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ACHIEVING REGIONAL INCLUSIVENESS THROUGH SMART CITIES : CASE OF KARNATAKA

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1. INTRODUCTION

Urban planning was traditionally seen as a means to control and regulate the development of towns and cities. In the cities of the developing world, however, traditional planning approaches have failed to address the challenges of rapid urbanisation and the poverty, exclusion, informality and vulnerability it brings in its wake. - UN-HABITAT, the 'Urban Planning In A State of Flux' Series

1.1 The National Sustainable Habitat and Smart City Mission

The perception of urbanisation and urban development in India has been through transformations since independence. Starting from a necessary evil, to an unavoidable future, to engines of growth, the concept of urbanisation now has evolved as the key ingredient for achieving sustainable growth for India in the face of increasingly complex challenges of climate change, achieving inclusiveness and maintaining economic growth momentum.

The Government of India's initiatives under the National Sustainable Habitat and Smart City Mission (NSHSCM) aspires to start a new paradigm in urban development programmes in India. Nevertheless, from a larger perspective it is the next stage of a marathon of addressing the challenges of urbanisation in India and thus part of a continued effort carried through various programmes since the 80's. Started with Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), the efforts evolved into the first national flagship programme for urbanisation- Jawaharlal Nehru Urban Renewal Mission (JNNURM). At the same time, there were programmes targeted towards the urban poor. "The Mission on Sustainable Habitats", as part of the eight ambitious missions under the National Action Plan on Climate Change was yet another initiative. The new mission on NSHSCM under which a number of cities will be developed as smart cities, is definitely a continuation of the same in a modified form.

1.2 Inclusiveness as an Urban Agenda

Inclusiveness and equity are determined by wide differences in quality of life indicators, factoring in either or a combination of aspects such as location (spatial boundaries, physical conditions), rights (human, legal, natural and scarce resources), freedom (of speech, practices etc.) income (per capita GDP, expenditure), opportunities (employment, knowledge etc), access (to infrastructure, services, facilities and information etc). Since the objective of urbanisation essentially includes achieving these, the spatial manifestation of equity and inclusiveness is a derivative of urban development strategies followed by governments at different levels among many other reasons.

Spatial exclusiveness can exist at three broad levels in terms of the aspects mentioned above (refer Figure-1):

- Intra-City exclusion- when there is large gap in quality of life indicators between dwellers in the same city

- Intra-Region exclusion- When there is substantial gap in quality of life indicators between a city and the peri-urban areas, or the city and the larger rural hinterland, or between two cities in close proximity
- Inter-Region exclusion- when there is large gap between two regions in quality of life indicators between regional averages, or between the cities in each region.

This paper focuses on the third form of exclusiveness, i.e., inter-region exclusiveness in terms of income differences that is evident in India's emerging urban context. Continued negligence of regions not only retards economic growth but may result in a low productive demography and undesirable geo-political tensions. What has emerged from the initiatives mentioned is the importance of governance reforms and building capabilities at state and local body levels.

The spatial aspect of urbanisation and its impact on the region have been ignored in the previous initiatives. Most infrastructure funding policies favour the larger cities, due to the urgent nature of the problems, and also due to their ability to generate funds. One of the key gaps identified in the regional level planning process across developing countries is the absence of a participatory process in regional level planning and thus lacking inclusiveness in a decision making process.

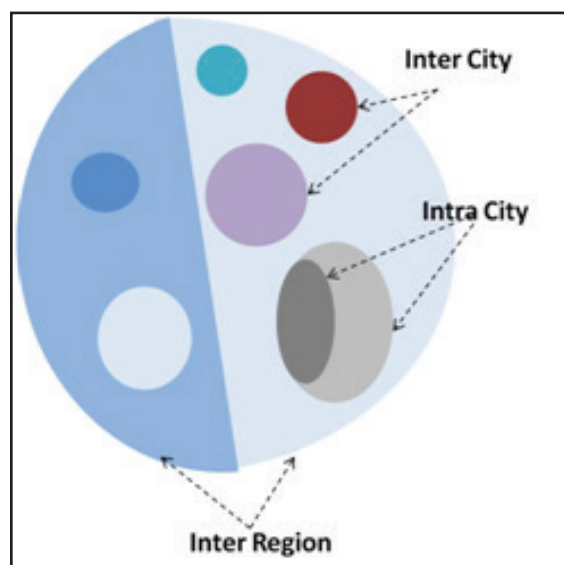
This paper argues that if cities are engines of growth, then they should be spatially distributed to achieve spatially inclusive growth. The smart city building efforts under NSHSCM can be seen as an opportunity for the states to re-think their urbanisation strategy and decision making process in an inclusive manner. The following sections discuss the regional disparity issues vis-a-vis urbanisation in the context of Karnataka and further suggest specific areas of intervention to bring in regional inclusiveness through the NSHSCM showing Karnataka as a case.

