Developing Sustainability Rating Criteria for emerging urban areas in India

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Abstract— It is an established fact that 'going green' is the only way forward but how does one create a 'liveable, sustainable, urban neighbourhood' in an existing city? Not only do we have to address the issues of environment, energy & resources – but it will also be necessary to talk about social equity and the economics of the city. It is also important to empower the citizens with the right information and standards that 'green cities' should be following – hence Sustainability Rating Criteria should be relevant to the context; in our case – they need to be adapted to the specific needs of Indian cities, their suburban areas and their administration. This paper first studies and analyses the existing Green Rating systems for Urban areas, across the world. Then it prioritizes and re-structures these rating criteria for Indian urban context and proposes a framework for emerging / existing urban areas in India, which can be used as a guide by urban planners, local bodies, policy makers as well as urban citizens and self-help groups. Instead of blindly aping what the western world has done for their Urban Green Rating systems, it would be beneficial to conduct an inquiry and study of our specific needs and priorities – and then develop these criteria that are specifically suited to our cities, the people who inhabit them and the systems that operate and administer our urban areas.

Index Terms— green rating criteria, india, sustainable cities, urban planning

1 Introduction

Cities are responsible for the depletion of natural resources and agricultural lands, and 70% of global CO2 emissions. There are significant risks to cities from the impacts of climate change in addition to existing vulnerabilities, primarily because of rapid urbanization. Urban design and development are generally considered as the instrument to shape the future of the city and they determine the pattern of a city's resource usage and resilience to change, from climate or otherwise.

When one looks around at our towns and cities and identifies the things that are going wrong with urban life in India, there are several aspects to it. But there are some fundamental issues with the way our urban areas are planned, developed, and lived in, that have caused significant degeneration of urban life in Indian towns and cities.

"…the great urban migrations of the last forty years, combined with the breakneck pace of technological development, has produced a scenario which confuses the contemporary city planner and reduces the planning process to an almost meaningless exercise. The banality characterising even the planned environment is the result of the loss of meaning in the contemporary urban situation." (1)

The reasons of why our urban areas are in a mess are quite well-researched and documented. As an emerging economy that thrives on its large population – people are at the root of most of the positive and negative aspects of our society and nation. As more and more people look for jobs, education, enrichment and a better life – they are drawn towards areas which offer these opportunities.

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Hence our large cities become magnets for smaller cities; small cities become centres of attraction for towns and villages, and so on. Throughout the several five-year plans that have been envisioned and implemented in this country – the focus has never been on making the villages richer, stronger and more vibrant. Rural economy and lifestyle has always been left to be 'aspirational' – wanting to move towards cities. Despite all the talk of Panchayati Raj and the importance of the village – in reality, that has never become a priority for the country's leadership.

Of course, there are factors of economics at work here too – the natural pattern of business development, societal evolution and basic human psychology – all have played a role in why India's cities have developed so haphazardly – and why rural migration is still as big an issue as it was a few decades ago.

Now that we know what all is wrong with our cities – and thousands of them are spread across the whole country – we need to find the best means and measures to improve our urban quality of life. One cannot wish them away and hope to start afresh – by designing model, utopian cities on greenfield land. There may be a new capital here and there – or a new business district or township that can have that luxury – but by and large – Indian urban planners and city designers will have to focus on how to improve and regenerate 'existing' urban areas with the set of limitations that one will come across everywhere.

These limitations will not just be physical or geographical in nature, but also in the mindset of people, in our laws and regulations, in the working of our society, in our business models, etc. With newer innovations, technology, materials and ways of thinking in urban planning and habitat design – we will have to raise several fundamental questions – if we are to successfully convert our urban areas into something that we

can be proud of.

How do we 'perceive' our cities?

How do you 'plan' our urban areas and its infrastructure?

How can urban areas be 're-engineered' or 're-generated'?

How do we operate and run our cities?

How do we truly involve and empower the citizens of our cities?

As urban planners and city designers, are we still prioritizing quality of life and richness of experiences? Or has planning just become an engineering / technical exercise of land-use, revenue, transport arteries, plotting, zoning, etc so that cities 'work' properly, so that they are 'efficient' engines of the country's economy?

"The city in India is more than a technocratically efficient system for exchange of goods and services. It is more appropriately understood as an expression, in physical as well as emotive terms, of the civilisation of the people." (2)

2 Understanding the Context

2.1 Indian Urbanity

Likewise, when we look at our cities, how do we perceive them? Are we still embedded in the colonial way of looking at settlements – are have we really understood the essence of "Indian urbanism"?

"we must acknowledge that modern town planning in India did not evolve out of a pre-existing ideology as it did in the west; what passes for such an ideology in India can only be inferred from the town planning laws which were enacted by the colonial government…. on account of the fact that modern town planning had no roots in the country, whereas in the case of architecture the links with tradition were more organic and direct. In any case, we find that the ambivalence that town planners experienced in their public and private preferences, was generally settled in favour of 'western' models in their work, perhaps in the belief that they represented a 'modern' option. In the face of choice between a 'stable' west and a transforming east, the town planner opted for equilibrium and certainty." (3)

At the same time, there are also the constantly evolving and ever-morphing under-currents of society, religion, regional & national politics, etc. that further complicate the understanding of our cities. As urban planners – one can never be sure that a certain decision will work exactly as intended – there may be several modifications to it when executed at site – people may choose to modify it, alter it or reject it altogether. One can never really be sure of how behavioural patterns of people may manifest themselves in the way the use their urban environments.

