

How to Measure Progress Towards an Inclusive, Safe, Resilient and Sustainable City? Reflections on Applying the Indicators of Sustainable Development Goal 11 in Germany and India

Florian Koch and Sohail Ahmad

1 Introduction

Cities¹ seem to be keystones within global policies towards sustainability. Urban areas are hot spots that drive environmental change at multiple scales (Grimm et al. 2008) and a large share of CO₂ emissions has urban origins (Sethi and Puppim de Oliveira 2015). At the same time, a global urbanization process that increases the total number, and also the share of urban dwellers worldwide, is taking place. Therefore, ambitious global goals for sustainability that do not consider urban areas seem to be predestined to fail and documents such as the UN's New Urban Agenda

¹Even though a myriad of urban scholars have struggled to define what a city or an urban area actually is, and “the urban is not a pre-given, self-evident reality, condition or form” and “cannot be plausibly understood as a bounded, enclosed site of social relations” (Brenner and Schmid 2013, p. 19f), we chose, for this article, a political science perspective, defining cities as the political entities and territories limited through administrative borders within which local governments act. Nevertheless, we acknowledge that these entities are nested in multi-level political arrangements (Kübler and Pagano 2015), that public actors are not necessarily most crucial for the pursuit of collective goals (governance perspective) (Pierre and Peters 2015), and that other definitions – for example, urbanism as a way of life (Wirth 1938) and the city as the place where a specific form of living appears (Simmel 1903 and Koch 2011) – exist and reveal the shortcomings of defining cities through political borders. Still, for the sake of this article, which deals with public data and indicators, we stick to this “traditional” form of definition.

F. Koch (✉)

Department of Urban and Environmental Sociology, Helmholtz Centre for Environmental Research-UFZ, Leipzig, Germany
e-mail: florian.koch@ufz.de

S. Ahmad

Mercator Research Institute on Global Commons and Climate Change (MCC),
Berlin, Germany

Department Economics of Climate Change, Technische Universität Berlin,
Berlin, Germany

e-mail: ahmad@mcc-berlin.net

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(UN Habitat 2016) highlight the need for profound changes in current urban developmental paths. These paradigm changes, also labeled *urban transformations towards sustainability*, demonstrate the normative dimension of urban transformations (see Rink et al., “Exploring the Extent, Selected Topics and Governance Modes of Urban Sustainability Transformations”, in this volume). *Urban transformations* receive increasing political recognition, as demonstrated by the much-cited statement of UN Secretary General, Ban Ki Moon, that “our struggle for sustainability will be won or lost in cities” (UNESCAP 2014, p. 1) (Rudd 2015 later complemented, rightly, that this struggle “will be won or lost by cities”). That is why one of the 17 Sustainable Development Goals (SDGs, also known as Global Goals, UN 2015), which, together, form the 2030 Agenda, has an explicit urban focus (Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable). Cities are also important for the implementation of other SDGs. Goals such as “End poverty in all its forms everywhere” (Goal 1) or “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (Goal 4) also need to encompass the urban dimension of poverty and learning opportunities in cities, in order to be realized. Estimates based on the wording of the SDG zero draft indicate that 21% of the 169 targets of all 17 SDGs can only be implemented with urban stakeholders, 24% should be implemented with urban stakeholders, and a further 20% should have a much clearer orientation towards urban stakeholders, although current wording does not suggest this (Misselwitz et al. 2015). Nevertheless, this chapter focuses only on Goal 11, acknowledging the crosscutting character of cities for the other SDGs as well.

