A grounded theory approach for the assessment of urban development policies in Indian cities

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Urbanization in India has led to the development of new urban centres and an increase in the number of million-plus cities. The planning principles keep on evolving with time. In India, these principles are implemented through development plans. This study examines the extent to which Indian urban planning policies address contemporary urban planning principles in the perspective of rapidly evolving global urban policies. Development plans of 13 million-plus state capital cities across India have been analysed following grounded theory. The study reveals that Indian cities are not completely embracing global contemporary urban planning principles in their development plans, and the provision of these principles also differs among cities. The study proposes suggestive planning measures which might be incorporated in the urban planning process to address the challenges arising out of complexities of urbanization. The study explores how development plans endorse and implement particular urban development strategies and more generally, contributes to enforcement of contemporary urban planning principles. The goal of the study is to establish a link between contemporary urban development principles articulated through the development plans.

Keywords: Development plans, grounded theory, million-plus cities, urban planning principles.

Urban planning researchers globally deal with the issues pertaining to congestion, haphazard development, overcrowded spaces, encroached walkways, limited transport options, avoidance of public facilities, biased housing promotion, lack of awareness regarding new technologies, inadequate infrastructure, exploitation of natural resources, degradation of heritage, etc. These issues might be addressed to a large extent by enforcing contemporary urban planning principles through statutory provisions. Modern town planning initiatives like comprehensive mobility plan, land transport integration, transit-oriented development, urban renewal, transferable development rights, public–private partnership, inclusive development, compact city, smart city, sustainable planning, medi-city, heritage city, sports city, green city, industrial city and liveable city have been introduced in many cities worldwide. These cities have adopted contemporary principles of urban planning to regulate urban issues and mandating their urban plans to integrate alternate liberal policies.

Urban research discusses planning issues and proposes innovative solutions. These studies highlight the necessity to formulate appropriate planning policies to effectively regulate the urban planning issues. Current Indian practices and policies of urban development are incompetent to handle the situation efficiently. The sheer magnitude of urbanization calls for devising innovative urban planning systems with solutions for the new era. The national economic growth has a direct bearing on the efficient and productive guidance of the urbanization process, with emphasis on housing and basic infrastructure development which need to be addressed in priority. The urban development process needs to be efficient as well as ensure equity of urban development benefits for improving liveability.

Research responds to the need for working on such urban issues by evaluating development plans (DPs) and identifying the challenges which India is experiencing in addressing sustainable–smart growth. The key question is whether or not urban development plans in India promote contemporary urban principles through their policies.

Urbanization in India

The world’s population is anticipated to grow by 9.6 billion by 2050, while the urban population is projected to grow by 2.5 billion, showing concentration of growth in urban centres. According to the Census of India 2011, the population of the country was 1.21 billion, of which 31.1% lived in urban areas. The urban population has increased from 290 to 377 million, while the number of cities and towns has increased from 5161 to 7935 in 2011 compared to 2001. The number of million-plus cities has increased from 35 in 2001 to 53 and 3 megacities in 2011. These million-plus cities (53) together hold 42.63% of the total urban population. It has also been projected that the urban population will exceed 600 million, distributed unevenly in 87 metropolitan centres within the next
two decades. India’s urban population is expected to reach about 810 million by 2050 (ref. 7) and the number of metropolitan cities would be more than 100 (ref. 5). The statistics confirms India’s rapid urbanization.

The urbanization issues have been ranging from the local to global level. High population growth, rural–urban migration, reclassification of urban centres and expansion of cities have been identified as the root causes for urbanization. The challenges of rapid urbanization necessitate provision of infrastructure and urban facilities. There are serious concerns regarding the negative impacts of urbanization on the environment, transportation, public health and deficiency in urban infrastructure. Failure to address these issues will lead to urban decay rather than planned development. The problems due to urbanization cannot be addressed with conventional approaches and need to be revisited in view of emerging planning principles. Therefore, inclusion of new principles in urban policy is a necessary precondition for undertaking planning.