"The singularity of our urban condition derives from the fact that our society has widely plural characteristics, temporally, culturally and economically. Such a condition does not exist in other societies, old or new, and while we may gain insights through cross-cultural references, it would be futile to adopt models from other contexts. The complexity of the situation can be gauged by the fact that in town planning terms, not one, but several disparate circumstances need to be reconciled simultaneously: neat suburban developments with homogenous population and the persistence of the heterogeneous 'chaotic' traditional settlements; the city of the 'haves' and the city of the 'have-nots'; Lutyens' baroque city and the qasba; the automobile and the bicycle; and so on. There are no models to conceptualise such a heterogeneous city anywhere, so Indian town planning will have to become self-referential. In spite of the complexity inherent in this perspective, there are promising clues, which need to be explored further." (4)

With the blossoming of the 'digital' age and availability of fast and constant communication and information – the concepts of urban planning may also need to be reviewed now. With the digital economy – where will we find the distinction between the 'urban' and 'rural'? If all the facilities and infrastructure of urban life are available at the villages – how will it affect migration? Within the virtual world – it wouldn't matter where you are physically – in the city or in the village – everyone would access the same things – any time, all the time. So education, business, healthcare, lifestyle, entertainment, etc – would not remain strictly linked to the built environment only. How do we then design our urban and rural environments?

While a lot has been said about the design and planning of cities – an equally important aspect, if not more, is that of how our cities are run / operated. The governance and administration of cities and its services is a vital part of how we feel about our urban surroundings. Even the best laid plans and designs can be rendered useless if they are not implemented and administered incorrectly. With the focus on transparency, citizen involvement, local body empowerment and e-governance – Indian urban areas are going to see a huge shift in the way they are run. Increasing role of private and semi-private entities, involvement of international agencies and funding from market has made urban governance and management, a very important subject.

However, the systems and mechanisms of governance in our cities are far from perfect; urban local bodies and their administrative heads still do not have significant power and authority. They are still bound by several local social and political factors and not totally and completely committed only the city and the citizens. We must ask ourselves – where does the real 'power' to govern our cities lie?

Are the administrators empowered enough?

Are the citizens powerful enough?

Tackling such difficult issues will help us overcome many of the hurdles we face in making our developing our cities into better environments.

2.2 Holistic and Sustainable Development

That is where we come to one of the most critical questions underlying the whole discussion;

What do we consider as 'development' or 'growth'?

In the post-liberalization and globalization phases of Indian society, growth and development have been the buzzwords - but one feels that they have been understood and executed (and ingrained in public psyche) in a very linear, non-inclusive and un-sustainable manner. Of course, it is easy to say this in hindsight – after several decades of 'growth & development' that the country (including its economy, environment and social fabric) has gone through. When this process was actually occurring, it might not have been so apparent to the participants – but one believes, that now we are at such a stage (as a society, country and as the entire human race on planet Earth), that it is fairly obvious that this approach was flawed and un-sustainable.

It is an established fact that being 'sustainable' is the only way forward – for all our future developments; buildings, systems, resources, cities; so the main focus of this study is definitely going to address that specific topic – of how to make our cities more green, sustainable, energy & resource efficient – *with a good life for its citizens*. But that is where the broader and larger perspective comes in;

What is a 'good life' in our cities?

Who do we include as 'citizens' of our cities?

There is little doubt that urban planning is very complex, multi-faceted and quite unpredictable (in terms of its desired results) – which is why it involves sociologists, economists, engineers, geographers, geologists, designers, etc. – different disciplines, people with lots of technical expertise, vision, and foresight.

It is equally true, that very few urban planning projects in Indian towns and cities go through the due processes and rigours of how urban planning should actually be done. Yet, one cannot but reflect on how inadequate and inefficient we have been in the envisioning, designing, making, and working of our cities.

Since its inception, sustainability has primarily been an ecological concept. However, during the course of its evolution, the scope of urban sustainable development has widened to incorporate economic and social dimensions, primarily due to the increasing body of knowledge on the impact of urban form (e.g. density, land- use, urban layouts) on a range of sustainability indicators, as well as to address societal urban practices linked with sustainability dimensions that result in undesirable urban trends.

In this context – how does one create a 'sustainable city' or a 'liveable urban neighbourhood'?

Not only do we have to address the issues of environment, energy & resources – but it will also be necessary to talk about social equity and the economics of the city.

That would be 'holistic and sustainable growth' in the true sense – creating a cities that are equitable, democratic, socialist, secular and federal – terms that find a place in the very foundations of this country – in the Preamble to the Constitution of the Indian Republic. The only concern that one finds missing here is that towards our planet – towards the Environment. When all these come together – that would be 'sustainable' in the true sense.

Migration, unemployment, exploitation, increased crime, pollution, social unrest, violence towards women, lack of cleanliness, extreme density, traffic snarls, road rage, urban flooding, lack of health & hygiene, depleting water sources, adulterated food produce, etc. – are all connected with each other. One cannot be addressed without considering the other. It would not be too far- fetched to say that in some way or the other – all these problems can be addressed and minimized by adopting a truly 'sustainable approach' towards urban planning.

