



## Investing to Nourish India's Cities

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### Executive Summary

- ▶ India is forecast to experience the largest increase in urban population of any country in the world. India's cities could have another 404 million mouths to feed by the year 2050.
- ▶ Cities will generate 70 percent of India's new jobs and gross domestic product (GDP).<sup>1</sup> India's \$360 billion food market will grow significantly as urban employment and rising incomes support increased consumption and access to quality food options.
- ▶ Against this backdrop of growth and opportunity, much of urban India is considered highly or moderately food insecure, reflecting differences in nutritional status among urban residents and communities.
- ▶ The majority of urban residents do not achieve the daily intake of nutrition recommended by India's National Institute of Nutrition. The poorest urban residents consume on average 55 percent less than the wealthiest urban residents.
- ▶ For the most vulnerable urban residents, a variety of public health interventions and social safety nets are required. But growing demand in urban food markets also necessitates significant transformation of India's food supply chain.
- ▶ Today, India's food system is largely unorganized and highly fragmented, inhibiting large-scale procurement, distribution, and retail sales.
- ▶ Substantial public investments are needed to expand and increase the quality of storage, handling, and transportation infrastructure.
- ▶ Value-added processing offers opportunities to mainstream micronutrients into the diet by fortifying widely consumed staples with vitamins, minerals, and iron to help address deficiencies.
- ▶ The government of India must continue improving the regulatory environment as a prerequisite to private-sector investments in vertically integrated sourcing, modern logistics services, large-scale food processing, and retail efficiencies—four critical routes to improving urban nutrition and food security in India.

## Introduction

India is an agriculture powerhouse. It is also home to roughly one-quarter of the world's undernourished people. India's vibrant cities are driving the nation's economic growth. But conditions in India's sprawling urban slums may worsen under the strain to provide basic services to its increasing number of residents. Malnutrition in urban areas reflects the widening income gap between the urban wealthy and urban poor.

Achieving urban food and nutrition security against these headwinds is one of India's greatest challenges. The solutions are as multifaceted and complex as the challenge. Public health interventions are required to provide effective food safety nets, improve nutrition literacy, and induce changes in behavior such as to eliminate the widespread practice of open defecation. Alongside these traditional approaches, nothing short of supply chain transformation in India will deliver the prospect of meeting increased demand for safe, affordable, and nutritious food in urban areas.<sup>2</sup>

The private sector has a central role to play in this transformation and will be instrumental in applying technologies and best practices to build out modern infrastructure and processes for delivering perish-

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able, nutritious foods from the rural farm to the urban table. But the onus is on policymakers to create an enabling environment for these critical private-sector investments to succeed. Many initiatives have already begun. Building on the successes already achieved can provide momentum for further—and faster—change.

This paper focuses on the journey of food in India from the farm to the urban markets where India's city residents buy their food, highlighting the commercial challenges, the public and private investments required, and the policy frameworks needed to improve the delivery of higher quality food options to India's cities and all of its residents. It extends the discussion of feeding the world's growing cities presented in the Chicago Council on Global Affairs' 2016 report *Growing Food for Growing Cities* by looking at the spe-

## Box 1

### The key role of the private sector

The private sector in its widest sense—farmers, traders and retailers, processors and small manufacturers, banks and investment funds that finance them, are the de facto engine for delivering better nutrition.... The intervention points for businesses along the entire food chain are many, and each has different implications for how government policy can positively influence nutrition.<sup>3</sup>

Source: Global Alliance for Improved Nutrition, 2011

cific case of India, which by 2050 is projected to have three of world's five largest cities, alone encompassing 112 million people.<sup>4</sup>