A close review of urban growth pattern of Indian cities indicates the prominence of urbanization in million-plus cities. These cities have shown a population growth of over 48% and five cities have attained more than 0.5 million population. These cities are facing urban issues and demand a paradigm shift in urban development strategies that would combat negative effects and bring in prosperity. In this study we propose a comparative city ranking framework incorporating urban policies drafted in the respective DP of Indian cities.

Urban planning challenges in India

Urban planning is an envisioning process which provides alternatives for sustainable–smart development. These alternatives are an outcome of strategies adopted after due consideration of the demographic, environmental, socio-economic, administrative and financial aspects. The planned development of towns and cities has witnessed a sea change since independence. During 1950s, the focus was on rehabilitation of refugees. In the sixties, a new era began for agricultural and industrial infrastructure, and many public sector townships were established. With the green revolution in the seventies, efforts were made to develop trading towns and infrastructure was augmented in small and medium towns. The eighties saw a spurt in employment opportunities, thereby leading to unprecedented migration to large cities. The nineties were marked with the initiation of reforms in the form of liberalization and globalization, which is still being continued, backed by the information and communication technology (ICT) revolution. New urban challenges insist on a more proactive planning approach which could justify the contemporary themes of urban planning and development. It is evident that despite several initiatives by the government towards the contemporary concept of urban development, the results are not according to expectations.

The present urban planning and development approach is far from its goal “to improve the welfare of the society by creating more convenient, equitable, healthy, efficient, sustainable and attractive places for the present and future generations”. Urban development in India is pursued through comprehensive planning and its statutory form is a DP. The policies of urban planning in India are aligned with global institutions. This has brought a change in the role and reach of the government at different levels. Based on the first few decades of urban planning in India, it was pointed out that the DPs are too high in standards and had no flexible regulations for acceptance of new changes. Urban planning needs to integrate with the modern global concept of social, economic and environment development and adoption of sustainable–smart strategies.

In order to address land scarcity and response to the impact of socio-economic and environmental changes, alternative approaches of urban planning are the need of the hour. Keeping the city compact by mixed land use to an optimum level, decreasing trip generation and high population density making mass rapid transit systems technically and economically viable is the solution. Urban planners should encourage best-designed pedestrian safety, protection of natural features and environmentally sensitive areas. Cities worldwide are attempting to transform themselves into sustainable–smart cities. The emerging aspects like inclusion, sustainable habitat, land use and transport integration, service-level benchmarks, disaster management and governance reforms have given a new dimension to the planning process. Modern urban development strategies mainly focus on mixed land use, taking advantage of compact and transit-oriented development, creating walkable neighbourhoods, alternate transport options, developing a strong sense of place, attractive community facilities, inclusive affordable housing, adequate infrastructure, inner-city redevelopment, urban renewal, preserving open spaces and environmental areas and protection of natural and built development. Hence contemporary urban planning principles are intended to encourage more compact development, greater transit use and enhanced environmental protection.

Contemporary urban planning principles

There is a significant change in urban development principles of different eras. The literature classifies the urban development trend has been discussed differently with reference to development in centuries, world wars and institutionalization of planning process. Figure 1 depicts the idea of urban planning and its development with their
progress and advancement. A combined review of urban researches, schemes and programmes and growth of cities helps to understand the change in development principles. Figure 1 also presents the classification of development trends in various eras, which is helpful in identifying the contemporary urban development principles.

The literature review reveals a significant change in urban development principles. The principles are directed with global economic development, environmental change and social response. Township during the 18th century was perfectly perpendicular roads and square farms. The urban density was very low and each family was living on an acre of its own. The grid iron pattern was also followed in the 19th century ignoring the city’s irregularly shaped coastline and topography. ‘Garden cities of tomorrow’ was the important milestone in the early 20th century. It designed an alternative to the overcrowded and polluted industrial cities. ‘Towers in the park’ was the outcome of building towards the sky concept, surrounded by green space which is a delineation between different uses. Mile-High Tower is a planned skyscraper which is the world’s first tallest building and centre piece.

