

Rural Urban Classification (RUC) and its impact on funding pattern for urban development in the context of Indian cities

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Abstract

This paper attempts to assess the impact of existing Rural-Urban Classification (RUC) on distribution of development funds among different realms of a settlement in Indian context. The paper questions upon the existing parameters of Census definitions for 'Urban' and 'Rural' and how it is affecting the 'Master Plan Preparation Process' for cities. Further, it indicates the role of RUC for creating disparity in distribution of various Government development funds among settlements, by discussing ten diverse contexts of the country. Due to census definition of settlement classification in a dichotomous fashion, all these developmental schemes are being applicable to Statutory Towns only, the Census Towns are completely ignored, especially the peripheral settlements around major urban centers. The paper seeks to analyze the interrelationship between present funding pattern and degree of urbanization in the selected cases, if exists at all. The paper concludes with a framework to establish a relationship between funding pattern and urbanization and develops an approach towards restructuring the settlement classification, where in the future, the Peri-Urban realms / Census Towns can be considered under urban development schemes, can undergo planned urbanization and as a result, disparity in terms of development can be minimized in the country.

Keywords: *Census; Funding pattern; Peri-Urban realm; Restructuring; Rural-Urban classification.*

1. Introduction

The differentiation of settlement into 'Rural' and 'Urban' realms has started in the wake of industrial development process and related growth of infrastructure such as transport, communication and power supply, etc. in the certain segments of space [1]. In many countries today the classification of settlements into rural and urban areas serves as an important input in the formulation of development strategy and provides an appropriate framework for local governance. In the similar manner, the link between settlement typology and its impact on funding pattern for urban development has for long been debated. Conventionally, depending upon the type of settlement, its demographic and administrative profile, the funds are being allocated. The paper intends to analyze such interrelation between these two aspects and attempts to establish whether the parameters defining settlement classification are appropriate to be the determinants for fund allocation to various classes of cities.

In broader perspective, the paper is concerned regarding the haphazard development in Peri-Urban areas around all the major cities of India. While doing thorough research on the issue, it is observed that as these transition areas lie outside the legal jurisdiction of the city / any Urban Local Body and considered as part of 'Rural' realm and thus, they are completely deprived from the various urban developmental grants of the Central / State Governments. From the last decade, several development schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) - (2006-2012), Smart City Mission - (2016 onwards) etc. have been announced from Government of India. However, the schemes

primarily follow Census data only; which are completely biased to 'urban' - especially towards statutory towns and its demographic and administrative database. Hence, due to lack of grant allocation, these outgrowths face an unsatisfactory level of environmental quality and infrastructural services like water supply, sanitation, drainage, solid waste management, transport and air pollution control [2], though they mostly appear with characteristics and amenities of urban area. Their identification, definition, method of delineation in a legal manner or through any planning policy by competent authority does not exist in the country till date [3]. Such background overview necessitated certain questions, whether the two-tier settlement typology (urban & rural) is appropriate at contemporary development scenario or there is an urgent need for restructuring of settlement typology to include a third-tier of development (peri-urban), so that the developmental grants can be distributed in an equal manner with a sense of justice and fairness. Even, it may be also questioned, whether administrative and demographic criteria are enough to define such realms, where they create larger impact in long way. The paper attempts to justify such interdependencies between RUC and fund allocation, if exists at all.

2. Background overview - the Rural-Urban Classification (RUC) scenario in India

With this overview, this paper examines the existing criteria of rural-urban classification used by the Census of India and shows its direct link / relation to create disparity in distribution of development funds among various levels of urban areas in and around a

city. In Section II, the background research on the Rural-Urban Classification scenario in the context of India has been discussed; while in Section III, Methodology of selection of sample cities and the method adopted for Analysis is elaborated. Section IV collates the collected data, put for comparative analyses among various planning schemes, cities, infrastructural sectors and explains the critical observations out of each of them. In Section V, the overall inferences are discussed and Section VI concludes with the proposed framework. In the final section, an approach is indicated towards restructuring the R-U classification for its future implication in reality and also to raise further research agenda to fulfil the gap between urban planning on paper and development on ground. The paper looks deeper into the planning and development process in the contemporary Indian context. In India, the Census of India – an organ of the Central Government – classifies settlements into ‘rural’ and ‘urban’, whereas it is State Governments which grant municipal status to urban centres. Urban Area, as defined by Census 2001 and 2011 [4, 5] is as follows:

1. All places with a municipality, corporation, cantonment board or notified town area committee, etc.
2. All other places which satisfied the following criteria:
 - i. A minimum population of 5,000;
 - ii. At least 75 per cent of the male main working population engaged in non-agricultural pursuits;
 - iii. A density of population of at least 400 persons per sq. km.

