Dialectical Analysis of Sustainability Assessment Framework in India for Agenda 2030

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Abstract

The pragmatic adoption of Agenda 2030 lies in acclimatizing its 17 goals as the objectives of sustainable vision for future cities. In a quest to attain these objectives, Indian cities are thus continuously challenged for the effective transference of country-wide SDG targets as the local level indicators of urban development. This paper intends to examine the dialectics around the sustainability assessment framework in India, as the country stands at the juncture of releasing dynamics for social, economic, and environmental growth of cities. The methodology adopted to conduct the research work includes a semantic literature perusal and an indicator-based communication mapping of proposed assessment indices, to analyze the competency of the existing framework. It has been observed from an aggregated analysis that the issues of data reliability and non-inclusivity of contextual elements at the local level act as critical challenges for ecological vulnerability and the economic feasibility of the goals. This paper intends to abate these gaps existing in the literature focusing on sustainability issues of India and direct the discussion towards reorienting the current role of indicators from being 'performance assessors to becoming catalytic enablers of sustainable cities.

Disciplinary: Architecture & Planning, Sustainable Development.

1 Introduction

Do In the last few decades, the concept of sustainable urban development has evolved colloquially worldwide. Being at an essential moment in time of global crises, United Nations (UN) positions this concept at the center stage of urban development under Agenda 2030 [1]. 17

interlinked Sustainable Development Goals (SDGs) of the agenda maneuver the issues of climate change, inefficient use of resources, migration, inequality, and the ever-increasing environmental deterioration of the planet. These SDGs progress from their predecessor's Millennium Development Goals as more ambitious and ubiquitous, in order to expand their scope, reach and participation [2]. Thus, to yield a corroborated framework for their implementation, UN Statistical Commission has endorsed the Sustainable Development Indicator (SDI) framework for quantitative measurement of SDGs [3]. The framework utilizes indicator-based sustainability assessment (SA) tools as prime auditors of the goal's progress and measures their performance with a set of 232 global indicators [4] acting as touchstones or references, against which the objectives of sustainability are measured [3] [5].

The utilization of such framework presents a contested debate around the globe, on the inception of the SA tools being dealt with defined indicators, as the definition of sustainability differs locally in conjunction with its objectives. Therefore, even though the 17 goals are supported with a concrete set of targets for measurement, most of them remain qualitative and vague in nature following their limited application across the nations [6]. Another vulnerable trait making the SA tools contextually inflexible is the requisite use of " a fixed" set of indicators and their dependency on only publicly available data, which at occasions prevents reliable assessment of specific locations and stakeholders with the application of these goals [7]. In the study conducted by environmental scientist Janoušková in 2018 on performance measurement of global SDGs, results show inconsistencies in comparison of similar countries along with different indices due to unclear interpretation of data for goals and fixed selective approach of indicators for index measurement. For instance, one SDG index assessing 34 OECD (Organization for Economic Co-operation and Development) countries, rank the Czech Republic at the bottom third place in sustainability performance while the welfare Index of Sustainable Economic Welfare, assessing 157 countries, ranks the country at a positive fifth place [8]. This indicates that in theory although these assessment tools are presented as an indivisible whole to measure the sustainable growth of the urban areas, in practice there is little knowledge of synergies between them and their efficiency in translating goals at the local level [9]. Consequently, the adoption of these SDGs has become essentially critical for developing economies such as India, where resource consumption and environmental damage are already pressing concerns for the cities [10]. India reaching a population of 583 million by 2030 as per UN estimates, will account for 18-19 percent of the global increase in urban population and therefore the importance of evolving efficient sustainable strategies becomes crucial for the country [11]. Anatomizing the sustainability assessment framework in India for Agenda 2030, the study indicates certain inefficiencies in the complimentary enactment of the adopted SA tools and their ineffectiveness in promoting transference of economic and environmental targets at the local level. These scenarios propel us to comprehend how competently do India's SDG assessment framework foster sustainable urban development, and what are the challenges faced for the adoption of the Agenda in the process.