Before industrial revolution the population was evenly distributed in the suburban areas and countryside. Development of regular cities took place irrespective of landforms. Urban pollution and overcrowding problems were fixed by working on horizontal expansion of settlement. Later, the same problem was addressed by developing high-rise building. Thus the urban development trend charged from layout and footprint of neighbourhoods at the street level to the volume of building towards the sky. This brought a paradigm shift from classical, low-density towns to compact, high-density mixed-use buildings along transit corridors. The future city aims to delve into details of various models and determine the best model depending on the strategic criteria. The challenges after the Industrial Revolution and world wars were of developing new cities which largely follow classical principles. In the present context, the development principles focus on accommodating the global community leading towards sustainable–smart growth. The list of contemporary urban principle categories for sustainable–smart growth could be prepared with respect to their physical, social, environmental and regulatory behaviours which were clearly different from the conventional development principles. A total of nine contemporary urban development principles and their indicators were identified (Table 1). It follows the initial stage of grounded theory analysis that pertains to the formation of categories and their properties. The coded indicators are categorized into sustainable–smart urban principles which are delineated in terms of their similarity and differences.

The Urban and Regional Development Plans Formulation and Implementation (URDIFI) Guidelines, 2015 have been formulated keeping in view the emerging scenario in planned development of cities and towns. Based on the recommended provisions and scope of URDIFI-2015, indicators for each principle were marked for the assessment of urban principles of Indian cities.

The 74th Constitutional Amendment stipulated that states should endow municipalities with obligatory powers to prepare DP focus on land-use planning and incorporate economic development, environmental protection and social justice. A DP is a statutory tool to guide and channelize the growth and development of an urban area. It provides a spatial framework for the planned...
RESEARCH ARTICLES

Table 1. List of identified urban development principles and their indicators

<table>
<thead>
<tr>
<th>$P\text{-code}$</th>
<th>Principle categories ($P$)</th>
<th>$i\text{-code}$</th>
<th>Indicators (i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Mixed land use</td>
<td>P1i1</td>
<td>Mixed land use within a neighbourhood zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P1i2</td>
<td>Diversity of a project’s land uses</td>
</tr>
<tr>
<td>P2</td>
<td>Compact development</td>
<td>P2i1</td>
<td>Flexible density within the neighbourhood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2i2</td>
<td>Purchasable FAR/FSI or TOD provision</td>
</tr>
<tr>
<td>P3</td>
<td>Walkable access</td>
<td>P3i1</td>
<td>Pedestrian facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P3i2</td>
<td>Internal paths and bikeways linking different activities</td>
</tr>
<tr>
<td>P4</td>
<td>Transport options</td>
<td>P4i1</td>
<td>Integrated street patterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P4i2</td>
<td>Alternative parking design promotion</td>
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<tr>
<td></td>
<td></td>
<td>P4i3</td>
<td>Classification and design consideration of urban roads</td>
</tr>
<tr>
<td>P5</td>
<td>Community facilities</td>
<td>P5i1</td>
<td>Diverse gathering places or common spaces in different land uses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P5i2</td>
<td>Common public or open spaces connecting neighbourhood</td>
</tr>
<tr>
<td>P6</td>
<td>Housing and inclusiveness</td>
<td>P6i1</td>
<td>Planning for affordable housing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P6i2</td>
<td>People’s participation in planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P6i3</td>
<td>Equitable space distribution</td>
</tr>
<tr>
<td>P7</td>
<td>Adequate infrastructure</td>
<td>P7i1</td>
<td>Comparison against benchmarks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P7i2</td>
<td>Promoting new technology for infrastructure management</td>
</tr>
<tr>
<td>P8</td>
<td>Urban renewal</td>
<td>P8i1</td>
<td>Redevelopment regulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P8i2</td>
<td>TDR techniques of land development</td>
</tr>
<tr>
<td>P9</td>
<td>Natural and built environment</td>
<td>P9i1</td>
<td>Green or regulated buffers in environmentally sensitive areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P9i2</td>
<td>Avoiding development on wetlands, streams, shorelines and buffer areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P9i3</td>
<td>Protecting and conserving community character in architecture and historical features</td>
</tr>
</tbody>
</table>

devolution of activities which are to come up in future. The objective of a DP prepared by following URDPFI-2015 is to provide necessary details and intended actions in the form of strategies and physical proposals for various policies depending upon the economic and social needs and aspirations of the people, available resources and priorities.

