

ANALYSIS OF URBAN ECONOMIC SUSTAINABILITY IN VARANASI CITY

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Abstract

Urban development should be guided by a sustainable planning and management vision that promotes interconnected green space, a multi-modal transportation system, and mixed-use development. Diverse public and private partnerships should be used to create sustainable and liveable communities that protect historic, cultural, and environmental resources. In addition, policymakers, regulators and developers should support sustainable planning and construction techniques that reduce pollution and create a balance between built and natural systems.

Socio-economic development is any program that creates sustainable economic access for its beneficiaries. This means that contributions should be providing sustainable benefits, to use the old saying- teach people. Sustainable socio-economic development is a core element while studying the concept of urban sustainability. While the first part of this definition relates to conventional social and economic development objectives, the second part incorporates a long-term view, including considering environmental issues. It has become common to isolate four factors that determine sustainable development: natural capital (i.e., ecology), physical or produced capital, human capital and, more recently, social capital. This chapter is about basic civic amenities and infrastructure provided by the city authority to the urban people and raises several issues and constraints.

Key Word- Sustainable, Urban development, Socio-economic

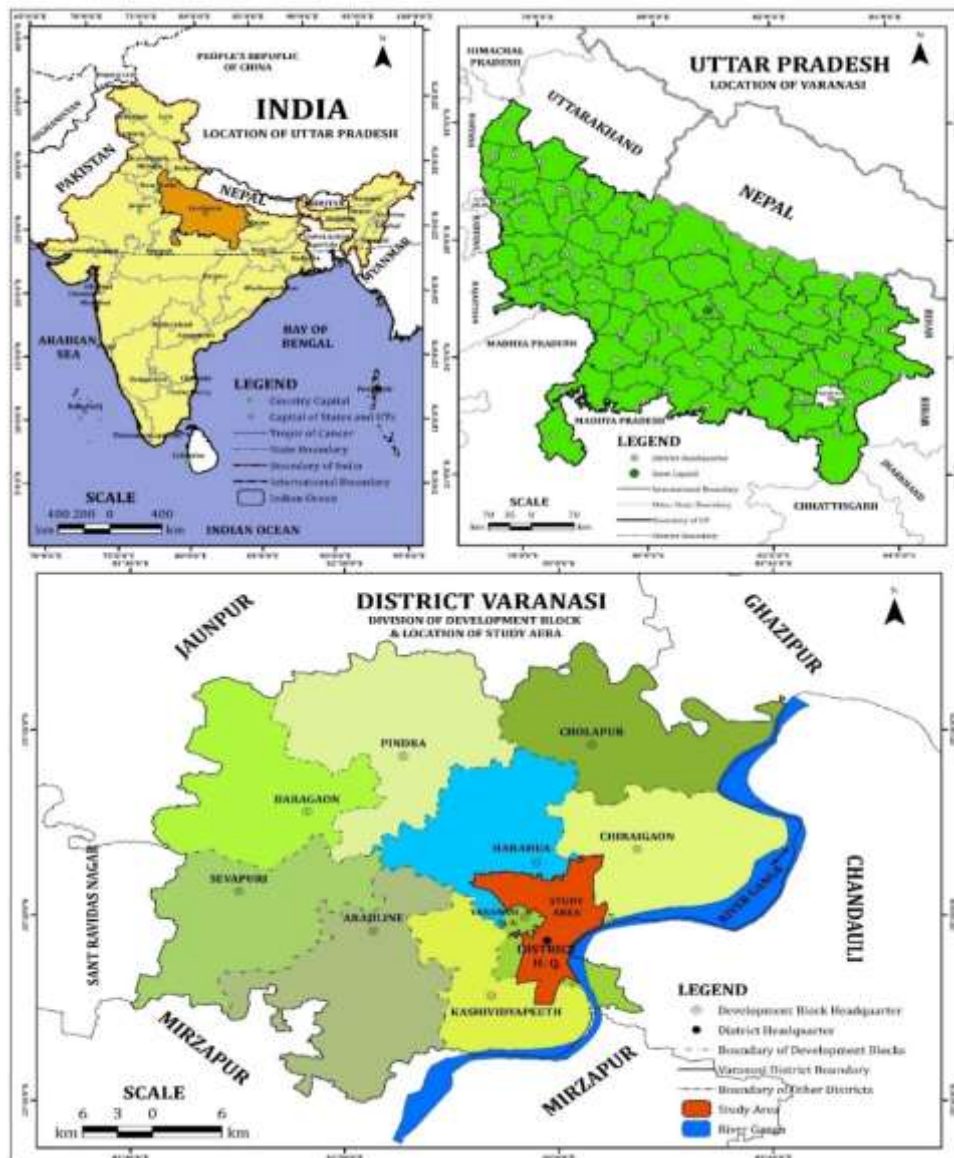
Introduction

Apart from being an end in itself, social development is also a means to promote economic growth and sustainability. Dreze and Sen (2017) have argued that expanding socio-economic opportunity is a key to development. Extension of basic civic amenities like water supply, housing and other physical infrastructure, more effective land reforms and greater access to social security provisions would enable the marginalized sections of society to lead a less restricted life and make better use of resources.

The concept of economic sustainability is nebulous, and it is helpful at this point to disentangle the several strands of thought implied by the term. In economic development, the meaning of sustainability is often constrained by the prefix self. A self-sustaining economy can provide the population with an adequate quality of life long-term without requiring substantial transfers from more prosperous regions. In the more restricted demographic sense, sustainability could refer to the ability of the population to reproduce itself and maintain a balanced structure. Within all these socio-economic contexts, sustainability may only be assessed in relative, not absolute, terms.

Site and Situation

The Varanasi city occupies an area of 174.20 sq. km with seven urban sub-units, and it is stretched between 25°14' North to 25°23'5' North latitude and 82°56' East to 83°3' East longitude. Administratively, Varanasi city has been divided into five zones- Varunapar zone, Adampur zone, Kotwali zone, Dashashwamegh zone and Bhelupur zone. All these zones constitute 90 wards collectively with a population of 12, 01,198. The wards have been further grouped into 16 sanitary sub-zones for the convenience of the services.