The argument that cities are increasingly seen as driving forces for reducing global environmental change and as facilitators of a more sustainable development globally is strengthened by ongoing political discussions: Besides the above-mentioned New Urban Agenda, also the UNFCCC’s Paris Agreement, as well as the latest report of the German Advisory Council on Global Change (WBGU), highlights the power of cities for sustainable transformations (WBGU 2016). These perceptions of cities as solution-providers for global sustainability are relatively new: Whereas, for a long time, cities were considered mainly as polluters and threats to the environment, the pendulum has swung back and urban areas are now seen as one option for combining economic, social, and environmental development in a sustainable way. The Sustainable Development Goals play a crucial role in this process because the importance of cities for achieving global sustainability is acknowledged and, at the same time, targets and indicators for inclusive, safe, resilient and sustainable cities are made explicit. The predecessor of the SDGs, the UN Millennium Goals, were adopted in 2000 and focused on the developing world through goals such as halving extreme poverty, halting the spread of HIV/AIDS, and providing universal primary education. In contrast, the Sustainable Development Goals have a global character, including developing and developed countries. This implies that Goal 11 applies to cities of the Global South and the Global North equally, i.e., Goal 11 can be considered as a global normative framework for urban transformations.

As welcome as the intent to create global targets for sustainable cities worldwide is, it is nonetheless of crucial importance to also think about how to implement these

goals. In this context, several issues, including governance aspects, funding, the negotiation of emerging trade-offs, as well as the general character of global agreements and responsibility, need to be considered. Implementation needs also to be measured and therefore indicators and the availability of data play a major role (Koch and Patterson 2015). In contrast to the Millennium Goals, a fundamental change about the data provision from the SDGs is that progress measurement – not only for Goal 11, but for all goals – should take place not only at national but also at subnational levels. This is a challenge for the official statistics (Schnorr-Bäcker 2016) because comparable data on the indicators mentioned in the SDGs are often more easily available on the national than on the city or regional level.

The UN's Statistical Commission, as well as the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs), are currently discussing indicators and data availability for the SDGs. Regarding Goal 11, several adjustments have already been made (United Nation Statistic Division 2016), and further changes are expected. Nevertheless, agreement on the 10 core principles of the SDG indicators exists (Simon et al. 2016)²: Based on these principles, it is stated that, wherever possible, data from the UN institutions should be used. With respect to this point, the WBGU proposed that UN Habitat could play an important role regarding indicators for and monitoring of Goal 11 (WBGU 2016, p. 445). Nevertheless, the question of disaggregation, which is of special importance for Goal 11, is not yet fully resolved. Two key concerns exist:

1. As stated in the latest UN documents, the indicators should contain, as the disaggregation level, only a distinction between urban and rural on the national level (as well as disaggregation by sex and age). It is argued that disaggregation with other characteristics should be realized when relevant and possible, but without further specification.
2. It is not yet clear whether data on the level of urban agglomerations (i.e., the city and its surrounding area/the urban region) or from the city area, defined through administrative boundaries, should be used. Whilst UN statistics frequently use urban agglomerations as a statistical unit, most publicly used data refer to the area of administrative boundaries. This divergence would require a somewhat complex re-aggregation after the disaggregation is done in order to ensure comparability.

Based on the UN's principles of using well-established data sources and making data collection transparent, we investigate which publicly accessible data on the SDGs already exist on the city/urban agglomeration level. This is based on the idea that monitoring the process of the SDGs needs to be performed locally. Aggregated

²The 10 principles are: (1) indicators that are limited in number and globally harmonized, (2) simple, single-variable indicators with straightforward policy implications, (3) allow for high-frequency (annual) monitoring, (4) consensus-based, in line with international standards and information already collected by national and environmental/economic information systems, (5) constructed from well-established data sources, (6) disaggregated, (7) universal, (8) mainly outcome-focused, (9) science-based and forward-looking, (10) a proxy for broader issues or conditions

UN data on the proportion of urban populations living in slums, informal settlements or inadequate housing in all urban areas in one country do not indicate where the actual problem is and in which city action is needed. This also holds true for the other SDGs. As Satterthwaite questions, “What does it serve to know the proportion of a nation’s territory that is public space? Or the national average in the time or distance to public transport?” (Satterthwaite 2016). In contrast, if it were possible to evaluate, for each city, how the various indicators of Goal 11 are fulfilled or what progress has been made, accountability as well as priorities on the urban level could be more easily addressed.

