Rural Transformation in India in the Decade of Miraculous Economic Growth

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Rural Transformation in India in the Decade of Miraculous Economic Growth

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Abstract

The study empirically measures the pattern and extent of rural transformation in India using a comprehensive assessment system based on three multidimensional indices, namely rural development index, rural transformation index and urban–rural coordination index. The constructed rural transformation index shows that rural India has undergone a sweeping transformation during the decade of sharp economic growth. The transformation that occurred in India is accompanied by an improvement in the rural development level. The analysis indicates that India's urban–rural coordination has slightly declined between 2001 and 2011. In addition, large regional disparities in rural transformation are shown. Based on findings, it is argued that policies aimed at region-specific rural transformation types may be an effective way to shape a more integrated urban–rural development pattern in India.

Introduction

Rural transformation is a proactive and positive process of change and development of rural communities in the context of national and global social and economic changes (Long, Zou, Pykett, & Li, 2011; Wang, Khan, & Zhang, 2013). It involves bringing features of urban environments into rural settings, changes to systems and processes that favourably impact rural people's standard of living and livelihoods. Rural transformation is a more dynamic concept than rural

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development as it embodies a transformation in people's perspective on life (Shaw, 2011). It is usually characterised by changes in civic amenities, female literacy, gender ratio, employment structure, agricultural intensity, crop selection pattern, farm income, labour productivity and major improvements in rural housing and economic and social conditions resulting from industrialisation and urbanisation (Kurien, 1980; Ravallion & Datt, 2002).

A significant discourse on the transformation of rural areas found its inspiration in Marxist theories (Atchoarena & Sedel, 2003). Indeed, rural people are no different from other people in that they too need to trade, to have access to education, entertainment, medical attention, government services, telecommunications and a host of other services to live a full life (Dey, 2011). In fact, rural concerns have not been given the predominance they deserve, especially in the cases of the south Asia and sub-Saharan Africa, where socio-economic problems are largely rural problems (Wang et al., 2013).

Despite rampant urbanisation, India is a country of villages where a staggering 69 per cent of population—833.5 million people—still lives in rural areas. As per Census 2011, the population of rural India is about 12 per cent of the world's total population, which makes it bigger than the size of the Europe. The rural people are mostly employed in agriculture and related informal sector activities, but receiving (and contributing to) a disproportionately low share of gross domestic product and also are characterised by low values in various development indicators. For example, human development index and life expectancy in Indian states decrease with every increase in rural population. Similarly, infant mortality, unsafe delivery, population below the poverty line and hunger index are directly and proportionally related to rurality.

In the current study we empirically measure the pattern and extent of rural transformation at the state level and for the county at large in India between 2001 and 2011. During the period under reference, India has witnessed an impressive economic growth—a whopping compound annual growth rate of 8.96 per cent. Because there are extreme discrepancies in socio-economic development between the urban elite and the rural poor in India (Ohlan, 2013), improving rural residents' wellbeing is a popular and political concern. Given the vital importance, several studies have analysed the drivers of rural development in India (e.g., Fan, Hazell, & Thorat, 2000; Haggblade, Hazell, & Reardon, 2010; Lanjouw & Murgai, 2009; Sarkar & Kundu, 2016; Singh, 2009). Contrary, a very few studies have focused on tracing the causes of unequal urban–rural distribution of the gains of economic reforms (Tiwari, Shahbaz, & Islam, 2013). Long neglected by policy makers, the rural transformation has attracted considerable attention in recent years. For instance, the Government of India has established the National Institution for Transforming India, as a replacement for the Planning Commission. More specifically, promulgation of 'Shyama Prasad Mukherji Rurban Mission' to develop smart villages its self is a sign of rapid transformation that is taking place in rural areas in India (Gupta, 2015). To our knowledge this is the first comprehensive study to quantify the

pattern and extent of rural transformation witnessed in the decade of faster economic growth in India. The aims of the study were to (a) investigate rural transformation in India during the 2001–2011 period, and (b) discuss the way forward for achieving coordinated urban–rural development. The study is useful in generating more dynamics to comprehend the socio-economic dimensions of rural transformation in India. The results should help to craft policies for addressing the issues of distributive justice of the fruits of economic growth on rural–urban basis.

Next we present an analytical framework of three multidimensional assessing indicator systems used in the study. This section also includes sources and processing of data. It is followed by a presentation and discussion of the empirical results obtained using indicator systems. In this way, the final section summarises the main findings and offers their policy implications to shape a more coordinated urban–rural development pattern and the general improvement of rural life in India.

