

A Local Chronicle of the Smart City Enterprise: *Case Study of New Town Kolkata, West Bengal, India*

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Abstract

The Smart City Mission (SCM) in India is one of the highly publicized projects that focus on the 'digital transformation' of cities and towns across India. However, policy analysts and scholars have raised questions and concerns regarding such a transformation. The question is whether the SCM fulfills the pressing needs of towns and cities or not. New Town Kolkata is one of the cities in West Bengal which initially adopted the SCM but later rejected the program. They adopted a new state-funded project called Green City Mission. Within this context, it tries to focus on the shortcomings of the SCM and how cities in a peri-urban interface like New Town Kolkata are transformed and encounter different challenges. In addition, this paper also analyzes the newly announced Green City Mission of West Bengal and tried to understand the differences and similarities between both projects. The paper reveals that such projects failed to create employment opportunities not only for the people of the town but also for the people of the surrounding villages.

Keywords: Smart City Mission; Green City; Digital Transformation

Introduction

It is almost eight years since the SCM in India was introduced. Many cities participated in the Mission, but some cities withdrew their application after a few rounds of the selection process. Four cities in West Bengal had participated up to the second round of selection but withdrew their candidature soon after. The State administration has rejected the Centre's 'Smart City Project,' opting instead to create a number of cities under its own 'Green City Project'. New Town Rajarhat, a Kolkata suburb that also was a part of the Centre's Smart City Project, will now be developed as India's first 'Green City'.

A smart city plan for individual cities in West Bengal was made based on citizen interaction, suggestions, and public opinion. It is noticed that there is no unanimous vision for the proposed smart city because each city represents a different character altogether, so the requirements have to be different. Some terminologies used in

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the visions have broader connotations, like 'sustainability' and 'smart', while some are very specific. It is important to note that the proposed smart city of Bidhannagar wants to attract a “new creative class” (Karmakar, Chatterjee, and Basu, 2017). It raises some crucial questions like who is the “new creative class”; what will happen to those who are not in the purview of the so-called 'new creative class'? The other concerns include whether will it create a barrier to the migration of traditionally skilled people and whether it will be inclusive.

Within this context, this paper tries to focus on the shortcomings of the Smart City Mission and how cities in a peri-urban interface like New Town Kolkata are transformed and encounter different challenges. In addition, this paper also analyzes the newly announced Green City Mission of West Bengal and tried to understand the differences and similarities between both projects. To analyze the paper, several official documents are used, including the land use plan of New Town Kolkata, environmental impact assessment plan, concept plan of New Town Kolkata, smart city project proposal, green city mission plan, etc. Socio-economic census data from 2011 and ESRI image 2020 are also used.

After the introductory section, the following section identifies some concerns and challenges of the Smart City Mission. The third section explores the transformation of New Town Kolkata and its challenges. The fourth section analytically discusses the Green City Mission and its similarities and differences with the Smart City Mission. Thereafter, a conclusion was made based on the above findings.

Concerns and Challenges of the Smart City Mission (SCM) in India

After the announcement of Smart City Mission (SCM) as a nationwide project in December 2014, policy experts argued that the project in its present form will promote skewed development rather than a comprehensive as well as inclusive urban future (Srinivasan, 2015). It came as part of Prime Minister Narendra Modi's initiative to capture the public imagination and as a continuation of the 'Gujarat Model' of development. The new scheme is focused on promoting not only new satellite towns but also modernizing existing cities.

The scheme would include upgrading social, institutional, and health infrastructure in existing cities. Moreover, it is a direct effort to reduce the pressure on metro cities and its 'solution' initiatives are based on technology. It is because the current government noted in its manifesto that “our cities should no longer remain a reflection of poverty and bottlenecks. Rather, they should become symbols of *efficiency, speed, and scale*”. However, it may sound vague, but initially, the scheme was able to capture the imagination of the public and projected the narrative of 100 new (smart) cities onto public perception (CFA, 2019).

Critics noted that the last seven years of the SCM implementation has been usually dubious, fragmented and at best chequered. Smart cities have been separated from the reality and needs of people's lives and have finally been packed with "development" rhetoric. Moreover, it is argued the concept of smart cities in

the Indian context is vague enough to overcome regional and regional differences and can be broadly described as a tool for considering cities as "more competitive". The lack of fixed meaning using catchphrases such as inclusivity and sustainability has made it possible to convey SCM as a human-friendly reform scheme.