## Evolving consumption and nutrition in urbanizing India

### The definition of urban food markets is expanding.

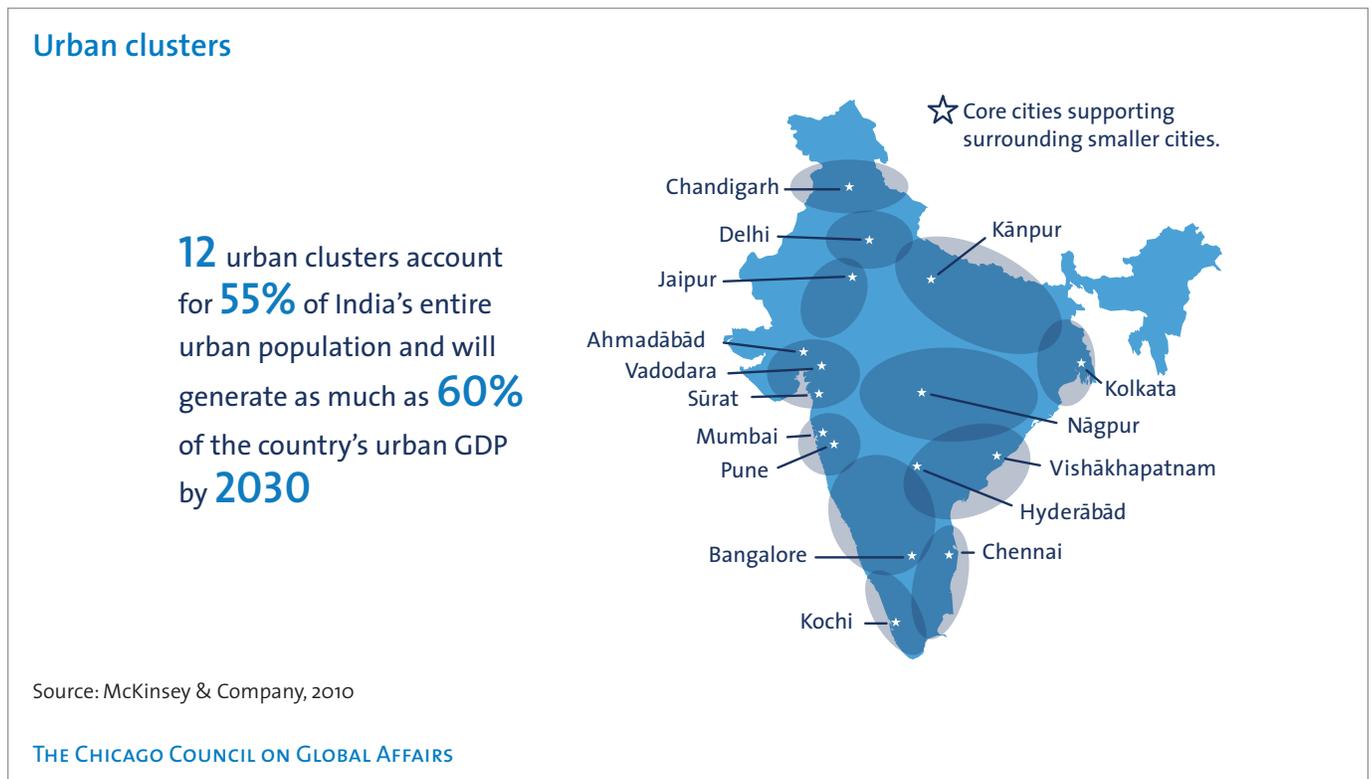
India added nearly 230 million people to its urban population over the last 40 years. In the next 40 years, another 404 million people will migrate to India's cities, doubling the urban population. Of India's 1.3 billion people today, about 32 percent live in urban areas. By 2050, half of India will live in cities.<sup>5</sup>

But what is "urban" in India? India is home to the global megacities of Delhi (population 25 million), Mumbai (population 21 million), and Kolkata (population 15 million). Four more are not far behind. Bangalore, Chennai, Hyderabad, and Ahmadabad are all projected to join megacity status as soon as 2030.

Beyond the megacities, India's 2011 Census counted an additional 7,935 cities and towns it also defines as urban based on population size, density, and economic activity. These include over 400 cities with a population of 100,000 or more.<sup>6</sup>

Fifty-five percent of India's urban population lives within 12 "urban clusters" that encompass two or more big cities and the closely connected towns that surround them.<sup>7</sup> These are important growth markets for food producers and retailers, as they include increasingly affluent residents in semi-urban and "transition" districts outside India's large metropolitan cities.

FIGURE 1



### The state of food and nutrition security for urban residents is uneven across India.

India is home to some of the highest levels of child undernutrition in the world. As India rapidly urbanizes, understanding the challenges to providing affordable,

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Urban areas are home to India's burgeoning middle class. Average household income is projected to triple over the next decade, stimulating an estimated four-fold increase in consumption by 2020.

But India's cities and neighborhoods comprise a range of incomes, livelihoods, social status, and cultural backgrounds. Expenditure patterns, including on food, vary widely across cities and consumer segments. Seventy-five percent of India's urban residents

are mired in poverty, earning an average of 80 rupees, or \$1.80 a day.<sup>8</sup>

In 2011 the M.S. Swaminathan Research Foundation and World Food Programme published the definitive report on *The State of Food Insecurity in Urban India*. Using standardized, weighted indicators across three dimensions of food security—availability, access, and absorption—a picture emerges of *high to moderate food insecurity across much of urban India*.<sup>9</sup> Progress to address urban food insecurity is uneven across Indian states. Poorer states are reducing malnutrition at faster rates, but they account for a small part of India's urban population.<sup>10</sup>

A research study published in the journal *Demography India* concludes that undernutrition among the urban poor in most states is worse than among rural poor.<sup>11</sup> Whether or not this shift has fully occurred, most studies show that the condition of the urban poor is not far behind that of the rural poor.

Malnutrition is a particular concern for urban children. Around half of children in the urban poor population are stunted or underweight.<sup>12</sup> Children in urban slums are at high risk for protein energy malnutrition, vitamin A deficiency, and iron deficiency anemia.<sup>13</sup>

Low-quality living conditions contribute to illness and poor nutrient absorption.

Datasets on the level and scope of malnutrition in urban areas as well as on the linkages between nutrition and household income are considered unsatisfactory, and many contemporary studies still rely on data that is eight to 10 years old. In general, nutritional performance is expected to increase with economic growth, but income growth has not produced significant reductions in undernutrition in India.

### There’s a growing gap between poor and wealthy urban Indians.

What does the urban food plate look like? Food consumption in urban India is growing nearly twice as fast as rural food consumption. Yet according to National Sample Survey data, *urban Indians consume fewer calories than their rural counterparts across almost all income levels.*<sup>14</sup> Not surprisingly, cereals comprise a higher percentage of calories in the average rural diet compared with the average urban diet. But the heavy reliance on cereals is quite similar between the urban poor and rural poor.