Research objectives

The main objective of the present paper is to analyse sustainable urban economic development in the context of Varanasi city.

Research methodology and database

This research is undertaken to understand the motivators and drivers pushing the city towards sustainability, the barriers and challenges encountered in this progress, and the benefits the city can realize from implementing urban sustainability initiatives. The following sections describe the methodology, approach and database utilized to generate results and meet the objectives of this thesis.

1.6.1 Methodology

The methodology of this study begins with on sustainability and sustainable development in urban contexts, city officials Data Analysis both qualitative and quantitative Data Synthesis and Sustainability Measurement. A study of comprehensive urban sustainability indicators has been generated from the economic and ecological conditions in Varanasi city.

1.6.2 Database

To achieve the above-stated primary objectives, relevant data for the study has been collected from various published and unpublished documents. The work is based on both primary and secondary data. The data has been collected from District Census Handbook, 2011. Information has been collected from the Municipal Corporation of Varanasi (MCV), Varanasi Development Authority (VDA), Vikash Bhavan, Jal Nigam etc. Apart from this, intense fieldwork has been done, and other

valuable sources have been consulted to provide background information on the subject and to give a theoretical base to the concerned research topic.

Indicators for urban sustainability measurement are also of significant use. The research study considers three sets of indicators to become familiar with the language of that city and measure the progress of city employment around sustainability. Indicators are also used to understand how cities and practitioners monitor progress towards sustainability and what benefits are believed to reflect progress. Based on the availability of data, covering the social, economic and ecological parameters have been considered for the analysis. The data considered for the study pertains to the years 2011 and 2021, for which the latest city-level data are available. The identification of intra-zonal disparities for different dimensions of selected indicators has been carried out separately. After constructing composite indices in each case, an aggregate composite Urban Sustainability Value (USI) has been calculated to determine the city's social, economic and ecological development level.

Urban housing

Housing, one of the essential services to be provided for a better quality of life, shall be given importance in the city development plan. The increasing level of urbanization has stressed the housing sector in Varanasi city. As indicated by the last two decades' population demographic data, it can be seen that there is a high increase of 33% in population from 2001-2011 while it came down to 17% in the next decade. However, the increase in housing cannot catch the pace of the increasing population, resulting in the housing gap.