"The economic, social, and environmental planning practices of societies embodying 'urban sustainability' have been proposed as antidotes to these negative urban trends. 'Urban sustainability' is a doctrine with diverse origins. The alternative models of cultural development in Curitiba, Brazil, Kerala, India, and Nayarit, Mexico embody the integration and interlinkage of economic, social, and environmental sustainability. Curitiba has become a more liveable city by building an efficient intra-urban bus system, expanding urban green space, and meeting the basic needs of the urban poor. Kerala has attained social harmony by emphasizing equitable resource distribution rather than consumption, by restraining reproduction, and by attacking divisions of race, caste, religion, and gender. Nayarit has sought to balance development with the environment by framing a nature-friendly development plan that protects natural systems from urban development and that involves the public in the development process. A detailed examination of these alternative cultural development models reveals a myriad of possible means by which economic, social, and environmental sustainability might be advanced in practice." (5)

2.3 Citizen Engagement and Empowerment

This brings us back to the beginning of the discussion – are we putting 'people' at the centre of everything? What needs to be done so that our cities are shaped by the power of the people who inhabit them? The empowerment of the urban citizen and the feeling of 'ownership' that the citizen would have towards his or her locality / area / city can do wonders. Many of today's urban problems occur because people do not feel that they belong to the city; that they are responsible for their city – this is partially also because a lot of urban inhabitants are migrants from other places. But even after staying in a new city for a few years – that feeling of pride and ownership is not generated. This leads to indifference and apathy – which will surely and directly be reflected in the state of our urban

areas. Contrary to this, in the old city areas (walled city) one can clearly see the difference in the way people look at their locality; they consider it as an extension of their homes. This has a direct effect on the liveability and liveliness of the place. Even though facilities and infrastructure may be weak – yet these areas are cleaner, well maintained, safer, more inclusive, more vibrant and have a distinct character. All this is greatly influenced by the way the inhabitants of those areas relate to the physical environment. Cities are inherently dynamic and require the participation and engagement of their diverse stakeholders for the effective management of change, which enables wider stakeholder involvement and buy-in at various stages of the development process.

Hence it is very important to get people involved and engaged with their cities or the localities where they live. This has also emerged as a recurrent theme in the urban reforms undertaken in India. The 74th Constitutional Amendment Act talks about empowering the urban local bodies and the citizens. Schemes under JnNURM focus on having transparency and accountability. At various stages in the planning process, public participation is encouraged and in many cases, made mandatory also. Investment from markets and from citizens themselves is also becoming an increasing preferred mode of funding projects in cities. Credit ratings for urban local bodies and their services become benchmarks for getting funding – this is directly dependent on how the citizens perceive the services to be. Several such measures are being implemented to make citizens more important and involved stake-holders.

Thus, "sustainability" needs to be looked at in totality, as very succinctly expressed in *the paradigm of sustainable development (below) in Agenda 21 by Kahn:* (6)

Element	Criteria
Economic Sustainability	Growth Development Productivity Trickle Down
Social Sustainability	Equity Empowerment Accessibility Participation Sharing Cultural Identity Institutional Stability
Environmental Sustainability	Eco-System Integrity Carrying Capacity Biodiversity

3 Case Studies & Literature Review

Before proposing the various goals and measures for existing urban areas in contemporary India – it is only natural that one would study and learn from the various similar rating systems for cities or parts of cities or communities – that already existing in different parts of the world. There are several such rating systems focussing on Sustainability and Green communities / neighbourhoods / cities, but this study will restrict itself to four such rating tools (two from USA, one each from Australia & Japan).

As of now, the Indian Green Building Council (IGBC) has indicated that it plans to launch a Green rating system for Cities (7). They have listed down the benefits of green cities and the kind of developments that this rating system would cover – but the Reference Guide is still not available – indicating that it is still under development. Other than this there is no Rating system that looks at sustainability in urban areas (existing or new). There are tools for Residential Townships or Neighbourhoods within private control – but not for urban localities / areas.

For the purpose of this study, four rating systems have been reviewed to understand the kind of areas that they focus on – and what are the compliance measures and standards worldwide. The following rating systems have been reviewed as part of this study – the observations and inferences from this study have helped in defining the focus areas, goals and measures of the Rating tool proposed for Indian urban areas.

- STAR Community Rating System (STAR) – USA
- GreenStar Communities v1.1(GREENSTAR) - Australia
- LEED v4 for Neighbourhood Development (LEED ND) – USA
- Comprehensive Assessment System for Built Environment Efficiency (CASBEE) – for Cities, Japan

However, one must keep in mind that the context of these case-studies is very different from that of our existing urban scenario – hence a certain degree of localization and modification is extremely essential. Besides, the mindset of people, available infrastructure, industry best practices, level of implementation of rules, etc differs greatly.

3.1 STAR Community Rating System (STAR) (8)

Released in October 2012, STAR represented a milestone in the USA's national movement to create more liveable communities for all. The rating system's evaluation measures collectively define community-scale sustainability and present a vision of how communities can become more healthy, inclusive, and prosperous across seven goal areas. The system's goals and objectives provide a much-needed vocabulary that local governments and their communities can use to more effectively strategize and define their sustainability planning efforts. The intent of the rating system is to help communities identify, validate, and support implementation of best practices to improve sustainable community conditions. Built on the guiding principle of continuous improvement, STAR evolves to remain the leading framework for local sustainability. There

is recognition that the content of the rating system may change over time to embrace innovation, apply new research, or adapt to changing conditions in the field of community sustainability. Refer 'Appendix A' for an overview of the priority areas and credits covered under this system.