The urban diet incorporates more high-value foods such as fruits, vegetables, and complex proteins.<sup>15</sup> This nutrition transition is typical of emerging economies

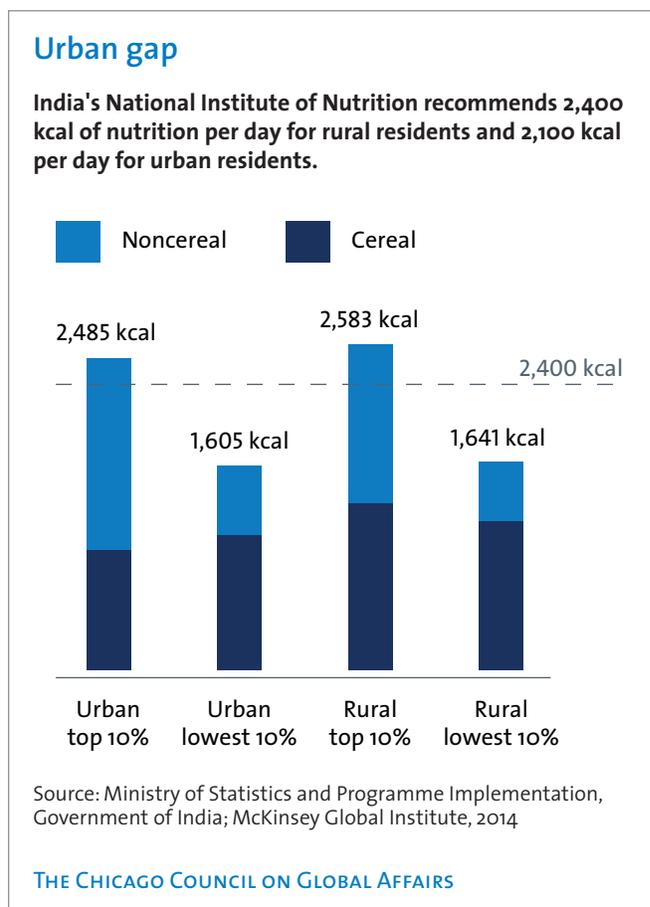
***In addition to continuously investing in agricultural productivity, the supply chains that link farmers to consumers must be further developed to deliver sufficient quantities of affordable, safe, and nutritious foods to urban residents.***

with a growing middle class. Yet almost 70 percent of urban Indians are not getting the average caloric intake of 2,100 kcal per day of nutrition recommended by the National Institute of Nutrition (ICMR). The gap between the poorest urban residents who consume 1,605 kcal per day and the wealthiest urban residents, who consume 2,485 kcal per day, constitutes a 50 percent difference.<sup>16</sup>

### Building supply chains to deliver urban nutrition

Meeting the growing demand for food in India’s swelling cities is a major challenge—and an immense

FIGURE 2



opportunity. In addition to continuously investing in agricultural productivity, the supply chains that link farmers to consumers must be further developed to deliver sufficient quantities of affordable, safe, and nutritious foods to urban residents. The private sector will play a primary role in meeting food demand, but the Indian government is also heavily invested and involved in the food sector. While maintaining traditional social safety net programs, public-sector capital investments in basic infrastructure will be critical to support private supply chain development. Public policies must open the door wider for expansion of organized and scaled private investments along the entire supply chain.

### Key government policies affect urban food delivery

#### Public procurement

With high levels of malnutrition and poverty in the country, public procurement and distribution of wheat and rice is a cornerstone of India’s food security

policy. The government sets minimum support prices for these commodities to insulate farmers from price fluctuations. A portion of wheat and rice production is purchased by over 7,500 Agricultural Procurement and Marketing Committees, or *mandis*. The mandis act as buyers for the Food Corporation of India (FCI), storing crops until they are distributed through the public distribution system, which provides subsidized grains to some 800 million poor people through small “fair price” shops throughout the country.

The National Food Security Act of 2013 massively expanded the public distribution system to some 830 million people. Half of the urban population is now entitled to five kilograms of subsidized food grains.

While public procurement of grains is designed to help feed the undernourished and protect farmers, the system has huge challenges. According to a 2011 World Bank study, just 41.4 percent of the grain purchased by the states from federal warehouses reaches Indian homes as a result of inefficiency and corruption along

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the distribution chain.<sup>17</sup> A High Level Commission report on the functioning of the FCI in January 2015 calculated that as much as 47 percent of grains procured by FCI is diverted from the public distribution system.<sup>18</sup>

The committee also calculates that the benefits of rice and wheat procurement have not gone to a large number of farmers (about 6 percent of total farmers).<sup>19</sup> When per-capita consumption of grains is stagnating or declining, minimum support prices may artificially deter farmers from diversifying to higher-value crops such as fruits and vegetables that are important sources of dietary nutrition and are increasingly in demand in urban centers.

Proposals to move to cash transfers in cities could provide more choice and diversity in diet. The High Level Commission recommended gradual introduction of cash transfers in the Public Distribution System, starting with large cities with a population of more than 1 million. In March 2016 the Indian government launched a pilot program in Chandigarh and Puducherry, offering direct cash transfers to food subsidy beneficiaries.