Many urban experts doubt whether the initiative is addressing the real problems facing too many people in India's cities or not. It is noticed that the "Smart" city proposal offers a variety of technical solutions for better cities, but cannot outline a comprehensive vision that takes into account the lack of basic services in many Indian cities. It fails a lot in that respect. In fact, experts also opine that a large part of our urban population is living in really dismal conditions, without basic services and smart city proposals fail to address that (Chatterjee, 2017; Chaudhry, 2017).

It is also highlighted that the Smart Cities Mission for promoting greater urbanization but fails to address structural causes of migration: an agrarian crisis, drought and floods, a lack of jobs in rural areas and failed land reform. Scholars also highlighted that people must be the focus of government intervention instead of technology. Technology development is very important and can bring about positive changes, but they should be based on an integrated approach rather than an apparently exclusive platform.

The SCM requires each city to create a Special Purpose Vehicle (SPV) under the Companies Act 2013. This is a limited liability company that manages the implementation of mission-based projects. This SPV plans, evaluates, approves, and releases funding to further implement, manage, operate, monitor, and evaluate smart city development projects in the cities involved (Kummitha, 2019). Due to the lack of know-how and resources in the existing urban local bodies (ULBs), it is possible under an alibi to ensure the implementation of the program.

Therefore, SPVs are given tremendous power under the SCM, which was originally (constitutionally) the "rights and obligations" of the local municipality. The SPV, which is clearly harmless and even said to be useful to the city's administration, is in direct conflict with the 74th Constitutional Amendment Act, which transfers planning and management functions to ULB. Ambiguous relationships between elected institutions and SPVs further complicate matters, as SPVs are usually run by state-level officials who run the show (Sandhir, 2016). This is the exact opposite of the SCM's goal of "strengthening local governments". So, the next section tries to capture the transformation of New Town Kolkata and the non-adherence of SCM.

1.1 Shifts from Smart to Green City Mission: Case of New Town Kolkata

New Town Kolkata is a planned newly developed satellite city on the north-eastern fringes of Kolkata. The city is 13 years old, being born with the enactment of the New Town Kolkata Development Authority (NKDA) Act in 2009. The township project was officially announced by the government of West Bengal on the 1st of June 1995. To accommodate the population growth in the Kolkata Metropolitan Area (KMA), the State Government conceived the development of the New Town Project at Rajarhat

(NTP) in the early nineties to provide land for the construction of houses for a population of 7.50 lakh for all income groups with emphasis on housing for economically weaker sections and lower income groups as well as developing a new Business Centre.