2. URBANISATION AND REGIONAL DEVELOPMENT IN KARNATAKA

2.1 Spatial pattern of urbanisation in Karnataka

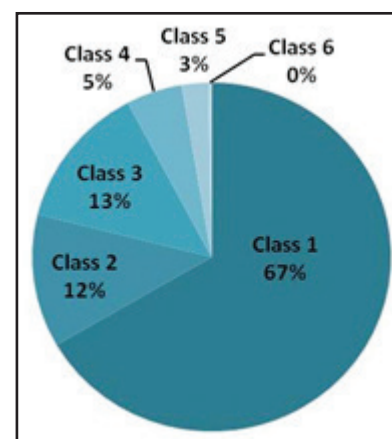
Karnataka is the fourth most urbanised state in India and has maintained its position as a leading urbanised state since the last few decades. Having an urbanisation level at 39%, the state is host to 328 statutory towns as per 2011 census (refer Figure-2 for urban population share in different size classes on towns). The growth rate of urban population during the last decade was 31% compared to rural population growth rate of about 8%. Among 30 districts, Bangalore urban district is the most urbanised, accounting for 40% of the total urban population in Karnataka. Dharwar and Dakshin Kannada come next, accounting for 5% each. There are gaps and

Fig. 1: Types of spatial exclusiveness



Source: STEP

Fig. 2: Urban population share by different size classes of towns in Karnataka, 2011 Census



Source: CSTEP

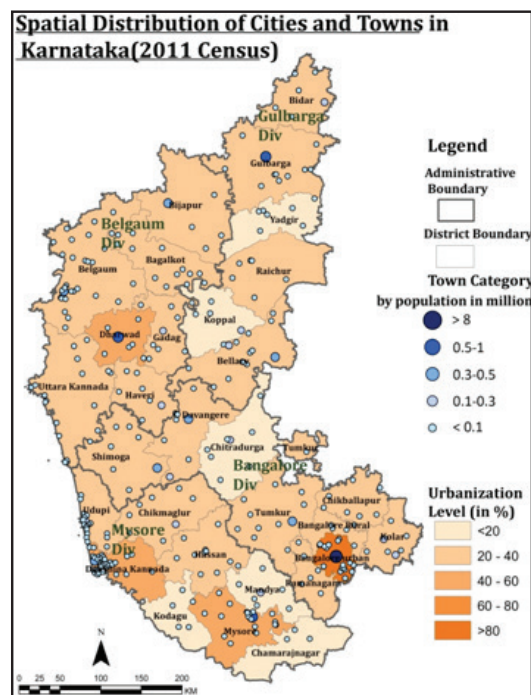
overlaps in the hierarchic structure of Karnataka's cities and towns. There is only one million plus city (Bangalore). The second order cities are between 0.5 to 1 million which are functionally ill-equipped to serve the entire state (though they are spatially well located in north, south and central Karnataka). Similar is the state of the third order cities, which are between 0.3-0.5 million. The number and facilities are not sufficient to encourage a balanced growth in Karnataka indicating a need for re-ordering the second and third order cities. According to Zipf's law analysis, the evolving primacy index for Bangalore is very high in the State of Karnataka indicating the increasing urban hierarchy. Spatially, the urbanisation levels of southern districts of Karnataka are in general higher than that of north. The Bangalore and Mysore division accounts for 68% of the total urban population. In terms of distribution of cities, the northern most part show lesser concentration of town compared to rest of the state (refer Figure-3).