## Cascading taxes

India maintains a highly complicated tax regime. The central government applies interstate taxes to the movement and sale of goods, while each of India's 29 states levies a variety of taxes, including a value added tax (VAT), service taxes, and excise taxes on sales within their states. VAT rates for the same product vary

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from 12.5 to 15 percent, depending upon the state. In addition to taxing goods at the point of sale, a number of state governments apply an entry tax on goods entering a local or municipal area in the state.

Most observers believe the environment for large-scale centralized warehousing and distribution centers and pan-India retail operations would be greatly improved under a uniform tax, which would bring down overall food costs for the urban Indian consumer. However, consideration of a nationwide goods and services tax, under which a good is taxed at the point of final sale, has been stalled in the parliament.

## Tariffs on imported food

India's bound agricultural tariffs are among the highest in the world, inhibiting the importation of food. India imports only a few agricultural commodities in large volumes such as edible oil and pulses. In 2014 India

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Under the World Trade Organization (WTO) Agreement on Agriculture, India committed to “bind” its agricultural tariffs at rates ranging from 0 to 100 percent for primary products, 150 percent for processed products, and 300 percent for edible oils, but retains the flexibility to adjust the tariffs it actually

FIGURE 3

Standard import tariffs	
	Bound Rate
Fish	Unbound
Palm Oil	300%
Chicken leg	150%
Potatoes	150%
Sugar	150%
Wheat flour	150%
Milk	100%
Oilseed	100%
Onions	100%
Pulses	100%
Strawberries	100%
Wheat	100%
Whole chicken	100%
Corn	70%
Rice (milled)	70%
Frozen vegetables	55%
Apples	50%
Cheese	40%

Source: Central Board of Excise and Customs, Department of Revenue, Ministry of Finance, Government of India

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applies.<sup>20</sup> For many products, India applies a tariff well below the bound rate.

However, the government of India often raises tariffs to strengthen producer prices or discourage imports.<sup>21</sup> For example, the Finance Ministry reinstated a 10 percent import duty on wheat in August 2015 following private deals to import 500,000 tons of premium Australian wheat, the biggest such purchase in over a decade. Indian flour millers had contracted to buy the wheat after weather damage to Indian crops earlier in the year.<sup>22</sup>

### Food safety standards and compliance

The Indian government has made significant investments in its regulatory regime for ensuring the health and safety of foods sold in India. In 2006 India consolidated its food safety regime through the Food Safety Standards Act, which became effective in 2011 and created the Food Safety and Standards Authority of India (FSSAI). One of the most pressing challenges is to promote conformity with food standards in the unorganized sector, where noncompliance is extremely high. Around 70 percent of samples tested by FSSAI in 2011 did not meet required standards.

Of great concern is that 20 percent of food samples randomly tested were either substandard or adulterated. For example, calcium carbide, a carcinogenic agent, may be used to accelerate the ripening of fruits.

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FSSAI is not equipped to maintain adequate oversight of the unorganized food distribution and processing sector or the large share of processing activity undertaken by local street vendors, restaurants, schools, and elsewhere, giving rise to serious hygienic and safety concerns. As India works to promote the food processing industry, it will need to focus heavily on promoting best-in-class safety and hygiene practices in all facets of food handling, storage, and processing—including by the consumer—to address the many causes of unsafe food.

## Reducing regulatory complexity

FSSAI is working to reorient India's approach from post-market surveillance toward prevention through safety and quality in production. In doing so, however, the new FSSAI overshoot with its requirement that all "nonstandardized" food items be approved. FSSAI only standardized a small number of food items, requiring that the agency affirmatively test and approve all others. The impracticality of the product approval requirements caused severe backlogs, which mounted when the regulations were litigated in the courts. During an attenuated period of regulatory uncertainty, food worth millions went to waste at ports when imported food could not be cleared.

Burdensome regulatory requirements can have the adverse effect of hindering the translation of nutrition R&D into product introductions in India. To overcome these concerns, FSSAI recently introduced revised regulations that focus instead on novel ingredients and has announced it is working toward harmonization of standards for another 12,000 foods to conform with *Codex Alimentarius*. Though producers welcome these initiatives, they remain concerned that onerous packaging and labeling requirements are replacing approvals as the next series of obstacles to selling their products in India.

## Enhancing food testing capacity

Another area targeted for improvement is the expansion of qualified food testing laboratories, as testing capacity currently remains insufficient to meet grow-

ing demand. Producers continue to seek that FSSAI become more open to adopting modern test method reference standards, which would reduce the opportunity for inaccurate test results if laboratory personnel are properly trained. The Ministry of Food Processing is providing assistance to state organizations and universities, including implementing partners in the private sector, to strengthen India's food safety testing laboratory network, recognizing that collaboration with the private sector is critical to improving food safety.

## Fragmented, inefficient supply chains

India's agricultural supply chains are largely unorganized and highly fragmented, with food passing between many sets of hands from farmer to urban consumer.<sup>23</sup> Many local traders and agents play an important role supporting workers and connecting small

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farmers to markets by facilitating collection of output and providing capital to farmers who are outside of the formal banking system. But the large unorganized economy has its trade-offs, adding complexity to procurement and distribution as well as inhibiting scale.

After the long journey from farm to urban market, urban consumers pay a price for distribution

FIGURE 4



FIGURE 5

### Price escalation in distribution

Distribution of tomatoes, cabbage, brinjal, okra, and beans in Andhra Pradesh.



