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# Urbanization in India's Future

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The results of India's 1981 census indicated that the country's urban population had grown to about 160 million. The urban population is still only about a quarter of the total population, but the absolute number is so large that the economics of urbanization has become an important subject for study in India. The population density of Indian cities will continue to increase, placing heavier demands on government for the provision of urban public services. A better understanding of the economic processes leading to urbanization is needed to permit planning and policies to make Indian cities more productive as well as better places in which to live.

Urbanization is a determinant as well as a consequence of economic development. It is a natural consequence of economic changes that take place as a country develops; certain activities are better performed in, indeed require, settlements with agglomerations of people with high densities. To understand why certain activities locate in urban areas and others do not, it is necessary to assess the nature of different kinds of economic activities. The distinguishing characteristic of urban areas is the high concentration of both people and activities. Activities that can substitute other inputs, mainly capital, for land are likely to be concentrated spatially. Technically, high elasticities of substitution between land and nonland inputs lead to urban concentration. Thus, although farm mechanization and irrigation enable substitution between land and nonland inputs in agriculture, the potential for such substitution is severely limited by technology. But office-based service activities have high substitution elasticities. Large modern industries, particularly continuous-process industries, have lower elasticities than small-batch production industries. Thus, office activities tend to be heavily concentrated in central cities, while large modern industries that need land for processing layout are generally located

on the peripheries of major cities or in new cities, where land is available at comparatively low cost.

But high land-nonland substitution elasticities are not by themselves sufficient to produce urban concentrations. The existence of other scale economies—both in manufacturing and in services—also contributes to concentration. Because of the existence of transportation costs, when there are economies of scale in a few activities the multiplier effect of those activities produces a concentration of other, complementary activities that are necessary for their functioning. These factors make it more economical and profitable for small and even artisanal industries to locate in densely populated cities than in smaller cities or towns. The combined effect of scale economies, transportation costs, and relatively high substitution elasticities between land and nonland inputs in nonagricultural activities produces urban concentrations. This is the process that transforms a largely agricultural economy into a non-agricultural economy.

As income rises there is a general shift in demand from food goods to nonfood goods. In a country as poor as India this effect is still somewhat limited because, for the poorer segment of the population, small increases in income would not appreciably lower the proportion of their incomes spent on food. However, according to successive Indian National Sample Surveys, the decline in the proportion of expenditure on food begins at about the 20th percentile of the income distribution. In other words, except among the poorest of the poor, Engel demand effects are noticeable even at relatively low income levels. As per capita income rises, the increase in the proportionate demand for nonfood goods accelerates. Consequently, the demand for labor for non-agricultural activities increases, and this heightened demand for labor stimulates urbanization. In modern history the process has invariably been triggered by an initial increase in agricultural productivity. Increasing rural income is, therefore, likely to accelerate urbanization.

The association between per capita incomes and levels of urbanization is apparent across countries. Over 75 percent of the variance between levels of urbanization observed for 110–120 countries for which data are available can be explained by per capita income differences between these countries.<sup>1</sup> India lies close to the regression line: hence the level of urbanization in India is consistent with the experience of other countries throughout the world. Even more interesting is that the different states of India with their different levels of per capita income also fall close to the urbanization levels of countries with equivalent per capita incomes.

Nonetheless, India is not faced with “urban explosion” as compared with trends in many other parts of the world.<sup>2</sup> India’s level of urbanization increased from 17.6 percent in 1951 to only 23.7 percent in 1981. Consistent with its low per capita income, India ranks about 90th in its level of urbanization: only about 30 countries have lower levels of urbanization. The rate of growth of urban population in India is also among the slower rates in the world.

### The record of urbanization in India since 1901

Table 1 presents the record of urban growth in India since 1901. This record has been discussed and analyzed in considerable detail elsewhere;<sup>3</sup> therefore, only the salient features are mentioned here. India has experienced steady, though slow, urban growth since 1921, with the level of urbanization inching up from 11.3 percent to 23.7 percent in 60 years. Different definitions of urban areas in terms of settlement size yield different absolute levels of urbanization, but the broad trend remains similar. The number of settlements increased by only about 80 percent over this period, while the urban population increased about sixfold. Thus most of the growth can be attributed to the growth of existing towns at every level—through rural–urban migration and natural increase—rather than to the addition of new towns.

This pattern implies a highly stable structure of settlements: the great majority of urban settlements now classified as such have exhibited urban characteristics for a very long time. According to one study,<sup>4</sup> there were 3,200 towns and 120 cities in India as early as 1586, quite close to the present numbers. Because population growth was slow until this century, most settlements remained at the same size for centuries. Most small towns historically functioned as market and service centers for the surrounding rural areas. The hierarchy of settlements in each region and subregion appears to have remained relatively stable, with small towns appearing and disappearing over time. Despite this long settlement history, vast areas in the country have few urban settlements of any size: levels of urbanization as low as 5–10 percent are found in these regions. In such areas, a large number of new towns can be expected to appear in the next two decades.

TABLE 1 Growth of the urban population in India, 1901–81

Census year (1)	Number of towns <sup>a</sup> (2)	Urban population (millions) (3)	Percent of total population urban (4)	Annual intercensal growth rate of urban population (percent) (5)	Annual growth rate of rural population (percent) (6)	URGD <sup>b</sup> (col. 5–col. 6) (7)
1901	1,834	25.6	11.0	—	—	—
1911	1,776	25.6	10.4	0.0	0.61	-0.61
1921	1,920	27.7	11.3	0.79	-0.18	0.97
1931	2,049	33.0	12.2	1.77	0.94	0.83
1941	2,210	43.6	14.1	2.82	1.11	1.71
1951	2,044	61.6	17.6	3.52	0.82	2.70
1961	2,330	77.6	18.3	2.34	1.88	0.46
1971	2,531	107.0	20.2	3.26	1.97	1.29
1981	3,245	156.0	23.7	3.86	1.75	2.11

NOTE: Table excludes Assam and Jammu and Kashmir.

<sup>a</sup> Constituent towns of urban agglomerations are not counted as separate units.

<sup>b</sup> Urban–rural growth differential.

SOURCE: Mohan and Pant, cited in note 3.

The belief is widespread that large towns and cities have been growing faster than smaller ones in India. This is not so; rather, the proportion of total urban population that lives in cities and towns above any cutoff point continues to increase because of the relatively stable structure of the Indian settlement pattern. The impression of faster growth of larger cities persists because tabulations are usually based not on individual cities but on size classes, without taking into account intercensal movement of towns from one size class to another.<sup>5</sup> As a result, the number of cities in the highest size class increases continually and hence the total population in this class increases faster than in the smaller size classes, in which changes in population reflect both entry and exit of towns.

In Table 2 growth rates are computed by comparing the total population of towns in each class in the initial census year with the total population of the same towns in the subsequent census year, irrespective of their classification in that census. The average growth rate of different-sized cities and towns shows little variation between 1971 and 1981. This is consistent with the tabulations by M. K. Jain<sup>6</sup> for 1951–61 and 1961–71. The idea that larger cities have grown considerably faster than smaller towns in India has had a strong influence on urbanization policy. It is interesting that even the largest of the cities, those above a million in population, have not grown perceptibly faster than others. In this respect India's experience is not different from those of most other regions in this decade, as documented by Samuel H. Preston.<sup>7</sup> However, Preston also identified a general slowdown in urbanization toward the end of the 1970s, particularly in Latin American countries, after continuing acceleration in earlier periods. As shown in Table 1 the experience of India is different, in that the acceleration is particularly marked in the 1971–81

TABLE 2 Annual growth rate of the urban population in India by size of town, 1971–81

Size class in 1971	1971		1981		Population growth rate, 1971–81 (percent per year)
	Number of towns	Urban population (millions)	Urban population (millions)		
Metropolitan and Class I <sup>a</sup>	145	60.1	85.8	3.62	
Class II (50,000–99,999)	178	12.0	16.9	3.44	
Class III (20,000–49,999)	560	17.2	23.7	3.28	
Class IV (10,000–19,999)	818	11.7	16.1	3.29	
Class V (5,000–9,999)	596	4.3	6.3	3.83	
Total	2,297	105.3	148.8	3.52	

<sup>a</sup> Metropolitan designates cities of 1 million and larger; Class I designates cities of 100,000 to 999,999. NOTE: Various towns were excluded from classes III, IV, and V because they could not be traced in the 1981 census. These missing towns are either declassified or amalgamated into larger units; see the source for details.

