* 32 (6):845–70. doi: 10.2747/0272-3638.32.6.845.
———. 2017. *The constitution of the city: Economy, society, and urbanization in the capitalist era*. London: Palgrave Macmillan.
Scott, A. J., and M. Storper. 2015. The nature of cities: The scope and limits of urban theory. *International Journal of Urban and Regional Research* 39 (1):1–15. doi: 10.1111/1468-2427.12134.
Shaw, A. 2015. Inner-city and outer-city neighbourhoods in Kolkata. *Environment and Urbanization ASIA* 6 (2):139–53. doi: 10.1177/0975425315589157.
Sheppard, E., H. Leitner, and A. Maringanti. 2013. Provincializing global urbanism: A manifesto. *Urban Geography* 34 (7):893–900. doi: 10.1080/02723638.2013.807977.
Sivaramakrishnan, K. C. 2002. Turning urban, staying rural. *The Hindu*, February 27. Accessed December 15, 2017. https://www.thehindu.com/2002/02/27/stories/2002022700041000.htm.
Smith, M. E. 2009. Just how comparative is comparative urban geography? A perspective from archaeology. *Urban Geography* 30 (2):113–17. doi: 10.2747/0272-3638.30.2.113.
Thomas, J. J. 2012. India's labour market during the 2000s: Surveying the changes. *Economic and Political Weekly* 47 (51):39–51.
Traffic congestion costs 4 major Indian cities 1.5 lakh crore a year. 2018. *Times of India*. Accessed April 26, 2018. https://timesofindia.indiatimes.com/india/traffic-congestion-costs-four-major-indian-cities-rs-1-5-lakh-crore-a-year/articleshow/63918040.cms
Tripathi, S., and S. Kaur. 2017. Do negative externalities have any impact on population agglomerations? Evidence from urban India. MPRA Paper No. 76897, University Library of Munich, Munich, Germany.
Turok, I. 2018. Informing Africa's urban transformation: A response to Fox et al. and Potts. *Urban Studies* 55 (5):987–93. doi: 10.1177/0042098017713575.
Turok, I., and G. McGranahan. 2013. Urbanization and economic growth: The arguments and evidence for Africa and Asia. *Environment and Urbanization* 25 (2):465–82. doi: 10.1177/0956247813490908.
United Nations. 2014. *World urbanization prospects: The 2014 revision*. New York: United Nations.
Vanderhaegen, S., and F. Canters. 2017. Mapping urban form and function at city block level using spatial metrics. *Landscape and Urban Planning* 167:399–409. doi: 10.1016/j.landurbplan.2017.05.023.
Walker, R. 2015. Building a better theory of the urban: A response to "Towards a new epistemology of the urban?" *City* 19 (2–3):183–91. doi: 10.1080/13604813.2015.1024073.
World Bank. 2009. *World development report: Reshaping economic geography*. Washington, DC: World Bank.
———. 2013. *Urbanization beyond municipal boundaries: Nurturing metropolitan economies and connecting peri-urban areas in India*. Washington, DC: World Bank.
———. 2017. GDP growth rate. World Bank national accounts data. Accessed August 6, 2018. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=IN
———. 2018. Urban growth rate. United Nations Population Division. Accessed August 6, 2018. https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=IN

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