This study complements the urban development goal by assessing the extent to which urban planning policies within the development plans can ensure successful implementation of contemporary urban principles. After coding and categorization of the principles according to the grounded theory approach (Table 1), development of the theme, testing and explanation of inter-relationships were followed to delineate the theory. The study reinforced a theme that ‘sustainable–smart urban development can be promoted through cumulative impact of urban planning principles’. Furthermore, principles are tested by formulating the similar principle index (SPI) for sample cities. SPI ranks the cities based on performance of the adopted principles. The results of SPI explain the inter-relationship of the principles. The present study addresses whether or not DP policies target contemporary principles of sustainable smart–urban growth.

Sample frame

The research sample comprises all the million-plus state capital cities/urban agglomerations of India according to the 2011 census. The census defines million-plus cities in terms of population, central built-up and suburb areas, local government and share of agricultural male employees.

The million-plus cities are facing rapid urbanization and need sustainable–smart growth on priority. These cities are the primary population carriers and economic centres. These are well-organized administrative jurisdictions with diverse state urban development regulations and thereby tend to be appropriate for policy analysis. There are 13 million-plus state capital cities in India according to the latest census. The research sample frame consists of DPs of these 13 million-plus state capital cities. DP is a statutory document which consists of ordinances for zoning, guiding regulations for future growth and development, policy statements to regulate functions and activities relating to land use, transport network and resources. The level of detail of each planning policy depends on the planning needs and issues of a city.

Research methodology and results

In this study, we assess the extent of urban planning policies within the DPs using a mixed method. We use content analysis to conduct an in-depth assessment of the policy framework of the sample DP and develop SPI which is theoretically conceptualized as the measure of the extent that DP policies recommend principles for sustainable–smart growth. Finally, the grounded theory approach is used to generate a theory of planning measures, which urban planners may incorporate to address contemporary urban development issues.
Literature background for conceptualizing SPI

The indices used to measure the urban development are cumulation of various aspects of sustainable, green and smart developments, which are evolved with time which have a longer history of development. For the assessment of sustainable–smart development in cities, researchers have conducted a systematic evaluation considering the social, economic, environmental, political and technological subsystems. These subsystems involve special scale and management of other subsystems in urban systems. According to the selected subsystems, the evaluation methods of sustainable–smart development in cities can be chosen.

An urban livability index is used to evaluate sustainable development in cities which target a single indicator, while the widely used Human Development Index is a measure of life expectancy, income, and education subsystems and their indicators. The urban bearing capacity uses the ecological footprint index to evaluate sustainable development. There are 24 indexes of economic development, social progress and ecological environment that can be used, when conducting a comprehensive evaluation of development in cities. To achieve urban sustainability, UN Habitat suggests different indices addressing productivity, infrastructure development, quality of life, equity, inclusion and environmental sustainability for a prosperous city. The city Development Index and the UN-Habitat City Prosperity Index are measures of average well-being and access to urban facilities. Zhou et al. describe the approach of building index system and principles for index screening. They propose a framework of monitoring index system hierarchy and its weighting. The Evaluation Index System of China was published to assess national-level development and guide the local government to develop its own evaluation indices.

The index formation through ‘linear dimensionless’ analysis is used to assess the comprehensive benefits when indicators are incomparable. Indicator values can be converted to index values, which can be added to form comprehensive indexes of evaluated benefits. Researchers have introduced indices based new approaches to prioritize urban projects according to their planning policies in an efficient and reliable manner. The inductive research directly adopts pre-defined indices while the deductive research proposes new or modified indices to measure development aspects for urban, rural and regional growth. While some studies have been done in this area, there is no one-size-fits-all solution for assessing urban development.