2 Literature Review

India is advancing with an exponential growth rate of urbanization. This is not just a "democratic shift" but it places India's response to various SDGs at a global focus. Urban indicators of these shifts are expected to not only contribute towards cities' performances in achieving SDGs but simultaneously elevate complex issues of planning in various urban sectors [12]. These aggravated issues further highlight the urgency of necessary actions needed for sustainable development of Indian cities before their prevalence worsen [13]. The literature review thus examines the dialectics around India's response to these issues with the help of adopted SDG assessment frameworks. It further comprehends the complexity of the framework adoption in the country's urban systems. The discussion is explored through the coverage of varied sources ranging from journals, policy reports, published case studies and the official Ministry of Housing and Urban Affairs (MoHUA) reports prepared for the indices acting as SA tools and their supporting urban policies.

India's commitment to attaining SDGs is catalyzed through the initiatives taken in form of policies, programs, schemes, and index measurement by the governing authorities. Given the importance of the urban sector to achieve sustainability, India aims at assessing the performance of existing urban policies and programs as mentioned in Figure 1 with the benchmarks set up under the National Indicator Framework monitored by NITI Aayog. At the macro level, the country's key developmental programs and schemes align themselves with SDG targets and contribute towards their implementation with monitoring mechanism of Sustainability Indices. For instance, MoHUA has floated schemes (Figure 1) such as AMRUT, Housing for All under PMAY, SBM, which are aligned with the targets set under SDG 11 with indicators concerning issues of housing, waste processing and urban sewerage capacity, etc. Though this presents a wide area of coverage for the promotion of sustainable cities and communities, unfortunately, the policies seem to have restricted their focus to providing only basic infrastructure services and utilities [13]. This has resulted in unattended attention toward achieving sustainability in cities holistically with negligible coverage of indicators for environmental SDGs such as SDG 14 (Life below water), SDG 15 (Life on Land), which are heavily impacted by city systems.

Smart Cities Mission (SCM)	Atal Mission for Rejuvenation and Urban Transformation (AMRUT)	Swatch Bharat Mission (SBM)	Pradhan Mantri Awaas Yojana (PMAY)	Pradhan Mantri Jan Arogya Yojana (PMJAY)
Aims to drive economic growth and improve the quality of life with smart technology inputs for 100 cities	Aims to provide basic civic amenities like water supply, sewerage, urban transport, parks for 500	Aims to eliminate open defecation and improve solid waste management for 4,041 statutory towns	Addresses urban housing shortage among the EWS/LIG and MIG categories including the slum dwellers by ensuring housing to all	Aims to provide free access to health insurance coverage for low-income earners in the country

Figure 1: Government of India (GoI) schemes linked towards the progress of sustainable development goals

Another major requisite for sustainable cities are linked with SDG 5(Gender Equality) indicator covering crime against women. It has been observed that crime prevention through environmental design (CPTED) is a growing fashionable approach globally for preventing crime and the fear of crime in cities but sees limited inclusion as a built environment planning tool [14] or policy initiative in India. It indicates that the existing programs and policies, hence, do not come across as multidimensional or multisectoral, keeping in mind the interlinking nature of SDGs and alignment of policy initiatives to the overall concept of the Agenda [15]. Ayushman Bharat (Pradhan Mantri Jan Arogya Yojana) acts as another major policy intervention providing the largest health protection scheme in the world and is aligned in relation to SDG 3 (health and well-being) and SDG 10 (reduced inequalities). However, strong policy implementation in the areas of proper nutrition, quality of education, decent economic and work growth, which in turn act as supporting framework for SDG 3 and 10, still need a push among other socio-economic indicators of goals [16].