The first category of urban units is known as ‘Statutory Town’. The second category of Towns is known as ‘Census Town’. It is significant to mention that Census being the only one agency, which defines settlement classification and all the earlier / latest master plan preparation and developmental schemes follow such categorization. It is observed that though Census is followed to prepare plan for any ‘Urban’ area, however existence of different types of plans, preparation parameters, boundaries etc. creates confusion. Developmental schemes like JNNURM, SMART City Mission etc. follow Census data only; however they are completely biased to ‘urban’ - especially towards statutory towns. Due to census defines settlement classification in a dichotomous fashion, all these developmental schemes are being applicable to statutory towns only, the census towns are completely ignored. These facts initiate questioning on the parameters of definition. Further, the contemporary urbanization scenario shows that the largest metropolitan cities in India have continued to expand laterally and are better described by the census term ‘Urban Agglomeration’ (UA). As found by Shaw [6] that in the largest cities, that is, the ‘primary metros’, the UA was growing faster than the city proper. The large metros mostly show declining growth in the core and continue to expand outwards engulfing many villages and smaller towns in the surrounding area. It is necessary to highlight that for the first time since Independence, the absolute increase in population is more in urban areas than in rural areas. Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census and this urbanization has happened by formation of more nos. of Census Towns (increased 2532 in no. in 2011) as compared to Statutory Towns (increased 242 in nos. in 2011). Spatially, these Census Towns are all spreaded around the major metro cities. Thus how ‘Peri-Urban Interfaces’ are emerging more prominently as transition areas in-between conventionally classified ‘urban’ and ‘rural’ realms [7].

With reference to development funds in India, the ‘JNNURM’ scheme had launched in December 2005 for duration of 7 years, a flagship project comprising two sub-missions to serve selected urban areas. For various projects under the scheme, a total cost of Rs 62,253 crores have been sanctioned till 2012. Later the present government has announced ‘Smart City Mission’, to cover 100

cities for duration of 5 years and Rs. 100 crores per city per year is allocated for various projects sanctioned under it. With this background, as JNNURM is already completed, the paper seeks to analyze the utilization of allocated funds over cities with respect to their degree of urbanization and intends to assess where the funds have been utilized and how the amount relates to the selected cases. Thus, the fund allocation can be either justified or not, from physical planning perspective.

3. Discussion on methodology

3.1. Selection of sample cities, overview of data sources and methods

As JNNURM and Smart City Mission are two significant urban development projects in India in the last decade and present time, thus 10 common cities from the list of selected cities under both of these projects have been taken in the paper to conduct a comparative study and analysis to find out the interrelation between funding pattern and degree of urbanization. However, these 10 common cities are selected in such way that they can produce diverse dataset in terms of their population size and other parameters. The study has been conducted on the basis of secondary data sources by obtaining Govt. Census data of the country and database of the City Development Plan(s) (CDPs) prepared by the Municipal Corporation & Urban Development Authorities of these selected cities under JNNURM for the period of 2006 - 2012.

3.2. Process of data analysis

- 1) Census, LUDCP, JNNURM & Smart City Mission are put for a comparative analysis to see how the process is linked from Census definition of cities - City Master Plan preparation - Funding for projects through various schemes (Table 1).
- 2) Specific to JNNURM funding for cities, comparative analysis has been done for 10 selected cities to see the allocated fund v/s utilized fund under various projects (Table 2).
- 3) Sector-wise funding pattern under JNNURM has been analysed to see which area of the city has been covered under the fund (Table 3).
- 4) Taking any one specific sector, funding pattern has been analysed w.r.t area coverage of cities (Table 4).
- 5) The obtained result from the previous analysis has been put into the graph to compare city's urbanization with per capita funding & with per sq.k.m funding to draw final inferences (Table 5).

4. Data collection, study & analysis

4.1. Comparative analysis among Census, LUDCP, JNNURM & Smart City Mission

Observations:

1. Census being the only one agency, which defines settlement classification and all the earlier / latest master plan preparation and developmental schemes, are made accordingly.
2. Though Census is followed to prepare Master Plan for any ‘Urban’ area, however existence of different types of plans, preparation parameters, boundaries etc. creates confusion at the time of implementation.