2.2 Disparity in regional development

Various studies have identified large regional disparity in Karnataka. The most widely accepted among them is the Dr. Nanjundappa Committee report which identified backwardness and inequality among Karnataka districts. This report clearly identifies many districts of North Karnataka as backward compared to south Karnataka districts in terms of economic growth as well as other development indices including the Human Development Index (HDI). The findings of the report and subsequent discussions have prompted the state government to re-think over the spatial development focus. However, in the absence of a well thought out spatial-urbanisation strategy, there seem to be a lack of convergence between the development strategies adopted by various sector agencies vis-a-vis natural ecological constraints.

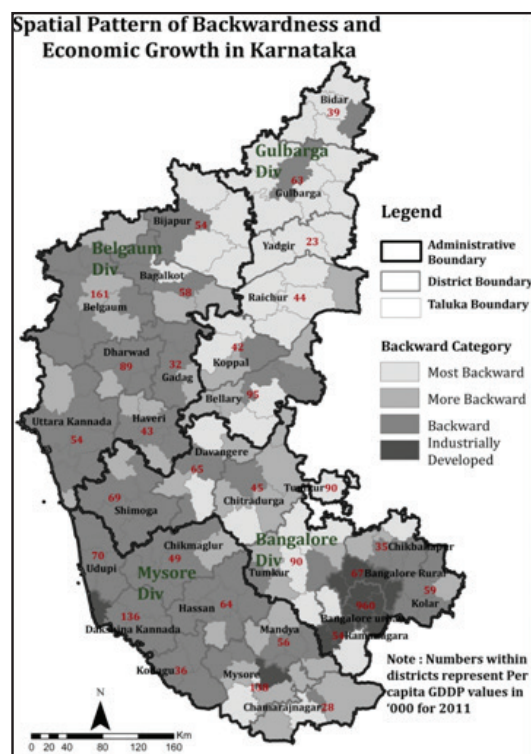
A comparison of Gross District Domestic Product (GDDP) and urbanisation levels in the districts over the past two decades (2001 and 2011) show that districts with a higher rate of growth of urban population showed a higher percentage increase in per capita GDDP. In general, highly urbanised districts expectedly show higher per capita GDDP. The variations in GDDP of Karnataka districts range between Rs 21 thousand (Yadgir) to Rs 129 thousand (Bangalore Urban). The two administrative divisions in the south Karnataka region (Bangalore and

Fig. 3: Urban population share by different size classes of towns in Karnataka



Source: CSTEP

Fig. 4: Backwardness and economic inequality vis a vis urbanisation levels in Karnataka districts



Source: CSTEP

Mysore) have a much higher per capita GDDP than the two north Karnataka divisions (Belgaum and Gulbarga). Interestingly though, Mysore division show per capita GDDP of about Rs. 45000 in 2011 which is much higher than that of Belgaum division (Rs.33000), whereas the urbanisation level of the two divisions are almost same (refer Figure-4). This could be partially described due to presence of an attractive city like Mysore, but more so due to the divisions spatial proximity to the primate city Bangalore and historically higher focus on south Karnataka region in terms of investment decisions.

3. ARE SMART CITIES AN INCLUSIVE CONCEPT?

3.1 International perspective

The smart city concept originated from the discussions on intelligent cities and smart growth. Later, technical institutes and technology companies started incubating the smart city concept. The 'Smarter Cities' trademark was officially registered to IBM in 2011. However, there is no standard definition and concept of smart cities. There are different views coming from different quarters. The research and academic view on smart cities clearly puts sustainability, primarily, environmental sustainability as the primary agenda to be achieved, where quality of life and economy come as major aspects of a sustainable and smart city. The corporate sector's definition of a smart city is overwhelmingly Information and Communication Technology (ICT) based, with limited recognition of city efficiency, management, infrastructure, environment, and quality of life. Notably, there is a very nominal emphasis on overall functionality, resilience and importance on city form and design. Though limited definitions come from the Government sector on smart cities, it is oriented towards ICT, governance, people and environment as major aspects. Quality of life, economy and city management are also highlighted and equity aspect does not get priority at all.