The proposed SPI focuses on measuring the various plan components that collectively constitute the extent of modern strategic growth within a city. SPI for each of the sample cities is developed by adapting the indices proposed by Berke and Conroy and Raparthi in their studies on sustainable and smart growth in urban development. The sustainability index helps to evaluate the extent to which comprehensive plans advance the sustainable principles, while the smart growth index measures the extent to which urban planning policies within the DP promote smart growth in a city.

This study is broadly classified into three stages. In the first stage, a grounded theory approach of the planning policies is employed. The data are coded and categorized which consist of a set of contemporary principle indicators. In the second stage, content analysis of DP is done to evaluate for presence of the principle indicators and weighted within the range of 0, 1 and 2. Next, a quantitative mathematical approach is followed to develop SPI. Finally, the grounded theory analysis addresses the urban development policies for Indian cities.

Calculating SPI

The index development involves three major steps. First is assigning weights to the indicators; second is to calculate standard principle (SP) scores and finally to develop SPI. The first step assigns weights to the principles in the policies of DPs based on the presence of indicators. If the indicator of a principle is not present in the DP policies, then the weight will be ‘0’. A weight of ‘1’ is assigned to an indicator which addresses the respective principle, but tends to be suggestive. Words such as ‘encourage, may, prefer, should and suggest’ indicate the suggestive character of the policy. If the indicator of any principle is present and is a mandatory policy of the DP, then that indicator is weighted ‘2’. Mandatory policies usually address keywords such as ‘mandate, must, shall and will’. The ranking orders the cities on the basis of mandatory policies, suggestive policies and lack of policies present in the DP of each city, and the mandatory policy is the most important among them. Since the mandatory policy is more important than the suggestive policy, the weightage to mandatory and suggestive policies is given as ‘2’ and ‘1’ respectively. Similarly suggestive policy is more important than lack or absence of policies; therefore the weight assigned to lack of policies is ‘0’. The numerical values of 2, 1 and 0 indicate the strength of policy enforcement in a city for its development. It has been quantified to assess the combined impact of all the indicators for a principle. Likert scale is considered to quantify the qualitative indicators and the combined impact of indicators is derived through its average values. The fractional score is derived by adding the assigned weight (2, 1 or 0) of each indicator for a principle and the average of scores of all principles for each city gives the SPI value. The cities are ranked based on their respective SPI values.

The evaluation protocol is pretested for the reliability of plan evaluation process. The plans are evaluated by three independently working coders. An inter-coder reliability score is computed, referred to as a percentage...
agreement. It is obtained by dividing the total number of disagreements received in coding by the total number of both agreements and disagreements and multiplying by 100. A percentage agreement reliability score of 84 is achieved for the plans. A score of 80% or higher is generally acceptable.

The second step is to compute the SP score. The sum of indicator’s weight of any principle on dividing by sum of maximum possible total weight of that principle will give its fractional score. Multiplying fractional score of each principle by 10 gives the SP for their respective principle, so that SP score for each principle can be scaled on a range from 0 to 10.

$$SP_j = \frac{10}{2m_j} \sum_{i=1}^{m_j} I_i,$$

where $SP_j$ is the SP score of the $j$th principle, $m_j$ the number of indicators within the $j$th principle and $I_i$ is the weight of the $i$th principle (scale of 0, 1 or 2).

SPI has been developed to extend this range for a comparative ranking of the number of cities (Figure 2). Finally, the SPI value of a city with respect to its DP is achieved by adding the SP scores of all principles and multiplying this sum total by 100 and dividing by the maximum SP score which is 90.

$$SPI_{\text{city}^n} = (SP_1 + SP_2 + SP_3 + \ldots + SP_j) \frac{100}{90},$$

where $SPI_{\text{city}^n}$ is the SPI of the $n$th city, and $SP_1$, $SP_2$, $SP_3$, ..., $SP_j$ are the SP scores of the $j$th principle in the development plan of the $n$th city.

The DPs of 13 cities were evaluated on nine identified contemporary urban development principles; the SPI ranged between 0 and 100. Assuming that the DP achieved a standardized score of 10 for each principle, SPI of such a DP will be 100.

Hence by calculating SPI, we can deduce whether planning policies within the DP have the ability to influence modern urban development practices in the city. This addresses a key question: do DPs of Indian cities promote urban development policies that target sustainable–smart growth based on contemporary principles?

