

Rural-urban transition and food security in India

Chetan Choithani^{a,*}, Abdul Jaleel CP^b, S Irudaya Rajan^c

^a *Inequality and Human Development Programme, National Institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru, Karnataka, 560012, India*

^b *National Institute of Nutrition, Indian Council of Medical Research, Beside Tarnaka Metro Station, Osmania University, PO, Hyderabad, Telangana, 500007, India*

^c *International Institute of Migration and Development, BN 43, Bapuji Nagar, Pongummoodu, Medical College P.O., Thiruvananthapuram, Kerala, 695011, India*

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ABSTRACT

As a growing proportion of world's population lives in cities and towns, food security is increasingly acquiring an urban character. The locus of food security research and policy agendas has correspondingly expanded from rural areas to include urban centres in recent years. However, the dominant discourse on urbanization-food security relationship appears to be shaped by perspectives from the Global North and large cities, and disregards urbanization-food security nexus in small towns of the Global South. This paper aims to correct this bias. With a focus on India where urbanization is increasingly concentrated in small, former rural regions, this paper looks at the food security implications of country's rural-urban transition and advances a conceptual framework to understand the food security impacts of peripheral urbanization.

1. Introduction

As a growing proportion of world's population lives in cities and towns, food security is increasingly acquiring an urban character. The locus of food security research and policy agendas has correspondingly expanded from rural areas to include cities and towns in recent years. The Food and Agriculture Organization (FAO) which leads the international efforts to improve global food and nutrition security has recently issued an *urban food agenda* framework to focus on urbanization-food security relationship (FAO, 2019). Similarly, the 2022 edition of *World Cities Report* of the United Nations Human Settlements Programme (UN-Habitat) points to the importance of food security for sustainable urban futures (UN-Habitat, 2022). However, the discussions on the subject show a lack of adequate understanding of urbanization-food security nexus in the developing world. The primary reasons for this disregard lie in the prevailing frames of enquiry. First, the dominant discourse on food security tends to take a *productivist* view and focuses invariably more on strengthening food production (Choithani, 2022). Urban agriculture has emerged as an influential theme in this discourse and is increasingly viewed as a go-to solution to improve urban dwellers' nutritional wellbeing (Pradhan et al., 2023). The debate on urban agriculture and urban food security more generally however is typically informed by perspective from the Global North and large cities (Davies et al., 2021). In urban studies, the uncritical celebration of cities that offer distinct urban advantage in terms of better incomes,

infrastructure, food, nutrition and health outcomes which is also largely informed by Northern experience (Glaeser, 2012) seems to further obfuscate the urban food security challenges of the Global South.

In many parts of the Global South, where much of the current and future growth is concentrated, accelerating urbanization is fundamentally reshaping the food systems and their ability to ensure food secure futures for growing urban populations. Urban expansion in the developing world is not accompanied by gainful livelihood opportunities for a large majority of urban dwellers, as has been observed in the historical experience of today's advanced countries (Henderson, 2010; Nijman, 2019). Consequently, there has been an increase in urban poverty and undernourishment in many parts of the developing world. Concurrently, dietary and lifestyle changes associated with urban ways of living are also leading to rise in overweight and obesity (IFPRI, 2017; Ruel et al., 2017). Moreover, processes of urbanization in the developing countries are increasingly led by small places, usually involving erstwhile rural regions adjacent to cities and economic corridors turning into urban centres (Balakrishnan 2019; Van Duijne and Nijman, 2019; Randolph and Deuskar, 2024). This urban spread extending to engulf former agrarian zones is leading to spatial disconnect of cities from traditional food sources which is adding to the challenge of improving the nutritional wellbeing of urban dwellers. Indeed, urbanization in developing countries is leading to multiple burdens of malnutrition whereby overweight and obesity are rising, along with persistently high levels of food insecurity and hunger (IFPRI, 2017).

* Corresponding author.

E-mail addresses: choithani@nias.res.in (C. Choithani), jaleel.cp@icmr.gov.in (A. Jaleel CP), rajan@iimad.org (S.I. Rajan).

This paper focuses on the food and nutrition security implications of urbanization processes in India which is in the midst of a major rural-urban transition. In India, rapid economic growth following the liberalization reforms in early 1990s has been accompanied by structural transition. The importance of farm sector has markedly declined, and recent economic growth has been led by urban-based nonfarm sectors. Consequently, millions of rural households have moved from rural-farm to urban-nonfarm jobs. This livelihood change also parallels substantial urban growth in former agrarian regions (Choithani et al., 2021; Van Duijne et al., 2023). This rural-urban transition is changing the sources of food security, as well as instigating dietary changes that necessitates their understanding.

2. India in the global urban transition

Urbanization is considered as one of the defining demographic “mega-trends” of the twenty-first century (United Nations, 2019, p.1). In 2018, there were 4.2 billion urban dwellers compared to 3.4 billion people who lived in the countryside. And future population projections show that this number will increase to 6.7 billion people by 2050. Much of the future projected urban growth will occur in developing countries. In particular, the continents of Africa and Asia that are currently home to 90 percent of global rural population will absorb 90 percent of all increase in urban population between 2018 and 2050 (United Nations, 2018, 2019).

Historically, cities have acted as important catalysts for economic development and innovation. However, the kind and nature of urbanization in the cities of Global South is precluding realistic opportunities for urban populations to improve their life chances. This is because of apparent decoupling of urbanization and income growth in many developing countries, deviating from the established pattern. In many developing nations, rapid urbanization has continued unabated even in the absence of significant urban-based economic growth (Fay and Opal, 2000; Gollin et al., 2016).

In India, however, urbanization-economic growth decoupling shows an inverse relationship. Following the economic liberalization since the early 1990s, Indian economy has witnessed rapid economic growth; this growth is also urban-centric with urban areas contributing to about two-thirds of national income (Planning Commission, 2011). But this has not resulted in concomitant rise in urbanization levels. While the absolute number of urban dwellers increased by 91 million in just last decade, only 31 percent of India’s population lived in urban areas in 2011. Moreover, contrary to expectations, the period coinciding with rapid economic growth has witnessed decline in growth rates of urban populations (Table 1). Some of India’s megacities with dynamic economies such as Delhi and Mumbai have seen their growth rates plummet by half; at the extreme, core regions of the cities such as Kolkata have lost populations in recent times (Bhagat, 2012).

There are two broad set of interrelated explanations for India’s

Table 1
Urbanization in India, 1951–2011.