2 Aims and Approach

Because the SDGs have a global character and should be applied not only in developing but also in developed countries, two test case countries – India as an example of a developing and Germany as an example of a developed country – were chosen in order to analyze the SDG 11 indicators. This chapter looks at German and Indian cities with a focus on how the implementation of SDG 11 can be measured in these two contrasting contexts. The manifold differences between German and Indian cities, for example, those related to population development, social welfare, informal building activities, institutional capacities, or municipal competencies make India and Germany a testbed for whether the indicators are globally applicable. Those countries were chosen because the authors are familiar with the respective national context. First, we briefly review the relevancy and availability of data pertaining to targets referring to Goal 11. Thereafter, the availability of data for the indicators related to Goal 11 is examined. Methodologically, we refer to existing documents and official data for German and Indian cities (for Germany: data of the *Statistisches Bundesamt* as well as other publicly accessible data; for India: data from the Office of the Registrar General and Census Commissioner, and the National Sample Survey Office, among others), to our own experience with urban planning processes in both countries, as well as to secondary literature on research that has been done on the SDGs and their implementation.

The chapter builds on previous work of the authors related to the Issues Papers of the Habitat III process and the ISSC seminar on sustainable urbanization in Taipei, in November 2014 (Ahmad and Koch 2015).

This chapter describes Goal 11, the related targets and indicators, and evaluates the relevancy and existing data for German and Indian cities. Furthermore, we discuss the findings and highlight common problems as well as country- or city-specific obstacles.

3 The Urban Dimension of the Sustainable Development Goals

The targets of Goal 11 demonstrate, on the one hand, the complexity of urban sustainability and, on the other hand, the difficulties concerning the data, which should reveal whether the goal has been fulfilled or not. Table 1 provides a survey of data availability and reliability, as well as the relevance of the respective targets in the German and Indian contexts. We have divided the parameters (relevancy, availability, and reliability) of data referring to the target into low, medium, and high, based on the approach of Simon and Arfidsson (2015) and Simon et al. (2016). The relevance of an indicator depends on whether the related target is of importance for the respective national urban context. For example, in high-income countries with good provision of housing, the measurement of the proportion of the urban population living in slums, informal settlements, or inadequate housing is less relevant than in countries in which the major proportion of the population lives in precarious forms of housing. In the table, we classify the relevancy, availability and reliability with L (=low), M (=medium), and H (=high). The relevance of an indicator for the German and the Indian context was determined by consulting the drafts of the national Reports for Habitat III (SRL 2015; UTC 2015).³ High availability is given if the data are easily accessible and usable for long-term monitoring. In order to track availability, we analyzed whether publicly accessible databases contain data on the respective indicator. Therefore, we cannot prove whether data on the selected indicators exist at all but we can estimate how easy available the data are. Reliability refers to the fact that gaps between official statistics and the actually occurring developments may exist, especially with regard to classifications in the so-called informal sectors. This may be the case for indicators that explicitly refer to informal (as yet unofficially documented aspects such as, for example, work relationships lacking legal definitions or housing construction outside of the existing formal regulatory framework) forms of development (Simon and Arfidsson 2015).

4 Discussion

Earlier studies have pointed out priorities for the UN SDGs: devise metrics, establish monitoring mechanisms, evaluate progress, enhance infrastructure, and standardize and verify data (Lu et al. 2015). All of these priorities are still major challenges. More precisely and for urban contexts involving a comparative framework of five fairly representative cities (globally) and broadly relevant, acceptable, and practicable targets, Simon et al. (2016) conclude that each city faced problems

³The final reports haven't been published by the time we wrote this article (April 2016) and could therefore not be used as sources. Nevertheless, the reports have now been published and are available at www.unhabitat.org

Table 1 Targets and indicators of Goal 11 of the SDGs and data availability for German and Indian cities