The progress towards sustainability is driven by the above-mentioned policies and programs of the government only to an extent. To track and monitor the pace of these initiatives, India further adopts an assessment framework of Sustainability Assessment (SA) tools with a defined set of indicators, targets and benchmarks covered across three major officially proposed indices [17]-[19] as mentioned in Figure 2.
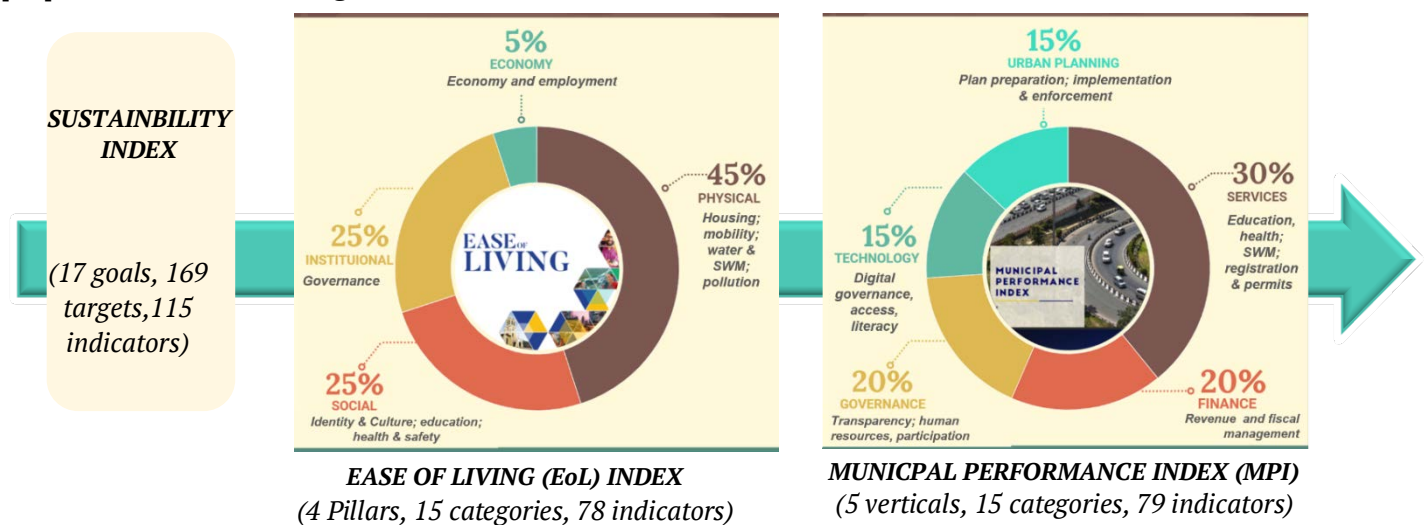

SUSTAINBILITY INDEX

(17 goals, 169 targets,115 indicators)

5% ECONOMY
Economy and employment

45% PHYSICAL
Housing; mobility; water & SWM; pollution

25% INSTITUIONAL
Governance

25% SOCIAL
Identity & Culture; education; health & safety

EASE of LIVING

EASE OF LIVING (EoL) INDEX
(4 Pillars, 15 categories, 78 indicators)

15% URBAN PLANNING
Plan preparation; implementation & enforcement

30% SERVICES
Education, health; SWM; registration & permits

15% TECHNOLOGY
Digital governance, access, literacy

20% GOVERNANCE
Transparency; human resources, participation

20% FINANCE
Revenue and fiscal management

MUNICIPAL PERFORMANCE INDEX

MUNICPAL PERFORMANCE INDEX (MPI)
(5 verticals, 15 categories, 79 indicators)

Figure 2: Official indices proposed by Niti Aayog as sustainability assessment tools to measure the performance of Indian states and cities towards SDGs

The Sustainability Index (SI) measures the performance of 17 SDGs across 28 states and 8 Union territories on the lines of adapted global benchmarks and hence provides an eclectic assessment framework for the complex and composite nature of goals [17]. It only initiates competition and understanding among States/UTs across the broader concept of the Agenda 2030 [17]. To further accompany the Sustainability Index (SI) and measure the livability standards in cities, the"Ease of Living (EoL) Index" is adopted. It examines economic and social opportunities available to the citizens across 4 pillars of development covering 78 indicators, focusing their impact on the quality of life. Since the EoL index focuses on the assessment of the outcomes rather than the inputs, the "Municipal Performance Index (MPI)" has been further launched as an

accompaniment to provide the inputs at the local level. The index seeks to examine local government practices of Indian municipalities, which act as enabling factors to municipal performance output.