SOURCE: Mohan and Pant, cited in note 3.

decade; moreover, this acceleration is evident for all sizes of towns and cities and for most of the regions in India.

### The regional pattern of urban growth and economic development

Table 3 presents the growth rates of urban and rural populations by state between 1951 and 1981. Among the slower growing urban populations are those of the early industrialized states of Maharashtra, West Bengal, and Tamil Nadu. These states, however, all have urbanization levels of over 30 percent, comparable to the levels in middle-income countries with a per capita income of about US\$400. At the other end of the scale are some of the least urbanized states—Orissa (11.8 percent), Bihar (12.5 percent), and Uttar Pradesh (18.0 percent)—but these are states with some of the highest rates of urban population growth between 1971 and 1981. Only ten countries in the world (including Bangladesh, Bhutan, and Nepal within the Indian subcontinent) have levels of urbanization below 12 percent, and they are at the lowest levels of per capita income. Thus, in terms of urbanization levels, India's states span the range of the 50 or so countries with annual per capita incomes from US\$100 to \$400. However, variation in levels of urbanization between states has declined in the last decade: while all the poor states have experienced accelerated rates of urban population growth, only Haryana, among the richer states, experienced comparable growth.<sup>8</sup> In some of the poorer areas—Orissa, parts of Bihar, eastern Uttar Pradesh, and eastern Madhya Pradesh, where current urbanization levels are low and towns are far apart—there has been a greater tendency for

**TABLE 3 Growth of the urban and rural population in India by state, 1951–81 (percent per year)**

State	Urban population			Rural population		
	1951–61	1961–71	1971–81	1951–61	1961–71	1971–81
Andhra Pradesh	1.5	2.9	4.0	1.5	1.7	1.6
Bihar	4.1	3.7	4.4	1.6	1.8	1.9
Gujarat	1.8	3.5	3.5	2.6	2.3	2.0
Haryana	3.1	3.1	4.8	2.9	2.8	2.0
Karnataka	1.7	3.1	4.2	2.1	1.9	1.7
Madhya Pradesh	4.0	3.9	4.6	1.9	2.3	1.8
Maharashtra	2.0	3.5	3.4	2.2	2.0	1.6
Orissa	6.5	5.2	5.3	1.6	2.0	1.4
Punjab	2.6	2.3	3.7	1.8	1.9	1.6
Rajasthan	1.1	3.3	4.6	2.6	2.3	2.4
Tamil Nadu	2.1	3.3	2.5	0.8	1.5	1.2
Uttar Pradesh	0.9	2.7	4.9	1.7	1.7	1.8
West Bengal	3.1	2.5	2.8	2.8	1.4	1.9
India <sup>a</sup>	2.33	3.26	3.85	1.89	2.00	1.75

<sup>a</sup> Including all states except Assam and Jammu and Kashmir.

NOTE: Table includes all states with a total population greater than 10 million in 1971, except Kerala and Assam.

SOURCE: Mohan and Pant, cited in note 3.

reclassification of large villages as towns, and the potential for the emergence of new towns is greater.<sup>9</sup>

An examination of rural population growth rates helps explain the emerging urbanization pattern in Indian states. The rate of growth of rural population has declined significantly in the high agricultural productivity states of Haryana and Punjab, while small increases have taken place in the low productivity states of Bihar, Rajasthan, and Uttar Pradesh. Other poor states such as Orissa and Madhya Pradesh have experienced declines. There is also evidence, now conclusive,<sup>10</sup> that for the first time since the turn of the century there was a perceptible decline in the proportion of labor force engaged in agriculture during 1971–81. For males, the share of cultivators and agricultural laborers in the total labor force declined from 67.4 percent in 1971 to 63.3 percent in 1981. This is at least consistent with the decline in the overall rate of rural population growth, from 2.0 percent a year from 1961 to 1971 to 1.75 percent during the following decade. This may be indicative of the declining capacity of agriculture to absorb continued increases in population and labor force.

The distribution of both rural and urban population growth rates has become progressively more uniform since 1951. Between 1951 and 1961 there were as many as five states whose rural population growth rates were higher than their urban rates; between 1971 and 1981, there were none. Over the past two decades urbanization has become pervasive in all the states of India.

### **Urbanization and economic development**

Different indexes of economic development are available to explore the connection between urbanization and economic development. Consistent economic data are difficult to obtain back to 1951 because of the reorganization of states in 1956. Thus this analysis is restricted to the record since 1961. Even here, there is controversy over the magnitudes of per capita state product. Given a countrywide common market, it is difficult to compute state domestic product. However, both State Statistical Bureaus and the Central Statistical Organization (CSO) make annual estimates of state per capita net domestic product. Usually, there are discrepancies between the two sets of estimates, and the CSO issues a set of consistent estimates with some lag. These are currently available for 1970–71 to 1975–76. More difficult still is to compute a constant price series of state per capita net domestic product, and no official series has been issued. The figures used here are from a compilation of data by the Centre for Monitoring the Indian Economy, a private organization. While errors exist in these data, they are adequate for the purpose at hand: they give a good picture of the magnitude and pattern of disparity in incomes between states and how this pattern has evolved over the past 20 years.

Table 4 gives estimates of state per capita net domestic product at constant 1970–71 prices for 1961, 1971, and 1978–79, the nearest "normal"<sup>11</sup> year to 1980–81. The coefficient of variation (CV) for per capita income has moved from 0.23 in 1961 to 0.26 in 1971 to 0.33 in 1979. This is in the opposite

TABLE 4 Selected indicators of economic development: Indian states, 1961–81

State	Per capita net domestic product (constant 1970–71 prices in Rupees)			Value-added in factory sector (current Rs. per capita)			Agricultural productivity <sup>a</sup> (tons per person)		
	1961	1971	1981 <sup>b</sup>	1961	1971	1981 <sup>c</sup>	1961 <sup>d</sup>	1971 <sup>e</sup>	1981 <sup>f</sup>
Andhra Pradesh	518	586	678	9	29	74	0.88	0.83	1.06
Bihar	390	418	438	14	31	57	0.71	0.69	0.67
Gujarat	697	845	884	52	108	245	0.59	0.94	0.85
Haryana <sup>g</sup>	627	932	1,029	—	70	169	—	2.77	2.91
Karnataka	559	675	723	14	62	107	0.82	1.06	1.13
Madhya Pradesh	472	489	463	8	27	68	1.24	1.26	0.98
Maharashtra	769	811	1,008	69	167	324	0.92	0.65	1.17
Orissa	392	541	514	6	27	62	0.98	0.96	0.98
Punjab	760	1,067	1,308	4	52	136	1.73 <sup>h</sup>	3.07	4.36
Rajasthan	500	629	591	5	26	56	1.10	1.44	1.05
Tamil Nadu	571	616	582	24	75	166	0.90	0.98	1.07
Uttar Pradesh	457	493	527	9	24	47	0.85	0.99	0.99
West Bengal	758	729	465	50	97	173	0.92	1.11	1.04
Mean	558	676	727	23	60	127	0.94	1.23	1.35
Coefficient of variation	0.23	0.26	0.33	0.92	0.67	0.62	0.3 <sup>i</sup>	0.59	0.73

<sup>a</sup> Defined as the total output of foodgrains in the state divided by the total male agricultural labor force.

<sup>b</sup> 1978–79 data.

<sup>c</sup> 1977–78 data.

<sup>d</sup> Average of 1959–60 to 1961–62.

<sup>e</sup> Average of 1970–71 and 1971–72.

<sup>f</sup> Average of 1978–79 to 1980–81.

<sup>g</sup> Haryana is included in Punjab data in 1961.

<sup>h</sup> Undivided Punjab.

SOURCE: Centre for Monitoring the Indian Economy, *Basic Statistics Relating to the Indian Economy*, vol. II (Bombay: Government of India, 1981).

direction from the CVs for level of urbanization, which are 0.37, 0.34, and 0.29 for the same years. The ratio of the per capita net domestic product of the richest to the poorest state was about 2 in 1961, 2.5 in 1971, and 3 in 1981. These are not high in comparison with the regional disparities found in other countries, but the increase in disparity over time is a matter of deep concern for Indian policymakers.