1 Housing density

The city's core area is very congested and highly dense. As the city is growing and new extension areas have low housing densities, some people are shifting from old areas to these areas in search of better living conditions. Table 1 shows the change in household densities for the last three decades shows the housing structure in the city.

Table 1 Household Density in Varanasi City 2021-22

Household Density in Varanasi City 2021-22			
Particular	1991	2011	2021
Area in sq. km	96.1	82.10	170.23
Number of Households	143453	190853	206154
HH/Sq.Km.	1492.75	2324.42	1211.03

Source- District Statistical Magazine Varanasi-2022, Census of India-2011, and Calculated by Research schooler

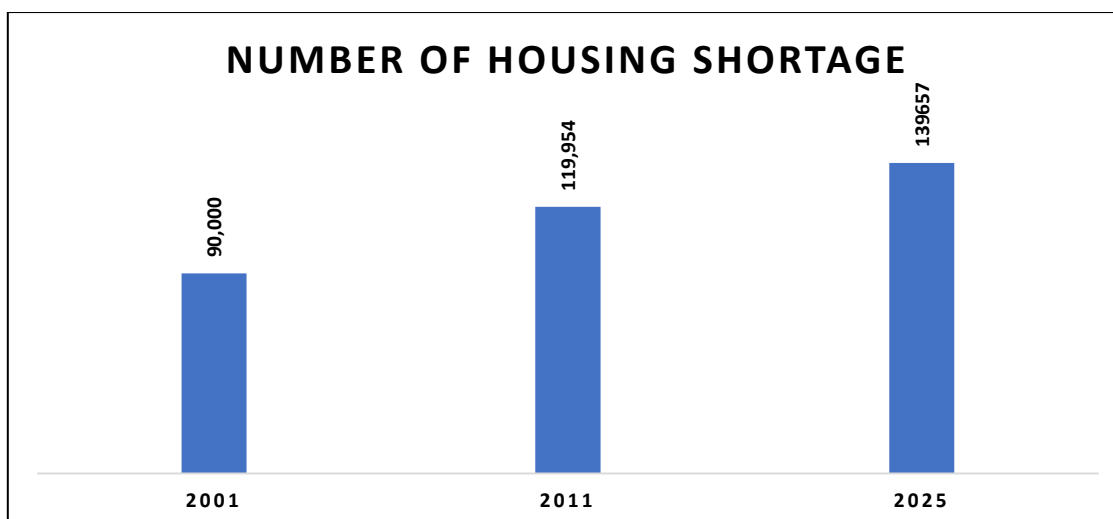
2 Housing shortage

The city faces an acute housing shortage. Credit Rating Agency (demand. The housing demand is increasing. Dense housing structure in Varanasi city, Household shortage in Varanasi city in 2011 1,19,954. The city faces an acute housing shortage. As per a study conducted by an agency a year, the Dense housing structure in Varanasi city in 2011.

Table 2 Housing Shortage in Varanasi City 2021-22

Housing Shortage in Varanasi City 2021-22			
Particular	2001	2011	2025
Number of Housing Shortage	90,000	1,19,954	139657

Source- District Statistical Magazine Varanasi-2022, Census of India-2011 and Calculated by Research schooler



3 Distribution of households by size

Due to the acute shortage of housing, Varanasi city faces the problem of overcrowding. With the average household size of Varanasi being the conditions of the people could be better and more modern. There are 47% of the households live in one room or two rooms, and five and six dwelling rooms are found in only 7% and 14% of the households, respectively.

Table 3 Distribution of households by size in Varanasi City 2021-22

Hosehold Size	Total Number of Households	No. of Rooms
All Hoseholds	206154	---
1	5021	1
2	8463	2
3	11276	3
4	22076	2
5	56924	1
6-8	47064	2
9+	49168	4

Source- District Statistical Magazine Varanasi-2022, Census of India-2011, and Calculated by Research schooler

Assuming that two persons can live in one room with better living conditions, the city area's overcrowding data can be calculated. The total overcrowding population in the city is approximately 47,064 housing to keep pace with the increasing population and avoid overcrowding.