Table 1: Comparison of Different Plans / Schemes and Selection Criteria for Respective Beneficial Areas

Census	LUDCP & Perspective Plan	JNNURM Schemes	National Smart Cities Mission
Census 2011 defines Urban Area as follows:	Agencies to prepare LUDCP & Perspective Plan are different.	Selection of cities was based upon Census 2001.	97 cities have been selected for the National Smart City Mission.
1. All places with a municipality, corporation, cantonment board or notified town area committee, etc.	LUDCP - Medium term plan, Perspective Plan - Long term plan.	JNNURM Schemes were applicable to only all the Statutory Towns, not for the Census Towns; as listed by Census 2001. Urban biasness is present in the schemes.	Like JNNURM schemes, this is also applicable to Statutory Towns, as per Census 2011.
2. All other places which satisfied the following criteria: i) A minimum population of 5,000; ii) At least 75 per cent of the male main working population engaged in non-agricultural pursuits; and iii) A density of population of at least 400 persons per sq. km.	LUDCP follows administrative jurisdictions to delineate the planning area, where as Perspective Plan delineate & categorize the planning area w.r.t spatial scenario, creates development zones based on existing situation and future trends.	For big cities, schemes like UIG & BSUP, fund allocation was dependent upon only one parameter - Population size as per Census data. Among selected 65 Mission Cities (7 cities with pop. More than 4 million, 28 cities with pop. More than 1 million, 30 cities with pop. less than 1 million), for fund allocation Metropolitan biasness is present.	Unlike JNNURM, for selection of cities from one state and respective fund allocation, equal weightage (50:50) has given to % of urban pop. Contributed & no. of statutory towns in the state.
The first category of urban units is known as Statutory Town. The second category of Towns is known as Census Town.	For all the 'Urban Area', governed by an ULB as per the definition by Census, these plans are prepared, however for any particular urban area; no clear overlap is existing in LUDCP & Perspective Plan.	For 65 selected Mission Cities contributing 42% urban pop., 70% fund is allocated under UIG & BSUP, whereas for other small towns contributing 58% urban pop. Only 30% fund is allocated under UIDSSMT & IHSDP. Disparity exists in fund allocation for developmental activities among big cities and small towns w.r.t their contribution in urban pop.	Like JNNURM schemes, here the fund is available to only all the Statutory Towns, not for the Census Towns; as listed by Census 2011. Urban biasness is present in the schemes.

Source: online data sources, available at <http://censusindia.gov.in/>, <http://jnnurmmis.nic.in/>, <http://smartcities.gov.in/content/>

Table 2: Comparison of Allotted and Utilized Funds for Projects under JNNURM

Sr. No.	Selected Common Cities between JNNURM & Smart City Mission for comparative study	JNNURM Category (as per Census 2001)	Funds allotted under different sub-missions of JNNURM (INR Cr.)			Funds utilized under JNNURM (INR Cr.)
			UIG	BSUP	Total	
1	NDMC / Delhi	Delhi - >4 million pop.	699	440	1140	684
2	Chennai	>4 million pop.	820	365	1185	731
3	Ahmedabad	>4 million pop.	653	254	908	818
4	Pune	>1 million pop. <4 million pop.	1322	414	1736	1564
5	Jaipur	>1 million pop. <4 million pop.	183	43	226	226
6	Bhopal	>1 million pop. <4 million pop.	327	143	470	294
7	Surat	>1 million pop. <4 million pop.	723	281	1004	905
8	Indore	>1 million pop. <4 million pop.	210	55	264	264
9	Ludhiana	>1 million pop. <4 million pop.	30	25	55	28
10	Bhubaneswar	<1 million pop.	185	29	214	100

Note. The color scheme to highlight the selected cities has been followed throughout the paper to indicate the grouping of cities in terms of their similarity in degree of urbanization.

Source: online data sources, available at <http://jnnurmmis.nic.in/>, CDPs of selected cities

- Developmental schemes like JNNURM, SMART City Mission etc. follow Census data only; however they are completely biased to 'urban' - especially towards Statutory Towns. Due to census definition of settlement classification in a dichotomous fashion, all these developmental schemes are being applicable to Statutory Towns only; the Census Towns are completely ignored in the process.