Target	Indicator	Country	Data related to targets (either L (Low), M (Medium), or H (High))		Comments
			Relevancy	Availability and reliability	
11.1 By 2030, ensure access for all to adequate, safe, and affordable housing and basic services, and upgrade slums;	11.1.1 Proportion of urban population living in slums, informal settlements, or inadequate housing	India	H	L	Sources Census of India (2011), National Sample Survey (NSS), and Indian Human Development Survey (IHDS)
		Germany	L	L	No official data about slums/informal settlements exist in the German context. The German National Report for Habitat III mentions that no slums exist in Germany (SRL 2015, p. 77) and, therefore, that no need for data on these issues exists because the goal has already been achieved
11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improve road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons;	11.2.1 Proportion of population that has convenient access to public transport, by sex, age, and persons with disabilities	India	H	L	The national travel survey is missing, and there are limited data sets on transport systems, especially disaggregated by sex, age, and person with disabilities.
		Germany	M	H	The draft for the German National Report to Habitat III indicates that 100% of the urban population has access to public transport, thus the target has already been achieved (SRL 2015, p. 78). Official data on transport issues only exist on the federal state level, partly without disaggregation levels.

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated, and sustainable human settlement planning and management in all countries;	11.3.1 Ratio of land consumption rate to population growth rate	India	M(11.3.1)/H(11.3.2)	M(11.3.1)/H(11.3.2)	11.3.1 Good data sets available, as mentioned above in target 11.1.1. 11.3.2 The devolution of power at the city level is still a major milestone to achieve and, similarly, civil society participation. In this context, data are obviously limited.
	11.3.2 Proportion of cities with direct participatory structures in the civil society that operate regularly and democratically in urban planning and management	Germany	H (11.3.1)/L (11.3.2)	H (11.3.1)/L (11.3.2)	11.3.1 Good data set on land use change and population change available on the city level. 11.3.2 Direct participation is part of the national planning law; therefore, it can be assumed that 100% of German cities already fulfill this goal.
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	Total expenditure (public and private) per capita spent on the preservation, protection, and conservation of the entire cultural and natural heritage, by type of heritage (cultural, natural, mixed, and World Heritage Center designation), level of government (national, regional, and local/municipal), type of expenditure (operating expenditure/investment), and type of private funding (donations in kind, private non-profit sector, and sponsorship)	India	H	L	Limited data available, and often not in the public domain. Details can be found at Archeological Survey of India (www.asi.nic.in)
		Germany	H	L	Very poor data availability for private spending for cultural and natural heritage, official data exist only for public spending on UNESCO World heritage sites

(continued)

Table 1 (continued)

Target	Indicator	Country	Data related to targets (either L (Low), M (Medium), or H (High))		Comments
			Relevancy	Availability and reliability	
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses, relative to global gross domestic product, caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;	11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people	India	H	L	<p>Sources</p> <p>11.5.1 Limited data available from National Disaster Management Authority, Government of India, and also lacking in urban/ rural distinction and completeness.</p> <p>11.5.2 Data almost impossible to find, given that these issues have only limited insurance and losses are, therefore, not documented.</p>
	11.5.2 Direct economic loss due to disaster in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services	Germany	M	H	<p>11.5.1 Data on victims of disaster is available, but the official data do not indicate numbers of missing persons and persons affected by disasters</p> <p>11.5.2 Cooperation with insurance companies necessary, no official data exist</p>
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including paying special attention to air quality and municipal and other waste management;	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities	India	H	M	<p>11.6.1 Weak data infrastructure for municipal governments; however, the Central Pollution Control Board (CPCB) can provide such data sets but not comprehensively.</p> <p>11.6.2 The CPCB provides good data regarding particulate matter.</p>
	11.6.2 Annual mean levels of fine particulate matter (e.g., PM _{2.5} and PM ₁₀) in cities (population-weighted)	Germany	M	H	<p>11.6.1. German law requires that urban solid waste is collected, data exist</p> <p>11.6.2 Cities are obliged to measure fine particulate matter; therefore, it can be assumed that data exist</p>