One common idea emerging from various definitions of a smart city is that it is a city which is sustainable, liveable, and competitive by deploying efficient ways to manage urban challenges. However, there is apparently an overlap in understanding the end (smart city) and the means to reach an end (ICT). It is of critical importance to be cognizant of the extent and fashion in which a city can use technology in a particular socio-economic context at a given point of time. The threat of increased inequality among citizens or 'digital divide' may creep in, fuelled by access and capacity to use technology.

The International Standards Organisation (ISO) has developed a set of indicators as benchmarks for a sustainable city. Interestingly, the indicators used across various branding of cities are not very different from sustainable city building concepts such as Green City, Eco-City, Inclusive-City.

3.2 Smart Cities in India

There were no concerted public sector effort in building smart cities in India before; neither there is any regulatory standard/market mechanism available in India for certifying a city as smart. However, there have been ongoing projects such as GIFT City in Ahmedabad, Mahindra World City in Jaipur etc which come with the smart city notion, primarily based on the advanced technological aspects. However, it is to be noted that most of them are large real estate developments creating gated communities. Thus even if efficient, they are not cities by the very term without a local elected government and/or (with few exceptions like Lavasa, Maharashtra) lacking the functionality of a city system with a strong economic anchor.

The National Conclave on Building Smart Cities held in New Delhi has coined three key words for smart city as: 1) Competitive (attracts investors and residents) 2) Sustainable (social, financial and environmental) and 3) Capital Rich (human and social). The states have been directed to select

their own pilot cities. However, considering cities as engines of growth, there is very less guidance on the actual process part of the programme, especially on the following aspects:

- What are the factors to be considered while selecting pilot cities to enhance probability of success?
- How would city level benchmarks help achieve smart city objectives in city/ state/national development, and thus the relative priority/urgency for each sector?
- How a city would go about achieving those benchmarks over a period of time?
- How to treat cities as spaces and address all aspects/sectors of urban development working on a city such as economic development which cannot be adequately addressed through municipal service delivery?

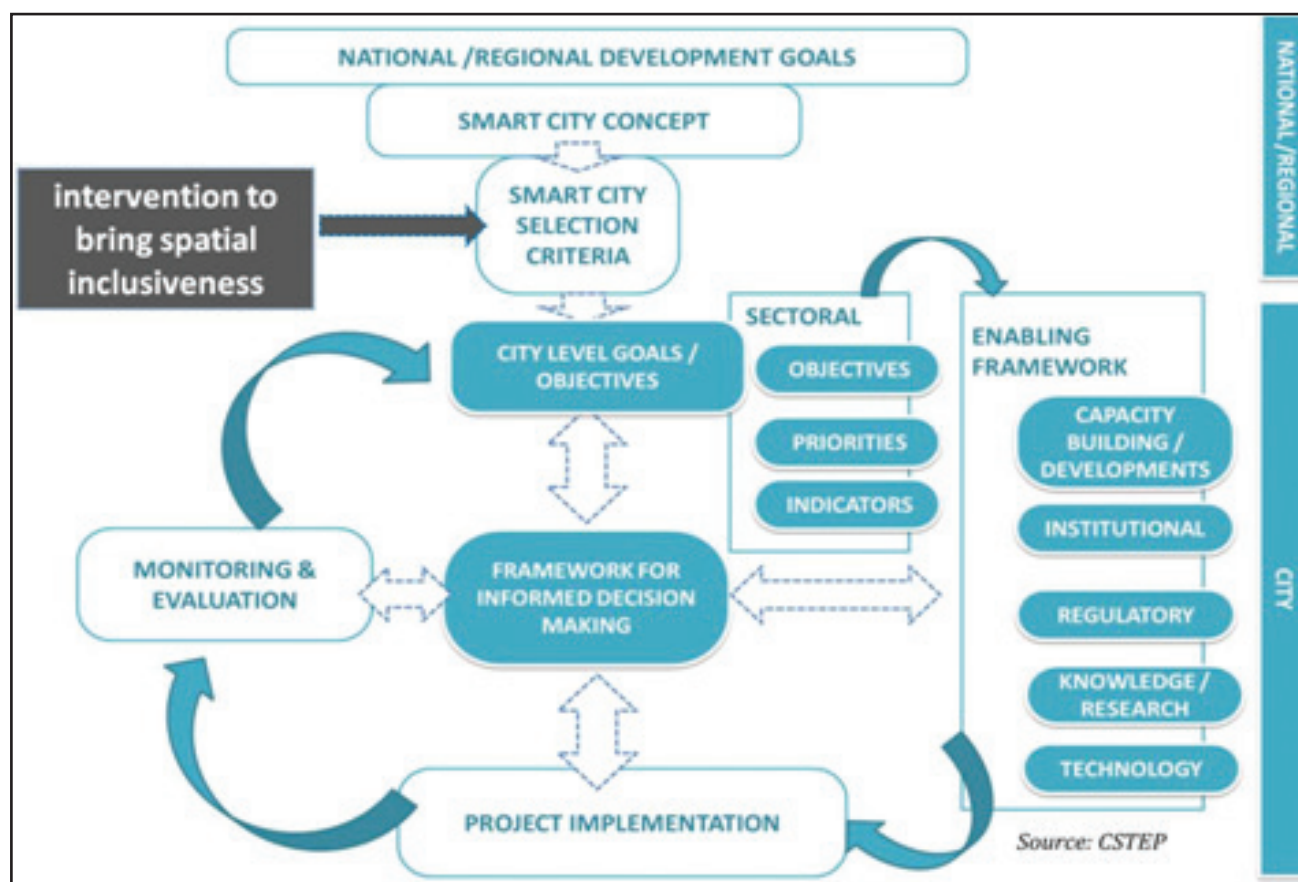
The following section elaborates how the city selection exercise, if done through a methodical approach, can facilitate bringing in regional inclusiveness.