	Urban Population (in million)	Percent Urban	Annual exponential growth rate of urban population
1951	62.44	17.29	
1961	78.94	17.98	2.34
1971	109.11	19.91	3.24
1981	159.46	23.34	3.79
1991	217.18	25.72	3.09
2001	286.12	27.86	2.75
2011	377.10	31.16	2.76

Source: Bhagat (2012, p. 28)

urbanization puzzle. First, the slowing of urbanization despite high economic growth indicates the *exclusionary* nature of country’s recent economic growth. While India’s economic growth post-1990 has been dominated by large urban agglomerations, it is driven mainly by capital- and skills-intensive sectors, such as information technology and finance (Kotwal et al., 2011; Nijman, 2012). This has created formal, decent employment options for a small section of urban educated workers, while the unskilled and low-skilled populations – which constitute a large majority – moving to cities to make up for livelihood deficits in rural areas are left out from the riches of India’s economic boom (Choithani, 2021). Most rural-urban migrants engage in low-wage, high-precarity informal jobs. While these informal urban jobs often provide an important alternative to millions of people moving out of agriculture, they curtail the prospects for migrants to carve out more permanent urban lives. Thus, labour migration is predominantly circular whereby migrants earn in cities while remaining embedded in their natal places. This circular migration has kept the overall urbanization low in India (Kundu, 2003; Choithani et al., 2021).

If India’s large cities exhibit exclusionary tendencies, the lower echelons of India’s urban system show growing dynamism: therein lies another major explanation for slow urbanization which pertains to how urban is defined and measured in the country. Since 1961, the official definition used in India includes two criteria to classify places as urban (and the residual units are then categorised as rural). These include: a) all places with a statutory administration such municipality, corporation, cantonment board or notified town area committee; b) for other settlements without statutory administration, they have to meet three criteria simultaneously to be classified as urban including i) minimum population of 5000 people, ii) population density of 400+ persons per square kilometre, and iii) 75 percent or more of male workers engaged in nonfarm activity (Census of India, 2011a, p. 1). The latter are referred to as *census towns* (CTs) which are small(est) urban units that do not have proper urban governance structures, but they meet the demographic and economic criteria. This definition of urban involving three conditions to be met simultaneously is viewed as too stringent and is considered as the reason for lower official levels of urbanization. Alternative estimates based on one or two of these three indicators yield urbanization estimates of between 40% and 70% (Sen, 2017; Tandel et al., 2019). These definitional issues notwithstanding, data from the last two population censuses conducted in 2001 and 2011 show that a total number of 2532 former rural settlements acquired the status of CTs in just this decade (Fig. 1), which is almost equal to the number of CTs added in the past century (1901–2001) (Kundu, 2011; Pradhan, 2013). This classification of erstwhile rural areas into urban towns contributed to one-third of the total urban growth rate in India during 2001–11; it also halted the trend of decline in growth rate of urban population that set in from 1990s (Bhagat, 2012).

While phenomenal, even this growth at the base of India’s urban system does not quite capture the true extent of rural-urban transition in the country. Fig. 2 presents the 2011 Indian census data on villages with a population of 1500 people and more where at least *two-thirds* of male main workers are in nonfarm jobs (one of the three conditions for settlements to be classified as urban). In 2011, there were over 13,500 of these high non-agricultural settlements with a combined population of nearly 55.3 million (Census of India, 2011b). These numbers indicate that the magnitude of rural-urban transition in terms of number of people involved is way higher than what the figures on CTs suggest. Detailed, fine-scale spatial analysis of these high non-agricultural settlements also show that many of them amalgamate to constitute large urban formations but are classified as rural due to arbitrary census boundaries (Choithani et al., 2021).

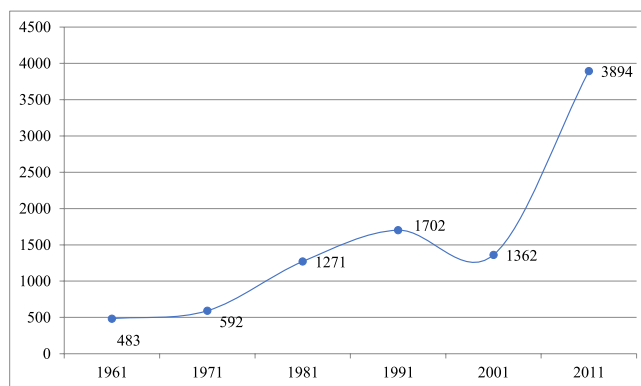


Fig. 1. Census towns in India, 1961–2011.
Source: Various Indian censuses.

3. Rural-urban transition and food security: a conceptual framework of pathways of linkages

The nature of India's urban transition presents a challenge to conceptualize its links with food security. This transition is not neat and does not fit into the existing theoretical models on urbanization-development relationship that assume a linear, one-way permanent shift of rural populations to cities (Kuznets, 1973). While large Indian cities dominate country's economy, recent urban growth has occurred in peripheral regions that include former agrarian zones. Projections show these places will continue to act as an important anchor of future urban growth in India (Pradhan, 2013; Roy and Pradhan, 2018). Given the growing significance of these emerging urban spaces in India's urbanization, these places are also becoming central to understanding the issue of urban food security. At the same time, not much is known about urbanization-food security linkages in these rural-urban transition geographies.

The distinct nature of India's urban transition notwithstanding, the key underlying driver of urbanization in country's periphery is the structural economic transformation and its attendant forces. Historically, it has been observed that structural transformation drives economic growth, shifts labour from farm to nonfarm occupations, reshapes agricultural systems, and changes the dietary patterns. As highlighted in the career-long work of Timmer (inter alia, 1988, 2000, 2009, 2015, 2017), connections between economic development and food security are shaped by three interlinked transformations namely *structural*, *agricultural* and *nutritional* (Timmer, 2017, p. 7; italics added). These interlinked transitions provide useful guide to conceptualize pathways of linkages between economic growth, urbanization and food security in India, and we use these foundational connections to inform our conceptual framework on food security at emerging urban spaces (Fig. 3).

To focus on structural transformation first, which also triggers the other two transitions, it is well-established that this process reconfigures the sectoral composition of the economy. As economy advances, the share of rural-farm sector in national income declines while the urban-nonfarm sectors gain significance. This structural transformation also instigates livelihood shifts from farm to nonfarm occupations as people respond to changes in economic environment. Given the urban nonfarm jobs are generally more remunerative, the structural transformation also provides a potent force to improve living standards. These outcomes of improved incomes and living standards, however, require public policies that enhance the productivity growth in both rural and urban sectors, failing which it can lead to growth of less-productive informal jobs and threaten the very viability of the transition itself (Timmer, 2009, 2017). In India, these latter outcomes of slow productivity and growth of informal sector are more visible. That said, the declining fortunes of farm sector in the national economy means that agriculture now plays a reduced role in households' livelihoods, and it is local and

extra-local nonfarm incomes that a growing majority of households rely on. From the perspective of food security, these shifts imply that a growing number of households now depend on nonfarm incomes for their nutritional needs. While households often hold onto land, land no longer fulfils their food requirements (Choithani, 2022). Households in these rural-urban transition geographies represent what De Janvry and Sadoulet (2011, p. 476) call "net food buyers" whose production of even the basic food staples from their land falls short of their food requirements and they now depend on market purchases to source food. These changes can be both positive and negative. If nonfarm jobs are more remunerative, they can improve food security and dietary diversity. At the same time, reliance on market for food can also have adverse effects on food consumption when food prices increase. For poor households who depend on low-paid informal jobs, even minor upward changes in food prices can adversely affect their nutritional wellbeing. Using the available evidence, this paper investigates these linkages.