Source: Federation of Indian Chambers of Commerce and Industry and A.T. Kearney, 2014

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inefficiencies, including markups along the way by middlemen and differential pricing among small neighborhood retailers. By some estimates, long marketing channels with many intermediaries inflate the cost of food by as much as 100 to 250 percent over the cost of production. Figure 5 shows an example of the value chain price buildup for fruits and vegetables in Andhra Pradesh, where the final price has been marked up 100 percent between farm and table due to three or four extra intermediaries in the transaction.

### Lack of modern food system infrastructure

Legal and regulatory restrictions, inadequate transportation infrastructure, suboptimal storage and handling for perishables, and barriers to expanding food retail outlets in India are all factors that compound the challenges to increasing the availability of affordable, high-quality nutrition in India's swelling cities.

### Connecting farmers to buyers

It is not enough to simply increase production to meet food demand. Agricultural and food products must reach the food markets in India's urban centers while

## Technology for price discovery

Poor price information reduces farmers' bargaining power with traders and prevents them from selling their product in the most lucrative market if options are available. Services like those offered by IFFCO Kisan Sanchar Ltd. provide information on market prices via voice messages in local languages or dialects.

Source: McKinsey Global Institute, 2014

retaining quality, safety, and affordability, a process that begins with the purchase of inputs from farmers. The marketing of agriculture products is regulated under state-by-state Agricultural Procurement Marketing Acts (APMAs). Over 650,000 licensed traders and commission agents serve as middlemen for larger private buyers. Only a few states currently permit direct procurement from farmers, though by most accounts enforcement of the APMAs varies considerably.

Contract farming, corporate farming, and cooperative farming can reduce the risk to farmers, offering them opportunities to seek volume guarantees, diversify to higher-value production, and improve price realization per unit sale. With a stable buyer, farmers have incentives to adopt new technologies and production practices and acquire the means to access finance by using contracts as collateral. For example, in the case of dairy cooperatives, increased efficiencies from these practices enabled farmers to shift the balance from local consumption and sales to the production of marketable surpluses, feeding and benefitting the urban consumer.

Greater private participation in procurement is also being enabled by the emergence of electronic platforms that connect farmers directly with buyers and provide spot market information to farmers. Some of the largest Indian retailers such as Reliance are establishing collection centers to bypass auctions and middlemen.

Most private buyers, however, continue to procure mainly from large traders and mandis, citing high transaction costs and difficulty collecting from small farmers whose production is dispersed. Traders and agents also remain important intermediaries between buyers and millions of farmers outside of the financial system.

Until more states both amend the Agricultural Procurement and Marketing Act and invest in agriculture marketing infrastructure to facilitate direct purchase, the existing system of wholesalers will continue to be the most important link—or obstacle—to more efficient distribution between rural producers and urban consumers.<sup>24</sup>

## Lost in transit

Logistics costs account for 6 to 10 percent of average retail prices in India compared with a global average of 4 to 5 percent.<sup>25</sup> India is the second largest producer of fruits and vegetables in the world, but anywhere from 30 to 40 percent—over \$8 billion in value—is estimated to be wasted or lost in transit every year.<sup>26</sup> Produce may be loaded, sorted, or repacked four or five times before consumption, each time increasing the possibility of degradation, contamination, and physical loss.

India relies heavily on its roads for freight transport, with just seven long-haul corridors carrying half of the

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***Poor logistics infrastructure costs the Indian economy as much as \$65 billion each year.***

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country's freight. Last mile links are often poor quality or absent, causing bottlenecks, increasing cost, and leaving areas underserved. Poor logistics infrastructure costs the Indian economy as much as \$65 billion each year.<sup>27</sup>

According to McKinsey & Company, over two-thirds of India's requirements for infrastructure network capacity has yet to be built.<sup>28</sup> The Indian government committed to \$1 trillion in infrastructure investment in the current Five Year Plan.<sup>29</sup> However, even with the planned public investment, analysts expect growth in freight traffic to rapidly outstrip the increased capacity. The government is increasingly engaging in public-private partnerships in an attempt to accelerate road expansion.

## Underdeveloped warehousing

A KPMG report summarized the state of the industry this way: "Until a decade ago, warehousing in India was a synonym for basic four-walled structures with suboptimal sizes, inadequate ventilation and lighting, lack of racking systems, poor hygiene conditions, and lack of inventory management."<sup>30</sup> A decade later, the Indian warehousing industry has improved only incre-

mentally, remaining mostly local, mostly unorganized, and mostly inadequate.

India's Planning Commission estimates the gap between supply and demand for agricultural warehousing at 35 million metric tons. Companies cite the need to arbitrage differences in state taxes and establish multiple small warehouses in different states to minimize their tax bill rather than invest in large, centrally located facilities that would incur repeated taxation when moving goods across state borders. The Indian parliament has been debating a uniform goods and service tax. If implemented, uniform taxation would support consolidation and encourage the rational allocation of larger-scale warehouses suited to perishable goods since these warehouses would be taxed the same in all states and only at the point of sale.<sup>31</sup>

### Cold chain: a weak link

Demand for perishable foods is growing among middle-class consumers and urban residents in India, underscoring the need for increased investment in

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cold chain infrastructure. Livestock products, fish, fruit, and vegetables incur the most risk due to lack of or poor refrigeration on the long journey to market.