Methodology

Methods of Analysis

In the study, related development indices are established to examine the pattern of rural transformation in India. These indices present relevant statistical information to explain as much as possible the key socio-economic issues and challenges faced by the rural communities. To meet the objectives, this work parallels Long et al. (2011) and Wang, Liu, Li, Y. and Li, T. (2016) in the use of three multidimensional assessing indicator systems: (a) rural development index (RDI), (b) rural transformation index (RTI) and (c) urban–rural coordination index (URCI).

The indicators used in the study for measuring the rural development level are given in Table 1. These indicators reflect changes within the rural society, economy, culture, resources and the environment within a national perspective.

Considering the availability of relative socio-economic data, we selected 10 representative indicators belonging to three rule layer factors: rural economic development, rural social development and rural infrastructural services development. All of the indicators given in Table 1 have positive effects on rural development level.

Essentially, rural transformation is marked by changes in the rural area's internal structures of industry, employment and consumption and corresponding changes in the rural population, female literacy and land-use pattern and cropping intensity. Therefore, seven indicators have been opted to assess rural transformation level. These indicators are presented in Table 2.

In order to assess the urban–rural coordination level, four general and intuitive indicators have been chosen which comprehensively present the degree of urban–rural coordination of society, economy, resources and the environment.

Table 1: Indicator System for Rural Development Level Assessment

Rule Layer Factors (Weight)	Indicator Layer Factors (Weight)	Definition
Rural economic development (0.387)	Agricultural output value level (0.487)	Gross output value of farming, forestry, animal husbandry and fishery per capita
	Productivity of rural labour (0.151)	Gross agricultural output value divided by the labourers employed in farming, forestry, animal husbandry and fishery
	Rural consumption level (0.362)	Per capita consumption expenditure of rural households
Rural social development (0.261)	Female literacy (0.421)	Proportion of literate female in total rural female population
	Infant survival rate (0.317)	Proportion of infants living behind one year of age
	Gender ratio (0.262)	Gender ratio of rural population in the age group of 0–6 years
Infrastructural services development (0.352)	House electrification (0.273)	Proportion of electrified houses in total houses in rural areas
	Drinking water availability (0.292)	Proportion of houses with drinking water sufficiently available throughout the year in rural areas
	Sanitation coverage (0.214)	Proportion of houses with toilet facility in rural areas
	Irrigation index (0.221)	Irrigated cropped area divided by the total cropped area

Source: Author's Calculation.

Table 2: Indicator System for Rural Transformation Level Assessment

Indicator (Weight)	Definition	Explanation
Urbanisation level change rate[2] (0.146)	$\dfrac{UL_l - UL_e}{UL_e}$	ULl = the proportion of the urban population in the total population for the later period; ULe = UL for the early period. A positive indicator: the higher the value, the higher the RTI.
Rural female literacy level change (0.175)	$\dfrac{RL_l - RL_e}{RL_e}$	RLl = the proportion of the literate rural female in the total rural female population for the later period; RLe = RL for the early period. A positive indicator: the higher the value, the higher the RTI.

Continued)

[2] As noted by Cali and Meon (2013) urbanisation has a substantial and systematic poverty-reducing causal effect in the surrounding rural areas in India.

(Table 2 Continued)

Indicator (Weight)	Definition	Explanation
Industrial structure change rate (0.124)	$\dfrac{IS_l - IS_e}{IS_e}$	ISl = the proportion of the output value of agriculture in the total gross domestic product (GDP) for the later period; ISe = IS for the early period. A negative indicator; the lower the value, the higher the RTI.
Employment structure change rate (0.120)	$\dfrac{ES_l - ES_e}{ES_e}$	ESl = the proportion of rural working population employed in agriculture among the total rural labourers for the later period; ESe = ES for the early period. A negative indicator; the lower the value, the higher the RTI.
Consumption structure change rate (0.110)	$\dfrac{CS_l - CS_e}{CS_e}$	CSl = the Engel coefficient for rural residents for the later period; CSe = CS for the early period. A negative indicator; the lower the value, the higher the RTI.
High-value crops farmland index change rate[3] (0.174)	$\dfrac{HI_l - HI_e}{HI_e}$	HIl = the proportion of high-value crops area in the total cropped area for the later period; HIe = HI for the early period. A positive indicator; the higher the value, the higher the RTI.
Cropping intensity index change rate (0.151)	$\dfrac{CI_l - CI_e}{CI_e}$	CII = the proportion of area sown more than once in the net area sown for the later period; CIe = CI for the early period. A positive indicator; the higher the value, the higher the RTI.