Research on the urban dimensions of the SDGs depicts that the application of indicator systems in cities of the Global South is challenging with shortcomings of data availability and reliability [1]. In an insightful study carried out by academician Prof. David Simon to test a set of proposed indicators of SDGs in the city of Bangalore, it was found struggling to access adequate data and an incompatible relationship emerged between the scientific characterization of goals through India's indices and the practical city planning systems [20]. Such scenarios can be seen as a result of generic global benchmarks being adopted for the identification of targets, leaving little room for contextual elements of a city to play a role [21]. These elevated issues of assessment framework further result in a lack of data comparison of cities through indices and their association with the performance of regions' planning systems. Sustainable Development Goals India Index (SDGII) report 2019-20 [17] states these issues as the limitations of the indices in the report. It states that for some indicators, data for all States/UTs, cities are not available and in computing the Index, "null" is assigned to such States/UTs and cities [17]. Therefore, where no international/national norms are available for standardization, the state, or the city with the best performance in its group is treated as a benchmark that may not appropriately weigh a region's performance towards sustainable urban development. This indicates that in practice, the official sustainability assessment frameworks limit the usage of contextual data indicators and apply broad SDG performance indicators for the ease of standardization and measurement, further decrementing a potential translation of national policies at the local level [2]. Another issue regarding contextual data sets comes across as the broad categories of Sustainability Index, ranking the states as: Aspirants (<50), Performers (51-64), Front runners (65-99), Achiever(100) [17] to explain their achievements. For instance, in Figure 3, the category of Front Runner spanning from 65-99 (35 points) is too broad of a range as Tripura and Andhra Pradesh both are placed in the same category despite large difference (27 points), in their achievement scores.
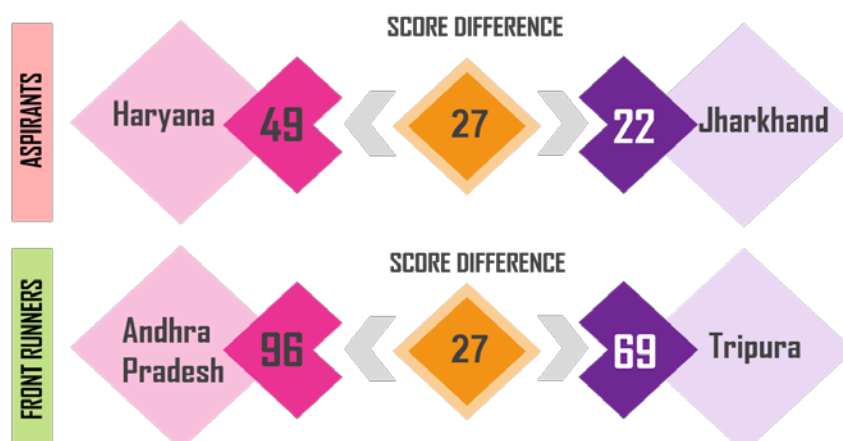

Figure 3: Broad range of categories across Sustainability Index result in creating data information gaps on consideration of contextual elements for their respective cities under different goals

As data is captured and publicly available for only a few Smart cities of the states which are considered under the EoL index [22], the holistic lookout towards state's performance considering contextual factors of all its cities remains questionable. Therefore, initial adoption of the indicator set from an established global framework may seem like an easier process for alignment of SDGs performance [7], but a specific, measurable and contextual data set comes as more challenging for the developing countries [23].