3.2 Greenstar Communities (v 1.1) (9)

Launched by the GBCA in 2003, Green Star is an internationally recognised built environment rating system. Developed by the Green Building Council of Australia in consultation with industry stakeholders, the framework consists of five principles that define a sustainable community in Australia and the rating tool sets benchmarks that enable community development projects to be assessed and rated against the framework's five principles.
Refer 'Appendix B' for an overview of the priority areas and credits covered under this system.

3.3 LEED ND (for Neighbourhood Development) (10)

In the year 1993, USGBC (United State Green Building Council) designed the first version of LEED; in order to transform the market for green buildings and then expanded quickly to urban development assessment. In 2007, the pilot version was launched and developed to include neighbourhood development (ND) in 2009-2010. It represented the specific version for assessing sustainability of urban design.
Refer 'Appendix C' for an overview of the priority areas and credits covered under this system.

3.4 Comprehensive Assessment System for Built Environment Efficiency (CASBEE) – for Cities (11)

The Japanese Sustainable Building Consortium (JSBC) is the developer of the environmental assessment tool for CASBEE as an environmental performance of buildings. after its appearance in 2001 as a sustainable assessment tool for office buildings. CASBEE-- UD was launched in 2012 as a joint product between the Japan Sustainable Building Consortium and the Japan Green Building to cover urban developments (town and city development).

This tool also focuses on evaluating cities from two perspectives; quality inside a city (Q = quality) and environmental load emitted from a city on the external environment (L = load), in accordance with the principle of the conventional CASBEE. Assessment items are carefully studied from various aspects in a comprehensive manner, whereas, in light of the urgent and important task of promoting a low-carbon society, L consists of items particularly focusing on a clear assessment of low-carbon policies of individual cities.

This is the only urban rating system that quantifies the performance in 'Present' and 'Future' scenarios separately – and gives points for both. The future performance is based on predictive standards.

This tool is highly calculative and attempts to make the quantification very precise and integrated across all aspects of time, place and performance. Refer 'Appendix D' for a summary of points included in this system; it involves a series of complex calculations (which are not indicated in this document)

4 Evaluation, Observations & Solutions

4.1 Identifying Core Concerns

From the overview of rating tools as above, one can extract some inferences as to how these systems have prioritized the concerns related to sustainability in the holistic sense.

Looking at the various topics / intents / Titles in each of the four rating systems – we can say that most of them address multiple concerns.
For eg. 'Access to Quality Transit' is a topic that address various aspects;

- It says that multiple options of transit should be made available and that they should be of a certain quality; hence it talks about Social Equity and Affordability
- It also emphasizes on Health & Fitness – as people can walk and / or cycle their way around – health and well-being will certainly impact the happiness of people and their economy as well.
- It also addresses GHG emissions, as shared / public transport facilities will reduce the fuel consumption and pollution - thus focussing on the Environment.
- Obviously, such facilities will save resources and money as well, and also generate local employment in the transit facilities – so it talks about Economy

So, in several such topics there may be multiple targets that are achieved; this can be understood and analysed by creating some broad 'concerns' under which we can then place the various topics.

The concerns proposed here would themselves fall under the three main E's of holistic sustainability – Equity, Economy & Environment.

FOCUS AREAS IN STUDIED URBAN GREEN RATING SYSTEMS

the 3 'e's of Sustainability	STAR - USA	GREENSTAR - AUS.	LEED ND - USA	CASBEE - JAPAN
ENVIRONMENT	NATURAL SYSTEMS	ENVIRONMENT		QUALITY - ENVIRONMENTAL ASPECTS
	CLIMATE & ENERGY			CO2 LOAD - ENERGY & NON-ENERGY SOURCES
EQUITY	EDUCATION, ARTS & COMMUNITY	GOVERNANCE		QUALITY - SOCIAL ASPECTS
	EQUITY & EMPOWERMENT			
	HEALTH & SAFETY			
ECONOMY	ECONOMY & JOBS	ECONOMIC PROSPERITY		QUALITY - ECONOMIC ASPECTS
UNIFIED / OTHER	BUILT ENVIRONMENT	LIVEABILITY	GREEN INFRASTRUCTURE & BUILDINGS	
	INNOVATION & PROCESS	INNOVATION	SMART LOCATION & LINKAGE	
			NEIGHBOURHOOD PATTERN & DESIGN	
			INNOVATION	
			REGIONAL PRIORITY	

4.2 Guidelines for 'Sustainability Rating Tool for Urban

Areas' (existing / emerging) in India (SRTUA)

Since this study intends to discuss and evolve a sustainability rating tool for urban areas of India – it would be worthwhile to first look at the mechanisms and processes that may be involved in developing, applying and evolving such a tool.

It is fairly obvious that such a rating system would be beneficial to the city and the citizens – and to the overall pursuit of holistic urban sustainability. What needs to be seen is how to make it most effective – in the context of our existing urban scenario – how to get the priorities and focus areas right and how to get them implemented. Considering the complex and multi-layered fabric that our urban society is, it will be helpful to spend time on laying down some guidelines and a framework of how this tool may work. Apart from the difficulties and constraints of our existing urban built environment, there will also be several social, economic, political and behavioural factors at play – which may significantly affect the success of such a tool.

4.3 Existing and Emerging Areas

This tool focuses on grading existing and emerging urban areas on various parameters of holistic sustainability. India has seen a lot of urbanization in the last few decades and these existing urban areas form a big component of our population today. If we are to make a significant impact – one has to look at these existing cities and towns and the new suburbs around them. New urban layouts on absolute greenfield sites are a rarity in India – and it is much easier to develop them in a sustainable manner, when starting afresh. Hence this tool focus mainly on existing areas or those areas whose main core is existing and the periphery is expanding rapidly. A variant of this tool can be generated for new areas also – based on the same concerns and goals that define this system.