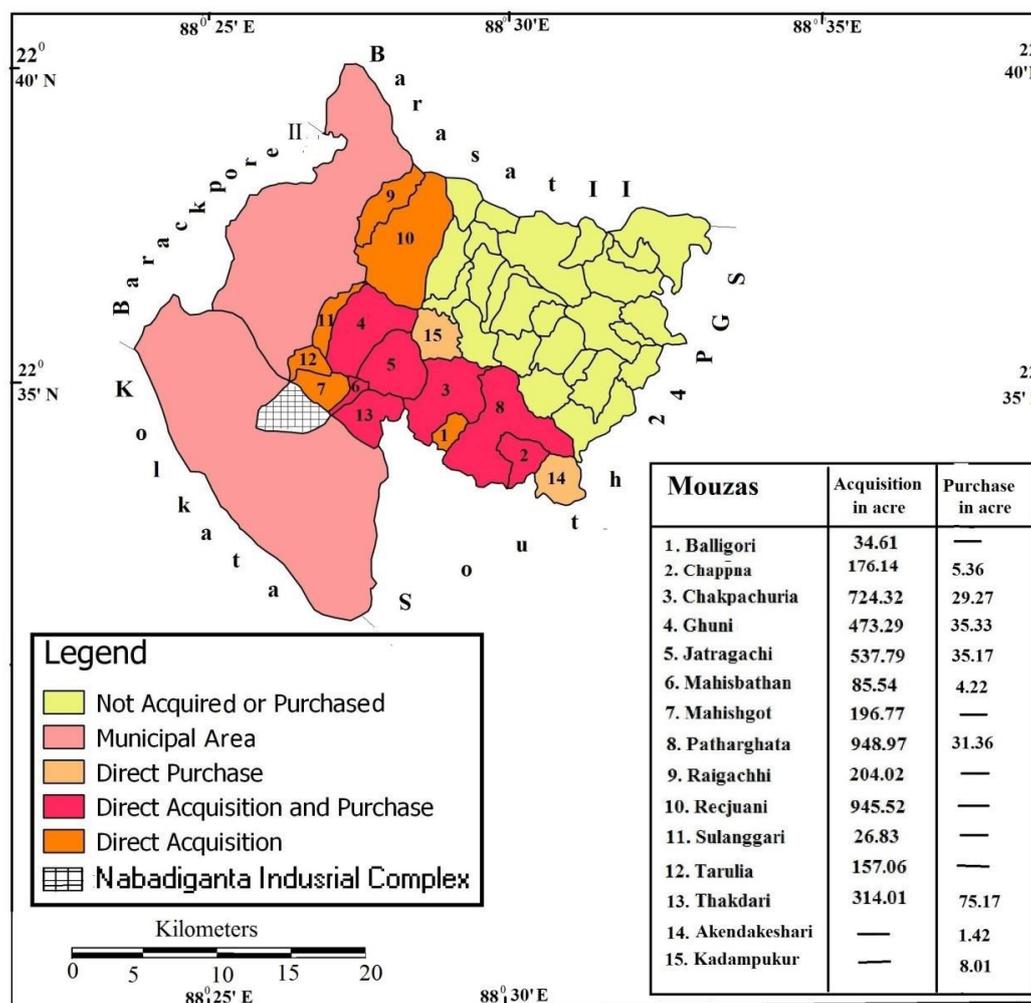
After the announcement of the Smart City Mission in 2014, the state government submitted a proposal to the center to declare New Town Kolkata as a 'smart green city'. For this purpose, NKDA submitted a 16-point initiative including a vehicle-tracking system for solid waste management. It is also worthwhile to remember that the United Progressive Alliance (UPA) government at the center declared this town as a 'solar city' (Chakraborty, 2014).

The vision statement for the smart city project of New Town Kolkata highlights that "New Town Kolkata - a future-ready global services hub attracting the best talent with a fine work-life balance" (Ministry of Urban Development, 2016). It is apparent that New Town Kolkata is projected as a global business center to attract global capital and compete with other cities. Citizen feedback reveals that walkability and transport are the main areas of intervention, followed by safety and security, the economy, and employment and water. The lack of adequate job opportunities for the residents or future property owners of New Town Kolkata is one of the main issues highlighted by the citizens.

New Town Kolkata is one of the eastern peri-urban planned towns where villages along the boundary still exist since only agricultural land has been acquired for this project. This paper analyzes the socio-economic condition of those villages and settlements existing in and along the boundary of the 'smart city' New Town Kolkata. It also takes into account the life of the people living in those spaces. Socio-economic census data has been used for the analysis as well as some case studies presented to show the reality of the people living in and around the so-called 'smart city'.

From the overview of the above Figure 1 below, it is evident that land procured for the project was in two ways, i.e., direct acquiring and purchase from the land owner. It is relevant here because this town is at its inception stage and the Smart City Mission projected the mission as 'inclusive'. Therefore, a narrative of inclusivity can be easily caught through the lens of different stakeholders living in and around this so-called smart space. These mouzas are under the jurisdiction of four Gram Panchayats, namely Chandpur, Jangrahatiara-II, Patharghata, and Rajarhat-Bishnupur II. There are a total of 32 villages under these three Gram Panchayats. Out of 32 villages, the land was procured from 15 villages. People of these villages have given their agricultural land for the development of the township project.

Figure 1: New Town Kolkata land procurement and its surrounding space



1.3.1 Socio-Economic Transformation and its Implications

Economic and social changes in the second half of the 20th century transformed the nature of the countryside. Aspects such as peri-urbanization, peri-urban agriculture, urban expansion, and associated areas, and environmental transformation become fundamental in urban studies. Due to such transformation, peri-urban people are encountering a complex situation because of the degradation of their activity and the transformation of their peasant condition. This is one face of the *New Rurality* characterized by the unequal access and use of urban-rural peripheral spaces (Ávila-Sánchez, 2011).