The second pathway of linkages between urban transition and food security manifests through agricultural transformation which generally results in improved farm productivity. Structural transition often provides the early trigger for this change, but agricultural transformation is driven by a wide range of factors including domestic food requirements, nature of country's agri-food system, international trade opportunities, production technologies. Historical experience shows two common paths to increasing farm productivity. The first is through enhancing *land productivity* via technologies such as high-yield varieties seeds, synthetic fertilizers, and pesticides, as was achieved through the Green Revolution in many land-scarce Asian countries, including India. The second way is through raising *labour productivity* via farm mechanization, as was witnessed in land-abundant countries such as the United States and Canada (Timmer 2017, p. 10). In India, the Green Revolution reforms in the northwest of the country in 1960s and 1970s led to tremendous gains in domestic agricultural productivity, helped the country achieve food self-sufficiency and boosted farm incomes (Pingali et al., 2017). However, land productivity seems to have hit the upper ceiling in northwestern states, making further gains difficult. And environmental stressors are only adding to the challenge of improving land productivity (Pritchard et al., 2014). Moreover, agricultural holdings in India are getting progressively smaller due to demographic pressures (Government of India, 2020). Lack of permanent migration to cities due to pervasive urban informal sector means that rural population continues to increase in India, placing demands on agricultural land for housing and developmental needs which is fueling India's rural-urban transition (Van Duijne et al., 2023). In terms of food security, urbanization-induced land demands can intensify pressure on rural agriculture land, and the reduced land available for agriculture can potentially also result in high food prices which can affect poor populations. How these processes play out is another issue this paper examines.

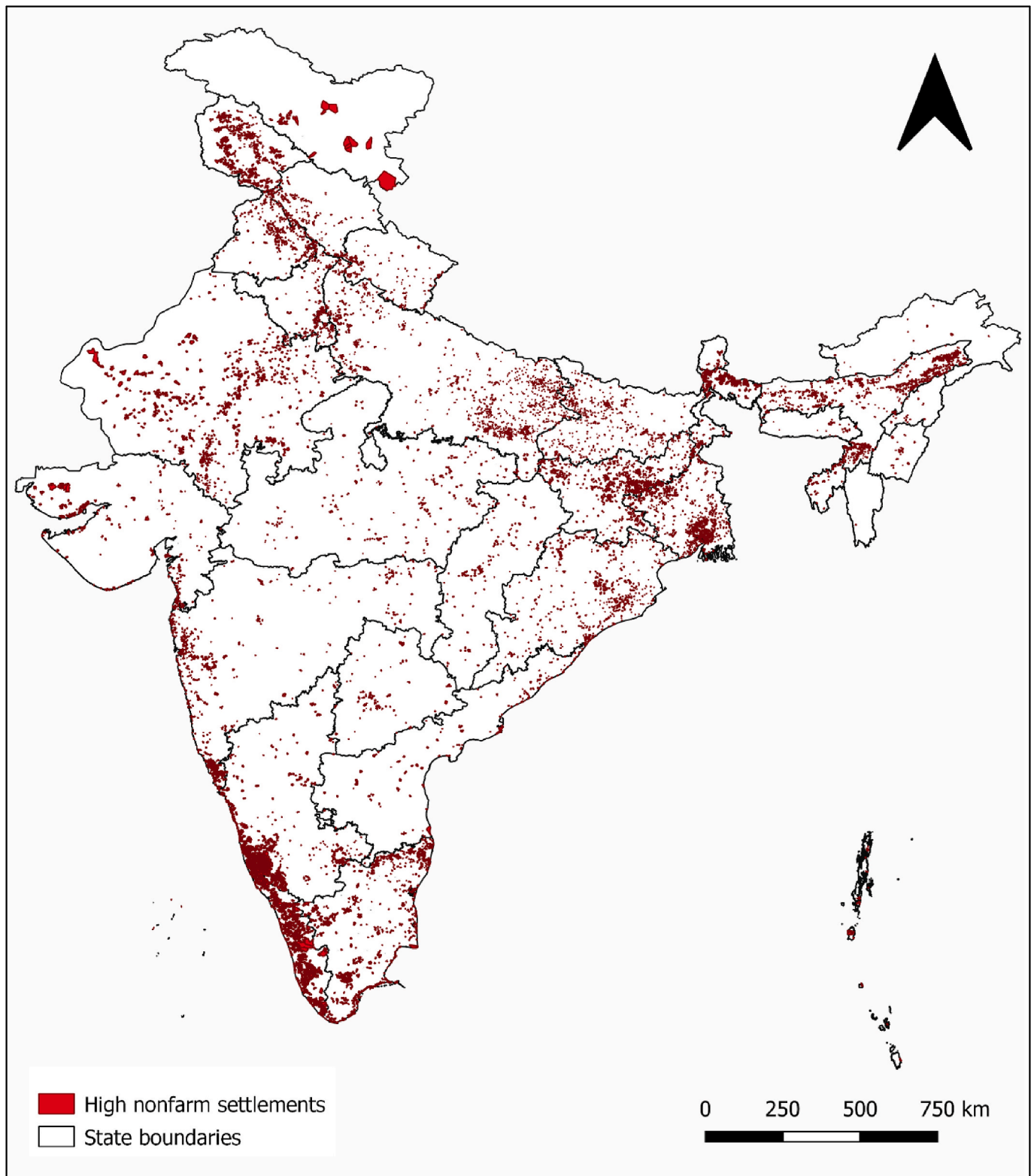


Fig. 2. High nonfarm settlements with a population of 1500 and above.

Source: Authors' work based on village level 2011 Primary Census Abstract data (Census of India, 2011b).

Finally, the urban transition is generally associated with nutrition transition involving “large shifts in the structure of diet” (Popkin, 1999, p. 1905). Compared to rural diets, urban diets typically involve greater consumption of milled grains such as rice and wheat, animal products, foods higher in fat and sugar, processed foods, and out-of-home eating

(Popkin and Bisgrove, 1988; d’Amour et al., 2020; Holdsworth et al., 2020). Shift from farm to nonfarm jobs generally improves incomes which, in turn, leads to increased demand for calories and dietary diversity (Pingali and Sunder, 2017). These livelihood shifts also reduce the need for strenuous manual labour and promote more sedentary

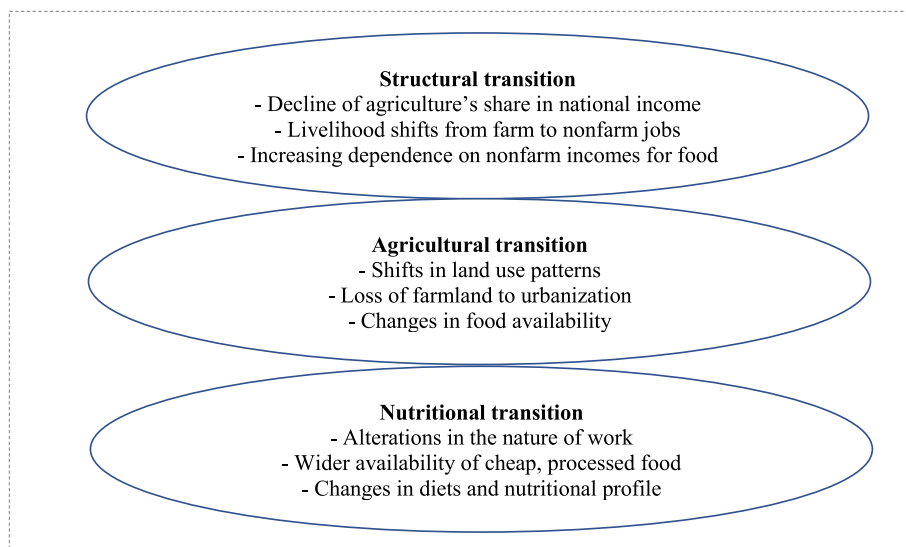


Fig. 3. Rural-urban transition and food security: a conceptual framework.