3 Method

The discussion on the SDG assessment framework of India is further explored by analyzing the individual monitoring reports of the existing three official indices, acting as data sources in Figure 4 for the mapping.
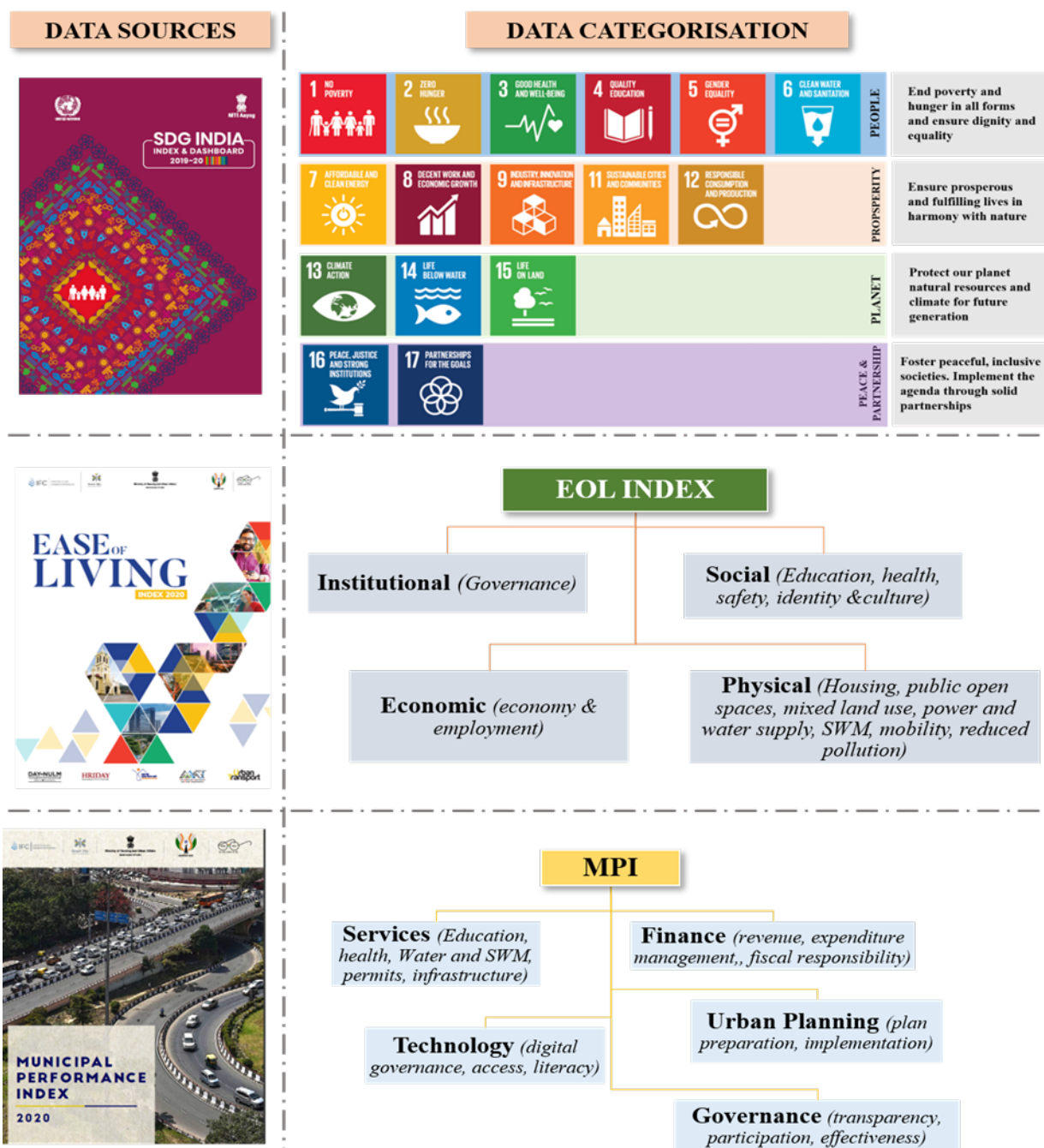

Figure 4: Data extraction of sustainability indicators from Ministry of Housing and Urban Affairs (MoHUA) reports on Sustainability index; Ease of Living (EoL) Index; Municipal Performance Index (MPI) and categorization of the targets under various verticals and sectors.

The referred reports are prepared by the Ministry of Housing and Urban Affairs (MoHUA) endorsing over 300 indicators across all the indices adopted by the Ministry of Statistics and Programme Implementation (MoSPI) in alignment with the National Indicator Framework (NIF) [17]-[19]. The focus of the analysis is to represent a semantic mapping on an indicator-based communication method of sustainable development at the local level. It sheaths indicators across 16 SDGs *(SDG 10: "Reducing Inequality" excluded as its qualitative indicators do not continue in the local level indices)* for the assessment of sustainability targets promoting principles of Prosperity, People, Planet, Peace & Partnership. The transference of SDGs under sustainability index is thus further contemplated across categories of EoL index and MPI and are communicated as either neglecting (No significant impact on the goal), enabling (aids the achievement of a goal to a limited extent), or promoting (Inevitable to the goal) indicators. The complexity of mapping this translation is reduced by grouping 15 categories of EoL index under 4 major pillars of comprehensive development and categorizing 19 sectors of Municipal Performance Index (MPI) under its 5 functional verticals as shown in Figure 4. The results intend to indicate the efficiency of the adopted sustainability assessment framework in India and the significant impact of indicators under various SA tools in achieving the goals.