Aguilar (2006) explains the process and timing of rapid changes in the peri-urban areas of a city compared to the other areas of the city. Huge constructions transform completely peripheral areas due to their magnitude: transport infrastructure, vast housing developments (formal and informal), the emergence of industrial sites, and corporate business management impact and change the use of large portions of agricultural land and its productive pattern. However, very few

papers investigate the socio-economic as well as environmental challenges encountered by the peri-urban area in the context of a smart city. This section of the paper argues that though there is a change in the peri-urban economy, the income and unequal access to material resources is remarkable.

The Indian socio-economic census 2011 has created four categories of households in rural and urban areas. These categories are based on some indicators² proposed mainly for different government schemes, like the National Social Assistance Program (NSAP). These categories excluded households, including households, deprived households, and zero-deprived households. From these categories, a glimpse of rural household status can be depicted. Villages in and around the New Town Kolkata can be looked at from this perspective. Figure 2 shows the different categories of households. Among the four Gram Panchayats, Jangrahatiara-II has the maximum number of households, followed by Rajarhat-Bishnupur II, Chandpur, and Patharghata, respectively.

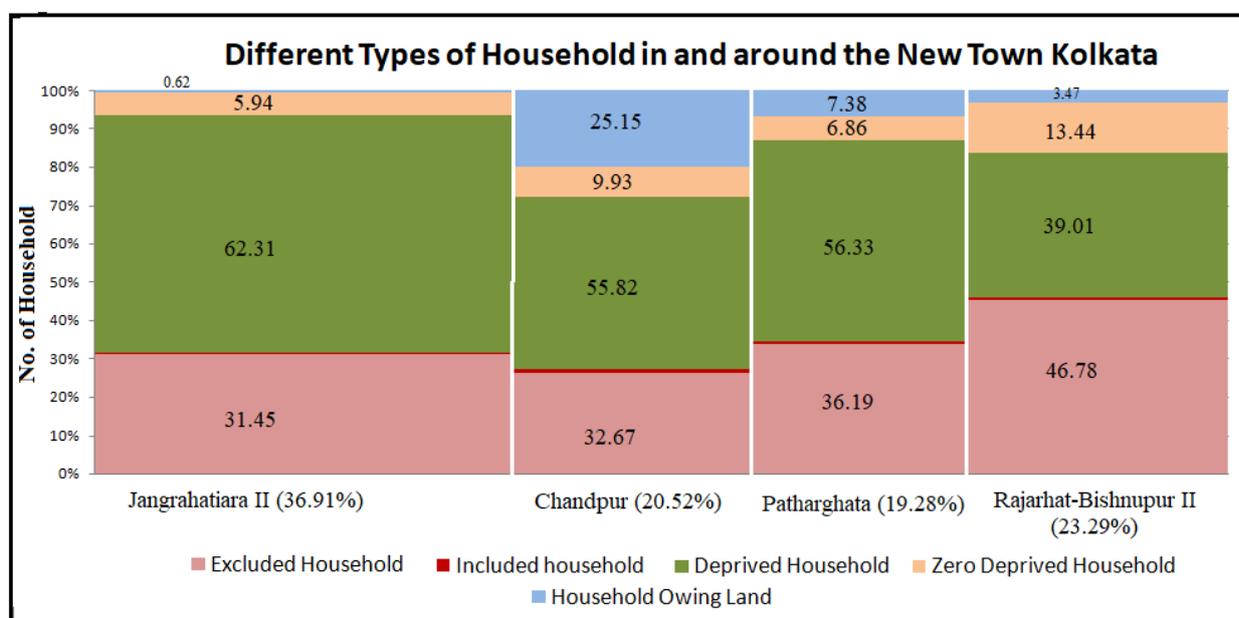


Figure 2: Types of Household In and around New Town Kolkata

Source: Socio-Economic and Caste Census, 2011

From the overview of Figure 2, it is apparent that there are a large number of households under the deprived category. Jangrahatiara II *Gram Panchayat* has more than 62% of households in the deprived group, followed by Patharghata (56.33%) and

² Households with only one room, *kuccha* walls and *kuccha* roof, no adult members between the ages of 16 to 59, Women headed households with no adult male members between 16 and 59, Household with disabled members and no able-bodied adult member, SC/ST households, Households with no literate adult above 25 years, Landless households depriving a major part of their income from manual casual labour. All these indicators are for deprived households. Non excluded household facing one or more deprivation; and households not reporting on any deprivation criteria but considered for deprivation (Zero Deprivation).