Source: Authors' work.

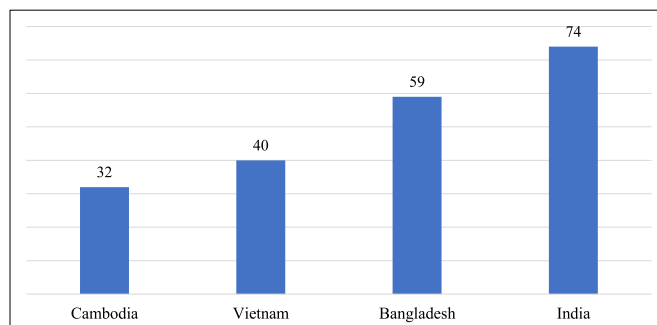


Fig. 4. Net buyers among smallholder households in select Asian countries (percentage of households).

Source: De Janvry and Sadoulet (2011, p. 475)

lifestyles; they are also linked with changes in time allocation patterns including less time spent in cooking which promote greater consumption of processed food and more out-of-home eating (Popkin, 1999; d'Amour et al., 2020). Urban transition is also linked to wider availability of cheap, processed food through supermarkets (Reardon et al., 2003). These lifestyle changes manifest in nutritional profile, with increasing overweight and obesity. These dietary and nutritional shifts provide another set of questions this paper probes.

4. Evidence on impact of rural-urban transition and food security in India

Building on the conceptual framework of pathways of linkages presented above, this section reviews the evidence on the impact of India's urban transition on food security.

4.1. Urban transition and households as net food buyers

Growing pressure on farm-based livelihoods in India means that agriculture no longer sufficiently fulfils household food and nutrition needs. Over 85 percent of landholdings in India are less than 2 hectares (Government of India, 2020). Not surprisingly, nearly two-thirds of smallholders in India are *net food buyers* (Fig. 4), meaning "they produce less [of their staple food] than they need and purchase the remainder on the market" (De Janvry and Sadoulet, 2011, p. 476). This also means that cash incomes earned outside agriculture now provide an important food security anchor.

Evidence from India's National Sample Survey shows that there has been a steady growth in nonfarm employment between 1983 and 2004–05. These nonfarm jobs also increasingly involve the poor. However, greater participation of poor communities in nonfarm sector is accompanied by deterioration of quality of nonfarm jobs involving increase in casual labour that entails daily wages or unfixed contracts as opposed to regular jobs (Himanshu et al., 2011). In the wake of agrarian decline, even these precarious nonfarm incomes can equip the communities with purchasing power to gain food access and improve dietary diversity (Choithani, 2017; Rahman and Mishra, 2020). However, weakened role of agriculture for food provisioning and growing reliance on market for food purchases also need to be understood in the context of food price volatility that has characterised the global food system in recent times. In 2022, global food prices in real terms were 45 percent higher (FAO, 2022). Supply chain disruption due to Covid-19 pandemic and the ongoing Russia-Ukraine war have compounded the challenge of persistently high food prices in recent times, and food price inflation will likely persist for a foreseeable future. The IMF's (2022, p. xvi) has recently warned: "More energy and food price shocks might cause inflation to persist for longer." Many countries across the world are battling prices spikes in basic commodities, and food inflation is a major contributor to rising costs of living. In India, prices of food items have remained high over the past 10 years from their base (Fig. 5).

Urban poor are the worst affected by the rise in food inflation due to their informal jobs and excessive reliance on market purchases. Research in Africa shows that urban migrants receive food remittances from their rural families to cope up with income and livelihood deficits

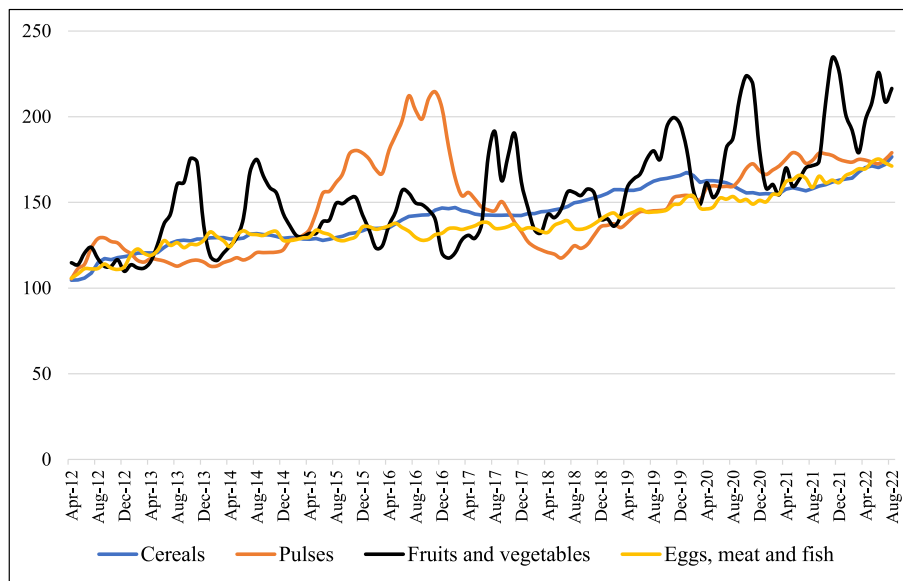


Fig. 5. Wholesale price index of food commodities in India, 2012–2022 (base value of 100 at 2011-12 prices). Source: Authors’ work based on Government of India (2022)

in cities (Onyango et al., 2021). Evidence on this in Indian context is not clear. But with livelihoods becoming degararinsed in India, food remittances are perhaps not as significant in India. The way urban poor in the country seem to cope with these food shocks is to cut their consumption or reduce dietary diversity. Recent research on the impact of Covid-19 on food security in India suggests that among urban communities, urban poor saw the maximum decline in their dietary diversity (Gupta and Kaicker, 2022). Another recent analysis by Crisil India (2021) showed that while the ‘food and beverages’ accounted for almost 60% of expenditure of the bottom 20% of population in both rural and urban areas, urban poor felt the impact of inflation the most. Our analysis of India’s recent round of National Family Health Survey (NFHS) (2019-21) also shows that India’s rural-urban transition is also relocating the food and nutritional deficits from villages to cities, particularly affecting the urban poor. The stunting and underweight prevalence among urban children aged below 5 years belonging to poor households was 46.8% and 41.7%, compared to the children from wealthy families where only 21.5% and 16.1% children were stunted and underweight respectively (IIPS, 2021).