Predominantly this rating tool would be applied to the typical mixed use areas / localities that we find around us in our cities and towns; comprising of mainly residential communities / colonies / societies mixed with shops, small businesses, offices, schools, clinics, urban service & govt. administrative buildings, parks, informal sector entities, etc. It is not focussed on any one type of land-use, because majority of our urban areas have the above kind of mix and that brings along its own kind of complexity – which is typical to Indian cities.

4.4 Defining the Coverage Area

The 'area' or 'locality' to which the SRTUA would be applied has to be defined at the earliest stage. This coverage area may be as per the administrative definition – 'ward'. But one should also keep in mind the perception and usage of people living there. If the community / neighbourhoods are living in such a manner that localities from adjacent wards have to be attached to the project area, then it may be done. This may cause some constraints and difficulties in the statutory regulations and legal processes, as an 'area' going for certification may be part of two different administrative 'wards'. But it is important to make this demarcation in a people-centric manner because the whole idea of this tool is to 'engage' and 'empower' the citizens of a particular urban area.

4.5 Statutory and Legal Scope

It is envisaged that the rating tool will look at the urban areas in their 'as is' condition – the way they are today. This means that they will fall under all the various administrative and statutory rules and regulations that govern our urban areas. Any proposed alterations to the physical environment or administration of the areas will require working with respective urban local department, state government department or private / P.P.P. (Public Private Partnership) entity that is operating any service. Separate legal or statutory frameworks will not be created – as it unnecessarily complicates the delivery mechanism. So, the urban areas will work under the framework of the Vision / Master plan, Development Plan, Town Planning (T.P.) Scheme, etc and if certain changes to those are required and possible – then they may be done. If it is not possible to do this – then the approach to achieve the intent of that Credit or Topic will have to be modified, or those points may have to be sacrificed. Similarly, funding required for the changes need by urban areas to implement the measures would be extracted from available funds, grants and schemes already existing for urban areas.

The various existing codes and guidelines covering Environment, Building, Construction, Safety, Human rights, Health & Sanitation, Children, Elderly, etc are more than sufficient to create good, sustainable, liveable urban areas in India – hence this tool will be reference to or benchmarked against these existing codes and standards.

This rating tool will work under the premise that our current policies, programs, schemes and regulations have significant possibilities, provisions and funds for developing good urban areas – only their interpretation and implementation may need to be addressed.

4.6 Drafting the Guidelines

The most important part of this exercise is the Rating tool itself – how would it be created, propagated and implemented? This particular study only gives on outline and emphasis of direction – the actual details of the rating tool will require a lot more study, inputs and tech cal analysis – prior to being finalized even as a Pilot Rating tool. Here one is listing down the important Goals and Intents – and how communities / citizens / ULBs could attempt to get Credits / Points – through some of the Compliance Measures. However, the exact Compliance Benchmarks (quantifiable, numerical targets) will be defined after inputs from experts of various subjects. A team of experts from the fields of urban planning / design, sustainability, climate, energy, water & wastewater, etc. and representatives from Urban Local body and its various departments

would have to sit together and evolve the compliance measures in such a way that they are realistically achievable, yet sufficiently ambitious to make a difference to our urban habitats.

The general sequence of formulating the details of a Rating tool would be as follows;

- Identifying the important Categories of intervention – within each category would be several Goals / Intents (to be covered in this study)
- Specific Topics / Intents to be mentioned – specifically talking about what one wants to achieve through that Intent (to be covered in this study)
- Points / Credits to be allocated to each of the above Topics / Intents – thus prioritizing the various parameters. More points may be allocated to some topics, if they are more relevant and critical in our context (not part of this study's scope)
- Compliance Measures to be specified – project teams would know exactly what is to be done so that they can win Credits / Points (suggestive measures included in this study; specific / quantifiable measures would need to be worked out). Some compliance measures would be 'prescriptive' in nature, while some would be 'performance' based. The kind of Documentation required to be submitted to demonstrate compliance, would also be specified (not part of this study's scope)

Evaluation would be done by a 3rd party team on the basis of Documentation submitted by the project team.

4.7 Mechanism of Implementation

After the Pilot version of the Rating tool has been drafted, discussed and finalized – there would be a need for general awareness program that conveys to the citizens that such a rating tool is available and getting a rating under it would entail certain benefits for their locality. Initially, the Urban Local body and State Govt may have to propagate the tool and provide support to localities in cities to take up this initiative – they may not do so on their own. Also, several incentives would have to be created for areas that get themselves certified through this tool.

Once a particular urban locality shows interest in going for a certification through SRTUA, the first step would be to decide the Area of Coverage. Subsequently, people from the various neighbourhoods within that area would be involved in the process along with members from ULB and technical experts / consultants. A separate cell may have to be created in the ULB to handle all such projects going for certification.

For the overall implementation and monitoring of the SRTUA, the setting up of several teams / committees may be required at different levels; given below are some recommendations on this.

SRTUA Core Committee: This group would comprise of high level authorities from the urban local body and relevant State govt departments; it would work at the level of the entire state. The following could be members of this Committee;

- Municipal Commissioners of various Municipalities
- Secretary, Urban Development & Urban Housing Development, Govt. of Gujarat
- Secretary, Climate Change, Govt. of Gujarat
- Chief Town Planner
- Chairman, Gujarat Municipal Finance Board
- Managing Director, Gujarat Urban Development Co. Ltd.