Source: Author's Calculation.

These indicators are reported in Table 3. All of the indicators given in Table 3 have positive effects on regional urban–rural coordination level.

As the variables in Table 1 are expressed in different units, they have to be transformed into comparable common units by normalising all measures. For this purpose Equation 1 is used:

$$X'_{ij} \;=\; \frac{X_{ij} - X_{i,\min}}{X_{i,\max} - X_{i,\min}} \tag{1}$$

where X'_{ij} = Standardised value of the indicator ij; ij = Indicator i in the rule layer j; X_{ij} = Value of the indicator ij; $X_{i,\max}$ = Maximum value of indicator ij for all states and $X_{i,\min}$ = Minimum value of indicator ij for all states.

The indicators in Tables 2 and 3 show relative indices without dimensions. To render them spatially and temporally comparable, the values of these indicators

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[3] High-value crops comprised fruits and vegetables.

Table 3: Indicator System for Urban–rural Coordination Level Assessment

Indicator (Weight)	Definition
Urban–rural consumption level gap (0.433)	Dividing the per capita consumption of rural households by the per capita consumption of urban households
Urban–rural consumption structure comparison (0.304)	Dividing the Engel coefficient of urban residents by that of rural residents
Industrial labour productivity comparison (0.150)	Dividing the productivity of labourers employed in farming, forestry, animal husbandry and fishery by that of labourers employed in other industries
Urban–rural female literacy gap comparison (0.113)	Dividing the female literacy rate of rural areas by that of urban areas

Source: Author's Calculation.

have been ranged from –1 to 1 using the general normalisation method, according to Equation 2:

$$X'_i = \frac{X_i}{X_{i,\max}} \tag{2}$$

where X'_i = Standardised value of the indicator i; X_i = Value of the indicator i and $X_{i,\max}$ = Maximum value of the absolute value of the indicator i for all states.

After multiplying each negative indicator (see Table 2) by –1, weight and normalised value of each indicator have been used to calculate the RDI, RTI and URCI scores for each state, using Equations 3–5:

$$\text{RDI} = \sum_{j=1}^{n}\left(\sum_{i=1}^{m} X'_{ij} \times W_{ij}\right) \times W_j; \qquad -1 \leq \text{RDI} \leq 1 \tag{3}$$

$$\text{RTI} = \sum_{k=1}^{t} X'_k \times W_k; \qquad -1 \leq \text{RTI} \leq 1 \tag{4}$$

$$\text{URCI} = \sum_{k=1}^{t} X'_k \times W_k; \qquad -1 \leq \text{URCI} \leq 1 \tag{5}$$

where X'_{ij} = Standardised value of the RDI indicator; W_{ij} = Weight for indicator layer factor ij; W_j = Weight of rule layer factor j; n = Number of the rule layer factors; m = Number of indicators in each rule layer; X'_k = Standardised value of RTI or URCI indicator k; W_k = Corresponding weight of the RTI or URCI indicator and t = Number of RTI or URCI indicators. The higher values of RDI, RTI and URCI indicate higher grades of rural development, rural transformation and urban rural coordination, respectively. It may be added here that an attempt was also made to measure the rural transformation in India using RTI proposed by Wang

et al. (2013). However, the results were inconclusive as that index did not indicate negative transformation.

Data Sources and Processing

The study is primarily based on secondary data. Our data cover the period 2001–11 for 19 major states in India and the national average. Our choice of period, states and unit of analysis is defined by the National Sample Survey Organisation quinquennial surveys in which state level household-based data for major states are available on urban–rural basis. All of the original economic data have been calculated using the constant prices. Our choice of time period is also dictated by the availability of original annual data for demographic variables like population and gender ratio for which original data are available on a decadal basis.

The data on population, urbanisation, literacy and gender ratio on urban–rural basis are taken from *Population Census India, 2001, 2011*, Government of India, New Delhi, India. The data on crop selection pattern, irrigation index and cropping intensity are taken from *Land Use Statistics Reports,* Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi, India. In order to determine the weights for the rule layer factors shown in Table 1 and all of the indicators in Tables 1–3, semi-structured interviews have been conducted with economics and sociology experts and government officials for rural development.