Approximately 104 million tons of perishable food are transported to cities throughout India every year, but only about 4 percent is transported in refrigerated vehicles that struggle to contend with India's poor roads.<sup>32</sup> Surprisingly, India has the largest total refrigerated warehouse capacity in the world. Yet on a per-capita basis, India has just 0.09 cubic meters of cold storage compared with 0.30 in Brazil, and 0.35 in the United States. Of the 6,000 or so refrigerated warehouses, some 5,900 date back to the 1960s. They were designed for potato storage and are not efficient enough to store perishables, dairy, or meat.

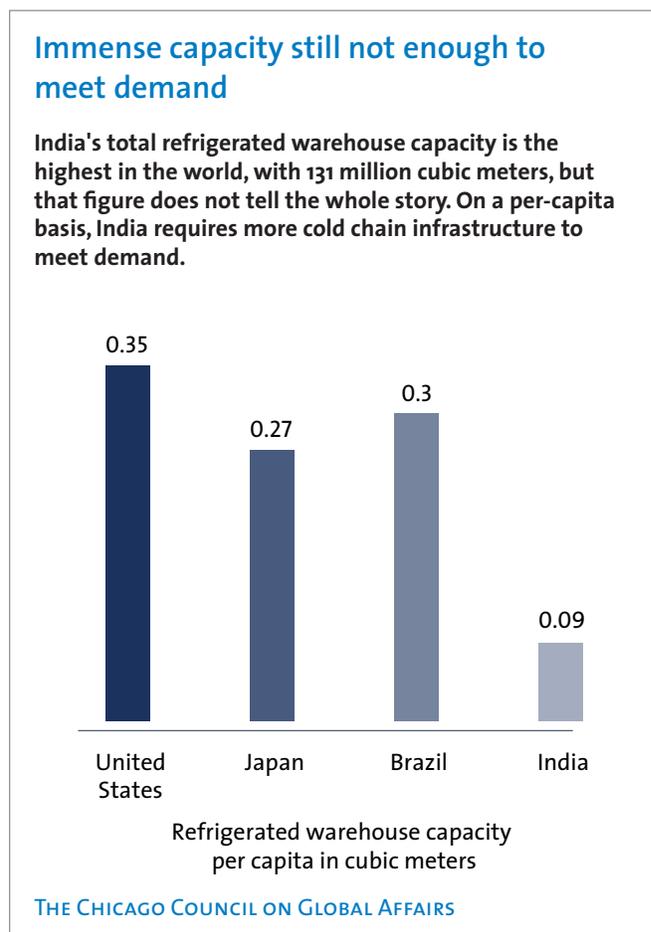
In 2015 the National Center for Cold-Chain Development (NCCD), an autonomous body of India's Ministry of Agriculture, conducted an assessment of the status and gaps in India's cold chain infrastructure. The NCCD estimated an additional 70,000 pack

houses, 8.25 million metric tons of cold storage space, and almost 53,000 refrigerated vehicles are required to meet the existing demand for perishable food products in India, excluding milk.<sup>33</sup> The Indian Institute of Management in Kolkata estimates that cold-storage facilities are available for only 10 percent of perishable food products, leaving around 370 million tons of perishable products at risk.<sup>34</sup>

Farmers need access to pre-cooling centers near the farm that can be integrated with facilities for weighing, sorting, grading, and other minimal processing activities. In the absence of storage, farmers face losses from selling at substandard prices or suffering spoilage of output that could otherwise generate more income for the farmer.

Adequate cold storage warehousing would ideally be developed in a hub-and-spoke model with refrigerated transportation to ensure food products are kept at controlled temperatures between precooling centers on the farm and cold storage and between cold storage

FIGURE 6



and the processing plant, wholesaler, or retailer. At the retail store, perishable food products must be stored at low temperatures in refrigeration units. Multiple breaks in the cold chain create risks for contamination and denigrate the nutritional value of food.

Investments in India's cold chain have been dampened by costly and unpredictable energy supply, constraints in securing sufficiently large tracts of land, and difficulty optimizing usage due to the seasonality of production. The Ministry of Food Processing Industries is redoubling in its effort to champion expanded investment in quality food processing infrastructure.

As of December 2015 the ministry had approved 138 cold chain projects across the country. Seventy of these projects have been completed or are operational, creating 295,933 metric tons of cold storage capac-

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ity.<sup>35</sup> Priority lending and tax breaks are among the incentives being offered to induce more private-sector investment in preservation technologies, modern warehousing, and logistics services. The Indian government is forecast to invest \$15 billion in the next five years and recently relaxed regulations to allow 100 percent foreign direct investment (FDI) in cold chain infrastructure to boost opportunities for private and government partnerships. The 2016-17 Union Budget also calls for reducing the customs duty on imported refrigerated containers from 10 to 5 percent and reducing the excise duty from 12.5 to 6 percent.

## Retail: where kiranas are king

Organized food retailers account for 72 percent of global food sales. In India, however, 98 percent of the food retail market is made up of 10 to 12 million small traders and grocers. They are curbside stalls, pushcarts, kiosks, and kiranas—small neighborhood mom-and-pop stores. Compare this figure with China, where over half of grocery sales are now within the modern trade.

According to a Boston Consulting Group survey in September 2012, 80 percent of urban consumers pre-

fer traditional outlets to supermarkets.<sup>36</sup> They buy the bulk of their fresh produce from vendors with pushcarts. They frequent small hawkers in wet markets for animal and fish proteins.