Table 3: Analysis of Funding Pattern (Sector-Wise)

Sr. No.	Selected Common Cities between JNNURM & Smart City Mission for comparative study	Sector-wise Funds Allotted under Different Sub-Missions of JNNURM (Rs. In Crores) *common sectors selected across the cities						Project Cost over the Span of (No. of Years)
		Water Supply			Sewerage			
		City	Periphery	Total	City	Periphery	Total	
1	NDMC / Delhi	1632	0	1632	2755	0	2755	5
2	Chennai	6321	0	6321	2299	0	2299	7
3	Ahmedabad	254	252	506	400	212	612	6
4	Pune	250	0	250	636	0	636	7
5	Jaipur	210	0	210	186	0	186	7
6	Bhopal	550	0	550	245	0	245	7
7	Surat	257	396	653	389	420	809	7
8	Indore	59.8	0	60	347	0	347	7
9	Ludhiana	35	0	35	488	0	488	6
10	Bhubaneshwar	691	0	691	496	0	496	7

Table 3: Continued below

Sr. No.	Selected Common Cities between JNNURM & Smart City Mission for comparative study	Sector-wise Funds Allotted under Different Sub-Missions of JNNURM (Rs. In Crores) *common sectors selected across the cities									Project Cost over the Span of (No. of Years)
		Storm Water Drainage			Solid Waste Management			Road & Transportation			
		City	Periphery	Total	City	Periphery	Total	City	Periphery	Total	
1	NDMC / Delhi	231	0	231	593	0	593	13487	0	13487	5
2	Chennai	1424	0	1424	848	0	848	19504	0	19504	7
3	Ahmedabad	385	190	575	97	54	151	1350	2335	3685	6
4	Pune	850	0	850	161	0	161	2124	0	2124	7
5	Jaipur	0	0	0	13	0	13	480	0	480	7
6	Bhopal	50	0	50	40	0	40	394	0	394	7
7	Surat	55	176	231	8	80	88	1653	980	2633	7
8	Indore	70	0	70	36	0	36	1391	0	1391	7
9	Ludhiana	280	0	280	140	0	140	546	0	546	6
10	Bhubaneshwar	130	0	130	25	0	25	508	0	508	7

Source: online data sources, available at <http://jnnurmmis.nic.in/>, CDPs of selected cities

4.2. Analysis of JNNURM funding: allotted v/s utilized

Observations:

1. In most of the cases, only 60% fund has been utilized.
2. Unutilized fund: is that excess? Not required for the targeted population? or the parameters for estimation of fund allocation is not effective? not discussed ever.

4.3. Sector-wise funding pattern under JNNURM: area coverage

Observations:

1. Except two cities Ahmedabad and Surat, only Municipal limits have been covered for selection of projects to be covered under JNNURM, where in reality all the selected

cities have a huge sprawl beyond municipal limits and have a trend to grow further to form densely populated peripheral area.

4.4. Analysis of funding for each sector under JNNURM (water supply)

Observations:

1. The results obtained in terms of funding in water supply sector under various JNNURM projects for selected cities per capita and per sq.k.m. area both for the city and the peripheral area have been further plotted into graph and analyzed to check the interrelation between the funding amount w.r.t the city size.

Table 4: Analysis of Funding Pattern for Water Supply Sector

Sr. No.	Selected Cities	Population as per 2001 Census	Area in sq. k.m. (2001)	Funding for Water Supply (Rs. in Crores)			Project Cost over the Span of (No. of Years)	Funding per Annum			
				City	Periphery	Total		City (Rs. in Crores)	Periphery (Rs. in Crores)	Funding per Capita (Rs. in Lakhs)	Funding per sq. k.m. (Rs. in Lakhs)
1	NDMC / Delhi	13850507	1483	1632	0	1632	5	326	0	236	2201057
2	Chennai	7041000	1189	6321	0	6321	7	903	0	1282	7594617
3	Ahmedabad	4709180	1330	254	252	506	6	42	42	179	634047
4	Pune	2538473	244	250	0	250	7	36	0	141	1467238
5	Jaipur	2322000	490	210	0	210	7	30	0	129	612661
6	Bhopal	1433351	285	550	0	550	7	79	0	548	2756892
7	Surat	2811464	130	257	396	653	7	37	57	332	7193795
8	Indore	1639000	130	60	0	60	7	9	0	52	656638
9	Ludhiana	1395467	159	35	0	35	6	6	0	42	366547
10	Bhubaneswar	648032	135	691	0	691	7	99	0	1524	7314921