Different Grades of Rural Transformation

To distinguish the internal mechanism of regional rural transformation from miscellaneous assessment results, we classified the RDI, RTI and URCI into five grades based on their mathematical and statistical features. For this purpose, the appropriate statistical standards for various grades of RDI, RTI and URCI are as follows: Low = $(-1, \bar{x} - 0.5\sigma)$, Intermediate–low = $(\bar{x} - 0.5\sigma, \bar{x})$, Medium = $(\bar{x}, \bar{x} + 0.5\sigma)$, Intermediate–high = $(\bar{x} + 0.5\sigma, \bar{x} + \sigma)$ and High = $(\bar{x} + \sigma, 1)$, where $\bar{x}$ = mean and σ = standard deviation.

For example, based on the above assumption, in case of initial RDI, the ranges of different grades are Low = $(-1, 0.278)$, Intermediate–low = $(0.278, 0.345)$, Medium = $(0.345, 0.411)$, Intermediate–high = $(0.411, 0.478)$ and High = $(0.478, 1)$.

Results and Discussion

Rural Development Level

Table 4 below presents the pattern of rural development in India in terms of RDI (Equation 3), descending order of different states based on RDI in 2011, analytical categorisation of stages of rural development and ΔRDI and coefficient of variation (CV) for major states and for the country at large. It is evident from Table 4 that the rural India has seen a clear improvement in the development level: the national

Table 4: Rural Development Level for Major Indian States

State	RDI 2001	Stage of Development 2001	RDI 2011	Stage of Development 2011	ΔRDI	Grade of ΔRDI
Punjab	0.489	High	0.700	High	0.211	High
Kerala	0.704	High	0.662	High	-0.042	Low
Haryana	0.351	Medium	0.540	High	0.188	High
Himachal Pradesh	0.531	High	0.492	Intermediate high	-0.039	Low
Tamil Nadu	0.403	Medium	0.469	Intermediate high	0.066	Medium
Andhra Pradesh	0.363	Medium	0.429	Medium	0.066	Medium
Gujarat	0.337	Intermediate low	0.419	Medium	0.082	Intermediate high
Karnataka	0.367	Medium	0.380	Intermediate low	0.013	Intermediate low
West Bengal	0.411	Intermediate high	0.378	Intermediate low	-0.033	Low
Jammu and Kashmir	0.372	Medium	0.370	Intermediate low	-0.002	Low
Maharashtra	0.394	Medium	0.360	Intermediate low	-0.034	Low
Assam	0.329	Intermediate low	0.335	Intermediate low	0.005	Intermediate low
Rajasthan	0.230	Low	0.286	Low	0.056	Medium
Chhattisgarh	0.260	Low	0.283	Low	0.023	Intermediate low
Uttar Pradesh	0.184	Low	0.280	Low	0.096	Intermediate high
Bihar	0.200	Low	0.250	Low	0.050	Medium
Madhya Pradesh	0.198	Low	0.238	Low	0.041	Medium
Jharkhand	0.224	Low	0.198	Low	-0.026	Low
Odisha	0.206	Low	0.183	Low	-0.023	Low
All-India	0.296	Intermediate low	0.337	Intermediate low	0.041	Medium
Coefficient of variation	38.37%	–	37.65%	–	–	–

Source: Author's calculation.

average RDI has improved from 0.296 in 2001 to 0.337 in 2011. The great strides are observed in rising consumption level, cropping intensity, adoption of high-value crops, per capita agricultural output and educational attainment.[4]

The states in Column 1 of Table 4 are given in descending order of value of the RDI in 2011. The order of level of rural development as per 2011 estimates is as follows: the state of Punjab has enjoyed the highest rank with the value of the RDI at 0.700, closely followed by Haryana at 0.662 and Kerala at 0.540. Orissa has the least developed rural area as indicated by the low value of the RDI at 0.183, followed by Jharkhand at 0.198 and Madhya Pradesh at 0.238. These results coincide with the finding of Rao (2008) who ranked India's states for incidence of poverty. It is clear here that with the rapid development of Indian economy the overall regional RDI shows a significant increase, with differing rates due to contrasting regional development models and policies.

Compared at regional level, a glance at Column 2 of Table 4 makes it clear that the rural areas in the Eastern region (Odisha, Jharkhand and Bihar) are generally low developed (RDI < 0.310). This may partially be because of underdeveloped human resources, low developed agriculture and allied activities in this region. It implies that the manufacturing and service sectors have not been observed low-skilled rural labour. In the context of the composition of RDI, we note that their situation is worst in almost every indicator, namely household consumption level, attainment of education, infant mortality, use of electricity, sanitation, availability of drinking water, irrigation intensity and labour productivity. The northern region (Punjab, Haryana, Himachal Pradesh and Jammu and Kashmir) has long been one of India's main grain production bases. It has excellent agricultural production conditions, including good agricultural machinery, irrigating facilities and capital accumulation, which have contributed to a high agricultural production level and relatively high rural development level.