Chandpur (55.82%) while Rajarhat-Bishnupur II (39.01) Gram Panchayat has the lowest number of deprived category household. Jagrahatiara has 50.48% landless households and it is the highest among the four Gram Panchayat. Patharghata and Chandpur have 46.86% and 40.87% landless households, respectively. Rajarhat-Bishnupur II Gram Panchayat has 31.92% landless households. This implies that these landless households are deriving a major part of their income from manual casual labor in the smart city. Broadly, the main source of household income of these Gram Panchayats is categorized into seven types.

Table 1: Households Involved in Different Types of Activities

Types of work	Jangrahatiara-II	Chandpur	Pathargahata	Rajarhat-Bishnupur I
Cultivation	0.41	15.00	5.40	1.24
Manual Casual Labour	58.36	53.31	61.08	39.64
Part-time or Full-Time Domestic Service	3.08	2.52	3.38	4.75
Foraging Rag Picking	0.06	0.40	0.41	0.10
Non-agricultural Own Account Enterprise	3.52	2.31	5.81	9.44
Begging/Charity/ Alms collection	0.37	1.70	0.93	0.95
Others	34.20	24.75	23.00	43.87
Total Household	12135	6747	6339	7659

Source: Socio-Economic and Caste Census, 2011

From Table 1, it is very clear that most households are engaged in manual casual labor and very few households have been able to develop a non-agricultural own account enterprise. At Patharghata, the number of households engaged in manual casual labor is 61.08. In Jangrahatiara and Chandpur, the percentage of households engaged in manual casual labor is 58.36% and 53.31%, respectively.

In Rajarhat-Bishnupur II *Gram Panchayat*, the lowest number (39.64) of households engaged in manual casual labor. Households engaged in part-time or full-time domestic service range from 2.52% to 4.75%. This is because the township is still not fully populated as expected in the policy documents. Therefore, demand for domestic service is very low in the township. Apart from this, a large number of households engaged in other activities that are miscellaneous in character.

Descriptive statistics of economic activities further reveal several things about the nature of job availability and people's engagement in different jobs.

Table 2: Descriptive Statistics of Labor Force Employed in Selected Activities

Economic Activities	Mean	SD	CV	Median	UQ	LQ	Minimal
Cultivation	46.84	58.89	125.71	25.50	59.00	5.75	2.00
Manual Casual Labour	549.59	583.21	106.12	383.50	665.75	215.00	79.00
Part-time or Full- Time Domestic Service	35.06	39.06	111.41	19.00	67.50	6.75	0.00
Foraging Rag Picking	2.13	3.27	153.89	0.50	2.50	0.00	0.00
Non-agricultural Own Account Enterprise	52.31	81.18	155.19	19.50	62.25	1.00	0.00
Begging/Charity/ Alms collection	9.13	7.41	81.24	7.00	12.25	5.00	0.00
Others	332.44	405.26	121.90	186.50	366.00	77.25	20.00

Source: Socio-Economic and Caste Census, 2011

The median values for all seven economic activities indicate the median occupational structure of all the villages in and around the township. Moreover, it also shows that the highest numbers of median workers are engaged in Manual Casual Labour. The minimal value for each economic activity is the smallest number of persons employed in that group in any village; it might be assumed that this is the minimal number of workers in each occupation group required to make a village viable.

Households' monthly income also reflects the economic conditions of the landscape. In Patharghata and Chandpur *Gram Panchayat*, more than 80% of households have a monthly income is less than Rupees 5000. In the case of Jangrahatiara II, more than 69% of household income is less than Rupees 5000 and in Rajarhat-Bishnupur I, more than 62% of households' income is less than Rupees 5000.

Table 2: Households' Monthly Income

<i>Gram Panchayat</i>	Less than Rs. 5,000	5,000 -10,000	More than Rs. 10,000
Jangrahatiara-II	69.54	18.61	11.84

Chandpur	82.15	13.07	4.77
Pathargahata	84.28	12.16	3.54
Rajarhat-Bishnupur I	62.64	23.18	14.16
Total Household	12135	6747	6339

Source: Socio-Economic and Caste Census, 2011

In Jangrahatiara-II and Rajarhat-Bishnupur I, more than 10% of households earn more than Rupees 10,000 monthly. In Chandpur and Pathargahata, only 4% and 3% of households earn more than Rupees 10,000 monthly, respectively. The above Table 2 clearly reflects that from the time of inception, it has failed to provide not only jobs but also adequate income to the people who live close to the ‘smart space’ despite the city being projected as a ‘global business center’. In addition, the persistence of cultivation and casual labor in agricultural fields in the peri-urban interface is an expression of the *New Rurality*, which reflects a territorial relationship between cities and their immediate rural surroundings.