Kiranas are neighborhood fixtures that make it easy for Indian consumers to shop more frequently

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*Eighty percent of urban consumers prefer traditional outlets to supermarkets.*

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for perishable foods such as fruits, vegetables, and dairy products. The kiranas have captive customers, but they work for customer loyalty, offering special treatment such as credit for repeat customers, home delivery, and extended hours. Indian consumers are accustomed to patronizing different kiranas to overcome limited choice and supply at these small outlets.

Since 2006 several large Indian retailers have sought to build hypermarket and supermarket chains, but profitability is challenging. India's top 10 food retailers have lost an accumulated \$2 billion in recent years and struggle to expand on margins of 2 to 2.5 percent. Their scale advantage is diminished by comparatively high costs of doing business and high attrition rates among store workers and retail managers. The lack of available quality retail space also poses a challenge to expansion. In contrast, kiranas operate in the informal economy. They pay no taxes or license fees. They

### Box 3

#### Investing to source locally

According to the World Bank, more than 70 million rural households in India depend on dairy to varying degrees for their livelihood. The world's largest dairy producer, India is forecast to produce over 150 million metric tons in 2016.

Most of the dairy produced is consumed domestically by India's largely vegetarian population, for whom milk, and milk products, are an important part of food and nutrition security.

When Abbott built a plant in Jhagadia, it pledged to source up to 80 percent of its nutrition product ingredients locally. To help achieve this goal while raising the quality of the milk it procures, Abbott is providing 1,500 small and rural dairy farmers with training on animal care and business skills. With local investors, Abbott is also building new milk chillers in 10 villages to help farmers with efficient transport and storage of milk.

## India's appetite

Food ordering apps such as FoodPanda, Zomato, TinyOwl, and Swiggy have grown in popularity. More than 400 delivery apps have sprung up in the last three years.

E-tail grocers like Big Basket, Zopnow, and Local Banya, not to mention Flipkart and Amazon India, are pursuing shares in what could become a \$20 billion market by 2020.

Kiranas are also moving online. Kiranawalla.com is a hybrid retail platform for independent neighborhood retailers in a limited number of cities. Customers order online and the nearest shopkeeper delivers the order.

employ relatives and are not bound to wage requirements. They maintain small inventory and operate no-frills, low-cost stores.

Reliance is among the most successful Indian retailers. Reliance grew quickly to 1,000 stores in 2009, but subsequently slowed expansion, closed stores, and stopped development of cash-and-carry stores. In fiscal year 2012, Reliance Retail lost money on its hyper- and supermarket chain, but began to regroup and expand stores in this segment by mid-2013. Reliance Fresh small supermarkets have been contracting, citing difficulty competing with kiranas.

### Enter foreign multibrand retail?

India is an approximately \$360 billion grocery market, but a history of limitations and changing requirements for FDI in the retail sector has deterred penetration of large-scale foreign discount stores.

Beginning in September 2012, the government opened the door to 51 percent foreign ownership in multibrand retail, but individual states could opt out. Just nine states and two union territories allowed FDI in multi-brand retail. States could also limit multi-brand FDI from establishing in cities or towns with populations of less than 1 million people.

Foreign retailers were required to invest a minimum of \$100 million to enter the Indian market, with at least half of that investment directed to back-end infrastructure within three years. In addition, 30 percent of all goods sold by multibrand retailers had to be sourced from local small- and medium-sized enterprises. These conditions on FDI effectively relegated all of the major multinationals except Tesco to the whole-

sale market (B2B trade), where their operations could be wholly owned.

Tesco entered a joint venture with Tata Group in March 2014 in Trent Supermarkets. Wal-Mart's 2009 venture into a retail partnership with Bharti was dissolved after four years, after which Wal-Mart India focused on growing its cash and carry and B2B e-commerce businesses across the country.

Per the 2016-17 Union Budget, 100 percent of FDI will be allowed with the approval of the Foreign Investment Promotion Board for the marketing of food products produced and manufactured in India. Time will tell whether these changes will open the door wide enough for the establishment of foreign multibrand retail in India.

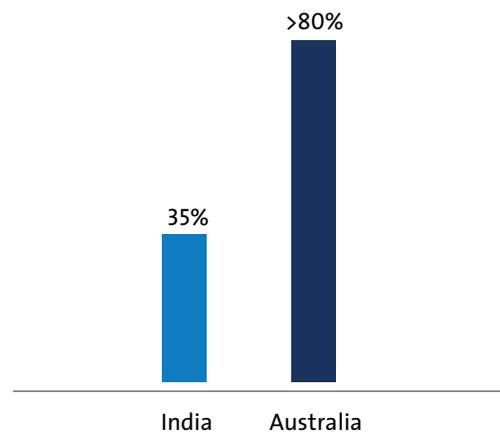
## Missing ingredients—The food processing industry

Indians have a strong preference for fresh foods and home preparation. Urban diets are shifting toward a

FIGURE 7

### Milk production is high, but share of milk processing is low

India is the world's largest milk producer. Since the processing industry is relatively nascent, and milk is both widely available and consumed locally, only a small portion of production is further processed. In contrast, Australia processes more than 80 percent of its milk production into dairy products.