4 Housing structure

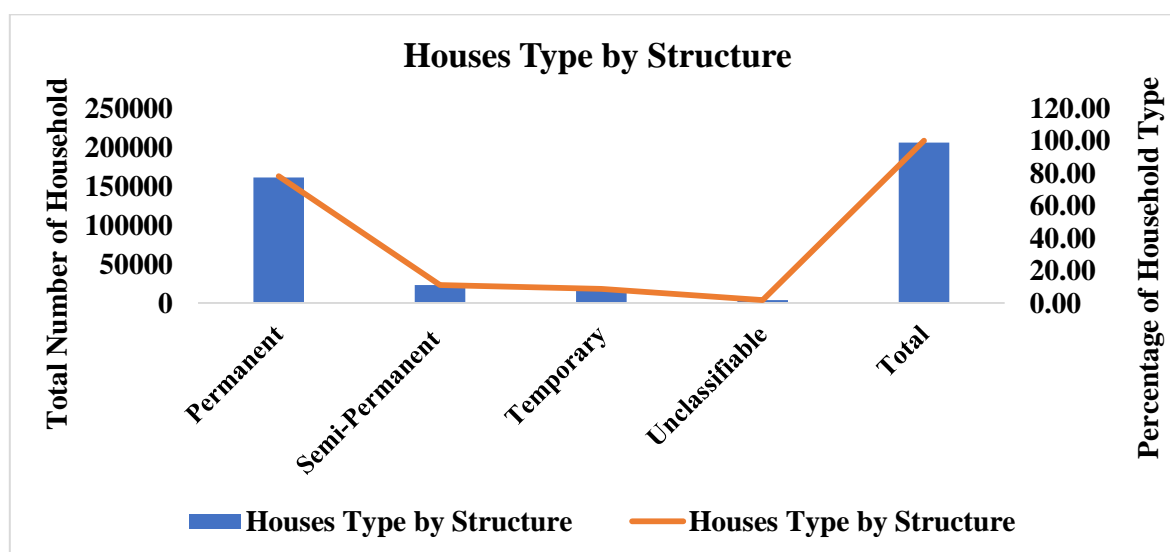
The condition of houses in the city has been assessed based on the type of structure. As 78.20% of houses are permanent (pacca) houses, the overall housing condition in the city is better. Only 11.19% constitute semi-permanent (semi-pacca) houses, and 8.76% constitute temporary housing structures. The distribution of census houses by residence, residence cum other use and type of structure is shown in Table 4 of the total housing structures, 89.83% of houses are in good condition, 8.75% are in livable condition, and the remaining 1.85% are in dilapidated condition. People living in dilapidated housing structures should also be included in the proposed housing talk required for the future population.

Table 4 Houses Type by Structure in Varanasi City 2021-22

Houses Type by Structure		
Type of House	Total Number of Household	Percentage of Household Type
Permanent	161207	78.20
Semi-Permanent	23076	11.19
Temporary	18049	8.76
Unclassifiable	3822	1.85

Total	206154	100.00
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Source- District Statistical Magazine Varanasi-2022, Census of India-2011, and Calculated by Research schooler



5 Ownership status of the houses

Ownership status is one of the major components as it helps to determine the housing demand of the city in future. It has been noted that 83.42% of the population owns a house, 13.13% of people live in rental accommodation, and the remaining 3.45% live in another form of housing. Housing demand in the city is increasing at a higher pace, but the supply is deficient.

6 Housing plan in Master Plan 2031

In Master Plan 2031, 5457.24 hectares of land is proposed for residential development, out of which only 47.9%, i.e., 2615.64 hectares of land, is developed. The rest 52.1% (2841.6 ha) of land is left undeveloped. As per the plan, densities in several congested areas have exceeded 1000 persons/ha.; hence they have identified the need for decentralization. Thus, for the city's planned development, they have identified a total land of 9254.61 ha for residential use in Master Plan 2031.

The land use pattern proposed for the year 2031 revealed a considerable change in residential land use, which in the existing Master Plan accounts for almost 52% of the total land use. This increase would be due to pressing demand for residential purposes. The industrial area constitutes 3.66% of total land use, drastically reduced by almost 46%. Industrial and commercial land use together account for marginally over 7% of the total land use and is far below compared to other cities like Haridwar (12.2%), Agra (15.9%) and other industrialized cities (11%). The total area under tourism/heritage is at alarmingly low levels (less than 3%); compared to similar-placed cities, 6%.