All four states of the south India (Kerala, Tamil Nadu, Andhra Pradesh and Karnataka) have acquired high RDI (RDI > 0.310). These states have attained the highest literacy level which is a widely recognised determinant of rural development. As compared to the eastern region (Odisha, Bihar, Jharkhand except West Bengal), the rural area of the north-eastern region (Assam) is better developed. In the northern India, only Uttar Pradesh falls into the category of low-developed states. This may be because of poor social infrastructure (education and health), low economic growth, small farm holdings, over-dependence on rain-fed agriculture, underdeveloped agro processing and lack of large-scale modern industries. The combined effect of political instability, social conflict and insufficient funds allocation from central government putted Uttar Pradesh and Bihar in the low-level equilibrium trap (Rasul & Sharma, 2014). However, it is heartening to note the state has shown the clear sign of improvements: the value of RDI for Uttar Pradesh has jumped up from 0.184 in 2001 to 0.280 in 2011. But the progress is still slow.

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[4] In spite of the many significant developments, alarming challenge of declining gender ratio still persists.

A look at Column 6 of Table 4 reveals that the improvement in rural development is far from uniform across different states of India. It is evident that rural backwardness is becoming increasingly concentrated in Odisha and Jharkhand. It is worthwhile to know have the states with developed agriculture and high economic growth fared better in improving rural development. It is clear here that Punjab and Haryana, which has had developed agriculture sector and high economic growth, have also had a significant improvement in the rural development level. Kerala which was at the top in 2001 has seen a decline in the rural development (ΔRDI = –0.042) and set back to second best in 2011. This may partially be because of relatively slow progress in the health sector.

The coastal state of the western region, Gujarat, experienced a massive industrial restructuring which brought about clear improvements in rural development and led to a high rural development level (ΔRDI = 0.082). In case of another coastal state of the western region, Maharashtra, we note that it is highly industrialised and urbanised state. The state has good physical infrastructure and a relative abundance of entrepreneurs. However, weak agro-climatic conditions, low irrigation potential and utilisation, almost stagnant public investment in agriculture, low agricultural yields and growth followed by the low public expenditure on health and education have resulted in poor quality of rural life in the state (ΔRDI = –0.034).

In case of Rajasthan, situated in the north-west region of India, agriculture and animal husbandry are the main occupation of rural people. However, horticulture development and agro-processing, including milk processing and agricultural mechanisation, in the state are very weak. Moreover, agriculture mostly depends on monsoon in the state. The industrial sector of the state is characterised by the predominance of small scale units, a high proportion of sick units, low labour productivity and lack of new entrepreneurs. As a result, it falls into the category of low-developed states with the value of the RDI at 0.286 in 2011. The literacy of rural female and agricultural productivity have slightly improved in Rajasthan during the last decade, which followed by similar improvements in the rural development level (ΔRDI = 0.056). The evidence of concentration of extreme poverty in rural areas of the eastern states and occurrence of dynamic rural development in the southern states also indicates the economic growth and human development nexus.

We note that all the BIMARU states—four northern Indian states: Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh—are laggards in rural development as well. However, their ranking has slightly changed during the period under study. For example, Uttar Pradesh (ΔRDI = 0.096) has outperformed Bihar (ΔRDI = 0.050) in RDI ranking. Conversely, Haryana (ΔRDI = 0.188) has improved its status: moved up from the category of medium developed states to high developed states. It implies that differences in initial conditions related to state's physical and human infrastructure matter to subsequent progress in rural development. The policy implication of this finding is that laggard states require more focused attention.

From our foregoing analysis, it is clear that there exist large interstate disparities in the level of rural development in the country. In order to know the direction of change in level of interstate disparities in rural development (convergence or divergence) during the last decade, we estimate the CV of the values of RDI. We find that states of India have shown a sign of convergence: the value of the CV

for RDI has slightly declined from 38.37 per cent in 2001 to 37.65 per cent in 2011. This result is in line with the finding of Mukherjee and Kuroda (2002). The existence of higher interstate variation in rural development highlights the need for tracking the forces which govern growth dynamics across the Indian states. In sum, one-size-fits-all policies are inappropriate and the effective solution will be multidimensional.