The role of this group would be more general and look at the overall progress of how various cities and towns are implementing the tool and whether the citizens and the state's climate change goals are genuinely benefitting from it. If certain policy level alterations are required (after sufficient feedback and technical validation) – this committee would be in a position to get those executed.

SRTUA City Facilitators: At the city level, there should be a team of influential members from the urban local body and some independent experts who are in a position to facilitate and monitor the progress of the implementation of this rating tool by various localities. Their role would be to ensure that maximum areas adopt this tool and they would assist in removing certain road-blocks that may come during alterations required to be done to the existing physical / infrastructural set-up. This group could consist of

- Municipal Commissioner
- Independent experts in the field of Urban planning, Sustainability, etc.
- Corporators of various Wards of the city

Area Task Force: This would be the main team responsible for getting the urban area / locality certified under SRTUA. This team should be headed by an expert / professional who understands urban areas / planning and would be supported by a group of responsible and enthusiastic people from the locality who would be volunteering to communicate with their respective neighbourhoods. The local Corporator of each Ward would also be part of this group (the corporator could be part of several such Area Task Forces). The State Govt or ULB should find a way to have provision for funding so that professionals / consultants may be appointed to head this team – to handle all the measures to be taken and documentation required for it. It would also include information and data collection, awareness programs, capacity building, coordinating and liaison with urban local body departments, etc. But at all times, the focus should be on involving maximum local citizens of all age groups – each of them can give some of their time and effort – and thus make it a peoples' movement.

The idea of such a rating tool and its certification is to make it grow from bottom up and not like other regulations and schemes that are forced upon from top. That is the fundamen-

tal premise of such a system – it has to be ingrained within the community – so that children living in that area grow up and continue all the efforts, or improve upon them – and also propagate them in the new places where they might move to. The process has to be such that citizens are involved and engaged – and when they get a certification – there is a certain sense of achievement and pride within them, with an urge to do better than the other areas of the city. We are seeing such a phenomenon in the 'Clean Cities' campaign – where citizens are now talking about the 'ranking' of their city in the country or the state and that would maybe translate into action.

This Area Task Force will decide the complete strategy of how to go about the process, which credits to attempt and how the implement the measures. Some of the important tasks of this group would be;

- Carry out the Feasibility study of the locality getting certified.
- Preparation and Pre-planning for implementation of the various measures
- Data collection and compiling base drawings / maps
- Forming of several smaller groups of volunteers to handle specific activities
- Awareness campaigns regarding SRTUA and how the locality is attempting to win points
- Conveying to the citizens, the importance of getting a rating, its benefits, incentives and long-term value for their locality
- Getting feedback from the citizens and ensuring that they are engaged in the process
- Analysis of data / feedback / information
- Document the compliance measures being adopted
- Coordinate with urban local body departments and other statutory agencies for compliance

In short, the Area Task Force is the main group of people who will be responsible for a locality getting certified and adopting various measures.

4.8 Thoughts on Adaptation / Modifications to Green Goals for existing urban areas in India

Some observations on the rating tools studied, and what may be required to adapt them to Indian conditions, are mentioned below; these are covering various goals across all four systems.

Compact Communities, Healthy & Active living, Walkable Access to Amenities, Connected & Open Community, Mixed-Use Neighbourhoods, Active Living: Our existing urban areas often reflect these characteristics; though some new / fringe areas may not be like this – it is a very relevant point; challenge would be connecting to public transit and housing for mixed income groups; need to consider social perception of mixed income housing in one area.

Housing Affordability, Housing Types & Affordability: Encouraging mixed income housing could be considered - but the entire goal of providing affordable housing, which is location efficient also, may not be in scope of a rating system.

Community Water Systems: Water supply & Wastewater Treatment in Indian cities is not a localized service; usually provided by ULB across the whole city - difficult to control for one part of the city.

Transportation Choices, Access to Quality Transit, Sustainable Transport & Movement, Bicycle Facilities, Transit Facilities: Provide options for public transport and make it affordable; make transportation safer (all forms; especially cycling, walking); reduce vehicular miles. This is an important criterion in Indian context - but needs different models of public transit modes. Mass transit will work only in few cities /areas. Identify other modes; Pedestrian safety should be given high priority - it may be easily accepted by people. Cycling is difficult due to lack of infrastructure and harsh climate.

Public Parkland: Important and do-able because DP already allocates Open spaces, Gardens, Community / Public use land; find ways to "reclaim" such land and make them Green.

Ambient Noise & Light: Very important – yet difficult; but can be implemented as awareness and demand has now emerged - Strong statutory support & local action needed.

Infill & Re-development, Smart Location: Already happens in Indian cities; they move out only after main / central areas are fully densified; moreover - this is a city level planning decision - not in the control of urban neighbourhoods / wards.

Climate Adaptation, Community Resilience: Identify and study what constitutes problems due to climate change in our Indian cities; Communities are typically very resilient in India; how built environments should "adapt" to changing climate is debatable?

Greenhouse Gas Mitigation, Local Govt GHG & Resource Footprint: Identify & document GHG emission sources and mitigation measures - check if this is indirectly achieved through other measures / priority areas; there may be a different Rating system for ULBs / Utility providers. Identify what can be achieved and targeted at local community / area level.