One of the possible arguments for the lack of jobs and employability would be the lack of education, skill, and training of the village population. This can be seen through the following Table 4. Education is one of the essential components to being part of the smart city as the various solutions are ‘technology based’. Therefore, education is the utmost requirement.

Table 4: Educational Scenario of the Villages

Category	Jangrahatiara-II	Chandpur	Pathargahata	Rajarhat-Bishnupur I
Illiterate	19.92	22.16	25.83	17.06
Below Primary	14.34	7.53	13.70	9.69
Primary	25.78	28.73	26.73	20.84
Middle	20.24	25.83	19.96	24.93
Secondary	8.79	8.25	7.83	11.53
Higher Secondary	4.34	4.03	3.46	6.97
Graduate or Above	6.01	3.34	2.29	8.03

Other	0.57	0.14	0.20	0.95
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Source: Socio-Economic and Caste Census, 2011

From Table 4, it is evident that more than 80% of the population of each *Gram Panchayat* do not have secondary and above educational qualifications. This makes people incompetent for higher-paid jobs that are supposed to be available in the smart city. However, it is important to highlight that occupational diversification in the smart city is less, which is reflected in the occupational engagement of the people.

Therefore, a policy of territorial intervention is in and around cities in the context of diversity (with tertiary activities, productive, educational, and recreational or ecotourism and environmental protection) that minimizes the adverse effects of urbanization and consumption of urban agricultural products. Agriculture should be promoted. It is important, this activity, which deviates from traditional agriculture, needs to be integrated into the territorial public policy.

Its practice should be promoted as an alternative to poverty reduction and as a contribution to community development. Bellet and Llop (2000) identify four services that urban centers offer to their rural surroundings: (i) specialized goods and services; (ii) greater social, economic, and cultural interaction; (iii) links to infrastructure networks that connect local communities with regional, national, and international communities; and (iv) public and government administration services through which local demands and needs can be channeled.

Satterthwaite and Tacoli (2006) propose four functions that can contribute to the development of rural areas where small and medium-sized cities are closely related (a) as markets of agricultural products; (b) as production and distribution centers of goods and services; (c) as centers for non-agricultural rural job growth and its consolidation; and (d) as attraction centers for rural migrants. They also added that the contribution of these functions to socially inclusive growth depends on existing social and economic structures in both urban and rural environments, their power relations, and development strategies at the national level (Satterthwaite and Tacoli, 2006).

1.3.2 Ecological Concerns over Township Creation

This section throws light on the changing land uses and ecological consequences encountered by the people of Rajarhat and New Town in particular. Conversion of agricultural land into urban land did not only bring economic change but also brought paramount environmental change. The environmental change includes the vanishing of agriculture and wetland ecosystems as a substantial part of the *mouza* were under wetland and ecosystem. Ecosystem services that the villagers used are at stake now. Not only has the acquired land been transformed, but the area which is not acquired is also transformed for the development of housing enclaves. Dhar et al. (2019)

studied the land surface temperature change due to changes in the land use in the Rajarhat block under which New Town Kolkata and surrounding villages are located.

They find out that from 1990 to 2016: 13 km² of vegetation cover was lost due to urbanization; 9.3 km² of open land was converted to agricultural land and open fields/parks; 1.4 km² of aquaculture ponds was converted to tree cover/scrublands, and 1.45 km² of lakes/ponds filled up. Furthermore, due to this change in land-use pattern over 26 years, LST has increased by 0.94°C. The urban-heat-island (UHI) phenomenon has also increased. In the following map in Figure 3, it is clear that there are still a few patches of agricultural land that exist outside the smart city of New Town Kolkata. Likewise, only a few artificially created large water bodies exist within the township.