Table 4 also presents per capita value-added in the factory sector and an index of agricultural productivity for each state. The latter has been defined as the total production of foodgrains per male agricultural laborer.<sup>12</sup> For the per capita value-added in the factory sector the CV has declined from 0.92 in 1961 to 0.67 in 1971 and 0.62 in 1978. The ratio of the highest to the lowest state was about 14 in 1961 and about 7 in 1971 and 1978. For agricultural productivity, on the other hand, there has been a continuous increase in disparity, the CV increasing from 0.30 in 1961 to 0.59 in 1971 and 0.72 in 1981, and this is consistent with the increasing interstate income disparity.

It is clear, then, that the increasing inequality in state incomes has not been caused by the manufacturing sector; indeed, there has been a strong trend toward equalization in this sector.<sup>13</sup> In 1961 the three poorest states in terms of income per capita were Bihar, Orissa, and Uttar Pradesh. They also had, along with Andhra Pradesh, Madhya Pradesh, Punjab, and Rajasthan, the lowest value-added in the factory sector. The position has not changed much in 1981, and these three states remain among the bottom five. The rates of increase in the factory sector value-added have, however, been higher in the poorest states. It is quite noticeable from the factory sector value-added columns that whereas in 1961 the only substantial manufacturing was located around the capital cities of Gujarat, Maharashtra, West Bengal, and Tamil Nadu, there has now been a considerable dispersion of industries.

The increase in disparity in agricultural productivity shows clearly that stagnation in agricultural productivity in the whole Eastern region is the main cause of the increasing inequality in state incomes.

The combination of increased manufacturing production and agricultural stagnation in the poorer states is likely to have caused significant acceleration in urbanization in the last decade. The data suggest that the absorptive power of agriculture has probably been stretched to its current technological limit in the sense that minimum per capita subsistence limits may have been reached. Earlier, the scope for increase in the area under cultivation was considerable. Today, increases in agricultural production can only take place through productivity changes, that is, technological change. The experience of Punjab and Haryana suggests that after the initial labor absorption and after income increases have taken place, and agriculture becomes more technologically intensive, urbanization is likely to accelerate. Curiously enough, both agricultural stagnation and growth in agricultural productivity are likely to promote urbanization in India in coming years. A systematic investigation of the determinants of interstate differences in Indian urbanization shows that industrial employment and state per capita net domestic product are key predictors of urbanization.<sup>14</sup>

### **The urban–rural distribution of income**

The transformation from a poor, mainly agricultural economy to a modern economy involves a structural shift toward the secondary and tertiary sectors in both output and employment. In India, although per capita income growth has been relatively slow at 1 to 1.5 percent a year over the last three decades, the economy has undergone a remarkable structural change in terms of output. This has not yet been accompanied, however, by a similar change in the sectoral shares of employment.

The share of agriculture in net domestic product has declined from about 60 percent in 1950–51 to less than 40 percent today. At the same time, the proportion of labor force employed in agriculture has remained broadly constant

at 67–70 percent. The share of mining and manufacturing in net domestic product has increased substantially from 10.7 percent in 1950–51 to 16.4 percent in 1980–81, and that of the tertiary sector from 28.8 percent to 42.1 percent. The declining share of agriculture has, therefore, had to provide for a constant share of the labor force and of population—in absolute terms, an increasing number of people. The increases in income shares of the other sectors have been substantial, while the share of labor force in these sectors has remained broadly constant. This implies that the per capita increases in income must have been significantly higher in these sectors than in agriculture.

Even with almost no change in the share of labor force in agriculture, the rural population has decreased from about 82 percent to about 76 percent of the total. This suggests that the urbanization that has taken place in terms of employment has mainly involved a transfer of rural-based secondary and tertiary sector activities to urban areas of all sizes.<sup>15</sup> Some of this has no doubt been because of reclassification of the larger villages into towns but, as has been shown in Mohan and Pant,<sup>16</sup> this effect has not been large in terms of share in urban population and hence in urban employment. It appears that rural India has become more specialized in agriculture and urban India in nonagricultural activities. There has not, as yet, been a large-scale transfer of employment from agricultural to nonagricultural pursuits.

An important consequence of a slow pace of urbanization while the economy undergoes structural change is that the disparities in per capita income between urban and rural areas tend to increase. Unfortunately the national income accounts do not usually distinguish the origin or accrual of income by urban and rural areas. This is difficult to do in principle because of the large volume of rural–urban transactions. Because of persistent demands for such estimates for policy purposes, the Central Statistical Organization (CSO) has recently published a set of estimates of rural and urban income for 1970–71, but these are limited to income originating in these areas—that is, to domestic product in rural and urban areas. These estimates are arrived at through indirect methods and should therefore be regarded as approximate. Subsequently, the CSO has also pieced together information from various studies and has published estimates for 1950–51 and for 1960–61.<sup>17</sup>

A few explanatory remarks are in order before presenting these estimates. It is not yet possible to estimate personal disposable income for rural and urban areas. Since remittances flow predominantly from urban to rural areas, the urban–rural differential in accrued incomes is likely to be less than that in originating incomes. Urban and rural net domestic products are estimated by using the respective data on wage/earnings/value-added per worker in different sectors available from different sources, along with information on the number of workers in each sector.

Table 5 shows trends in urban and rural shares in area, population, and labor force from 1950–51 to 1970–71. All urban areas combined cover only about 1.4 percent of the total area of the country. The ratio of urban to rural per capita net domestic product increased from about 1.8 to about 2.6 from

**TABLE 5 Trend of urban–rural shares  
in inputs and outputs: India, 1950–51 to  
1970–71**

Measure	1950–51	1960–61	1970–71
<b>Percentage rural share</b>			
Area	NA	98.8	98.6
Population	82.7	82.0	80.1
Labor force	84.9	84.9	82.3
<b>Per capita net domestic product at factor cost (Rs. current price)</b>			
Total	267	323	638
Rural	232	261	469
Urban	424	608	1,201
<b>Differentials (urban: rural ratios)</b>			
Per capita net domestic product	1.83	2.33	2.56
Per capita household consumer expenditure	NA	1.37	1.50

NA = not available.

SOURCE: Central Statistical Organization, *Monthly Abstract of Statistics*, July 1981, p. S-7.

1950–51 to 1970–71. The ratio of per capita household expenditure, however, increased from about 1.4 in 1960–61 to only about 1.5 in 1970–71 according to the relevant National Sample Surveys. Lest these figures be viewed with undue puzzlement, a few caveats are in order. First, as stated earlier, the figures are only rough approximations. Second, the real difference between urban and rural per capita incomes is lower because of urban–rural price differences. Third, the net domestic product figures obviously include taxes, and this affects the estimate for urban areas much more because agricultural income is not taxable. Fourth, the impact of urban–rural remittances is not accounted for. The ratio of 2.56 for 1970–71 should not therefore be regarded as an indication of “real” income or welfare differences between urban and rural areas. The direction of change that is indicated over the period, however, is probably a reasonably accurate indicator of the trend.

Table 6, Panel A, shows the movement of sectoral shares in net domestic product from 1950–51 to 1980–81. Panel B gives estimates of the rural share in sectoral net domestic product up to 1970–71. Agriculture had declined to about 40 percent of net domestic product by 1980–81. Concurrently, although the rural share in agriculture has remained roughly constant, the rural share in secondary and tertiary activities has been declining—particularly in mining and manufacturing. The combined effect of the declining share of agriculture and the urbanization of nonagricultural activities has accentuated the urban–rural income disparities. At the same time, the rate of urbanization has been relatively slow, so the increasing income share of urban areas has not been matched by major proportional increases in the urban share of either the

**TABLE 6 Movement of sectoral shares in net domestic product:  
India, 1950–51 to 1980–81**

	1950–51	1960–61	1970–71	1980–81
<b>Panel A Percent share of sectors in NDP</b>				
Agriculture	60.5	55.7	49.0	41.5
Mining and manufacturing	10.7	12.9	14.6	16.4
Tertiary	28.8	31.4	36.4	42.1
<b>Panel B Percent of sectoral NDP originating in rural areas</b>				
Agriculture	96.5	97.7	96.4	NA
Mining and manufacturing	56.2	38.6	32.3	NA
Tertiary	36.1	35.3	28.8	NA

NA = not available.