4. SMART CITIES AS VEHICLES FOR INCLUSIVE GROWTH IN INDIA

4.1 Areas of intervention

The notes released by Government of India under NSHSCM have been focussing on the conceptual part of smart city development. The stages involved in the process can be represented in the following diagram (Figure-5).

Fig. 5: Road map for Smart City development in India



Source: CSTEP

4.2 The Proposed City Selection Process

Principles and Objectives: The process for city selection has been developed based on principles of good governance, which were taken forward through pilot city selection objectives.

Based on the above principles and objectives, a combination of both 'top-down' and 'bottom-up' approach to city selection has been proposed (refer Figure-6). The process is also cognizant of two crucial factors in the given context, i.e., time and complexity.

The Process:

Step-1: Development of Indicators

An exhaustive list of indicators were prepared, which went through a series of iterations based on availability and reliability of data, complexity of calculation and time suitability. Following are the final set of indicators suggested under each objective. It is to be noted that the indicators include both city level quantifiable parameters as well as larger regional level information.

Principles	Objectives for Pilot City Selection
• Inclusiveness	• Larger regional growth agenda
• Equity	• Probability of Success
• Transparency	• Replicability and scalability
• Participatory	• Addressing vulnerability

Step-2: Development of Evaluation Methodology- a top down and bottom up approach

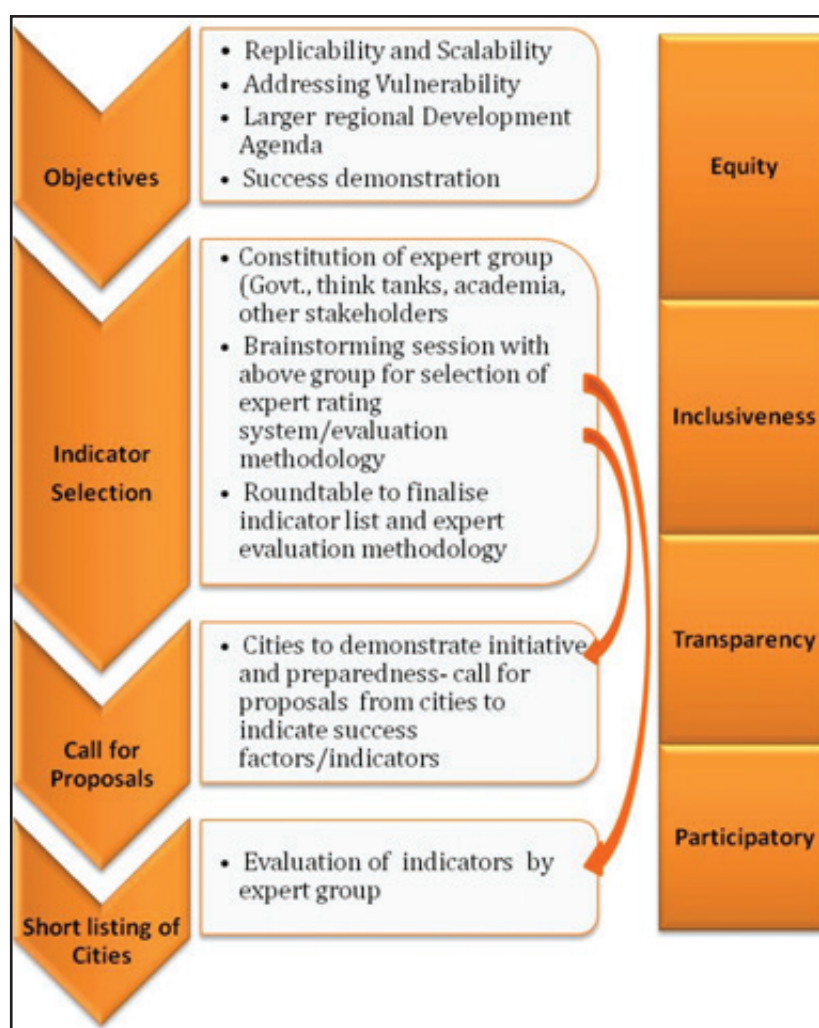
A combination of top-down and bottom-up approach is required for city evaluation. While the first three are required to be evaluated in a top-down method, the fourth and last one needs a bottom-up approach involving city level data and demonstration of proactive involvement by cities.

A set of simple weightages can be development, based on scientific weighting methodology. An expert rating (Delphi method) can be used for evaluation of indicators on a scale of 1 to 10.

Step-3: Call for Proposal from Cities

Proposals can be sought from cities asking for two major components:
a) the city level data required for

Fig. 6: Pilot City Selection Process



Source: CSTEP