4 Result and Discussion

Aggregated analysis across the key principles of sustainability in Figure 5, indicates that goals advocating planet conservation tend to be most neglected in their translation as the local level indicators of EoL index and MPI in India. The results, inclusive of the other principles of sustainability, indicate a broad incompatibility among all three indices that are represented as supporting SA tools to one another for performance measurement of states and cities. A sizeable fraction of neglecting indicators is observed across SDG 14 (Life below water), SDG 7 (Affordable and clean energy), SDG 12 (Responsible consumption and production), SDG 13 (Climate Action), SDG 15 (Life on Land) in their transference as local indicators (Figure 5b). For instance, SDG 13 talks about solar share in renewable power generation as a target, but it sees limited inclusion in finance, physical planning, and technology categories across indices. Proper inclusion of the indicators under these categories may otherwise serve as the backbone for adherence to the above-mentioned SDGs, as the indicators cover fields of transportation and infrastructure planning along with issues of resource mobilization and fiscal decentralization. SDG 14 as well disintegrates with the urban planning and technology category which affects the potential actions taken in the direction of climate change against different city systems for the SDG. It is important to understand the indicators of planning violations, coverage of information in the form of GIS mapping and penalty efficiency while measuring the performance of these SDGs in relation to the urban planning vertical. This is indicative of the fact that the distortions are found mostly between the resources acting as city planning tools and knowledge of earth system clusters because in-depth coverage necessary for the representation of climate adaptation and energy consumption is lacking in the

People / Prosperity / Planet / Peace & Partnership	SDGs (Sustainability Index)	Ease of Living Index				Municipal Performance Index				
		INSTITUTIONAL	SOCIAL	PHYSICAL	ECONOMIC	SERVICES	FINANCE	TECHNOLOGY	URBAN PLANNING	GOVERNANCE
PEOPLE	NO POVERTY	★	★	★★	★	★★	★	★	★★	★
PEOPLE	ZERO HUNGER	★	★	★★	★	★	★	★		★
PEOPLE	GOOD HEALTH AND WELL BEING	★	★★	★★★	★	★★	★	★	★★	★
PEOPLE	QUALITY EDUCATION	★★	★★★	★	★	★	★★	★★	★★	★★
PEOPLE	GENDER EQUALITY	★	★	★	★★	★	★	★★		★★★
PEOPLE	CLEAN WATER AND SANITATION	★	★	★★	★★	★★	★★★	★	★★★	★★
PROSPERITY	AFFORDABLE AND CLEAN ENERGY	★	★	★★	★	★	★	★	★★	★
PROSPERITY	DECENT WORK AND ECONOMIC GROWTH	★	★	★	★★★	★	★	★★	★	★★
PROSPERITY	INDUSTRY, INNOVATION AND INFRASTRUCTURE	★★	★	★	★	★★	★★	★★	★	★
PROSPERITY	SUSTAINABLE CITIES AND COMMUNITIES	★	★	★★★	★	★★	★★	★★	★★★	★
PROSPERITY	RESPONSIBLE CONSUMPTION AND PRODUCTION	★	★	★★	★	★★	★	★	★★	★
PLANET	CLIMATE ACTION	★	★	★★	★	★	★	★★	★	★★
PLANET	LIFE BELOW WATER	★	★	★	★	★★	★	★	★	★
PLANET	LIFE ON LAND	★	★	★★	★	★★	★★	★	★★	★
PEACE & PARTNERSHIP	PEACE, JUSTICE AND STRONG INSTITUTION	★★	★★	★	★	★★	★	★	★	★★
PEACE & PARTNERSHIP	PARTNERSHIP FOR GOALS	★★			★★★		★★	★	★	★★