NOTE: NDP at factor cost at 1970–71 prices for 1950–51 to 1980–81.

SOURCES: Central Statistical Organization, *Monthly Abstract of Statistics*, July 1981, p. S-8.

labor force or population. It would seem that labor-intensive, village-based manufacturing is being replaced by more capital-intensive, urban-based manufacturing.

### The future: Urban India in the year 2001

Making economic and demographic projections is always a hazardous task because it is difficult to capture the interaction between economic and demographic variables in addition to accounting for future uncertainties. The ideal methodology would use a dynamic model of the economy that simulated economic growth of the country, distributed this growth by sector as well as space, and also modeled the interaction of demographic variables with economic growth. Such a model is difficult to construct, although a few attempts have indeed been made to model the essential economic structural changes associated with urbanization.<sup>18</sup> In this paper I use much more "judgmental techniques" to project the effects of urbanization in India up to the year 2001. I derive ranges of growth that appear feasible given the recent demographic and economic experience of the country. A relatively straightforward statistical exercise indicates upper and lower bounds of the expected distribution of urbanization.

The results of India's 1981 census belied expectations of a slowdown in population growth in the last decade as compared with the 1961–71 decade. The growth of total population was over 2.2 percent per year in both intervals. Thus the net reproduction rate is unlikely to decline to 1.00 by the end of the century, as had been projected earlier.<sup>19</sup> (Faster declines in fertility have been observed in some countries, but these have been associated either with much faster rates of economic growth or with coercive measures to curb population growth—neither of which are likely in India in the near future.) The rate of growth of the rural population has shown greater stability than that of the urban population, but it declined to 1.75 percent per year in the last decade as compared with almost 2.0 percent in the previous decade. These observations,

population in 2001 to be in the area of 900 million. Before the 1981 census was conducted, Robert H. Cassen reviewed a number of population projections made in the 1960s and 1970s.<sup>20</sup> Those projecting a population of 1000 million for the year 2001 were generally regarded as "pessimistic." Cassen's own "preferred" projection was 922 million, which he himself regarded as pessimistic.

Table 8 projects the urban-rural breakdown of the total population. The methodology is outlined in the appendix. The level of urbanization—that is, urban population as a proportion of total population—typically grows in a logistic fashion. If it is assumed that this logistic curve is symmetrical around a level of 0.5 (i.e., 50 percent urbanization), then the level of urbanization at any given time can be predicted given the urban-rural growth differential and the initial level of urbanization.

The URGD for 1971-81 was 2.11 for India as a whole, with the rate of urban population growth at 3.86 percent a year and that of rural population growth at 1.75 percent (Table 1). Two variants of URGD have been used over the projection period. Under urban variant I, URGD increases to 2.2 over the first five-year period and declines gradually to 2.0 over 1986-91, 1.8 over 1991-96, and 1.6 over 1996-2001. Under urban variant II URGD remains constant at 2.0 over the whole period. It is important to stress, however, that there is no sound basis for projecting the behavior of URGD. The preceding assumptions are judgmental ones arising from the expectations about the behavior of the Indian economy as outlined above. To review, the share of

TABLE 8 Projections of urbanization in India, 1981-2001

Level of urbanization (percent)									
	1981		1986		1991		1996		2001
Urban variant I	23.53		25.57		27.52		29.35		31.04
Urban variant II	23.53		25.38		27.32		29.35		31.47
Urban and rural population projections (millions)									
	1981	1986		1991		1996		2001	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Urban variant I	164	533	198	578	236	620	275	661	315
Urban variant II	164	533	197	579	234	622	275	661	320
									701
									696
Implied rates of population growth (percent per year)									
	1981-86		1986-91		1991-96		1996-2001		
Urban variant I	Urban	3.84	Rural	1.63	Urban	3.49	Rural	1.44	3.10
									2.75
									1.29
									1.18
Urban variant II	Urban	3.73	Rural	1.67	Urban	3.50	Rural	1.44	3.28
									3.08
									1.22
									1.03

NOTES: For assumptions regarding URGD under each of the two urban variants, see text above. All calculations use population variant I, i.e., terminal-year growth rate = 1.6 percent. The 1981 population counts net omission rate for urban and rural areas separately.

agriculture in the national economy has declined to about 37 percent and is expected to continue to decline up to the end of the century. An attendant decline in rural population growth rates over the projection period is expected. As shown in Table 8, the rural growth rates resulting from the projection assumptions imply a decline to about 1.1 percent in the terminal year, when the total population growth rate is 1.6 percent; and to 0.9 percent when the terminal-year population growth is 1.4 percent. It would seem unrealistic for these growth rates to decline much further by the end of the century. This is the rationale for not expecting a further increase in URGD as has occurred over the past three decades. Moreover, the preferred variant is variant I, in which URGD is assumed to decline roughly in accordance with the decline in total population growth.

To summarize the results of the projections:

- 1 The level of urbanization is expected to be around 27–28 percent in 1991, and around 31–32 percent in 2001.
- 2 This implies an absolute increase in the urban population of about 70 million in the current decade to about 235 million in 1991 and a further 80–85 million increase to about 320 million by 2001.

These results are consistent with world urbanization trends as suggested by the equation relating the level of urbanization to national per capita income. When a variable capturing the structure of the economy<sup>21</sup> is added, the level of explanation is improved considerably. At present, India is found to be quite near the regression line. When Indian gross national product per capita is projected to increase by 2 percent per year over the rest of the century and the proportion of agricultural employment is assumed to decline to about 64 percent, the predicted urbanization level is 28.5 percent for the year 2001—lower than the level obtained from the largely mechanical projections in Table 8. This indicates that if the demographic projections are “more correct,” the economy will need to undergo a greater structural transformation in terms of employment than is expected from extrapolation of past trends, according to an estimated equation that explains world urbanization trends well.

This scenario reflects the fact that changes in the structure of the Indian economy on the production side have been unmatched to date by changes in employment structure. “Reasonable” or plausible projections indicate the difficulties this continuing imbalance will cause. Even the modeled decline in rural population growth to about 1.0 percent per year by the end of the century (and the implied decline in the share of agricultural labor force built into these projections) may not be adequate to match the changes in production structure expected in the slow-growing Indian economy. The unprecedented decline in the agricultural share in employment indicated by the 1981 census may then be more real and significant than is often supposed and a precursor of things to come.

In order to appreciate better the effects of increased urbanization on individual cities, it is useful to distribute the growth in urban population by city size. The same method is used as for projection of the urban population as a whole, as described in the appendix. Projections of the distribution in 1971 and 1981 using data in each instance for the previous decade come remarkably close to the actual populations. Table 9 gives these results as well as those for 1991 and 2001.

The proportion of total urban population residing in metropolitan cities is expected to increase only marginally, from about 27 percent in 1981 to 28 percent in 1991, despite the inclusion of population deriving from the addition of about 10 cities that are expected to cross the million population mark over the next decade. The proportion of total urban population in metropolitan and class I cities (all cities over 100,000 population) as a whole is, however, expected to increase from about 60 percent in 1981 to about 64.5 percent in 1991. The projections in Table 9 are quite firm for the upper class sizes through about class III, since the towns that are expected to be included in these categories already exist. The proportion of smaller towns that are likely to grow from class IV and class V to class III can be predicted well based on past patterns.

A more detailed analysis was made of metropolitan city growth in order to check the results reported in Table 9. The population of the 12 existing metropolitan cities<sup>22</sup> is projected according to four different assumptions. Variant A projects the population of each of these cities to 1991 using the weighted average growth rate of all 12 for 1971–81; variant B assumes that each city

**TABLE 9 Projected distribution of the urban population in India over various city size classes, 1971–2001 (millions)**

Year	Class size <sup>a</sup>						Total urban	Projected <sup>b</sup> urban	Rural
	Metropolitan	I	II	III	IV	V			
1971 <sup>c</sup>	(i)	27.6	32.7	12.0	18.7	12.2	4.4	0.7	108.3
	(ii)	25.5	28.6	11.6	18.1	12.5	3.4	0.7	100.4
	(A)	27.4	32.7	12.0	17.5	12.0	4.5	0.5	106.6
1981 <sup>c</sup>	(i)	42.0	45.2	17.0	22.2	19.7	5.6	0.6	152.3
	(ii)	41.2	48.3	16.3	21.7	13.8	3.9	0.7	145.9
	(A)	42.0	52.3	18.1	22.4	14.9	5.6	0.8	156.1
1991 <sup>d</sup>	(i)	66.3	85.5	28.3	29.2	18.6	6.6	1.2	235.7
	(ii)	66.5	85.7	27.5	29.2	18.6	6.8	1.3	235.6
2001 <sup>d</sup>	(i)	97.4	132.0	39.5	34.4	21.0	8.0	1.3	333.6
	(ii)	97.2	133.5	38.6	34.0	21.3	7.5	1.3	333.4

NOTES: "A" is the actual population according to the census of India. (i) gives projections from the "downward procedure" (see appendix). (ii) gives projections from the "upward procedure" (see appendix). Metropolitan designates cities of 1 million and larger; Class I designates cities of 100,000 to 999,999.