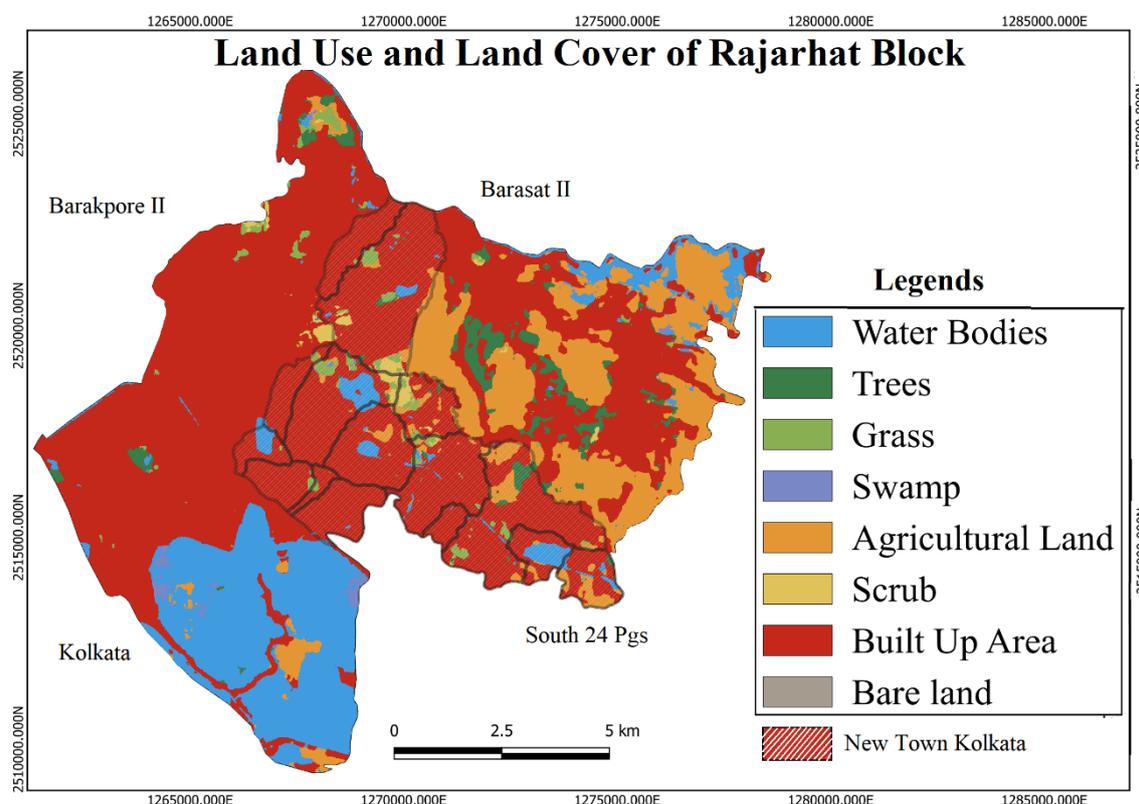


Figure 3: Source: Reproduced by the author from ESRI land use map 2020

It is to be noted that most of the converted agricultural land within and outside the juridical boundary of New Town Kolkata are now transformed into several housing estates like Sanjeeva Orchard, Sukhobrishti Township, Unitech Uniworld, etc.

For example, in Thakdari *mouza*, apart from the East Kolkata Wetland³ (EKW) area (35.60 acres approximately) within the village, *mouza* had a 1.62-acre wetland area and two big *Beels*, whose size is 0.69 acre and 0.11 acre. Out of 1.62 acres of wetland in the village, 0.7 acres of land have been directly purchased by WBHIDCO

³ East Kolkata Wetland is a Ramsar site so its legally protected from any type of conversion

for the New Township Project (Government of West Bengal, 2013). In total ten ponds and two small water bodies compared to a pond i.e., *Doba* has been filled up for purposes (Karmakar, 2015). However, for the permission of any project, the state government created a legal body called State Level Expert Appraisal Committee (SEAC) and they look at the various aspects of the project including the environmental aspects.

The Committee proposes some stipulated conditions for environmental clearance as per the provision of Environmental Impact Assessment Notification 2006 and the subsequent amendments like water bodies if any, should not be lined and their embankments should not be cemented. The water bodies are to be kept in natural conditions without disturbing the ecological habitat. No existing water body, if any, should be encroached/relocated/reshaped without prior permission of competent authorities, and the unit should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Rules, 2007.