Figure 5a. Translation of SDGs under Sustainability Index as local level indicators with Ease of Living (EoL) Index and Municipal Performance Index (MPI)
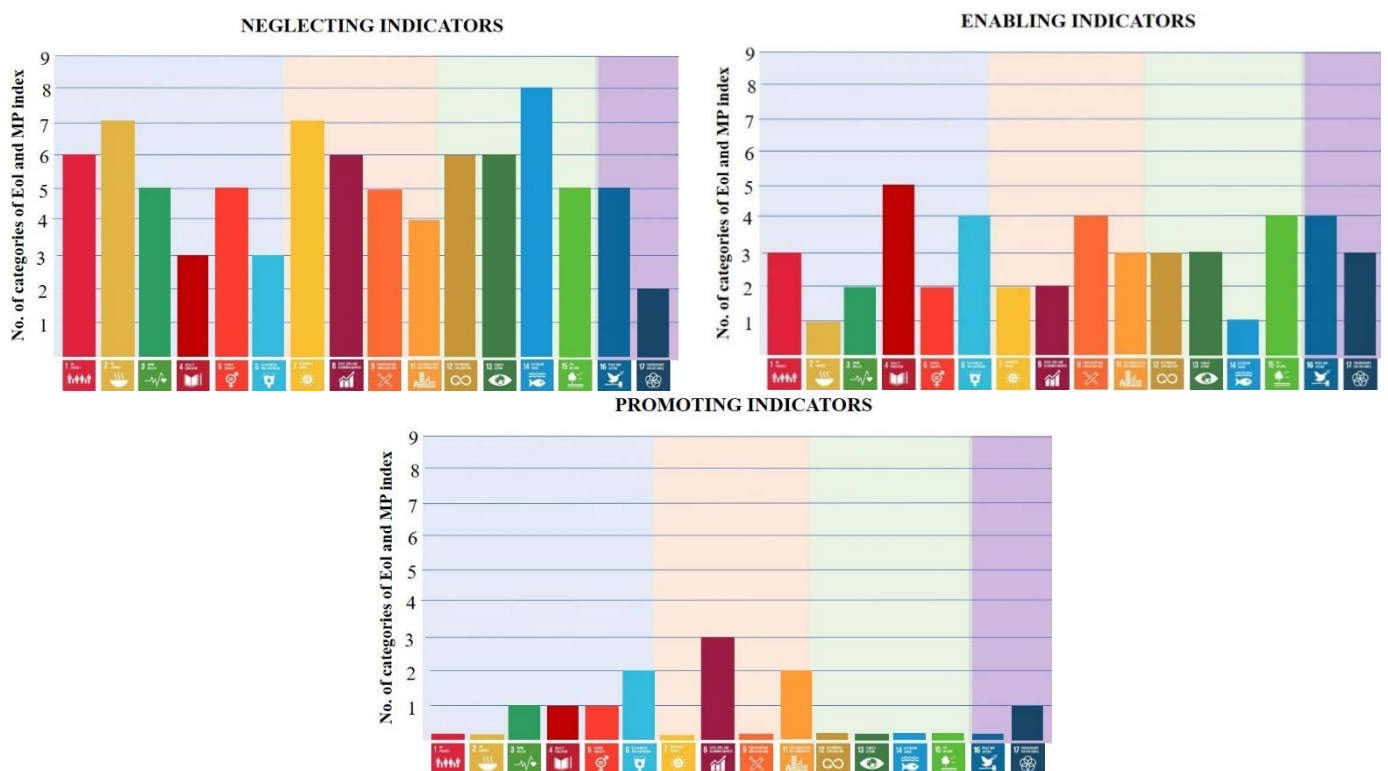

Figure 5b. No. of categories neglecting, enabling, and promoting SDG indicators under EoL index and MPI
Figure 5: Fostering SUD for cities through SA tools: a) Interpreting SDGs translation from sustainability index with indicators under EoL index and MPI categories. Three stars in a category promote the goal with comprehensive adoption of SDG targets at the local level; two stars enable the achievement of a goal to a limited extent; a single star ★ depicts that the local indicators have no significant impact on the SDGs. Columns with no stars indicate exclusion of targets in the index category b)Bar height of each SDG represents no. of categories containing neglecting, enabling, and promoting indicators for the respective goal.

process. The contrasting indicators across all three indices not only ignore the holistic coverage of goals promoting actions for an individual SDG also neglects the synergy between other sustainability indicators. Thus, it becomes unlikely to achieve these goals without a comprehensive strategy to involve the cross-integration of targets across all three indices.