Source: online data sources, available at <http://censusindia.gov.in/>, <http://jnurmms.nic.in/>, CDPs of selected cities

tion, are granted equivalent amount of fund for development. As population was the sole criteria behind selection of cities and funding, the amount of funding must be pro-

4.5. Graphical analysis of funding for water supply

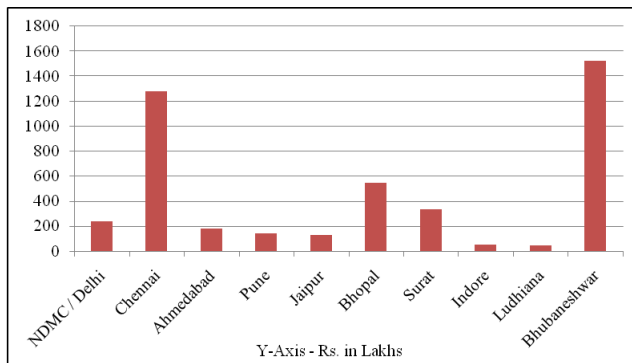


Fig. 1: Funding per capita for water supply projects under JNNURM for selected cities (Source: Author)

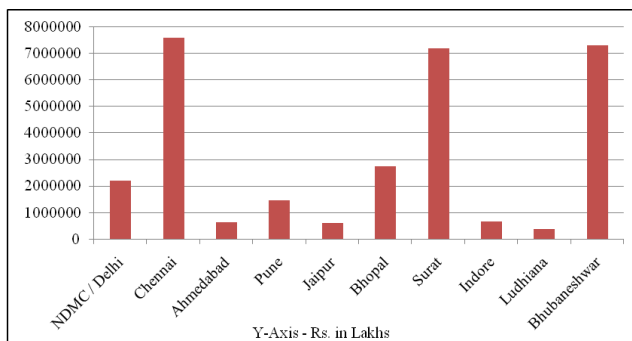


Fig. 2: Funding per sq.k.m. area for water supply projects under JNNURM for selected cities (Source: Author)

Observations from figure 1 & 2:

- Graph showing per year per capita funding (in lakhs) for each city and there is no coherence between its funding and the city's level of urbanization. For example: Chennai being a city having more than 4 million population and Bhubaneswar being a city of less than 1 million popula-

-portionate with the population of the city, which is not been reflected from the graph.

- Graph showing per year per sq. k.m. area funding (in lakhs) for each city and there is no coherence between its funding and the city's level of urbanization. For example: Chennai having an area of 1189 sq. k.m., far bigger than Surat (130 sq. k.m.) and Bhubaneswar (135 sq. k.m.), still granted equivalent amount of funding. Hence, there is no coherence and interrelation found in between area and funding pattern also.

5. Inferences: framework to establish relation among funding & urbanity of a settlement

A city and its urbanization cannot be measured only by population / an area (spread). City is a 3-dimensional phenomenon. A certain amount of population (say X) can be spreaded within an area of Y or may be spreaded within an area of Y+n and there are several variables of any infrastructure sector, measures of which are related with population, area, heights of buildings etc., as reflected in Fig. 3. Thus, a certain amount of density can create different urban form in terms of its compactness or sprawlness. Even, if only 'Area' is considered as a determinant of funding calculation, it may be incomplete. Area can consider the effect of water supply variable like 'pipe length', but cannot take consideration of several other variables of water supply sector like 'pressure requirement due to height variations throughout the city', 'selection of pipe diameters' etc.

Therefore, while estimating the total funding for any city, the vertical dimension of the settlement needs to be addressed, which is always missed out in the present practice. Now, F.S.I is one the most important parameter to capture the vertical dimension of a city, which has never been included at the time of estimation of funding. Analysing the F.S.I component, there are two elements - Area (Floor area / Plot area) and No. of floors. Thinking from a settlement point of view, heights / no. of floors vary. Hence, an average measurement of the same can be considered to address certain variables pertaining to estimation of funding for water

supply or similar infrastructural sectors. Considering the above discussion, it can be inferred that a no. of variables are involved, while estimating the total funding required:

- 1) The funding per sq. k.m. (gross estimation as per provision in the budget)
- 2) The total area (where the boundary is delineated across the city and periphery to consider equal distribution of fund throughout the settlement)
- 3) Avg. no. of floors throughout the city (F.S.I Component)
- 4) Function of relevant variables (sector-wise), like for water supply the length of pipe network can be one of the variables. These variables are not constant as their values will depend on the structure / morphology / spatial pattern of the city.
- 5) No. of years (Project Duration for which fund is allotted)

A multiplication of the above can produce the final value for total funding requirement for any specific urban infrastructural sector.