11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons, and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	India	H	L	11.7.1 Master Plans of cities, but often not comparable; however, RS/GIS could be used.
	11.7.2 Proportion of victims of physical or sexual harassment, by sex, age, disability status, and place of occurrence, in the previous 12 months	Germany	M	M	11.7.2 Limited data, including under-reporting. 11.7.1 Data on land use in cities exist. Due to the law, it can be assumed that open space can be used by all 11.7.2 Data exist on sexual harassment against women (Europäischen Union für Grundrechte (FRA); thus, data are partially available
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning;	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city	India	H	L	Required by Indian planning law, but great variation between provinces.
		Germany	H	L	Required by German planning law and therefore it can be assumed that all German cities implement such plans.

(continued)

Table 1 (continued)

Target	Indicator	Country	Data related to targets (either L (Low), M (Medium), or H (High))		Comments
			Relevancy	Availability and reliability	
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation of and adaptation to climate change, resilience to disasters, as well as develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels;	11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	India	H	L	Sources 11b.1 Not available, but could be compiled. 11b.2 Some data exist; could be strengthened.
	11.b.2 Number of countries with national and local disaster risk reduction strategies	Germany	L	H	11b.1 No official data on the proportion of local governments that adopt and implement disaster risk reduction strategies 11b.2 Disaster risk strategies already exist in Germany
11.c Support least developed countries, including through financial and technical assistance, to build sustainable and resilient buildings, utilizing local materials	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient, and resource-efficient buildings utilizing local materials	India	L	L	Not applied directly for India. Nevertheless, India has supported neighboring countries, e.g., Nepal and Afghanistan. Data can be compiled.
		Germany	H	H	Data on financial support to the least developed countries exist on national as well as on European levels.

Source: Authors' assessment based on the UN (2015) and UNSTATS (2016) datasets

in providing all the data required; however, each city also proposed various changes to maximize the local relevance of particular targets and indicators.

The analysis of Indian and German cities has confirmed these results and, again, demonstrated the challenges concerning data for the SDG as well as the difficulties related to having universal, but at the same time, city-specific data. National or local data on all of the indicators for Goal 11 do not exist in either the German or in the Indian context. Even though some indicators (not only for Goal 11 but also for other SDGs) can be already measured on local levels (Schnorr-Bäcker 2015), the provision of data for all the indicators on a subnational and, even more, on an urban level remains challenging.

Of course, the provision of data on the indicators of the targets does not automatically guarantee that Goal 11 will be realized and cities will become “inclusive, safe, resilient and sustainable”, but it is necessary to measure the progress towards this goal. If data on the indicators do not exist, Goal 11 becomes an issue of wishful thinking that some cities might, and others might not achieve. Through data monitoring, the necessary actions to avoid the non-achievement of the SDGs can be identified. As our analyses have shown, data on most of the indicators for Goal 11 do not exist, currently, for cities in Germany and India. Adjustments and modification of the official statistics are necessary, not only in order to provide data for Goal 11 but also for the other Goals (Schnorr-Bäcker 2015). From an urban point of view, we propose four major points that need to be considered in further discussions on monitoring and evaluating progress on the SDGs and, especially, on Goal 11.

- *Reach and limits of data:* The selected indicators try to sketch which issues need to be considered in order to make a city inclusive, safe, resilient and sustainable. It was beyond the scope of this article to question whether these indicators are the right ones for defining inclusive, safe, resilient and sustainable cities (for a detailed discussion of the SDGs, see ICSU and ISSC 2015, or Loewe and Rippin 2015). We acknowledge that these indicators can serve only as a first approximation towards what future urban development should look like; other issues, such as social coherence on an urban level, the institutional capacity of city-/region-wide forms of governance, or the strengthening of urban circular economies, also need to be considered.
- *Disaggregation level:* As stated above, a disaggregation of data that only distinguishes between rural and urban areas on the national level is not helpful for monitoring and developing concrete actions in order to achieve Goal 11. We suggest, therefore, that the focus of such datasets should be beyond the urban/rural disaggregation, but also city-specific. Only if city authorities can identify which target’s implementation poses a problem, can specific actions be taken. Nevertheless, the indicators should not lead to a situation in which cities that have already achieved the targets should lean back and cease actions towards inclusiveness, safety, resilience and sustainability. Furthermore, it has to be acknowledged that not all targets of Goal 11 can be realized by local authorities; several require national politics (see, for example, targets 11.4 or 11.c). In cases where data on a city level are not accessible, data should be compiled on types of