4.2. Land use changes and food security

Another way in which India’s urban transition is adding to the food security challenge is through the changes in land use, with farmland

increasingly being converted to support urban growth. In an insightful study of these dynamics, Pandey and Seto (2015) showed that during 2001-10 (a period coinciding with rapid rural-urban transition), India lost over 7,00,000 hectares of agricultural land – a “very conservative” estimate (p. 63) (see Fig. 6). Urbanization is a leading driver of these changing land use dynamics, and urban population growth explained 53.8% of the variation in state-level farmland loss estimates. Two other important findings of this study were: i) smaller cities witnessed faster farmland conversion compared to big cities which indicates greater growth at smaller places (perhaps also a function of the fact that scope for urban expansion is greater in smaller places); ii) agriculture land loss was predominantly in states with higher agricultural land suitability (pp. 56–63). Other estimates show that growth in urban land area in India exceeded 1,00,000 hectares between 1992 and 2016 which ranked India among the top three countries out of 186 nations in terms of urban land expansion, and this urban expansion came at the expense of cropland displacement (Huang et al., 2020).

In 2001, Indian government launched an ambitious initiative of developing economic corridors which were to be supported by highway infrastructure across the length and breadth of the country. These developments have required massive land acquisitions in former agricultural regions. While these changes have instigated a new politics around land, the economic opportunities and road infrastructure have also led to massive urban growth in these heretofore rural regions (Levien, 2018;

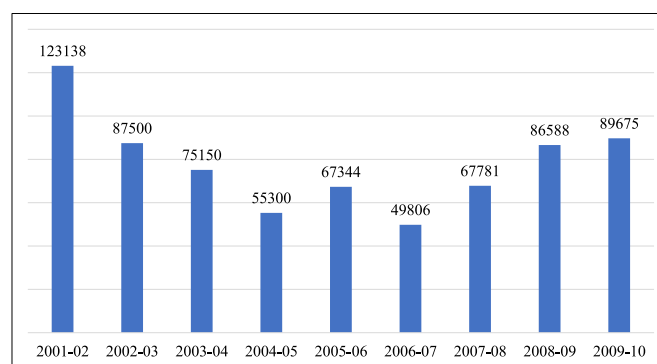


Fig. 6. Year-wise trends in agricultural land loss in India (in hectare). Source: Pandey and Seto (2015, p. 57)

Balakrishnan, 2019; Van Duijne and Nijman, 2019; Van Duijne et al., 2020). As noted earlier, these places are not fully urban and retain elements of the rural, but livelihoods at these rural-urban transition zones are increasingly detached from farming. A growing number of households now eke out their living chiefly from nonfarm jobs, pursued locally and/or in distant urban places. As regards the latter, circular labour migration to large cities is key livelihood strategy of households at the rural-urban transition which is further propelling urbanization processes in these regions. One key aspect of this is the housing growth. Recent field-based studies in different parts of India show that circular migrants invest their incomes to build better houses at origin (Iyer 2017; Choithani et al., 2021). Many use their agriculture land for their housing needs.

Conversion of farmland for urban use can change food availability. The study by Pandey and Seto (2015), quoted above, did not find any adverse effects of farmland conversion on food production in India, perhaps due to agriculture intensification. At the same time, urban growth at rural-urban transition does raise important questions about future of food production. While farm intensification may enable same output from less land, this may not hold when the positive benefits of technological interventions subside. India's food bowl states of Punjab and Haryana in the northwest provide examples where Green Revolution reforms, while boosting food production, have also depleted groundwater tables, making any future gains difficult (Pritchard et al., 2014). Indeed, recent research also shows that between 1992 and 2016 cropland loss due to urban expansion reduced net primary productivity (NPP) in India, and it is among the top five countries (along with China, Brazil, United States and Argentina) with "the largest cropland NPP losses due to urban expansion" (Huang et al., 2020, p. 6). This loss of farmland assumes greater significance in the context of climate change which will have negative impacts of food production (IPCC, 2022). Secondly, urbanization and nonfarm jobs can also lead to shift in cultural values towards farming, particularly among the youth, who may withdraw from farming altogether which threatens the long-term sustainability of food production. A recent study in India shows rural families with working adults living close to economically dynamic cities send their members as migrants to work in cities and do not replace lost family labour in agriculture; instead, they reduce their labour (and financial) investment in farming which reduces overall food production. While this leads to non-migrant households living in villages farther from high-growth cities to deepen their engagement with agriculture, this does not fully compensate the food production loss (Madhok et al., 2022). Third, this urban growth is also fuelling land speculation in which traditionally disadvantaged communities are being further dispossessed of their land-based resources (Levien, 2018). These processes can result in decline in overall food availability, particularly in the long run, which can in turn hurt the poor through increased food prices.

4.3. Dietary changes and nutritional wellbeing

India's rural-urban transition is also changing the food environment in the country, and overweight and obesity are on the rise. Caste has traditionally played a significant part in determining the food choices of Indians (Acharya, 1994). But rapid economic change and urbanization are steadily altering eating patterns. Convenience seems to be replacing caste, and foods like pre-cut vegetables, bottled and canned products, frozen meat and snacks, etc. are gaining popularity among the urban dwellers (Kaur et al., 2016). Consumption of sugars, fats, oil, and ultra-processed foods has also increased (Shetty, 2013; Gulati and Misra, 2014; Law et al., 2019). Overweight and obesity are also on the rise consequently. Recent NFHS (2019-21) data show that while overweight far exceeds underweight in urban areas, obesity and overweight are also on the rise in rural India. In fact, some population groups such as adult women (15–49 years) have greater prevalence of overweight (21.3%) than underweight (18.1%) even in rural India (IIPS, 2021). These trends

align with the evidence on growing urbanization in remote, rural places which are not part of official urban imaginations and discourse in India.

Furthermore, our analysis shows that food consumption patterns also vary between rural and urban areas. Fig. 7 presents data on consumption of various food items by adult women (15–49 years). While a greater proportion of urban women consume fruits, eggs, fish and meat vis-à-vis their rural counterparts, consumption of unhealthy fried foods and aerated drinks is also higher in urban areas. Economic status mediates access to healthy food items. For example, proportion of women who drink milk daily is 33% in the poorest quintile, while this proportion in the richest quintile is 66.4%. Similarly, daily fruit consumption among women from poorest and richest quintiles was 6% and 22.5%, respectively. This indicates that income effects often weigh more heavily on diets, and urbanization does not offer the same benefits to the poor who rely on low-cost cereal-based diets. In other words, while urban poor still suffer from chronic food insecurity, diet excesses are making better-off sections overweight.