<sup>a</sup> For range of population in each size class, see Table 2.

<sup>b</sup> From Table 8, population variant I.

<sup>c</sup> 1971 and 1981 figures exclude Jammu and Kashmir and Assam.

<sup>d</sup> 1991 and 2001 projections include Jammu and Kashmir and Assam.

will grow at its own immediate past rate; variant C uses the weighted average growth of the first four metropolitan cities for all; and variant D uses the weighted average rate of the next eight. The 1991 total projected population in these 12 cities is between 58 and 62 million. The range of projected population for Calcutta is 12.0 to 13.5 million, Bombay 11.3 to 12.0 million, and Delhi 7.9 to 9 million. Similar procedures are applied to predict which cities are likely to grow to over a million population by 1991. Eight to 12 could be in this list.<sup>23</sup> The first nine cities listed are in order of size in 1981. Eight of these are expected to cross the million mark under all of my different growth assumptions; Agra will not if its slow growth in the past decade continues. The next three, Dhanbad, Bhopal, and Ulhasnagar (near Bombay), had very high growth rates (of between 4.5 percent and 5.8 percent a year) over 1971-81; they will join this metropolitan group only if these high rates continue.

Summing the total projected population of the existing 12 metropolitan cities and of the new additions produces a range of 70-75 million in 1991, as compared with 66 million shown in Table 9. This reflects the fact that the projections of metropolitan cities incorporate the assumption that growth in some of the largest cities (Calcutta, Bombay, Madras) will slow down. If, instead, the largest 20-24 cities continue to grow at their current rates, their total population and, consequently, their share in total urban population will be higher than that projected. At any rate, it can be asserted with confidence that the population in million-plus cities is unlikely to be less than 65 million in 1991.

I next use the Pareto distribution to generate the number of cities and towns in each size class. Details are given in the appendix. Judging from the 1981 predictions, this method should be quite good at predicting the number of metropolitan and class I (about 300) and class II (about 350) cities in 1991. But for 1981, the predictions for the lower size classes were underestimates. To obtain a better approximation for class III and class IV, first assume that the average growth rate of the urban population over 1981-91 is about 4.5 percent and that, as in the past, the growth rate of cities and towns in each size class is similar, on average. Then the number of towns in class III and class IV can be predicted by including the number of existing towns that can be expected to cross over into these categories by 1991. Thus most towns with 14,000 and above population in 1981 can be expected to exceed 20,000 in 1991, and those between 7,000 and 10,000 can be expected to exceed 10,000 over the same period. Since the number of these towns is large, it may be expected that the slower than average growers will be compensated by fast growers that are not accounted for here.

The population projections indicate gradual urbanization of the country to between 31 and 32 percent in 2001, for a total urban population of about 320 million in that year. Even with a slight slowdown in the growth of the largest cities, the total population in cities of over one million population is expected to be almost 100 million by that time. The distribution of urban

population will continue to be similar to that in the past, except that with overall population growth the proportion of people in large cities will continue to increase due to the increase in the number of such cities.

### The growth of employment, labor force, and income

To project employment in urban and rural areas, it would be desirable to use a countrywide intersectoral dynamic model. This has not been possible, and, once again, relatively crude methods have been employed instead. Specifically, the expected crude labor force participation rates have been applied to the population projections. These participation rates are expected to increase gradually over the next 15–20 years. As the rate of population growth declines, there is a change in the age structure of the population such that the proportion of persons aged 15–64 increases. In addition, the participation of women in the labor force is expected to increase. These two trends will be countered by increasing educational opportunities, which delay the average age of entry into the labor force. Table 10 gives the labor force participation rates that have been assumed. Table 11 gives the resulting projection of the size of the labor force. Results are given only for the most preferred population and urbanization variants: population variant I and urban variant I.

Noteworthy is the rapidly rising labor force in urban areas. While the quinquennial absolute increase in the rural labor force is projected to remain

**TABLE 10 Assumed labor force participation rates (percent of total population), India, 1981–2001**

	1981	1986	1991	1996	2001
Rural	45.0	45.5	46.0	46.5	47.5
Urban	37.0	37.5	38.5	39.5	40.5

SOURCE: J. Krishnamurthy, private communication.

**TABLE 11 Projected growth in the labor force in India, 1981–2001 (millions)**

Year	Labor force			Growth in interperiod labor force		
	Rural	Urban	Total	Rural	Urban	Total
1981	240	61	301	—	—	—
1986	263	74	337	23	13	36
1991	285	91	376	22	17	39
1996	308	109	417	23	18	41
2001	333	128	461	25	19	44

NOTES: Population variant I and urban variant I are used. For assumptions regarding population growth and URGD, see text above. Assumptions about labor force participation rates are shown in Table 10.

stable at about 23 million, the net additions to the urban labor force increase from about 13–14 million in 1981–86 to 19–20 million in 1996–2001. The net additions to the rural and urban labor force will be nearly identical in size toward the end of the period. The pressure such increases in the labor force will exert on employment opportunities is obvious. During the Seventh Plan period (1985–90) alone, over 3 million urban jobs will have to be created annually.

A first approximation of the economywide changes in the sectoral distribution of the labor force can be obtained by using the sectoral distribution of employment according to the 1977–78 National Sample Survey (32nd Round). Intraurban and intrarural changes in the sectoral distribution of employment have been negligible over the past two decades. (A comparison with other countries also reveals that these proportions generally remain quite stable until much higher increases in income are achieved.) Agriculture claims approximately 80–85 percent of employment in rural areas. Among the major states, only in Tamil Nadu, West Bengal, and Kerala is employment in agriculture in rural areas lower than 80 percent. In urban areas, employment in agriculture is stable at about 15 percent, as more and more fringe areas and formerly rural settlements are classified as urban. The proportion of employment in the secondary sector in urban areas is seldom much beyond 30 percent.

It is therefore to be expected that the structural change in employment in the economy will be due mainly to rural–urban shifts. Assuming the same intraurban and intrarural distributions as shown by the 1977–78 National Sample Survey, the economywide distribution of employment is projected for 1981 to 2001 in Table 12. Employment in agriculture (including forestry and fisheries) is found to decline very slowly, from just under 70 percent in 1981 to about 64–65 percent by 2001. Although this change seems minor, in the Indian historical context it will constitute a major change, since this proportion has remained stable since the beginning of the century.

**TABLE 12 Projected sectoral employment structure in India implied by unchanging intrarural and intraurban sectoral structure, 1981–2001 (percent distribution by sector)**

Sector	1981	1991	2001
Agriculture, forestry, and fisheries	69.6	66.9	64.5
Mining and manufacturing	10.9	11.7	12.5
Electricity, gas, and water supply	0.3	0.3	0.3
Construction	1.8	1.9	2.0
Trade, hotel, and restaurant	6.4	7.0	7.6
Transport, communication, and storage	2.3	2.5	2.8
Other	8.8	9.6	10.3
Total	100	100	100

NOTES: Intraurban and intrarural distribution as in National Sample Survey 1977–78. Labor force projection as in Table 11. For assumptions see discussion in text.

The implication of minor changes in the intraurban and intrarural distribution can also be noted. If the share of the rural labor force in agriculture is assumed to decline from the current 83 percent to 78 percent by 2001 (with corresponding increases in the secondary and tertiary sectors), and the share of urban labor in manufacturing increases to 32 percent, the total labor force in agriculture will decline to about 60 percent. This scenario is unlikely, since even the more advanced states do not at present show any systematic decline in the share of agricultural employment in rural areas. A 60 percent share of agriculture in overall employment can therefore be regarded as the outer limit to its decline by 2001. Table 13 gives these results.