7 New development schemes

Varanasi Development Authority (VDA) is responsible for the overall planned development of the city. Presently VDA has a few new housing schemes in the city, i.e., the Lodhan housing scheme and the Unitech housing scheme. Awasthi Vikas Parishad has appointed VDA for the development of these areas. The area of the Lodhan scheme is Residential, 52% Commercial, 3% Industrial, 4% Recreational, 6% Public and Semi-Public, 7% Tourism and Heritage, 2% Transport and Communication, 28% Others. Unitech scheme, has an area of 2200 acre. These two schemes are located in the southwest region of the city. Awasthi Vikas Parishad is active in meeting the city's housing demand. The details of the properties declared completed up to May 2020 are given in Table 5 as follows.

Table 5 New Housing Schemes of Varanasi City 2021-22

New Housing Schemes of Varanasi City 2021-22		
Name of Scheme	Category	Properties Declared Complete up to 2020-21
Kabir Nagar	M.I.G	602
	M.I.G	171

	H.I.G	126
	E.W.S	164
Jawahar Scheme	Residential Plots	84
	H.I.G	96
	E.W.S	134
	L.I.G.	208
Pandeypur	M.I.G	316
Total		1901

Source- District Statistical Magazine Varanasi-2022, Census of India-201, and Calculated by Research schooler

Urban public transportation

Cities play a vital role in generating economic growth and prosperity. The sustainable development of a city largely depends upon their physical, social and institutional infrastructure. In this context, the importance of transport infrastructure is paramount. To facilitate this, what is required is a sound urban transport policy. Urban transportation is an essential component in shaping urban development and living. While urban areas may be viewed as engines of growth, urban transport is, figuratively and literally, the wheel of that engine. The transport sector is an essential component of the urban economy, impacting development and the welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multiplier effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in capacity or reliability, they can have an economical cost, such as reduced or missed opportunities. Transport also carries a significant social and environmental load, which must be addressed.

Because of the importance of a sound transportation system for livelihood improvement, we must focus on better roadways connecting even remote areas and ensure the availability of required transportation services, both from public and private service providers. Urban transportation is an integral part of urban planning and is responsible for the smooth functioning of the city. Besides other factors, it is also responsible for the city's spatial growth by increasing the accessibility of sites on the periphery of the city. A study of the transport infrastructure for Varanasi city is crucial for understanding and analyzing the micro level (within the different zones of the city linkages between the old city and the newer developments) as well as the macro level (linkages to Sarnath, etc.) functioning and linkages of the city.

1 City-level road network

The total length of the roads within the MCV area is 1755 km, which constitute roads maintained by NHAI and CPWD, National Highways No. 2, 29 and 56, roads maintained by the state PWD department and other roads maintained by MCV. Out of the total length of the roads, MCV maintains approximately 70% of roads, which are internal arterial roads and narrow streets in the old city area are the major road network in the city. Based on traffic characteristics, the city can be divided into three zones. The first zone consists of the old city area near the Ghats, the second consists of the area from the old city to the GT Road, and the third is the new areas on the northern side of the railway line.

Table No.6 Length of Road in Varanasi City

Length of Road in Varanasi City			
Category	Length in Km.	Percent	Remarks
Kuchha Roads	216	12.30	National Highways are maintained by PED while MCV maintains rest nearly 70% of arterial and other roads
Water Bound Macadam Roads	-		
Black Topped Road	849	48.37	
Other Roads	690	39.31	
Total	1755	100	

Source- District Statistical Magazine Varanasi-2022, Census of India-201, and Calculated by Research schooler

2 The old city area

The old city includes very congested areas like Chauk, Kotwali, Adampura, etc., with very narrow streets and mixed land use. Narrow, irregular lanes leading to the Ghats are typical of this area. The width of these lanes varies from 1 to 2 meters, and only pedestrian movement is possible. However, people ply two-wheelers, making it difficult for pedestrians to walk. Wholesale trade and Mandis in the old city add to the congestion. Commercial encroachments considerably reduce the available right of way on all the roads leading to the Ghats. There is a high degree of conflict between pedestrians and vehicles in the old city area. The high density of the area, coupled with encroachment and heavy movement of cycle rickshaws and pedestrians, makes it the most chaotic and congested area in Varanasi. Slow moving traffic causing chaos in an old city, satellite image of old city area showing high density and small lanes Roadside parking of private buses causing congestion Roadside parking at Railway Station.