SPI of development plans

The SPI for 13 sample DPs was calculated based on the weighting and scoring method. Table 2 presents the list of 13 sample cities, their fractional score, SP score on a scale of 10, calculated SPI value and city rank. Indexes range from a low of 25.93 to a high of 95.37. Populous cities in India are more focused to adopt modern urban planning practices and promote sustainable–smart policies through their DP. Three sample cities – Lucknow, Patna and Srinagar had low SPI (below 50), and as such failed to promote contemporary principles. SPI value of seven cities ranged from 50 to 75, suggesting that majority of the cities had initiated the new theme of urban development. The remaining three cities – Mumbai, Bengaluru and Chennai had SPI value above 75, practising contemporary principles statutorily supported by their respective DP.

Table 2 shows highlights that million-plus cities lack modern urban principles in their DP. The emerging sustainable–smart growth is a model that is worth emulating, at least for the integration and adoption of fundamental
contemporary principles into planning policies. From this standpoint, it is interesting to analyse SP scores of the principles. Mean SP score suggests which of the nine principles are addressed and mostly promoted in the DP.

Mean SP score of urban planning principles

To ensure an in-depth analysis of the contemporary principles in the DPs of cities, the mean SP score (eq. (1)) of all principles within the sample cities was computed. The mean standardized score of a particular principle was calculated as the average of SP for DP. The range of the mean SP scores for sample cities is significant. High mean SP suggests that the DP of cities has a number of policies which promote and address the contemporary principles.

Mean SP scores ranged from a low of 4.81 for urban renewal principle to a high of 8.46 for policies that foster protection and conservation of natural and built environment. The variation in the mean score across all principles indicates that DPs have policies that promote these principles; however, all the principles are not equally addressed. This variation reflects the type of priority that the planner has framed for each principle and the number of policies that address the contemporary principles.

Among the nine principles, three (transport options, housing and inclusiveness, and natural and built environment) received a high SP score. Protection and conservation of natural and built environment achieved the highest score of 8.46. Alternate transport options for better communication received the second highest score. It is encouraging to see that the coordination of infrastructure and development characterized by walkable access and compact community development offers a variety of transportation choices. The majority of cities adopted the walkability principle, although only nine sample cities included it comprehensively. On the other hand, after urban renewal, compact development and community facilities received lower scores; thus the DPs have limited policies that address these principles. The limited policies that promote compact development and mixed land use further strengthened the finding that city planners are not taking measures to implement modern policies of sustainable–smart growth in India.
Analysis

SPI reveals the rank of the cities. A higher rank indicates incorporating more number of principles. The mean SP score indicates its presence in the cities. The cumulative impact of principles was tested using the results of SPI. Rank of cities can be explained by the performance of principles. The interlinkage of performance of principles for different cities contributes towards theory delineation. Performance levels of principles outline urban development perspectives which substantiate the theory.

Performance of sample cities

- Million-plus cities in India are more focused on contemporary policies through their DPs.
- SPI ranged from 25.93 (Lucknow) to 95.37 (Mumbai) for sample cities.
- Mumbai, Chennai and Bengaluru were the top three cities which have adopted the contemporary principles.
- Lucknow, Patna and Srinagar had SPI value less than 50 and had poorly addressed contemporary principles of urban planning.
- High mean SP scores suggest that the DPs of cities have policies which address the contemporary principles like transport options, and natural and built environment.
- Low mean scores imply that DP policies do not address principles like compact development, community facilities and urban renewal in sample cities.
- DPs have policies that address contemporary principles; however, all principles are not equally addressed.
- All cities adopted the natural and built environment protection principle strongly. Ranchi, Jaipur and Delhi had liberal environmental protection policies in their DPs.
- Urban renewal received the lowest score, suggesting that DPs have limited policies that address this principle.
- Almost half of sample cities did not address the purchaseable floor area ratio (FAR), transit-oriented development (TOD), promotion of new technology and transferable development rights (TDR) techniques.
- City planners have not taken proper measures while dealing with the current schemes by imposing contemporary principles and drafting new urban development policies.
- DPs of Indian cities need to revisit their development policies to make these more liberal for the implementation of urban schemes following contemporary principles.