the indicators, i.e., the bottom up indicators; b) the city's vision towards its future development. The responsiveness of cities in making a competitive proposal to indicate pro-activeness of city government which is a critical factor for the success of the programme.

Step-4: Proposal Evaluation

Based on evaluation methodology developed in Step 2, the cities may be shortlisted for the smart city programme.

Table 1: Description of proposed indicators for pilot city selection

Larger regional development agenda
The city selection parameters should converge with larger sustainability goals like:
<ul style="list-style-type: none"> ➤ Regional development strategy ➤ State development strategy ➤ Climate Change Action Plan
Replicability and scalability
Each city is different, however the initiatives need to be scaled up and processes replicated, if the pilot cities are such that it demonstrates contextual variation. Thus the selection should include
<ul style="list-style-type: none"> ➤ Cities of different population size ranges ➤ Cities with varied physical characteristics ➤ Cities with different types of economic activities
Addressing vulnerability
Some cities are more vulnerable, due to their locational constraints and so prioritisation of the challenges become necessary. Vulnerability constraints that should be addressed are
<ul style="list-style-type: none"> ➤ Area prone to climate/other disasters ➤ Natural resource constraint, especially water ➤ Ecologically sensitive areas (natural trails etc)
Probability of Success
The pilot smart city initiatives should have a positive impact of ensuring stakeholder confidence. The major parameters that determine this are as follows
<ul style="list-style-type: none"> ➤ Economic growth potential- location with respect to growth corridors, committed investments etc. ➤ Infrastructure preparedness- Physical infrastructure and facilities such as roads, water supply, sewerage, drainage, sanitation etc., social infrastructure such as education institutions, health care facilities ➤ Educated/ aware citizens- education level, presence of knowledge institutions, participation in governance, use of internet based services ➤ Pro-active city government- timely preparation of required plans and their revision, responsiveness to reforms, efficiency of citizen services and grievance redressal, ➤ ICT intervention preparedness- database, GIS Basemap etc