The proponent should undertake the plantation of trees over at least 20% of the total area. No trees can be felled without prior permission from the Tree Cutting Authority constituted as per the West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006, and subsequent rules (GoWB, 2012). It is worthwhile to mention that these laws are applicable within the boundary of New Township, but outside the boundary, especially in peripheral villages, various housing enclaves are formed ignoring such environmental concerns.

1.4 Non-adherence to the national SCM and the floating of the Green City plan

As noted earlier, New Town Kolkata is a recently developed major planned satellite township located in the peri-urban areas of Kolkata which participated in the SCM competition in 2014. Out of three stages of the competition, New Town Kolkata participated in two stages of the competition. In fact, they also organized a program for stakeholder engagement. But in the month of August 2016, the state government rejected the smart city project and decided to develop selected cities along the line of its own 'Green City Project' (Ghosal, 2016).

According to government officials, there are two reasons for this move. The primary reason is the "skewed nature of investment from the state and the Centre" and the second reason is the mandatory collection of water taxes in smart cities (*Financial Express*, 2016). In the first public appearance after the 2016 election victory, the Chief Minister said the smart city's "ideas" and "theories" were "wrong." She argued that spending Rupees 500 million on smart city projects is not recommended and added that the money should be spent according to the state government's own understanding (Ghosal, 2016). It is a 7-year running program in which, except for West Bengal, all the states and Union Territories of India are participating and have nominated at least one city for the Smart Cities challenge.

1.4.1 Components of the Green City plan in comparison to SCM

After denouncing SCM, the government of West Bengal introduced Green City Mission (GCM) in the state. The two objectives of the GCM are to build an ‘environmentally friendly, sustainable, livable, an energy positive, safe city’ as well as to focus on the ‘creation of jobs and affordable housing for the poor’. The component of the program includes greening, blueing, and cleaning the city, building an energy-positive, safe, secure, technology-efficient city (GoWB, 2017).

Moreover, they also focused on livelihood generation programs as well as innovation efforts. Under the greening plan of the city, they stressed on projects like urban afforestation, park creation, and plantation along the medians of the road. In the case of the blueing plan, they focused on the conservation of water bodies, waterfront development, and water-based recreation. The concept of an energy-positive city is visualized through the installation of LED lights and incentives for green buildings. They emphasized battery-operated vehicles and eco-friendly parking spaces as well as CCTV installation at important locations under the program.

Initially, the state government invested Rupees 650 crore in GCM (Laha Roy, 2017). It was decided that Rupees 50 lakh each for all the 125 Urban Local Bodies (ULB) will be allotted (Ghosal, 2016). On July 25th 2018, the government of West Bengal informed the assembly that they spent Rupees 1372 crore (*Business Standard*, 2018). Since the start of the Green City mission, up to 3109 projects have been approved at an estimated cost of Rupees 1605.89 crore. Of these, Rupees 806.45 crore were released to ULB authorities primarily in the areas of LED street lights, high mast lighting, water body restoration, green space development, and various projects such as seating arrangements, bus stops, communal toilets, and water ATM, etc.

There are some basic differences between GCM and SCM. SCM proposed and tried to set up a new ad hoc structure within the ULB to implement the program, which is termed as an ‘extralegal’ body by the various stakeholders. On the contrary, GCM relies on the existing ULB’s elected representatives for the implementation of the program. Moreover, smart cities focused on area-based development programs, while, green city missions stressed city-wide project development and implementation.

Conclusion

This paper made an attempt to understand the challenges and concerns faced by the SCM in India. The SCM is still running, but policy-makers and scholars have raised some crucial questions regarding the fulfillment of the purpose of the projects. Critics argue that the implementation has usually been dubious, fragmented, and at best chequered. Smart cities have been separated from the reality and needs of people's lives and have finally been packed with "development" rhetoric. The peri-urban interface of New Town Kolkata shows that the area has been ecologically and economically transformed but it produces unequal access to resources and spaces in the townships. Moreover, the lack of education among the peri-urban population

created limited access to the job market. After the rejection of the SCM, New Town Kolkata adopted the green city mission, but since the mission is not directly linked with any livelihood mission as a result, it did not produce any job opportunities for people in the peri-urban interface, who lost their livelihood due to the transformation of space. Therefore, there is a difference between the existing reality and the visualization of the program.

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