Rural Transformation Level

Table 5 gives the extent of rural transformation in India measured in terms of RTI (Equation 4), descending order of different states based on RTI, CV, and a characterisation of different grades of transformation of major Indian states and for national average over the period 2001–2011. It is evident from Table 5 that the rural India has undergone a clear transformation with a value of the RTI at 0.323 for the last decade, an intermediate high grade. As noted above, India has experienced rapid development and profound changes in socio-economic structure

Table 5: Rural Transformation Level for Major Indian States

State	RTI 2001–11	Grade of RTI
Jammu and Kashmir	0.366	High
Karnataka	0.346	High
Jharkhand	0.324	Intermediate high
Uttar Pradesh	0.307	Intermediate high
Himachal Pradesh	0.292	Intermediate high
Bihar	0.291	Intermediate high
Assam	0.290	Intermediate high
Kerala	0.286	Intermediate high
Punjab	0.264	Medium
Haryana	0.254	Medium
Chhattisgarh	0.249	Medium
Madhya Pradesh	0.239	Medium
Rajasthan	0.187	Intermediate low
West Bengal	0.168	Intermediate low
Tamil Nadu	0.160	Intermediate low
Andhra Pradesh	0.089	Low
Gujarat	0.013	Low
Odisha	−0.006	Low
Maharashtra	−0.177	Low
All-India	0.323	Intermediate high
Coefficient of variation	66.80%	–

Source: Author's calculation.

which exerted a huge influence on India's rural transformation. In this context, the very significant improvements are observed in the rural female literacy rate, adoption of high value crops, cropping intensity and urbanisation level, whereas employment structure has to improve.

A brief perusal of Column 2 of Table 5 reveals that the value of RTI varies from 0.366 for Jammu and Kashmir to –0.177 for Maharashtra. The interstate disparity in RTI is much higher with the value of the CV at 66.80 per cent. In terms of rural transformation the state of Jammu and Kashmir turns out to be the best performer during the last decade. Much of this transformation can be attributed to improvement in employment structure and female literacy in rural areas in the state. In addition, many small- and medium-scale industries have come up both in the traditional and new areas in the state which generated employment opportunities in non-farm sectors. The second, third, fourth and fifth performers are Karnataka (RTI = 0.346), Jharkhand (RTI = 0.324), Uttar Pradesh (RTI = 0.307) and Himachal Pradesh (RTI = 0.292), respectively. In case of Karnataka we note it is one of three states (other two are Uttar Pradesh and Assam) which have seen a positive transformation in all seven indicators considered in the study.

In respect of Jharkhand, it is observed that the rate of rural female literacy has improved considerably: increased from 30 per cent in 2001 to 49 per cent in 2011, a 63.6 per cent increase. But it is still second lowest level among Indian states; there is much scope for further improvement in literacy level. The worst performer in rural transformation was Maharashtra. It experienced a negative transformation in industrial structure, employment structure, consumption structure and adoption of high-value crops between 2001 and 2011. The other poor performers were Odisha (RTI = –0.006), Gujarat (RTI = 0.013) and Andhra Pradesh (RTI = 0.089). In case of Odisha, negative changes were occurred in cropping intensity and adoption of high-value crops.

Let us now disaggregate the RTI. The variable-wise the worst performers are Himachal Pradesh (urbanisation change rate), Andhra Pradesh (rural female literacy change rate), Gujarat (industrial structure change rate), Gujarat (employment structure change rate), Maharashtra (consumption structure change rate), Odisha (high-value crops change rate) and Odisha (cropping intensity change rate), whereas best performers are Kerala, Bihar, Karnataka, Jammu and Kashmir, Jharkhand, Madhya Pradesh and Madhya Pradesh, respectively.

In order to know whether the RTI is associated with ΔRDI, we estimated the correlation between these indices. It is noticed that RTI and ΔRDI are positively correlated with the value of Pearson's bivariate correlation coefficient at 0.19. It implies that rural development provides a motivation for transformation. Need of the hour is to ensuring economic activities at village level.