4.3 Selecting Pilot Cities: The Karnataka Example

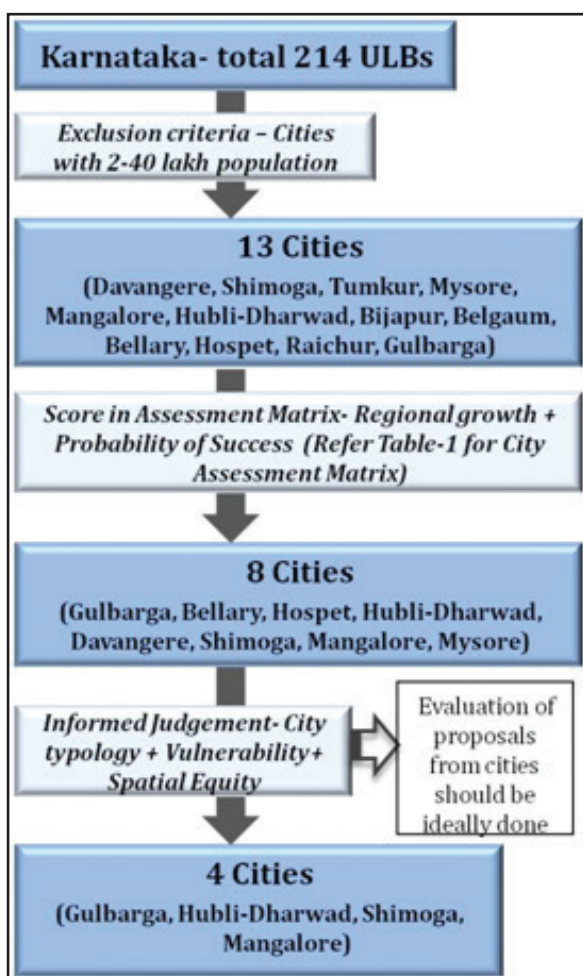
This section illustrates a case study carried out in Karnataka to facilitate the pilot city selection. It is to be noted that an exhaustive set of indicators were developed under each of the four main objectives. These were then filtered after a few rounds of iterations based on the objectivity of the analysis, complexity of the method, criteria suggested by Ministry of Urban Development (MoUD), Government of India and overall data availability for indicators. The Karnataka city selection example shared in this section is a step short of calling proposals from cities and thus is an entirely top-down approach to facilitate a first-hand sense of how the city selection process may evolve. Figure-7 represents the overall analytical flow applied for the city selection exercise.

The matrix below summarises the criteria used and status/performance of cities against the criteria on a quantitative scale. It is to be noted that there are both inclusionary and exclusionary criteria used to justify to the objectives mentioned above. Figure-8 shows the location of cities selected at various stages of the process to ensure judicious distribution across Karnataka's spatial canvas.

5. THE WAY FORWARD

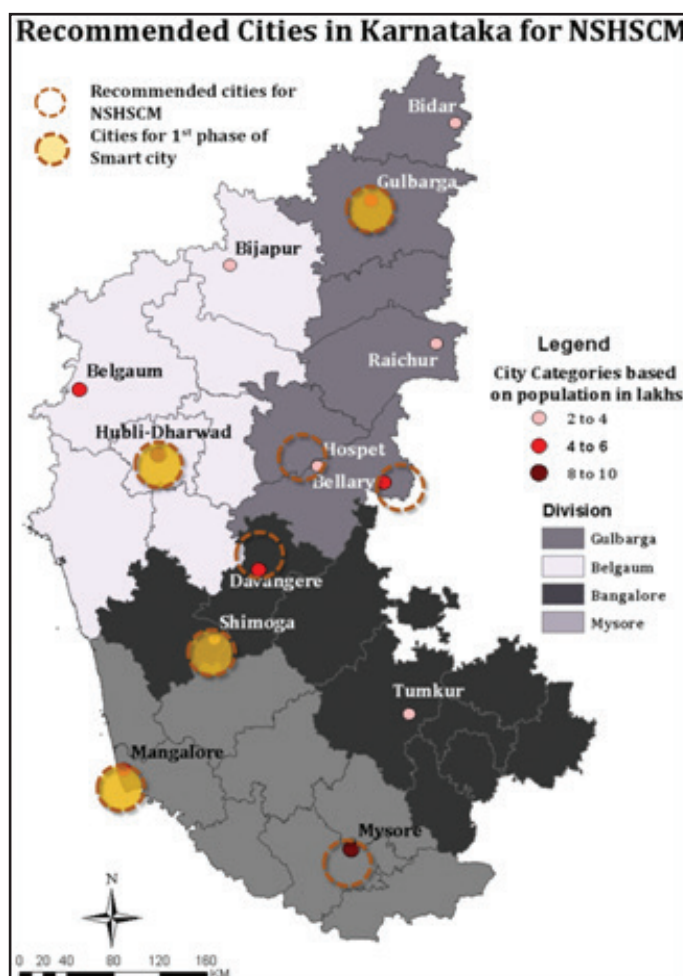
The need for maintaining competitiveness of a prime city like Bangalore goes beyond question. However, there is an urgent need for diffusion of urbanisation in order to enable relatively backward regions of