I next attempt to project the growth of urban and rural incomes. As was shown earlier, increases in urban incomes over the last three decades led to a rise in the ratio of urban to rural per capita incomes. These estimates of urban and rural incomes are very crude because of the lack of direct data in the national accounts statistics.

Table 14 projects changes in the structure of the Indian economy over the next decade or so. The figures take account of the revised estimates for 1984-85 as given in the Sixth Plan Mid-Term Appraisal of the Planning Commission. Projections to 1989-90 and 1994-95 are based on the growth projections for each sector in the Sixth Plan. The share of agriculture continues to decline quite rapidly, while output is assumed to grow at 3.75 percent a year from 1984-85 to 1994-95, which is higher than the trend growth achieved in the last three decades. The growth rates assumed for the other sectors are also on the optimistic side; the changing proportions are quite realistic.

Projecting urban product, or incomes, from these data is problematical. Table 15 represents a first approximation, however. The urban and rural sectoral distributions of the labor force have already been derived. The gross output in urban areas is projected to rise from about 47 percent in 1980-81 to 51 percent in 1984-85, 54 percent in 1989-90, and just under 58 percent in 1994-95, while the share of urban population moves from nearly 24 percent to 29 percent. It is clear, therefore, that urban per capita incomes are expected to continue to rise faster than rural incomes. Table 16 gives the projected urban-rural per capita income ratios. The ratio rises from 2.87 in 1980-81, to 3.05 in 1984-85, 3.19 in 1989-90, and 3.34 in 1994-95.

**TABLE 13 Projected sectoral employment structure in India implied by changing intrarural and intraurban sectoral structure, 1981-2001 (percent distribution by sector)**

Sector	1981			1991			2001		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Primary	83	15	69	80	15	63.3	78	15	60.5
Secondary	6.5	28	11	6.75	30	12.4	7	32	13.9
Tertiary	10.5	57	20	13.25	55	23.3	15	53	22.5
Total	100	100	100	100	100	100	100	100	100

NOTE: Labor force projection as in Table 11. For assumptions see discussion in text.

**TABLE 14 Projected structure of the Indian economy:  
sectoral distribution of gross output at factor cost,  
1980-81 to 1994-95**

<b>Sector</b>	<b>Percent share</b>			
	<b>1980-81</b>	<b>1984-85</b>	<b>1989-90</b>	<b>1994-95</b>
Agriculture, forestry, and fisheries	37.8	34.2	31.3	28.5
Mining and manufacturing	18.7	21.3	22.3	23.4
Electricity, gas, and water supply	1.8	1.9	1.9	2.1
Construction	4.7	4.6	5.0	5.3
Trade, hotel, and restaurant	14.4	15.0	15.7	16.3
Transport, communication, and storage	6.0	6.4	6.6	6.8
Other	16.7	16.6	17.1	17.6
Total	100	100	100	100

SOURCE: Planning Commission, Government of India, *Sixth Five-Year Plan*, 1979-80 to 1984-85, New Delhi, 1981 and *Mid-Term Appraisal*, 1983.

It is difficult to envisage a scenario very different from this somewhat disturbing projection. There are two possibilities: either urbanization would be more rapid, leading to more people sharing urban incomes, or rural productivity would rise faster than projected. As mentioned, the assumed rate of growth of agricultural output is already higher than the trend record would suggest. Thus, rural productivity could be higher only if there were a greater spread of nonagricultural activities in the rural areas. The record of the more advanced states is not too encouraging in this respect. The share of the labor force devoted to agriculture has declined little in these states: West Bengal at 75

**TABLE 15 Projected gross output in urban areas of  
India by sectors, 1980-81 and 1994-95**

<b>Sector</b>	<b>Percent share</b>		<b>Urban-rural ratio of value-added per worker, 1970-71</b>
	<b>1980-81</b>	<b>1994-95</b>	
Agriculture, forestry, and fisheries	4.1	3.4	1.2
Mining and manufacturing	29.2	32.0	2.5
Electricity, gas, and water supply	2.4	2.5	1.0
Construction	5.0	5.4	1.4
Trade, hotel, and restaurant	24.6	23.8	2.8
Transport, communication, and storage	9.8	9.7	1.3
Other	24.8	23.2	1.6
Total urban output	100.0	100.0	2.7
(Billions Rs. 1979-80 prices)	(478)	(1,209)	
Percent of total output	46.9	57.7	
Percent urban population	23.6	29...	

NOTES: Sectoral distribution of GDP as in Table 14. Sectoral distribution of labor force calculated for these years from Table 12.

SOURCE: Ratio of value-added per worker in urban and rural areas for 1970-71 from Central Statistical Organization, *National Accounts Statistics*, 1981 (New Delhi, 1983), pp. 150-151.

**TABLE 16 Projected urban and rural populations and per capita incomes in India, 1980–81 to 1994–95**

Year	Population (millions)		Per capita income (Rs.) <sup>a</sup>		Urban-rural ratio
	Urban	Rural	Urban	Rural	
1980–81	164	533	2,916	1,017	2.87
1984–85	191	569	3,203	1,051	3.05
1989–90	228	612	3,788	1,188	3.19
1994–95	267	653	4,529	1,357	3.34

<sup>a</sup> 1979–80 prices.

NOTES: Urban-rural value-added per worker from Table 15.

Urban-rural population interpolated from Table 8 (using population variant I, urban variant I).

percent and Tamil Nadu at 78 percent have the lowest shares in agriculture. Hence, dramatic change in the structure of the rural labor force in the next 10–15 years seems highly unlikely. The other possibility, a higher rate of urbanization and greater absorption of labor in urban areas, also seems unlikely given the record of urban employment to date. The direction of projections given here is therefore realistic, even optimistic, in light of current conditions and trends.

The main mitigating feature that makes urban-rural disparities lower than suggested by these projections is the considerable transfer of incomes through remittances from urban to rural areas. Table 5 documented the relatively small change in the urban-rural ratio for per capita consumption (from 1.37 in the early 1960s to 1.50 in the early 1970s) as measured by the various National Sample Surveys on consumption expenditure. The discrepancy between these ratios and those calculated for the urban-rural per capita product can be explained partly by income transfers between urban and rural areas. Nonetheless, it is clear that much greater attention will have to be given to the provision of urban employment if rural areas are not to become even more impoverished. At the same time, it is imperative that rural productivity be raised.

#### **Urbanization in India's future : A new challenge to the Indian economy**

The broad canvas of urbanization up to the year 2001 that has been painted here carries a number of implications for the medium-term future for the Indian economy as a whole. To date, the nature and magnitude of these consequences have neither been recognized nor analyzed. One of the key indicators is the reduced share of agriculture to close to one-third of national income, while agriculture provides employment for more than two-thirds of the population.<sup>24</sup> Thus the general perception of the country as predominantly agricultural is

now only half true. This quiet revolution in the structure of the economy has taken place since Independence, at which time agriculture contributed about 60 percent of national income, while supporting a similar proportion (two-thirds) of the people.

Despite this imbalanced consequence of urbanization and industrialization, the pattern of urbanization in India has clearly not been chaotic: it is much as would be expected from theory and from comparison with world trends. Moreover, even the interstate differences in urbanization are consistent with theorized determinants of urbanization—namely, increases in per capita income and change in employment structure, marginal though the latter has been. As would be predicted, there is a strong relationship between levels of urbanization and economic development within the states in India.<sup>25</sup> This conclusion is in marked contrast to earlier views that India has been overurbanized in relation to its level of economic activity,<sup>26</sup> or that India's urbanization has been dysfunctional relative to its economic growth.<sup>27</sup> Such views have influenced the thinking of policymakers over the past three decades, and it is therefore important to set the empirical record straight.