Much of this research on urbanization-diets-nutrition nexus in India focuses on large cities. But recent studies on food security at peripheral urban geographies show that improved living standards and increased demand for urban consumption is linked to rising overweight and obesity prevalence (Aiyar et al., 2021), and dietary diversity remains abysmal at these transition zones (Geetha et al., 2020; Marla and Padmaja, 2023). It is also likely that the very poor in these transition zones continue to suffer from basic calorie deprivation, given their detachment from traditional farm-based livelihoods and precarious urban informal jobs.

5. Conclusion

This paper looks at the food and nutrition security implications of rural-urban transition in India, within the wider context of accelerating urbanization of the globe. A critical reading urbanization-food security discourse suggests that the connections between them are inadequately acknowledged and explored. This neglect seems to emanate from the dominant frames of enquiry that posit food insecurity as a production concern and view cities as having a distinct urban advantage. However, the nature of the global urban transition, as it is currently occurring, defies these dominant logics. In many parts of the Global South – where much of the current and future urban growth is concentrated – urban environments are increasingly the hotspots of chronic hunger and undernutrition due to their inability to provide decent, stable livelihoods to a large majority of urban dwellers (Crush, 2016). Worryingly, moreover, recent patterns of urban-centric economic growth in many developing economies have also weakened the traditional role of land and agriculture as a source of income and food security and intensified rural-urban labour migration (Choithani, 2022). But a bulk of urban jobs are informal which, while enabling migrants and their families to make up for the agrarian decline, preclude opportunities for them to carve out permanent urban futures. In other words, rural-urban migrants in developing countries face the double curse of farm decline and curtailed urban prospects.

Perhaps nowhere in the world are these exclusionary outcomes as prominent as in India. Structural economic change and urban-centric economic growth in India over the past three decades mean that millions of former agricultural households now increasingly depend on nonfarm, urban jobs in India's large cities where economic opportunities are concentrated. But these alternative jobs are predominantly in the informal sector and are of low-wage, high-precarity nature which prevent a complete shift from rural-farm to urban-nonfarm existence for millions in this transition. While rural-urban labour migration has grown significantly, much of it is of circular nature with migrants earning in cities while maintaining their rural base (Choithani et al., 2021). India's exclusionary urbanization is manifested in national statistics that show slowing of urban growth despite rapid economic advancement. Crucially, moreover, exclusionary nature of India's large

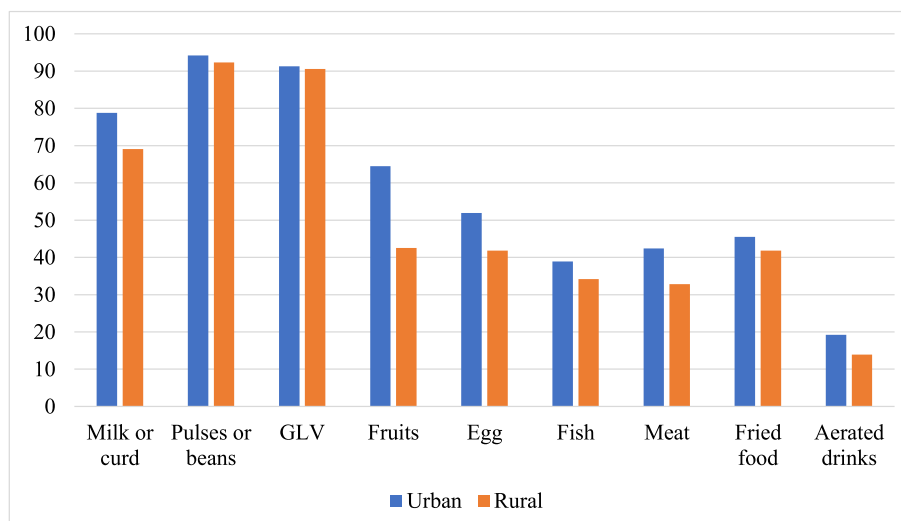


Fig. 7. Consumption of various food items (daily or weekly) by urban and rural women (15–49 years) in India (NFHS-5, 2019–2021). Source: Authors' work based on NFHS-5 2019-21 data (IIPS & ICF, 2021).GLV: Green Leafy Vegetables.

cities is also prompting substantial urban growth in former agrarian zones. There is a dearth of systematic research on the food and nutrition security implications of this bottom-led urbanization in India. This paper has attempted such an understanding.

The evidence reviewed suggests overall worsening of food and nutrition security for people in this rural-urban transition, particularly for the poor populations. First, the decreasing significance of land and agriculture for food security has led to increased reliance on the market for food purchases, and an increasing number of farm households now depend on cash incomes from nonfarm jobs to meet their food needs. The generally low cash incomes from informal jobs, however, do not always allow the households to improve their nutritional wellbeing. Even when income gains from nonfarm sources are significant, their positive effects are often negated by food price rise which has been a *defining* feature of the global food system in the past few years. Second, the conversion of fertile agricultural land to support urban growth in former rural geographies also seems to hurt the poor through increased food prices. While these land use changes may not result in drastically negative effects on overall food production in the immediate run (though the evidence indicates productivity losses), they seem to compound the challenge of food access among the poor in the wake of increasing volatile food prices. Third, rural-urban transition also seems to be driving dietary changes which affect the different socio-economic groups differently: while there is a general increase in overweight and obesity, the poor populations still suffer from basic macronutrient deprivation. Finally, there is another major issue this paper has not addressed due to lack of data which pertains to the implications of rural-urban transition for gender roles and food security. In India, circular labour migration is dominated by men while the women stay behind which reconfigures the gender relations; it often requires women to assume the added load of household's productive and reproductive functions which can undermine the food security of women and children (Choithani, 2022).

These insights have relevance beyond India. Urban expansion in many parts of the developing world is increasingly dominated by smaller places (Randolph and Deuskar, 2024). While the drivers of this bottom-led urbanization are complex and context-specific, it is likely that exclusionary urban processes are contributing to peripheral urbanization at a wider scale. Whether and how this rural-urban transition weighs on food and nutritional security are pressing questions. This paper presents a conceptual framework on the pathways of linkages between rural-urban transition and food security which could provide a useful guide to explore these linkages.

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CRedit authorship contribution statement

Chetan Choithani: Conceptualization, Data curation, Formal analysis, Funding acquisition, Writing – original draft, Writing – review & editing. **Abdul Jaleel CP:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing, Conceptualization. **S Irudaya Rajan:** Conceptualization, Data curation, Formal analysis, Supervision, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data availability

The data used is publicly available

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References

- Achaya, K., 1994. *Indian Food: A Historical Companion*. Oxford University Press, Delhi.
- Aiyar, A., Rahman, A., Pingali, P., 2021. India's rural transformation and rising obesity burden. *World Dev.* 138, 105258 <https://doi.org/10.1016/j.worlddev.2020.105258>.
- Balakrishnan, S., 2019. *Shareholder Cities: Land Transformations along Urban Corridors in India*. University of Pennsylvania Press, Philadelphia.
- Bhagat, R., 2012. A turnaround in India's urbanisation. *Asia Pac. Popul. J.* 27 (2), 23–39.
- Census of India, 2011a. Provisional population totals: urban agglomerations and cities (Paper 2). New Delhi, Registrar General and Census Commissioner of India. <https://censusindia.gov.in/>. (Accessed 23 August 2023).