Greening the Energy Supply, Renewable Energy Production: For Building use - consider Solar (integrate with Govt's policy); from alternative fuels for transportation - it is unlikely to fall into the scope of urban areas / ULBs; however, facilities like elec. charging points etc. may be provided as a way of creating awareness and encouragement.

Energy Efficiency, Peak Electricity Demand, Infrastructure Energy Efficiency, CO2 Emissions – Energy Sources: Identify various measures that can be taken in the built environment, equipment, machines, infrastructure, etc - that will reduce the consumption of energy (and embodied energy) - this may cover a wide array of systems / elements across Public spaces, ULB / Utility systems and Individual Owners.

Waste Minimization, Solid Waste management: Waste man-

agement programs and awareness; segregation, door-to-door collection, etc. - this is already being done by ULBs – local areas can show more support / participation.

Water Efficiency, Integrated Water cycle: Identify various measures that can be taken in the built environment, infrastructure, etc. - that will reduce the consumption of water - this may cover a wide array of systems / elements across Public spaces, ULB / Utility systems and Individual Owners.

Business Retention & Development, Local Economy, Targeted Industry Development, Quality jobs & Living wages, Employment & Economic Resilience, Quality – Economic aspects: Identify measures that can be taken to attract business creation in local areas and how they can be retained / sustained - will include a wide range of measures - many of them may not be in the scope of local community; several topics in this category may be over-lapping in their intent. Useful to get community involved in their area and have a sense of ownership / attachment with their own habitat; it is already happening to varying degrees in many of our urban localities - need to encourage it more.

Workforce Readiness: This could be a useful and impactful measure; it also becomes a tool of integrating different types of citizens across strata. Training / capacity building could be in different forms - could talk of measures such as play-group for weaker sections, women's education, night school, learning through sport, technical training, employment bureau, etc.

Arts & Culture: Due to the nature of Indian society, religions, rituals, etc. this already happens to a large extent; though one could identify some specific activities that focus on bringing art to urban spaces and using it to revitalize urban environments.

Educational Opportunity & Attainment, Neighbourhood Schools: Out of scope; though efforts may be made in conjugation with Govt & Private education providers - for upgrading local pre-primary and primary schools - so that children do not have to travel a lot for primary education; access to close, affordable and quality education for children could become a major point in future.

Historic Preservation, Historic Resource Preservation & Adaptive Re-use: Should be developed as it may be valid in various existing urban areas as several old buildings, rituals, festivals are associated with them; they could be developed as elements that re-vitalize the urban fabric and create a distinct identity of that urban area.

Social & Cultural Diversity, Equitable Services & Access: Very important point in context of current urban scenario in Indian cities; can look at religion, caste, income group, gender, disability, etc. This could be very important in the current Indian urban scenario as prevention of ghettoization, conglomeration of migrated communities, and related issues can be tackled or minimized. It is fundamental to the essence of Indian society and Constitution of Indian Republic; however, actual implementation on ground may see several and severe roadblocks.

Civic Engagement, Stakeholder Engagement Strategy, Awareness - Community User Guide & Sustainability Education facilities, Community Outreach & Involvement: Some very important and relevant measures recommended here - must adopt and adapt if required. This is also a key concern of the 74th Constitutional Amendment Act. and urban reforms in India - hence must be a priority. Most decisions in our cities are short-sighted and not thought through; involvement of local people is absolutely essential here - first priority is to make them stakeholders - make them feel involved; sense of ownership of their locality / area. Need to create a culture, lifestyle that will sustain in future. It may require integration of existing informal and formal frameworks.

Civil & Human Rights: Out of scope; but could bring in some aspect related to promptness of assistance by police, ULB agencies etc. - support by a local liaison team, etc. so that the community is assured prompt and just governance, rule of the law.

Poverty Prevention & Alleviation: Out of scope; but work towards integrating some measures that help / empower weaker sections of citizens in the urban community / locality / ward.

Community Health, Health Systems: Out of scope; but can look at coordination with health system to ensure that local centres are working properly. It may be modified to address health hazards occurring in our built habitats - like pollution, incorrect construction practices, garbage dumping, littering, spitting, burning - smoke generation, etc.

Food Access & Nutrition, Local Food Production: Out of scope / control of urban communities in india; but could consider looking at the quality / basic standards of food that comes into the local market; also how govt schemes for food and nutrition can reach the necessary people. Focus could be generated on local market, organic products, responsibly sourced, local manufactured, etc

Emergency Management & Prevention, Hazard Mitigation: Valid point; especially considering the increase in incidents of urban flooding, rioting, etc. that our cities are seeing…identify potential disasters / emergency situations (could overlap with other topics).

Safe Communities, Safe Places: Should be included; focus on children, women and elderly -this is a high priority goal in our growing urban areas. Very useful and relevant in our urban areas; identify mechanism of involving citizens and coordinating with concerned Govt agencies; also several measures can be addressed through the built environment design and operations - consider Counselling, Helplines, etc which can act quickly and locally.

Green Infrastructure, Natural Resource Protection: Very im-

portant and valid for our urban areas - may overlap with other topics within this category - identify what green infrastructure / features / ecosystems should be protected / enhanced; what are the specific parameters that will influence formation of good ecosystems / green areas.

Water in the Environment, Wetland & Water-body Conservation: Urban water bodies are very crucial in many ways; topic may overlap with others - but important concern that should have high weightage. Integrate Ground water re-charge, Rain water harvesting, Restrictions on borewells, Pollution control measures, etc. Though how to get this implemented in existing areas is a challenge.