Source: Federation of Indian Chambers of Commerce and Industry and A.T. Kearney, 2014

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larger portion of perishable foods for energy and protein such as fish, meats, dairy, fruits, and vegetables. On average, a little over half of the food consumed in India is processed, mostly as packed fruits and vegetables, packed milk, edible oils, milled rice, and flour. The fastest growth is in the gradual shift toward packaged tea, coffee, salt, pulses, and spices, which are traditionally sold loose.

Expanding the food processing industry will be critical to increasing access to high-quality foods through preservation and packaging, which can lengthen shelf life while retaining nutrients. Food processing companies can foster increased use of standard scientific methods for sorting and grading, help diffuse quality control measures, and accelerate demand for investment in storage and transportation capabilities, while increasing economic opportunity and employment in local economies. The growth of processors can also create positive linkages to farming practices through B2B extension services offered by buyers.

In its Vision Document 2015, the Ministry of Food Processing Industries set a goal of growing the level of food processing of perishables from 6 to 20 percent.<sup>37</sup> The 12th Five Year Plan calls for policies and incen-

tives to build 42 mega food processing parks in the next three to four years by providing access to cheaper credit, reducing duties on imported machinery, and technical training.<sup>38</sup> The creation of industrial clusters should stimulate vertical integration of supply chains and enable improved oversight of quality and safety compliance by both producers and the government.

### Mainstreaming micronutrients

Growing the food processing industry can drive supply chain modernization and deliver more nutrition and variety to urban Indian residents. Low-quality produce that would otherwise be thrown away could be turned into pastes or sauces. In the case of pulses and grains, improvements to food processing could result in higher nutrient retention and purity and greater use of whole grains in processed foods. It is estimated that during the processing of 15 to 18 million tons of wheat to flour in India, nearly 60 percent of iron is lost. If recaptured, this amount could ensure a daily availability of 40 to 50 milligrams of iron per capita, almost double the recommended daily allowance.<sup>39</sup>

Industry leaders are partnering with nonprofit organizations to deliver fortified foods to underserved

FIGURE 8

	Primary	Secondary	Tertiary
<b>Fruits and vegetables</b>	Cleaning, cutting, sorting	Pulps, pastes, slices	Jams, juices, pickles
<b>Grains and cereals</b>	Sorting and grading	Flour, malt, milling	Biscuits, noodles, cakes
<b>Dairy products</b>	Grading and refrigeration	Cottage, cream, dried	Yogurts, spreadable
<b>Meat and poultry</b>	Sorting and refrigeration	Cut, frozen	Ready-to-eat
<b>Marine products</b>	Chilling and freezing	Cut, frozen	Ready-to-eat
<b>Edible oils</b>	Sorting and grading	Refined oils	Fortified oils

Source: Federation of Indian Chambers of Commerce and Industry and A.T. Kearney, 2014

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FIGURE 9

## Four routes to urban nutrition

The government of India will need to improve the regulatory environment to encourage more investment by responsible manufacturers, experienced logistics providers, and larger retailers who all help deliver nutrition to urban residents.



Vertical sourcing integration



Expanded modern retail trade



Improved logistics infrastructure



Growth of agriprocessing

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communities, and fortified foods are a growing portion of manufacturers' product offerings. Britannia, known for its iron-fortified Tiger biscuits distributed by the Naandi Foundation, has now fortified more than half of its product portfolio. Cargill India took the initiative to fortify its refined edible oils with vitamins A, D, and E.

Debated for years in India, the government has recently renewed discussions across ministries and with nonprofit organizations and private producers about mandating fortification of all staple food items including rice, wheat, flour, edible oils, and milk sold on the open market. FSSAI regulates flour fortification but would need to put in place a more comprehensive regulatory framework to standardize universal food fortification, and work to overcome historical barriers to consumer acceptance in India.

## Continuing transformation

### Public policies to encourage private investment

The journey of food from rural farm to urban fork in India is a complex, dynamic, and evolving process. As the administration of Prime Minister Narendra Modi works to reform policies to enable and stimulate domestic and foreign investments in the agriculture, animal husbandry, and manufacturing sectors, private sector groups such as the Confederation of Indian Industry are calling for a comprehensive national farm-gate to market infrastructure.<sup>40</sup>

To improve the state of urban nutrition and meet growing demand for food in India's cities, India must also target public investments to reduce the infrastructure deficit and eliminate regulatory complexity in the food value chain. Both are prerequisites to private-sector investments in more vertically integrated sourcing, the emergence of modern logistics services, large-scale food processing, and retail efficiencies—four critical routes to improving urban nutrition and food security.

### Food as an urban priority

In its seminal paper *On Global Cities*, the Chicago Council on Global Affairs posits, "If the true measure of an economy is the well-being of the people who live within it, the evolution of global cities is the issue of our time."<sup>41</sup> Prime Minister Modi has vowed to create 100 new smart cities by 2022 featuring Internet connectivity, e-governance, and quality infrastructure such as waste management and efficient public transport. These are important and laudable goals for India's economic development and quality of life, but there is no more fundamental measure of the well-being of a population than its food and nutrition security.

India's urban modernization plans must therefore include and prioritize measures and policies to address supply-side constraints in the food sector. Doing so will better position the private sector to deliver higher quality, diverse sources of nutrition accessible to all of India's growing urban residents.

## About the author

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