One surprising feature that emerges from the pattern of Indian urbanization is the relative slowdown of urban growth in the more advanced states. The result is unexpected because the analysis of international data suggests that these states should be accelerating their urban growth, given their relatively higher per capita income levels among Indian states. Such a slowdown occurs when overall income increases because of industrial growth but is unaccompanied by matching changes in the agricultural sector—the familiar dualistic pattern of development. This may be happening in India's more industrialized states: Maharashtra, Tamil Nadu, West Bengal, and Gujarat. All have experienced a significant deceleration in their rates of urbanization except for Gujarat, and all have experienced stagnating agricultural productivity. Their historically high levels of industrialization and urbanization were clearly not due to intrinsic forces of urbanization and economic development but to external demands of the colonial system.

The observed pattern of urbanization is understood better by observing the various kinds of economic demands made by different activities. Agricultural activity creates demand for services and agroindustry in small- and medium-size towns. The population of large cities has little relationship with agricultural activity except in an indirect fashion through general income growth, which creates demand for urban goods. Hence in the situation of countrywide agricultural stagnation that India experienced in the 100 years before Independence, the small amount of urbanization that took place had to be "exogenous," based on colonial trade patterns. But variations in factory employment now explain the expansion of population in large cities to a great extent. The policy relevance of these findings is twofold. First, the growth of small- and medium-size towns is likely to be brought about by agricultural growth in the backward regions, including those in the more advanced states, rather than by industrial dispersal. Second, the appropriate policy with respect

to industrial dispersal is promotion of dispersal to those existing large cities that are industrially backward. Additionally, the findings recommend the creation of new centers of substantial size rather than small ones. There should be a concentration of dispersal rather than a dispersal of concentrations. This, then, is one of the challenges facing the Indian economy.

One of the developments reported here is the increasing disparity in income among states in India. This is associated largely with increasing interstate disparity of agricultural productivity rather than urban productivity. In fact, there has been a tendency for the inequality in industrial productivity to decrease, and this has been associated with a reduction in disparity in urbanization levels among states. There has been an overall acceleration of urbanization in most states, accompanied by increasing industrial production in some states, increasing agricultural productivity in others, and agricultural stagnation in still others. There is some evidence, though not conclusive, of the beginning of a "push" from the countryside in some of the most backward regions in northern Bihar and eastern Uttar Pradesh. Interesting evidence is also found of extremely high population mobility in the backward regions of southern Bihar, eastern Madhya Pradesh, and Orissa, which have had heavy industrial investment unaccompanied by agricultural improvements. This indicates that, given the faintest glimmer of opportunity, people will move very rapidly from rural to urban areas.<sup>28</sup>

The broad challenge facing the Indian economy is rapid urbanization during the next 30 years: a vast movement of people from the countryside to the cities. While the process is a familiar one, the magnitude of the movement is unprecedented and hence so will be the problems. One is the implied volume of necessary investment in urban infrastructure: conservatively estimated at about Rs.1,000 per head<sup>29</sup> and therefore amounting to about Rs.300 billion (US\$25 billion) by the end of the century—and this does not include investments in urban transportation and industry. Another problem is the required accelerated generation of urban employment—ironically, this may best be achieved by increasing agricultural productivity, which will give rise to many avenues of employment in towns. Moreover, redressing the increased and increasing urban-rural disparity probably hinges on the spread of increased agricultural productivity. It would improve per capita agricultural incomes on the one hand, while inducing more widespread, less capital-intensive urban employment on the other.

It is appropriate to conclude with the key policy challenge implied by the findings in this paper. The growth of agriculture in the backward regions, and specifically in the entire Eastern region, needs the highest attention. This essentially means that technological innovations in rice and dry-area crops urgently require greater research inputs. Agricultural stagnation in the Eastern region, as well as in the backward regions of the hitherto most advanced states, is largely responsible for India's increasing regional as well as urban-rural disparity. Redressing this disparity in agriculture is also the best policy for balanced urban growth.

### Appendix:

#### Methodology for projecting trends in urbanization

Projecting the total population of a country that has little net immigration or emigration is a relatively simple matter with the application of well-known demographic methods to mortality rates, fertility rates, and the estimated age and sex structure. Projecting the urban population is much more difficult since it depends to a much greater degree on the movement of economic variables that are difficult to predict. Projections can be made of plausible ranges of urban growth, however, using available information on past experience and knowledge of urbanization trends.

#### Projection of the total urban population

The method recommended by the United Nations is to use the net difference between the rate of growth in the urban population and that in the rural population—the urban-rural growth differential (URGD)—for projection. This method "has several interesting advantages, . . . especially in its range of applicability. In a wide variety of circumstances, comprising virtually all those which will ever occur, the assumption can be made that a URGD observed in the past may also be maintained for an indefinite future period without leading to the kind of absurd results (which appear from the use of simpler projection methods such as mere growth rate extrapolation of urban population). This remains true irrespective of the current level of urbanization, the rate of growth in total population, or whether rural population is increasing or diminishing."<sup>30</sup> Furthermore, the level of urbanization is, in general, found to increase in a logistic fashion. It can be shown that the assumption of a constant URGD is consistent with this logistic pattern.

Let  $U_t$ ,  $R_t$ , and  $T_t$  be the urban population, the rural population, and total population at time  $t$ , and  $U_0$ ,  $R_0$ , and  $T_0$  the corresponding population at time 0. Let  $u$  and  $r$  be the exponential rates of growth of the urban and rural populations. Denote the URGD by  $d$ .

Then,

$$d = u - r$$

$$U_t = U_0 e^{ut}$$

$$R_t = R_0 e^{rt}$$

and  $U_t/T_t$  is the level of urbanization at time  $t$ .

$$\text{Now } \frac{U_t}{R_t} = \frac{U_0}{R_0} e^{(u-r)t} = \frac{U_0}{R_0} e^{dt}$$

$$T_t = U_t + R_t = \frac{U_0}{R_0} e^{dt} R_0 + R_0$$

Hence

$$\frac{U_t}{T_t} = \frac{U_t/R_t}{T_t/R_t} = \frac{\frac{U_0}{R_0} e^{dt}}{\frac{U_0}{R_0} e^{dt} + 1} = \frac{1}{1 + \frac{R_0}{U_0} e^{-dt}}$$

Denote the level of urbanization in percentage terms by  $URB_t$ , i.e.,

$$URB_t = 100 \frac{U_t}{T_t}$$

If it is assumed that the logistic is symmetrical about the 50 percent level, where  $U_0 = R_0$ , then

$$URB_t = \frac{100}{1 + e^{-dt}}$$

Hence  $URB_t$  is calibrated for different values of  $dt$ , assuming that this curve is symmetrical about

$$\frac{U_0}{T_0} = 0.5$$

i.e.,  $URB_0 = 50$  percent. For urbanization levels of less than 50 percent,  $dt$  is negative, while it is positive for urbanization levels over 50 percent. Specifying  $d$ , that is, URGD, the logistic formula can be used to locate any particular current level of urbanization on the standardized time scale and thence to project future levels of urbanization. Note that different URGDs can be used for different time periods.

The URGD method has good empirical grounding in observed urbanization patterns.

#### Projection of the distribution of the urban population by city size

An extension of the projection method outlined above is used to project the population in each size class of cities and towns. The proportion of population in each size class is expected to follow a logistic pattern—including the population added by new towns and cities being added to the size class in each census. The procedure is as follows:

(1) *Metropolitan cities* Let  $M_{71}$  be the total population in the nine metropolitan cities in 1971 and  $M_{81}$  the total in the 12 metropolitan cities in 1981. Let total (urban and rural) population be  $T_{71}$  and  $T_{81}$ . Now

$$\% M_{71} = \frac{M_{71}}{T_{71}} \times 100$$

and       $\% M_{81} = \frac{M_{81}}{T_{81}} \times 100$

These percentages of metropolitan population can be read off the logistic scale in the same way as the percentage of total urban population. If it is assumed that the pattern of growth in the future is similar to the past on the logistic scale, the projected proportion  $\% M_{91}$  can be read off the logistic scale by assuming the same  $dt$  in the next decade. In effect, urban population is defined as metropolitan population, and  $d$  is now the difference between the rate of growth of metropolitan population and that of the remaining population.

### (2) Class I cities (100,000 to 999,999)

The next step is to subtract  $M_{71}$  and  $M_{81}$  from  $T_{71}$  and  $T_{81}$  to obtain the remaining population in each year. Now the population of class I cities is taken as a percentage of this remaining population for each year. These percentages are read off the logistic scale as before and projected similarly. Again, the population of this class is regarded as the total urban population and is projected according to a logistic pattern of growth.