Fig. 7: Proposed city selection exercise done for Karnataka



Source: CSTEP

Fig. 8: Recommended pilot cities in Karnataka under NSHSCM



Source: CSTEP

Table 2: City Assessment Matrix for Pilot City Selection under NSHSCM in Karnataka

Administrative Divisions	Exclusion/ Inclusion criteria	Regional Growth		Probability of Success/ Sustainability of Investment				Total Score	Replicability and Scalability		Vulnerability
		Inclusion of Backward Areas	Spatial impact within Karnataka	Investment region- 1: Located along Suvarna Karnataka and/or Mumbai Bangalore Corridor	Investment region-2: Located wrt. Hyderabad- Karnataka region	SEZ Investments (Operational and Notification issued)	District per capita GDP, 2011		Type of Economy	City Size (Popula- tion range in lakhs)	
Bangalore Division	City	If within backward=1, if outside=0	Assuming 100 km radius as impact area, <50% within Karnataka=(-)2, 50%-75%=(-)1, >75%=0	If along the corridors=1, if not=0	If within Hyd-Ka region=1, if not=0	If close to SEZ investment areas=1, if not=0	if more than average of state per capita GDP>1, If not=0				Ecological sensitivity/ Locational vulnerability
	Davangere	1		1	1			3	Agro- Manufacturing	4-6	Central dry zone
	Shimoga			1		1	1	3	Agro+Tourism	2-4	Eco sensitive area
Belgaum Division	Tumkur			1				1	Mixed	2-4	Eastern Dry Zone
	Belgaum		-1	1		1		1	commercial- exports	4-6	Norther Dry Zone
	Bijapur	1	-1	1				1	Heritage- tourism	2-4	Norther Dry Zone
Mysore Division	Hubli- Dharwad			1			1	2	Mixed	8-10	Northern Transition Zone
	Mysore					1	1	2	Heritage- tourism	8-10	Souther Dry Zone
	Mangalore					1	1	2	Port	4-6	Coastal area
Gulbarga Division	Gulbarga	1		1	1			3	Heritage- tourism	4-6	Northeastern Dry Zone
	Raichur	1	-2		1			0	Agro based	2-4	Dry Zone/Hilly to Plain
	Bidar	1	-2	1	1			1	Mixed	2-4	Northeast Transition Zone
	Hospet	1			1			2	Mining industry	2-4	Northern Dry Zone
	Bellary	1	-1	1	1		1	3	Mining industry	4-6	Northern Dry Zone

Source:CSTEP

*Note: The above matrix is based on analysis of macro level data available in public domain

a state to become attractive destinations. While the city selection is a first step in the smart cities development programme to address partial inclusiveness, there will be intense challenges in evolving an inclusive planning and implementation framework. There is a critical need for specific research inputs in defining a smart city in Indian context in terms its objectives and benchmarks to support further decision making in this regard. It is of utmost importance to be cognizant of the baseline conditions of Indian cities and thus to select achievable targets spread over a clearly defined timeline within a framework which links city development objectives to national development agenda and project identification. The development of a Maturity Framework and baselining the current context in this framework to understand the roadmap for smart cities or any city would be the next logical step forward in this discourse.

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