The following discussion contrasts how and to what extent million-plus capital cities in India have incorporated the urban policies for implementation of contemporary principles for sustainable–smart growth.

(i) Mixed land uses: Increasing density in new development has been well addressed in Indian cities by regulating the height of buildings. Promotion of commercial, residential, recreational and cultural areas in other uses has also been done in the DPs.

(ii) Compact development: This principle is not addressed much. Compact development strategies like transit-oriented development, etc. have not been considered in the DP.

(iii) Walkable access: This principle is strongly embedded in the DP by encouraging walkability, namely pedestrian features and internal paths, etc.

(iv) Transport options: Alternate transport options are provided with a focus on public transit that indirectly promotes a compact city. Mean standardized scores for walkable access and providing transport options have implications of linking transportation and land use.

(v) Community facilities: Regulatory provisions in the DP allow different community facilities in a land use for easy and safe access, which ultimately promotes compact development.

(vi) Housing and inclusiveness: Affordable housing has been recommended in the DP. Special focus has been given to Economic Weaker Section (EWS) and Low Income Group (LIG) housing. Public participation has also been the focus during plan preparation stage. Inclusion of poor sections of society was considered in the DP by reserving land for housing in each residential colony.

(vii) Adequate infrastructure: Provision of adequate infrastructure has been made in the DP policies, but these are not managed by new technology. Standard benchmarks for each basic civil and social service have been marked in some DPs.

(viii) Urban renewal: Taking advantage of public investments and locating the upcoming projects within an existing urban service area are poorly addressed in the DP. Promoting urban development toward the existing urban service area helps in easy and economic access to basic services and overcoming sprawl to some extent.

(ix) Natural and built environment: This has boundless policies, and most of them are recommended. Protection of environmental sensitive-areas is mandatory. Developments in wetlands, streams and catchment areas of water bodies are controlled. Developments around historic and architecturally important buildings are regulated.

The variations in mean scores suggest that compact development, provision of community facilities and urban renewal are not prioritized by most of cities.

Thus, the SP score reveals that although development plans address contemporary principles, there is a lack of sense of balance. Analysis highlights that principles vary
Table 3. Suggestive planning measures for contemporary urban development

<table>
<thead>
<tr>
<th>Principles</th>
<th>Suggestive measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed land use</td>
<td>• Conventional land-use zoning is obsolete and non-functional in Indian cities. Mixed land use should be promoted at settlement and building level</td>
</tr>
<tr>
<td>Compact development</td>
<td>• High density along transit routes should be promoted. Innovative tools like purchasable FAR, TDR, etc. might be adopted</td>
</tr>
<tr>
<td>Walkable access</td>
<td>• Neighbourhood amenities within walkable distance</td>
</tr>
<tr>
<td></td>
<td>• Segregation of pedestrian and motorized traffic</td>
</tr>
<tr>
<td>Transport options</td>
<td>• Multimodal transport system for last-mile connectivity. Adequate transport infrastructure</td>
</tr>
<tr>
<td>Community facilities</td>
<td>• Provision for multifunctional community facilities and public spaces.</td>
</tr>
<tr>
<td></td>
<td>• Improving accessibility</td>
</tr>
<tr>
<td>Housing and inclusiveness</td>
<td>• Promote equitable and affordable housing</td>
</tr>
<tr>
<td></td>
<td>• Encourage public and private participation</td>
</tr>
<tr>
<td>Adequate infrastructure</td>
<td>• Meet the minimum defined standard</td>
</tr>
<tr>
<td></td>
<td>• Application of information and communication technology and high-end technology</td>
</tr>
<tr>
<td>Urban renewal</td>
<td>• Rejuvenation, adaptive reuse and place making of heritage area</td>
</tr>
<tr>
<td></td>
<td>• Encouraging local people using tools like heritage TDR</td>
</tr>
<tr>
<td>Natural and built environment</td>
<td>• Promoting green and blue infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Protection and conservation of natural and built heritage</td>
</tr>
</tbody>
</table>

from one city to another, and planners have to prioritize policies based on the goals of each city. Table 3 summarizes the principles with their suggestive planning measures to successfully implement modern urban projects.