(3) *Class II and below* The same procedure is repeated, excluding the already-projected population each time.

The population in each size class is thus obtained and the remainder is the rural population. This is called the "downward procedure." The "upward procedure" is similar except that it starts from the rural population, takes the next (smallest) size class and so on until it reaches metropolitan cities, excluding each projected group as we go upward.

Both procedures have been utilized in the projections made. As a test of the procedure, 1971 and 1981 size-class populations were predicted using the 1951–61 data for 1971 and the 1961–71 data for 1981. This procedure, in principle, accounts for the changing classification of towns, in terms of size, between censuses. It assumes that the proportion of urban population above any cutoff point follows over time a logistic pattern.

### Projection of the number of towns in each size class

A systematic statistical examination of the trend in city size distribution may be done by fitting the Pareto distribution  $R = a/P_R^b$ , where  $R$  is the rank of the urban area (by population size) with population  $P_R$ ;  $a$  and  $b$  are constants to be estimated from the data. The larger is  $b$ , the more even is the distribution of city sizes. As  $b$  tends to zero, the entire urban population is concentrated in one city. If  $b = 1$ , the distribution is reduced to the familiar rank size rule. The population of a town with the  $R^{\text{th}}$  rank is then  $\frac{a}{R}$  or  $1/R$  of the population  $a$  of the largest city.

Once the values of  $a$  and  $b$  are determined, the whole distribution of towns and cities can be generated from the Pareto distribution. Thus,  $a$  and  $b$  have been estimated for the distribution of class I and class II cities in 1981.<sup>11</sup>

$$\ln a = 18.27$$

and       $b = 1.12$

For projection purposes,  $b$  is assumed to be approximately constant over time (as it has been for India) but  $a$  is expected to increase. It is therefore necessary to estimate  $a$  for 1991.

The information used here is from the projections for individual metropolitan cities. At the upper end of the range, it may be predicted confidently that there will be 21 to 23 cities with a million population and over in 1991. Assuming  $b = 1.12$ , with  $R = 21$  or 23, for  $P_R = 1$  million,  $a$  can be estimated. This is done for the different projections reported in the text.

$\ln a$	Projection
18.64	A
18.59	B
18.53	C

The number of towns in class I and lower classes can then be found by identifying the rank,  $R$ , of the town at the border line of each class. It turns out that by this procedure the number of towns in size classes III, IV, and V is much lower than the actual. If the estimation of  $b$  is done using all the towns in the distribution,  $b$  is greater than the 1.12 estimated by using only towns in class II and above.

## Notes

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1 See, for example, Edwin S. Mills and Charles Becker, *Studies in Indian Urban Development* (New York: Oxford University Press, 1986); and Bertrand Renaud, *National Urbanization Policy in Developing Countries* (New York: Oxford University Press, 1982).

2 Data from the World Bank, *World Development Report* (New York: Oxford University Press), various issues.

3 Rakesh Mohan and Chandrashekhar Pant, "Morphology of urbanization in India," *Economic and Political Weekly* 17, nos. 38 and 39 (18 and 25 September 1982), World Bank Reprint Series No. 295. Also see "India: Population growth in the 1970s," *Population and Development Review* 7, no. 2 (June 1981): 325-334.

4 Moonis Raza et al., "India: Urbanization and national development," in *Urbanization and Regional Development*, ed. M. Honjo (Singapore: Maruzen Books, 1982).

5 As is the case in the influential work of Ashish Bose, *India's Urbanization 1901-2001* (New Delhi: Tata McGraw-Hill, 1978). For mention of this issue, see also Nigel Crook and Tim Dyson, "Urbanization in India: Results of the 1981 census," *Population and Development Review* 8, no. 1 (March 1982): 145-155.

6 M. K. Jain, "Interstate variations in the trends of urbanization in India 1951-71" (Bombay: International Institute of Population Studies, 1977).

7 Samuel H. Preston, "Urban growth in developing countries: A demographic reappraisal," *Population and Development Review* 5, no. 2 (June 1979): 195-215.

8 Crook and Dyson, cited in note 5, graph this negative association between the rate of urban population growth in 1971-1981 and the level of urbanization in 1971 among the largest Indian states (p. 150).

9 See Mohan and Pant, cited in note 3, for more detail on intrastate patterns.

10 See J. Krishnamurthy's careful analysis, which accounts for changes in work force definitions between censuses, "Changes in the Indian workforce," *Economic and Political Weekly* 19, no. 50 (15 December 1984): 2121-2128. But for earlier doubts on this issue, see J. N. Sinha, "1981 census data: A note," *Economic and Political Weekly* 17, no. 6 (6 February 1982): 195-203.

11 The Indian economy suffered from a severe drought in 1979-80 and only partly recovered from it in 1980-81.

12 Only male agricultural labor is used because of the well-known definitional changes in the 1971 census, which have made female agricultural labor data noncomparable with other years.

13 See A. Uday Sekhar, "Industrial location policy: The Indian experience," World Bank Staff Working Paper No. 620, Washington, D.C., 1983.

14 See Rakesh Mohan, "The regional pattern of urbanization and economic development in India," Conference on Recent Population Trends in South Asia, New Delhi, February 1983.

15 This is corroborated by Krishnamurthy, cited in note 10.

16 Mohan and Pant, cited in note 3.

17 Central Statistical Organization, *Monthly Abstract of Statistics* (New Delhi: Government Printing Office, 1981), pp. S6-S10.

18 See, for example, Rakesh Mohan, "The effect of population growth, the pattern of demand and of technology on the process of urbanization," *Journal of Urban Economics* 15, no. 2 (March 1984): 125-156, where population growth is only partly endogenous depending on the pace of urbanization. The 3-sector model is a long-run model calibrated on

Indian data (1951-84). For a more advanced attempt at such modeling, see Allen C. Kelley and Jeffrey G. Williamson, *What Drives Third World City Growth?* (Princeton, N.J.: Princeton University Press, 1984); and for an application of their model to projections of urbanization in the Third World as a whole and for a "representative developing country," see their "Modeling the urban transition," *Population and Development Review* 10, no. 3 (September 1984): 419-441.

19 Census of India 1971, India Series, *Report of the Expert Committee on Population Projections. Paper I of 1979* (New Delhi, 1979).

20 Robert H. Cassen, *India: Population, Economy, Society* (London: Macmillan, 1978), pp. 128-140.

21 Mills and Becker, cited in note 1, estimate an equation of the form:

$$U = b_0 + b_1 Y - b_2 Y^2 - b_3 A$$

or

$$U = c_0 + c_1 Y - c_2 Y^2 + c_3 M$$

where  $U$  is level of urbanization,  $Y$  is GNP per capita, and  $A$  and  $M$  are percent of labor force in agriculture and manufacturing, respectively.

22 The 12 cities in descending order by size of population are: Calcutta, Bombay, Delhi, Madras, Bangalore, Hyderabad, Ahmedabad, Kanpur, Pune, Nagpur, Lucknow, Jaipur.

23 Coimbatore, Patna, Surat, Madurai, Indore, Varanasi, Agra, Jabalpur, Baroda, Dhanbad, Bhopal, Ulhasnagar.

24 For interesting discussions on this issue, see recent works by Harry T. Oshima on the need for an increase in off-farm employment for successful transition from agricultural economies in "Monsoon Asia" into industrial economies: "The transition of an industrial economy in Monsoon Asia," Asian Development Bank Economic Staff Paper No. 20 (Manila, 1983); and "The significance of off-farm employment and incomes in post-war East Asian growth," Asian Development Bank Economic Staff Paper No. 21 (Manila, 1984).

25 Reported in Mohan, cited in note 14.

26 See N. V. Sovani, *Urbanization and Urban India* (New York: Asia Publishing House, 1966) for a summary of this debate in the 1960s.

27 See Amitabh Kundu and Moonis Raza, *Indian Economy: The Regional Dimension* (Delhi: Spektrum Publications, 1982).

28 See Mohan and Pant, cited in note 3.

29 Planning Commission, *Report of the Task Force on Financing of Urban Development* (New Delhi: Government of India Press, 1985).

30 United Nations, *Methods for Projections of Urban and Rural Population*, Department of Economic and Social Affairs, Population Studies No. 55 (New York, 1974).

31 Mills and Becker, cited in note 1.