Urban–rural Coordination Development

It is widely known that the quality of life in rural areas is poor in comparison of urban areas, it becomes imperative to examine the extent of urban–rural coordination occurred during the last decade. Table 6 shows the dynamics of urban–rural coordination in India in terms of URCI (Equation 5), descending

Table 6: Urban–rural Coordination Level for Major Indian States

State	URCI 2001	Grade of Coordination 2001	URCI 2011	Grade of Coordination 2011	ΔURCI	Grade of ΔURCI
Punjab	0.899	High	0.963	High	0.064	High
Kerala	0.852	High	0.914	High	0.062	High
Himachal Pradesh	0.903	High	0.858	High	−0.045	Low
Jammu and Kashmir	0.869	High	0.815	Intermediate high	−0.053	Low
Rajasthan	0.803	Intermediate high	0.770	Intermediate high	−0.033	Intermediate low
Bihar	0.703	Medium	0.741	Medium	0.038	High
Assam	0.758	Medium	0.718	Medium	−0.040	Low
Tamil Nadu	0.718	Intermediate low	0.711	Intermediate low	−0.007	Medium
Andhra Pradesh	0.730	Intermediate low	0.696	Intermediate low	−0.034	Low
Gujarat	0.721	Intermediate low	0.689	Intermediate low	−0.032	Intermediate low
Haryana	0.783	Intermediate high	0.689	Intermediate low	−0.093	Low
Uttar Pradesh	0.695	Intermediate low	0.676	Intermediate low	−0.019	Intermediate low
Madhya Pradesh	0.652	Low	0.640	Low	−0.012	Medium
West Bengal	0.667	Low	0.634	Low	−0.033	Intermediate low
Karnataka	0.678	Intermediate low	0.628	Low	−0.050	Low
Chhattisgarh	0.621	Low	0.627	Low	0.006	Medium
Maharashtra	0.646	Low	0.627	Low	−0.019	Intermediate low
Odisha	0.586	Low	0.620	Low	0.034	High
Jharkhand	0.584	Low	0.599	Low	0.016	Intermediate high
All-India	0.657	Low	0.644	Low	−0.012	Medium
Coefficient of variation	13.62%	–	14.56%	–	–	–

Source: Author's calculation.

order of different states based on URCI in 2011, analytical grades of URCI, ΔURCI and CV for major states and for the whole country during 2001 and 2011. It can be seen from Column 5 of Table 6 that there is considerable variation in URCI across states of India. For example, the state of Punjab (URCI = 0.963) turns out to be the best performer in 2011: disparities in consumption structure and level are least in comparison to other states of India and exhibit a declining trend. However, urban–rural gap in female literacy is still considerable and need to be narrowed down. The second, third, fourth and fifth highest urban rural coordination levels are observed in Kerala (URCI = 0.914), Himachal Pradesh (URCI = 0.858), Jammu and Kashmir (URCI = 0.815) and Rajasthan (URCI = 0.770), respectively.

In terms of urban–rural coordination, the worst performer is Jharkhand (URCI = 0.644). The highest urban–rural disparities in this state are in labour productivity and female literacy. The other poor performers are Odisha, Maharashtra, Chhattisgarh, Karnataka, West Bengal and Madhya Pradesh, respectively. It is also evident from the results presented in Table 6 that India's urban–rural coordination development has slightly declined during the period under study—the value of URCI has fallen from 0.657 in 2001 to 0.644 in 2011. This result complements the finding of Tiwari et al. (2013) that financial development, economic growth and consumer prices aggravate urban–rural income inequality in India. It may partially be traced in widening labour productivity differential between the agriculture and non-agricultural sectors.[5]

Besides, labour absorption in the urban economy and especially in the manufacturing sector, has been low; formal sector jobs are few and declining as a share of employment; and labour contracts are increasingly informal (Binswanger Mkhize, 2013). At the same time, urban–rural per capita consumption differentials have not widened, whereas the urban–rural differentials in consumption structure and female literacy have narrowed.

A glance at Column 6 of Table 6 reveals that changes in URCI diverse across the states of India: range from 0.064 in Punjab to –0.093 in Haryana. Accordingly, the ranking of the sates has varied significantly during the period under study. For example, the state of Himachal Pradesh (ΔURCI = –0.045) which ranked first in respect of URCI in 2001 has slipped back to third position in 2011. It has seen a decline in the rural development level as well. In respect of Haryana, widening urban–rural differentials are seen in consumption level and labour productivity while rural the female literacy rate has been improved significantly and faster than that of urban areas. The estimates of the CV reported at the bottom of Table 6 indicate that interstate variation in urban–rural coordination has slightly increased, variation enlarged from 13.62 per cent in 2001 to 14.56 per cent in 2011. In addition, we observe that interstate disparity in URCI is much below RDI and RTI.

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[5] In sharp contrast, the wages gap in urban and rural areas has been significantly converged during the same period.