Sustainability Reporting: This is important - need to prioritize / focus on good and accurate documentation and record-keeping.

Community Investment: Talks about how much is invested by govt / ULB per house, in common facilities / infrastructure. This may not be directly applicable to our condition - but its intent to be discussed.

Digital Infrastructure: Should be included; it has indirect impact on economy, equity, empowerment, safety, etc; many other aspects of urban life; directly benefits e-governance goals of ULBs.

Heat Island Effect, Tree-lined & Shaded Streetscapes, Reduced Parking Footprint: Should be included; probably given more weightage too - just to create awareness of how our built environment and materials used impacts our micro climate.

Light Pollution, Light Pollution Reduction: Should be included; probably given more weightage too - just to create awareness of how our built environment and materials used impacts nature, birds, insects, animals and the whole ecosystem.

Wastewater Management: On-site treatment within each area is not possible; but they all go to centralized utility facility; see what can be improved / addressed here.

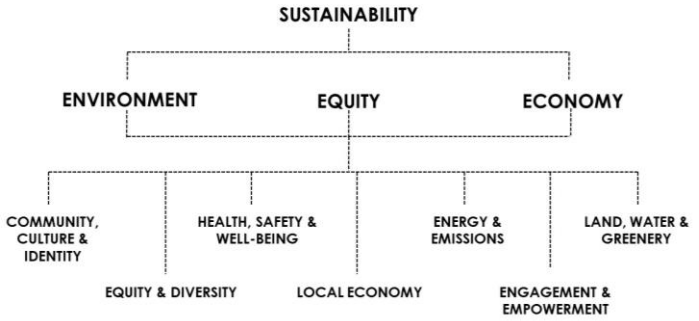
District Heating & Cooling: Does not seem so relevant to our urban areas (existing / emerging)

5 Closing thoughts & Future Directions

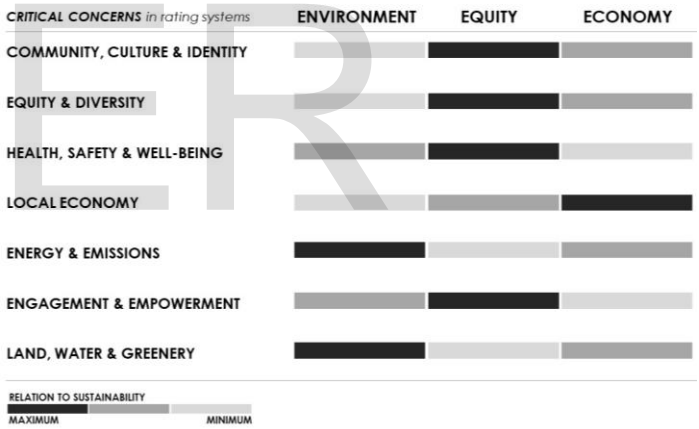
The following are the proposed goals and priority areas which would broadly define the rating tool;

- Health, Safety & Well being
- Community, Culture & Identity
- Energy & Emissions
- Land, Water & Greenery
- Equity & Diversity
- Local Economy
- Engagement & Empowerment

One can go back to our initial discussion of how 'sustainability' needs to have a holistic approach – and see how these focus areas relate to the three E's of Sustainability;



As mentioned earlier, there is often much overlap in how these concerns will affect Environment, Equity and Economy – some would impact one aspect more, but they would also contribute to the others as well;



Within each of these categories would be several Credits, whose compliance will enable project teams to win points as seen in table below – also see 'Appendix E' (enlarged)

A detailed listing of the Credits that fall under each of the below mentioned Criteria has been developed in line with the discussion in this study (but not included here as it is more about technical deliverables and methodologies)

HEALTH, SAFETY & WELL-BEING	COMMUNITY, CULTURE & IDENTITY	ENERGY & EMISSIONS	LAND, WATER & GREENERY	EQUITY & DIVERSITY	LOCAL ECONOMY	ENGAGEMENT & EMPOWERMENT
Public Open spaces	Recreational & Cultural facilities	Connectivity & Shared Transit	Development Density	Housing Type, Standards & Mix	Food Source Proximity	Redressal Mechanism
Pedestrian Walkways	Community Cohesion	Energy efficiency	Minimize Heat Island effect	Inclusive & Safe public spaces	Local Businesses	Emergency Response mechanism
Outdoor Activity	Reclaimed urban spaces	Renewable Energy Production	Private Parking provisions	Universal Design	Employment generation	Volunteer Program
Prevention of Construction Pollution	Historic Preservation & Integration	Resource efficiency	Green cover - Quantity & Quality	Access to Primary Education	Digital Infrastructure	Capacity enhancement
Access to Health Facilities		Waste Management	Rain-water Management	Access to Amenities	Integrating Informal sector	Stakeholders spectrum
Noise Pollution		Traffic Management	Water use Reduction		Return on Investment	Addressing Local Concerns
Light Pollution						Documentation & Data collection
Hazardous Activities						
Climate change Adaptation						

There will be numerous contributions and efforts needed to address the many problems that plague our cities – and this study attempts to look at one such tool – 'Sustainability Rating Criteria'. By giving tangible values (qualitative & quantitative) to our urban areas and their performance – one hopes that the citizens and their cities relate to each other in a better manner.

This tool can become a way of empowering and engaging the citizens in the process of city building – and thus develop a culture of connecting with the city.

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