- Census of India, 2011b. Primary census abstract (online data). New Delhi, Registrar General and Census Commissioner of India. <https://censusindia.gov.in/>. (Accessed 23 August 2023).
- Choithani, C., 2017. Understanding the linkages between migration and household food security in India. *Geogr. Res.* 55 (2), 192–205. <https://doi.org/10.1111/1745-5871.12223>.
- Choithani, C., 2021. Of left-behind places and people: inequality, labour migration and development in India. NIAS Working Paper Number 22. Bengaluru, National Institute of Advanced Studies. <http://eprints.nias.res.in/2244/1/WP22-2021-Chetan-Choithani.pdf>. (Accessed 25 August 2023).
- Choithani, C., 2022. *Migration, Food Security and Development: Insights from Rural India*. Cambridge University Press, New Delhi.
- Choithani, C., Van Duijne, R., Nijman, J., 2021. Changing livelihoods at India's rural–urban transition. *World Dev.* 146, 105617 <https://doi.org/10.1016/j.worlddev.2021.105617>.
- Crisil 2021. Quickonomics: same inflation, different burdens by income. <https://www.crisil.com/en/home/our-analysis/views-and-commentaries/2021/10/same-inflation-different-burdens-by-income.html>. (Accessed 1 September 2023).
- Crush, J., 2016. Hungry cities of the Global South. Hungry cities partnership discussion paper No. 1. Waterloo, hungry cities partnership. <https://hungrycities.net/wp-content/uploads/2016/06/Hungry-Cities-Final-Discussion-Paper-No-1.pdf>, 12 July 2023.
- d'Amour, C., Pandey, B., Reba, M., Ahmad, S., Creutzig, F., Seto, K.C., 2020. Urbanisation, processed foods, and eating out in India. *Glob. Food Secur.* 25, 100361.
- Davies, J., Hannah, C., Guido, Z., Zimmer, A., McCann, L., Battersby, J., Evans, T., 2021. Barriers to urban agriculture in sub-Saharan Africa. *Food Pol.* 103, 101999.
- De Janvry, A., Sadoulet, E., 2011. Subsistence farming as a safety net for food-price shocks. *Dev. Pract.* 21 (4–5), 472–480.
- FAO, 2022. *FAO Food Price Index (Base 2014–16). Food and Agriculture Organization, Rome*. <https://www.fao.org/worldfoodsituation/foodpricesindex/en/>. (Accessed 30 September 2023).
- FAO, 2019. *FAO Framework for the Urban Food Agenda. Food and Agriculture Organization, Rome*.
- Fay, M., Opal, C., 2000. *Urbanisation without Growth: a Not So Uncommon Phenomenon*. The World Bank, Washington D.C. World Bank Policy Research Working Paper No. 2412.
- Geetha, K., Yatnatti, S., Vijayalakshmi, D., Dittirich, C., 2020. Food consumption practices of men and women across rural-urban interface of south Indian megacity Bangalore. *Eur. J. Nutr. Food Saf* 12 (5), 1–9.
- Glaeser, E., 2012. *Triumph of the City: How Urban Spaces Make Us Human*. Pan Macmillan, London.
- Gollin, D., Jedwab, R., Vollrath, D., 2016. Urbanisation with and without industrialisation. *J. Econ. Growth* 21, 35–70. <https://doi.org/10.1007/s10887-015-9121-4>.
- Government of India, 2020. *All India Report on Agriculture Census 2015–16*. Ministry of Agriculture, New Delhi.
- Government of India, 2022. *Index Files for WPI Series (Base 2011–12)*. New Delhi, Office of the Economic Advisor. Government of India. <https://eaindustry.nic.in/>. (Accessed 24 July 2023).
- Gulati, S., Misra, A., 2014. Sugar intake, obesity, and diabetes in India. *Nutrients* 6 (12), 5955–5974. <https://doi.org/10.3390/nu6125955>.
- Gupta, A., Kaicker, N., 2022. Dietary diversity during covid-19 in India. *Econ. Polit. Wkly.* 47 (39), 21–24.
- Himanshu, H., Lanjouw, P., Mukhopadhyay, A., Murgai, R., 2011. Non-farm diversification and rural poverty decline: a perspective from Indian sample survey and village study data. Asia Research Centre Working Paper 44. London School of Economics & Political Science, London. <https://core.ac.uk/download/pdf/220821.pdf>.
- Henderson, J., 2010. *Cities and development*. *J. Reg. Sci.* 50 (1), 515–540.
- Holdsworth, M., Pradeilles, R., Tandoh, A., Green, M., Wanjohi, M., Zotor, F., et al., 2020. Unhealthy eating practices of city-dwelling Africans in deprived neighbourhoods: evidence for policy action from Ghana and Kenya. *Global Food Secur.* 26, 100452 <https://doi.org/10.1016/j.gfs.2020.100452>.
- Huang, Q., Liu, Z., He, C., Gou, S., Bai, Y., Wang, Y., Shen, M., 2020. The occupation of cropland by global urban expansion from 1992 to 2016 and its implications. *Environ. Res. Lett.* 15 (8), 084037 <https://doi.org/10.1088/1748-9326/ab858c>.
- IFPRI, 2017. *Global Food Policy Report 2017*. International Food Policy Research Institute, Washington, DC.
- IIPS, I.C.F., 2021. *National family health survey (NFHS-5), 2019–2021. Dataset. DHS Program*. https://dhsprogram.com/data/dataset_admin/login_main.cfm. (Accessed 10 July 2023).
- IMF, 2022. *World Economic Outlook: Countering the Cost-Of-Living Crisis (Oct 2022)*. International Monetary Fund, Washington, DC.
- IPCC, 2022. *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge and New York.
- Iyer, S., 2017. Circular migration and localised urbanisation in rural India. *Environ. Urban. ASIA* 8 (1), 105–119.
- Kaur, A., Malik, G., Sharma, N., Mittal, R., 2016. The new Indian middle class consumption preference towards convenience foods: a grounded theory approach. *Pac. Bus. Rev. Int.* 9 (2), 31–38.
- Kotwal, A., Ramaswami, B., Wadhwa, W., 2011. Economic liberalisation and Indian economic growth: what's the evidence? *J. Econ. Lit.* 49 (4), 1152–1199. <https://doi.org/10.1257/jel.49.4.1152>.
- Kundu, A., 2003. Urbanisation and urban governance: search for a perspective beyond neo-liberalism. *Econ. Polit. Wkly.* 38 (29), 3079–3087.
- Kundu, A., 2011. Method in madness: urban data from 2011 census. *Econ. Polit. Wkly.* 46 (40), 13–16.
- Kuznets, S., 1973. *Modern economic growth: findings and reflections*. *Am. Econ. Rev.* 63 (3), 247–258.
- Law, C., Green, R., Kadiyala, S., Shankar, B., Knai, C., Brown, K.A., et al., 2019. Purchase trends of processed foods and beverages in urban India. *Global Food Secur.* 23, 191–204. <https://doi.org/10.1016/j.gfs.2019.05.007>.