cities, e.g., size of the city, or based on specific typologies of cities, e.g., coastal cities. Such a data compilation could help to develop urban public policy interventions for specific types of cities.

- *Transparency – open access data*: One of the targets of Goal 17 is to encourage civil society partnerships to strengthen the means of implementation and to revitalize the Global Partnership for sustainable development. In keeping with this line, we would like to emphasize the need for open access data on the SDGs' indicators. This is especially true for the city level, where public interest and civil society involvements may be greater than for issues that are discussed on a more abstract, global level. If civil society involvement should be facilitated in the implementation of the SDGs, free access to data that monitor the SDGs' implementation is needed. Civil society's access to data can be considered as a powerful way of feeding information on the implementation level of the SDGs back into the policy and political arena, to hold responsible stakeholders to account. If we do not create these sorts of 'feedback loops', based on civil society, how will we make sure that the SDGs are actually being implemented? This is in line with current discussions on adjustments and modifications of the official statistics and public access to SDG-relevant data (Schnorr-Bäcker 2015).
- *City and country specifics*: As our analysis has shown, the relevance of the various targets of Goal 11 varies and depends, to a high degree, on the respective national context. Therefore, we suggest that each country should assess the relevance, availability, and reliability of datasets for measuring and monitoring SDGs/targets and, thereafter, efforts should be made to create and compile the respective datasets. Nevertheless, this process should be made transparent and decisions about why some indicators are considered to be of greater importance than others should be explained. Cities should be encouraged to perceive the task of monitoring the implementation of the SDGs as municipal business and include them in their urban development strategy.

5 Outlook

Measurement is acknowledged to be crucial for monitoring and implementation of the SDGs and freely accessible data for each city, preferably divided between the city and the wider urban region, would be useful. However, considering the related costs and the restricted resources of municipal or regional statistical offices, not only but especially in developing countries, it is obvious that trade-offs between an expansive, but hardly realizable set of indicators and the focus on a more limited set of indicators need to be made (Cities Alliance 2015). Discussing these trade-offs should not be left to national and international institutions. Perspectives from urban stakeholders, as well as from cities and urban civil societies, are needed. Therefore, the UN Habitat III conference in Quito, characterized as the first implementation conference on the SDG agenda, seems to be an appropriate context to discuss these issues, and a close linkage between the Habitat III New Urban Agenda and the

SDGs, as envisaged, is fundamental (Cities Alliance 2015). Whether our cities have the adequate data and mechanisms to measure whether they are becoming more inclusive, safe, resilient, and sustainable thus depends on how urban stakeholders, such as local administrations, mayors, civil society and urban enterprises, but also urban scholars, raise their voices and become more visible in the global debates on the Sustainable Development Goals.

From a theoretical point of view, the SDGs and, especially, Goal 11 can be considered as a normative and universal vision of what cities should look like in 2030. Therefore, SDG Number 11 can also be read as global guideline for the minimum standards that a city should fulfill – irrespective of its location in the Global South or North. This makes the SDGs especially valuable for discussions on urban transformations towards sustainability, such as those included in this book: The SDGs attempt to operationalize sustainable development and present indicators on how to measure progress towards sustainability. Even though shortcomings concerning the selection of indicators and the conceptualization and ambition of the SDGs exist (Unmüßig 2016), the SDGs can be a starting point for thinking about indicators of how to measure sustainability transformations and about how the shift from declarations of interest towards implementation of sustainable urban development can be realized.

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