The environmental goals are followed by SDG 8 (Decent work and economic growth) and SDG 9 (Industry, infrastructure, and innovation) with neglecting indicators in almost six and five categories of EoL index and MPI respectively. Since these SDGs are meant to promote the principle of prosperity for a sustainable city, the economic category under the EoL index well captures their targets and provides promoting indicators as seen in Figure 5a. But the negligible attention in physical, social, and urban planning categories further represents a possibility of hindrance in the achievement of economic goals to a much greater extent. On the other hand, the overall translation of the SDG 1(No poverty) and SDG 2 (Zero Hunger) targets tread towards a sustainability path with enabling and promoting indicators at the local level. SDG 4 (quality education), SDG 11 (Sustainable cities and communities), SDG 16 (peace, justice, and strong institution) advance as well with an effective transference of the indicators. For instance, indicators of SDG 11 considering waste collection and processing are successfully inherited in categories of physical and urban planning which covers aspects related to sanitation, waste management, and infrastructure development, while technology and services seem to be enabling these targets. The analysis substantiates the fact that though the efforts are visible in the transference of certain SDGs as local level indicators, the comprehensibility of all the three indices depicts a discordant nature in fostering sustainability as an integrated concept for cities. For sustainable urban development of Indian cities, the study indicates a scarce occurrence of potential synergies across different sustainability indices. This results in an ineffective translation of SDGs as local level indicators through the proposed assessment indices.

A large fraction of neglecting indicators lies across goals enhancing the principle of planet preservation and promoting prosperity. The ecological vulnerability and economic inclusivity in indices must be sensitized to the changes occurring in the cities. Different urban morphologies face unique challenges in their local contexts associated with mitigating the effects to achieve sustainability and it is important for them to be accounted as crucial SDG indicators. Another essential focus is to put across technology category indicators of MPI at the forefront for effectively linking city planning systems whilst providing real-time data. The category covers aspects of digital access, literacy, and governance, capturing service provision of internet facilities and e-governance tenders. This further needs to be evolved in measuring contextually adopted intelligent integrated grid systems, to reduce crimes by enhancing peace under SDG 16 and prevent crime against women under SDG 5 for the built environment of cities [24]. These combined issues raise a grave concern about India's path towards Agenda 2030. Such distortions stipulate that numerous fields of sectoral policies, index categories and actions of city planning are required to be linked with sustainability targets from the very beginning of the urban planning process in an efficient manner. The study

clearly corroborates that EoL Index and MPI may include certain indicators enabling the transformation of cities on a sustainable path, but cannot be seen as an accompaniment to the Sustainability index or to one another in a holistic way. The translation of SDGs is lost in the process and only specific municipal issues are substantiated through these indices at the lowest level.

5 Conclusion

The successful implementation of Agenda 2030 can only be addressed with a system where all SDGs are seen as "interacting cogwheels" [26] ensuring social welfare, economic growth, and environmental planning. The report "India and Sustainable Development Goals: The Way Forward" represent the choice of indices and their cross-sectional comparability as major issues for evaluating an impact of a development program across varying physiological and socio-economic characteristics of an Indian city [11]. Our study indicates that though the current sustainability assessment framework of India provides a quantitative and measurable definition towards elements of national development programs, there remains a gap in associating these goals with the contextual sustainability elements captured as local level indicators. It is impossible to measure sustainability with a definitive quantitative approach [27]. Rather it can only be assessed after the fact that sustainability targets across various indices either leverage synergies with local planning components or their non-inclusion needs to be tackled with appropriate policy measures.

As India moves forward towards achieving sustainable urban development for cities, the quest for inclusive and informed decision-making, articulating interlinkages between city planning elements and SDGs becomes a critical issue [28]. An important connecting link to establish this relation is to further strengthen the importance of capturing people's perception towards attributes of the built environment [29]. Therefore, the indicators need to be comprehended as guides for the evaluation of progress towards sustainable cities but not as prescribed benchmarks to judge them by the same yardstick. Reorienting the current role of indicators from performance measurers to catalytic enablers of promoting context-specific sustainability, can support the sustainable urban development of Indian cities. Once the paradigm comes into effect, India may be able to look towards more sustainable cities beyond Agenda 2030.

6 Availability of Data and Material

Data can be made available by contacting the corresponding author.

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