Conclusion

Indian cities and towns need effective urban planning protocols, processes and institutions underpinned by effective policies to manage any transformation. The Government of India introduced new urban development schemes focusing on smart growth, improvizing infrastructure, strengthening urban transport, housing for all, clean India, conserving heritage city and livelihood opportunities. One of the objectives is to ensure that urbanization is effective in a discrete manner through the process of planned development with new solutions.

The grounded theory approach was used in the present study. It is an inductive method which leads to the emergence of conceptual categories, developing themes, testing, inter-relating explanations and delineation of theories at the level of analysis. The coding and categorization help in identifying mutually exclusive indicators of each principle for quantitative analysis. The theme for assessment of urban development principles helps in framing the testing approach and explanation of interpretation. City ranking and SP score explain the inter-relationship among cities and principles. Assessment of urban development policies using grounded theory argues that ‘the theme of sustainable smart urban development can be promoted through cumulative impact of urban planning principles; if there is a change in the themes of urban development the principles need to be changed accordingly’.

This study reports several findings that divulge the status of contemporary principles in the DP. A detailed study of SPI value and mean SP score reveals that much emphasis is being placed on promoting contemporary urban development policies, specifically within the zoning, housing, transportation and heritage conservation components of the DP. Policies of mixed land use, transportation options and fostering distinctive sustainable communities are being promoted. By analysing the DP policy framework, it has been concluded that Indian urban planning policies of populous cities are encouraging contemporary principles in various components of their DPs in a limited manner.

It was found that the conservation of natural and built heritage, and transport options principles had a high mean SP score, while attractive compact communities through urban renewal with a strong sense of place and modern community facilities had a relatively low score. This implies that Indian cities are locating projects within an existing urban limit and promoting distinctive, attractive communities mainly on the outskirts, and are less likely to focus on urban renewal or redevelopment. As such, cities are paying more attention to peripheral urban development as it is comparatively easy to propose new development by expanding the city limits; less interest is shown in renewing and addressing the complexity of existing core areas. This has led to sprawl in the outskirts of the city and the spaces of inner city often remain underutilized. This study highlights that although DPs directly address sustainable–smart policies are comparatively new and the DP had been prepared before the launch of these policies.
In view of urbanization, it is necessary to focus on the compact development and mixed land use with alternate transport options. The mixed land use will lead to self-sufficient neighbourhood with available amenities within walking distance. These neighbourhoods should be connected through transit corridors. The compact development will optimize land utilization and result in efficient service delivery. Use of advanced technology integrated with ICT for infrastructure provision will enhance sustainability. The socio-cultural aspects of society are fulfilled through community facilities for recreational, educational and health amenities in view of the evolving modern society. Urbanization demands for multiple housing options at affordable prices. Dimensions of social, economic and cultural inclusivity should be included in the DPs. Cities function as living organisms; the services, building, etc. decay with time and need to be renewed after subsequent periods. In addition, development in sensitive areas must be strictly controlled to protect natural and built heritage sites and relics, thereby conserving historic landscapes of the cities. There is a need to encourage redevelopment in old city areas, urban renewal and supply of basic services in sensitive areas, thereby protecting socio-economic backward classes and the community environment.

It is evident that policies encouraging these principles promote modern planning initiatives like compact cities, land-transport integration, inclusive development and urban renewal, so that the cities can foster a social and economic development and provide a conducive environment for growth of the society. There is a need to regulate and strengthen policies pertaining to sustainable–smart growth by adopting the contemporary principles in the policies of DPs. In summary, this study highlights that limited action by adopting the contemporary principles in the policies of growth of the society. There is a need to regulate and strengthen policies pertaining to sustainable–smart growth by adopting the contemporary principles in the policies of DPs. In summary, this study highlights that limited action by adopting the contemporary principles in the policies of

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