Fig. 3: Abstraction of area & population linked with nature of urbanity of a city (Source: online data sources, available at <https://citygeographics.org/tag/density/>)

6. Conclusion

As per the current practice in the context of Indian cities, the major drawback lies in the definition of ‘urban’ and ‘rural’ realms itself, for which the overall estimation of fund amount and also the beneficiary areas / coverage of fund for projects are being inappropriate. Thus, in the analysis it is observed that there is no coherence in between the degree of urbanization of a city with the fund allocated / utilized for it. Primarily there are two issues to be resolved on urgent basis: first, the focus area for fund allocation towards the statutory towns only, which is due to the census definition of ‘urban’ in a dichotomous fashion, for which nos. of census towns / peripheral urban areas are being neglected though they contribute larger percentage of urban population at present scenario in the country, secondly, estimating the fund amount on the basis of population and area under administrative jurisdiction - these two parameters are being ineffective, as urbanization being a 3-dimensional phenomenon, estimation of funding requirement should be calculated on the basis of other physical planning parameters too. Therefore, the link between the degree of urbanization of a specific place and its funding requirement for future development needs to be established to create a comprehensive structure for urban planning, governance, finance and implementation.

7. Implications for practice & advancement of research

Way Forward: An Approach towards Restructuring the R-U-Classification - The analysis is done to find out the interrelationship between the present funding pattern with the demographic and administrative database, if exists. It is observed that the selection of beneficiary towns and cities whether in case of JNNURM or Smart City Mission, is entirely based upon Census definition of ‘Urban’ realm, specifically for the criteria of population and administrative boundary, within which the projects will be located and applicability for the Statutory Towns only. The analysis also shows that in the present system how disparity exists at different strata / levels:

- Selection of beneficiary towns
- Funding allocation w.r.t administrative boundary
- Funding allocation w.r.t population size of the cities, still no coherence found while comparing among cities.

However, it can be said that the focal issue remains same - the dichotomous definition of ‘Urban’ area as per Census. The impacts of this phenomenon are analysed in the paper and it infers that the relationship of an effective funding pattern for cities and towns can only be achieved, if the definition (the base of all calculations) can be modified. Hence, it is essential to delineate the settlements as the most urbanized to the least and thus grouping them as clusters of settlements having similar characteristics [8]. This clustering should delineate a group of settlements, which have homogeneity amongst themselves within the cluster group and should be heterogeneous when compared between the clusters. Such clustering of settlements under the umbrella of present classification of Census will add another layer further in terms of typological categorization of settlements, which will be helpful for various policy formulation, equity in funding pattern and for the benefit of spatial planning process as a whole [9]. Currently for all spatial planning process, the unit of assessment is taken as a local body (Municipality, Corporation or Village Panchayats). Hence when preparing Master Plans, and City Development Strategies, the boundary of analysis is taken as the boundary of the administrative unit. However, in reality such a boundary does not exist [9]. Hence the best procedure for spatial planning is to adopt a regional planning approach (long term spatial planning process) for selected regions and then prepare a Master Plan/Development Plan for the local body with in the region, based on the broad frame work of the Regional Plan. Further, the step towards such clustering of settlements is to determine the parameters / indicators, which contribute towards measurement of the type / nature of ‘Urban Tendency’ or ‘Rural Tendency’. The similar cases of typology delineation by various studies like PLUREL, ESPON, OECD in European context needs to be studied and the parameters used for determining the settlement typology is required to be explored. Apart from these literature reviews, certain other indicators also may be added, which are found relevant specifically for Indian context. These indicators can be analysed further and settlements can be grouped accordingly. As the settlements will be further classified apart from the conventional ‘Urban’ and ‘Rural’ realms, spatial planning becomes easier and efficient. Such typological classification also helps for better infrastructure and resource allocation planning, investment planning, land-use and environmental planning and especially for better fund allocation for urban governance with a sense of fairness and justice.

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