- Levien, M., 2018. *Dispossession without Development: Land Grabs in Neoliberal India*. Oxford University Press, New Delhi.
- Madhok, R., Noack, F., Mobarak, A., Deschenes, O., 2022. Rural-urban migration and the re-organization of agriculture. EGC Discussion Paper No. 1095. <https://elischolar.library.yale.edu/egcenter-discussion-paper-series/1095>.
- Marla, K., Padmaja, R., 2023. Analyzing gender differentials in dietary diversity across urban and peri-urban areas of Hyderabad, India. *BMC Nutr* 9 (1), 1–10.
- Nijman, J., 2012. India's urban challenge. *Eurasian Geogr. Econ.* 53 (1), 7–20.
- Nijman, J., 2019. Urbanization and economic development: comparing the trajectories of China and the United States. In: Forrest, R., Ren, J., Wissink, B. (Eds.), *The City in China*. Bristol University Press, Bristol, pp. 101–124.
- Onyango, E., Crush, J., Owuor, S., 2021. Food remittances, migration and rural-urban linkages in Kenya. MiFOOD Working Paper No. 2. Waterloo, Hungry Cities Partnership.
- Pandey, B., Seto, K., 2015. Urbanization and agricultural land loss in India: comparing satellite estimates with census data. *J. Environ. Manag.* 148, 53–66.
- Pingali, P., Sunder, N., 2017. Transitioning toward nutrition-sensitive food systems in developing countries. *Annu. Rev. Resour. Econ.* 9, 439–459.
- Pingali, P., Mitra, B., Rahman, A., 2017. The bumpy road from food to nutrition security: slow evolution of India's food policy. *Global Food Secur.* 15, 77–84. <https://doi.org/10.1016/j.gfs.2017.05.002>.
- Planning Commission, 2011. *Eleventh Five-Year Plan (2007–12): Mid-term Appraisal*. Government of India, New Delhi.
- Popkin, B., 1999. Urbanization, lifestyle changes and the nutrition transition. *World Dev.* 27 (11), 1905–1916. [https://doi.org/10.1016/S0305-750X\(99\)00094-7](https://doi.org/10.1016/S0305-750X(99)00094-7).
- Popkin, B., Bisgrove, E., 1988. Urbanization and nutrition in low-income countries. *Food Nutr. Bull.* 10 (1), 3–23.
- Pradhan, K., 2013. Unacknowledged urbanisation: the new census towns of India. *Econ. Polit. Wkly.* 48 (36), 43–51.
- Pradhan, P., Callaghan, M., Hu, Y., Dahal, K., Hunecke, C., Reuwig, F., et al., 2023. A systematic review highlights that there are multiple benefits of urban agriculture besides food. *Global Food Secur.* 38, 100700 <https://doi.org/10.1016/j.gfs.2023.100700>.
- Pritchard, B., Rammohan, A., Sekher, M., Parasuraman, S., Choithani, C., 2014. *Feeding India: Livelihoods, Entitlements and Capabilities*. Routledge, Oxon.
- Rahman, A., Mishra, S., 2020. Does non-farm income affect food security? Evidence from India. *J. Dev. Stud.* 56 (6), 1190–1209. <https://doi.org/10.1080/00220388.2019.1640871>.
- Randolph, G.F., Deuskar, C., 2024. Urbanization beyond the metropolis: planning for a large number of small places in the global south. *J. Plann. Educ. Res.* 44 (1), 279–291. <https://doi.org/10.1177/0739456X20971705>.
- Reardon, T., Timmer, C., Barrett, C., Berdegue, J., 2003. The rise of supermarkets in Africa, Asia, and Latin America. *Am. J. Agric. Econ.* 85 (5), 1140–1146. <https://doi.org/10.1111/j.0092-5853.2003.00520.x>.
- Roy, S.N., Pradhan, K.C., 2018. Predicting the future of census towns. *Econ. Polit. Wkly.* 53 (49), 70–79.
- Ruel, M., Garrett, J., Yosef, S., Olivier, M., 2017. Urbanization, food security and nutrition. In: de Pee, S., Douglas T., Martin, W.B. (Eds.), *Nutrition and Health in a Developing World*. Springer, Cham, pp. 705–735.
- Sen, P., 2017. The puzzle of Indian urbanization. Livemint, 4 May 2017. <https://www.livemint.com/Opinion/tQTbqmQg9cXjgAKYgkclK/The-puzzle-of-Indian-urbanization.html>. (Accessed 12 August 2023).
- Shetty, P., 2013. Nutrition transition and its health outcomes. *Indian J. Pediatr.* 80 (Suppl. 1), S21–S27. <https://doi.org/10.1007/s12098-013-0971-5>.
- Tandel, V., Hiranandani, K., Kapoor, M., 2019. What's in a definition? A study on the suitability of the current urban definition in India through its employment guarantee programme. *J. Asian Econ.* 60, 69–84. <https://doi.org/10.1016/j.asieco.2018.11.001>.
- Timmer, C.P., 1988. The agricultural transformation. In: Chenery, H., Srinivasan, T. (Eds.), *Handbook of Development Economics*. Elsevier, pp. 275–331.
- Timmer, C.P., 2000. The macro dimensions of food security: economic growth, equitable distribution, and food price stability. *Food Pol.* 25 (3), 283–295.
- Timmer, C.P., 2009. A world without agriculture: the structural transformation in historical perspective. Wendt Distinguished Lecture. American Enterprise Institute, Washington, DC. https://www.aei.org/wp-content/uploads/2014/06/a-world-without-agriculture-the-structural-transformation-in-historical-perspective_145442400043.pdf.
- Timmer, C.P., 2015. *Managing structural transformation: a political economy approach*. WIDER Annual Lecture 018. UNU-WIDER, Helsinki. <https://www.wider.unu.edu/publication/managing-structural-transformation>. (Accessed 27 July 2023).
- Timmer, C.P., 2017. Food security, structural transformation, markets and government policy. *Asia Pac. Policy Stud.* 4 (1), 4–19.
- UN-Habitat, 2022. *World Cities Report 2022: Envisaging the Future of Cities*. United Nations Human Settlements Programme, Nairobi.
- United Nations, 2018. *World urbanisation prospects: the 2018 revision (Dataset)*. <https://population.un.org/wup/Download/>.

United Nations, 2019. World urbanisation prospects: the 2018 revision (Report). At. <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>.

Van Duijne, R., Nijman, J., 2019. India's emergent urban formations. *Ann. Assoc. Am. Geogr.* 109 (6), 1978–1998. <https://doi.org/10.1080/24694452.2019.1587285>.

Van Duijne, R., Choithani, C., Pfeffer, K., 2020. New urban geographies of West Bengal, east India. *J. Maps* 16 (1), 172–183.

Van Duijne, R., Nijman, J., Choithani, C., 2023. Injected urbanism? Exploring India's urbanising periphery. *Econ. Geogr.* 99 (2), 161–190. <https://doi.org/10.1080/00130095.2022.2133696>.