It is to be noted that Bihar, a state with initial low RDI, falls in the category of medium level of URCI. It has seen high grade development in the urban–rural coordination (ΔURCI = 0.038), the intermediate high level of rural transformation as well as medium grade improvement in rural development (ΔRDI = 0.050) during the period under study. Furthermore, it is evident from the results presented in Tables 4 and 6 that the states having high rural development level, Punjab Kerala and Himachal Pradesh, have enjoyed the status of higher urban–rural coordination as well. Contrary, the least developed states, Odisha and Jharkhand, are the worst performers in the context of urban–rural disparities as well. However, their level of urban–rural coordination has slightly improved during the period under reference. On the basis of the above, it can fairly be deduced that rural development is positively associated with urban–rural coordination. We also note that the pattern of rural transformation experienced by India is consistent with that witnessed in another Asian giant, China, during the same period (for detail, see, e.g., Long et al., 2011).

Concluding Remarks

In the study, the pattern and extent of rural transformation are measured and analysed at the state level and for the country at large over the period 2001 to 2011. The indicator systems corresponding to different aspects of societal changes were established to enable a comprehensive assessment. These tools of analysis comprised (a) RDI, (b) RTI and (c) URCI. A few concluding observations about the rural transformation occurred in India are in order. The analysis shows that rural India has experienced a significant transformation during the decade of impressive economic growth. In addition, the rural transformation observed in India has been accompanied by an improvement in the rural development level. Specifically, the rural India has taken great strides in rising consumption level, cropping intensity, adoption of high-value crops, per capita agricultural output and educational attainment. However, improvement in rural transformation has not been kept pace with rapid industrialisation and urbanisation.

The narrowing the prosperity gap between urban and rural areas and achieving urban-rural coordination development have been central concerns of India's central and state governments during the last decade. In this context, we find that, in general, India's urban–rural dived has widened slightly between 2001 and 2011. The states (e.g., Haryana, Andhra Pradesh, Uttar Pradesh, Madhya Pradesh, Gujarat, Rajasthan, Assam, Tamil Nadu, Karnataka) that experienced a reduction in urban–rural coordination level were mainly concentrated in areas with rapid economic development but without a good balance between urban and rural areas.

This finding provides justification for rural areas first growth strategy. More steps like employment, economic empowerment, strengthening of drinking water, education and electricity are required to upgrade villages like cities.

At the disaggregated level, polices targeting rural populations appear to have achieved some successes in reducing infant mortality and female literacy urban–rural differentials. At the same time, the inter-sectoral differences in labour productivity between agriculture and non-agriculture sectors have widened significantly. It means that there is a strong need for industrialisation of agricultural labour. The Government of India skill development programmes should focus on rural areas. The rural India called for employment-oriented education and establishment of community colleges for facilitating rural transformation.

In addition, large interstate disparities in rural transformation are observed. The analysis indicates that states of the southern region are generally better developed in comparison of the eastern states. There is a strong economic case for granting discretionary packages to backward regions.

Compared to international experience, we note that the level of rural transformation witnessed by India during the last decade is below that of another Asian giant, China, mainly on account of an almost stagnant share of manufacturing and service sectors in the employment. Absorption of labour in the urban economy has been slow, and urban–rural migration has been far less than could have been expected in a rapidly growing economy (Binswanger-Mkhize, 2013).

Rural transformation experienced by India is mainly characterised by accelerated rural social development and an improvement in infrastructural services which have greatly changed quality of life in rural areas. In sum, it may be concluded that India's sharp economic growth has brought considerable improvement in rural transformation as well as rural development. However, the rural India is still lagged behind urban areas. The policy implication is that there is much scope for further focus on rural areas to bridge the urban–rural gap. More powerful measures such as strengthening rural sanitation services, irrigation intensity and technological support from industry and urban areas to agriculture and rural areas, are needed to reverse the trend of urban–rural divide.

More importantly, there is a need for continuous focus on promoting sustainable high-value agriculture, non-farm activities and community-led participatory processes. Nonetheless, better results from rural development programmes can be ensured by fixing accountability of those who responsible for actual implementation. Some of the issues on which focused in-depth investigation might be pursued include cultural changes, change in mindset of rural people, village leadership, and local dispute settlement mechanisms and processes. As noted by Bakshi, Chawla and Shah (2015) the geographical concentration of tribal population is significantly different from each other, so its proportion could not be considered as a structural variable in our assessing indicator systems. Based on our findings, we argue that policies aimed at region specify rural transformation types may be an effective way to bridge the gap between urban and rural areas of the country. The implementation of 'Rurban Mission' on the basis of villages cluster is an appreciable recent step in this direction. The study provides justification for the further region specific case studies to monitor and evaluate the effectiveness of rural transformation programmes.

Acknowledgements

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