3 Central city area

The second zone comprises the area beyond the old city area up to G.T. road in the north. Road widths in this zone are higher than in the old city area, but the roads are still congested. The roads leading to the inner city are wider but are fully encroached on both sides, creating chaos for the movement. Roadside parking and street vendors add to traffic problems in the area, reducing the road width available for movement. The two central bus stands on G.T. road: one of U.P. State Transport Corporation and another private (Ghazipur bus stand), add to the traffic problems and restrict smooth vehicular movement on the main road. The area near the railway station on either side of G.T. road needs to have organized parking and create havoc outside the railway station. Traffic congestion at Andhra Chowk is because of mismanagement of traffic, the absence of traffic signals, an absence of an auto rickshaw stand, and the roadside encroachments The lack of organized parking spaces at the railway station leads to a conflict between traffic and pedestrian traffic. Since the railway station has a central opening towards the south of the city, the northbound traffic also has to pass through the southern side, leading to severe traffic congestion.

4 Peripheral and newly developed areas

This area comprises the Nadesar, Police lines, Tajpura etc., which characteristically have reasonable road widths with few encroachments but no traffic signals. The major problem areas in the zone are Pandeypur, chowk, Andhra Bridge and Chauka Ghat. Another hindrance to the traffic flow in the city is the presence of streetlights and transformers in the middle of the roads. There should be traffic management exercises for these areas.

In general, traffic condition in Varanasi city is poor as most of the roads are narrow and congested. To aggravate the traffic flow problem is a mix of slow and fast-moving traffic. The mixed traffic mode with variable speeds like rickshaws and cars/lorries on the roads during the peak hours causes most congestion/traffic jams on the roads.

5 Traffic characteristics

The traffic composition in the city varies with the area. Traffic in the city comprises mostly motorized (comprising mainly of two-wheelers and autos) as well as no motorized (comprising of cycle rickshaws and bicycles) vehicles. The main reason for city congestion is the unregulated cycle rickshaws movement followed by two-wheelers and autos. The traffic volume is very high at all the nodes and intersections, and the roads have already exhausted their capacity. Slow-moving traffic in the form of rickshaws contributes maximum to the traffic volume of the city, causing congestion in various places. The NH-2 from Khazakpura to Lahartara Cantonment has been identified as the most congested highway in the city.

Traffic intersections and rotaries play an essential role in better traffic management. Varanasi has no signalized intersections except the Marimaika Temple, Kabir Chaura, Rathyatra, and Maldahiya. These signals are not in working condition and lack maintenance. Apart from these, there are about 32 intersections manually operated by traffic police. No proper traffic management plan is put in place for better traffic management, which is one of the significant reasons for congestion in the city. The city needs street furniture on almost all the roads of the city. The junctions with the highest traffic volume are Golghar Chowk, Pandeypur Chowk, Andhra Pul, Chowka Ghat, Gadaulia, Ramapura, Kabirchaura, Lanka, Maldahiya, Sigra, Golgadda, Rathyatra, Dharamshala Chowk. These

intersections are problem areas in design and management and need to be more suitable for meeting the rapidly changing requirements of vehicle traffic. Most of the intersections are full of encroachments and need more traffic sense among the people, making it challenging to manage the traffic movement, especially during peak hours.

Findings

Cities and the world are in the midst of a massive urban transition, unlike that of any other time in history. Along with the benefits of urbanization, socio-economic and ecological ills adversely affect the city system and its population. These include problems like lack of access to safe drinking water, slums sprawl, inadequate housing and traffic congestion. Although urban economic problems defy easy categorization, they can be grouped into two broad classes, those associated with poverty and those associated with economic growth or affluence. The two often coexist within the same city.

Unbalanced urbanization and the emergence of “Hom Urbanicus” have seriously challenged achieving urban economic sustainability at the city level. It believes this challenge could primarily be addressed with the help of integrative policy measures and proper research. The key, therefore, is to link the local community with urban planners and decision-makers closely, and it must be integrated and embedded in a delineated policy and action framework. Improve governance and institutional mechanisms by reflecting multiple levels of responsibilities and benefit transfers, involving multistakeholder and participatory processes to promote an integrated approach to sustainable urban planning with both a spatial development perspective and physical planning dimension.

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