

A REPORT ON SOME URBAN SUSTAINABILITY INDICATORS PRACTICED IN THE WORLD

世界で実践されている都市の持続可能性指標について

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Abstract 21世紀は都市の世紀である。世界人口の半数以上がすでに都市に住み、その割合がさらに増大すると予測されている。都市は人々の生活水準を高める一方、環境に重大な影響を与えている。持続可能な都市およびその評価指標についての研究は多く発表されているが、その実践についてレビューは必ずしも多くない。本稿は世界で実践されている都市レベルの持続可能性指標をまとめ、地域に適した持続可能性指標の構築方法の研究に基礎的資料を提供することを目的とする。

Keywords: urban, sustainability, indicators, practice
都市, 持続可能性, 指標, 実践

I. Introduction

Cities are the defining ecological phenomenon of the twenty-first century¹. Now, more than half of the world population lives in the urban areas. While cities provide huge opportunities for economic development, they also pose mounting problems to the global ecosystem and human sustainability. With global population growth centered largely in urban areas, cities will increasingly be the locations where human activities and their associated ecological impacts can be most aptly met with policy and planning responses². Urban indicators are crucial to help local and national policymakers improve their action towards sustainability. Conceptual research on the sustainable city and its evaluation indicators have been accumulated in the past decades^{3,4}. However, there are not many reports on how they are implemented. This paper introduces some urban sustainability indicators practiced in the world in order to provide the background information for further research on the methodology of building sustainability indicators that are measurable to a certain locality. Here, we only target on the indicator sets that proposed and measured by the some organizations and countries, excluding the well-known indicators provided by the international organizations such as UNCHS, UN-Habitat, OECD, EEA, WHO, and World Bank.

II. Urban Sustainability Indicators in practice

1. Government of Ontario, Canada - Global City Indicators

The Global City Indicators Program⁵ was initiated by the World Bank and now managed by the Global City Indicator Facility which was supported by the Ministry of Municipal Affairs and Housing, Government of Ontario, Canada. The program builds on existing indicators and provides an established set of city indicators with a globally standardized methodology that allows for global comparability of city performance and knowledge. The main purpose of the Program is to help cities maximize their investment in performance monitoring by providing a framework to facilitate consistent and comparative collection and sharing of city indicators. It focuses on cities with populations over 100,000. The Global City Indicators Framework is organized into two brand categories: city services, which includes services typically provided by city governments and other entities, and quality of life, which includes critical contributors to overall quality of life⁶. And the two categories are structured around 18 themes. Each theme consists of core and supporting indicators. Currently, there are 27 core and 36 supporting indicators, including 10 indices under development. At present, 168 cities in the world are participating in

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the Global City Indicators Program.

2. Siemens Organization - European Green City Index

European Green City Index⁷ is one of the city indices developed by the Siemens Organization which puts sustainability as a polar of the corporate strategy. It is a unique research projects assessing and comparing cities in terms of their environmental performance. Siemens has developed Green City Index of Africa, US and Canada, Latin American, Asia, Europe, and Germany. The Green City Indices allow key stakeholder groups to compare their city's performance against others overall, and within each category. Meanwhile, it offer a tool to enhance the understanding and decision-making abilities of all those interested in environmental performance, from individual citizens through to leading urban policy makers.

The European Green City Index measures and rates the environmental performance of 30 leading European cities from 30 European countries. It takes into account 30 individual indicators per city, touching on a wide range of environmental areas, from environmental governance and water consumption to waste management and greenhouse gas emissions. The Index evaluates cities across 8 categories – CO2 emissions, energy, buildings, transport, water, waste and land use, air quality and environmental governance—and 30 individual indicators. And 16 of the index's 30 indicators are derived from quantitative data, while the remaining 14 indicators are qualitative assessments of cities' aspiration or ambitions.

3. Forum for the Future - The Sustainability Cities Index

The Sustainability Cities Index, produced by Forum for the Future, is a tool for measuring the sustainability of Britain's 20 largest cities according to their social, economic and environmental performance⁸. The index is intended to encourage healthy competition, stimulate discussion and suggestion of new thoughts of cities. It provides a snapshot of sustainability in each city. The Index compasses 3 broad criteria which are environmental performance in terms of resource use and pollution, quality of life – what the city is like to live in for all its citizens, and “future-proofing”- how well the city is preparing itself for a sustainable future. In order to give an insight into the sustainability of cities, the Sustainable Cities Index develops the three distinct baskets into 13 indicators which were selected for their public availability and comparability in order to ensure the fair and balance measurement of sustainability of each city.

4. European Foundation – Urban Sustainability Indicators

Urban Sustainability Indicators is proposed by the European Foundation as tools for quantifying sustainability performance. The European Foundation started its works on urban sustainability indicators in 1994, when the first set of indicators based upon The Charter of European Sustainable Cities and Towns⁹. The Foundation developed a series of indicators related to urban sustainability, based on a conceptual framework of Pressure-State-Response (PSR) framework. The indicators include: 1) Global Climate Indicator, 2) Air Quality Indicator, 3) Acidification Indicator, 4) Ecosystem Toxicification Indicator, 5) Urban Mobility Indicator or Clean Transportation Indicator, 6) Waste Management Indicator, 7) Energy Consumption Indicator, 8) Water Consumption Indicator, 9) Nuisance Indicator, 10) Social Justice Indicator, 11) Housing Quality Indicator, 12) Urban Safety Indicator, 13) Economic Urban Sustainability Indicator, 14) Green, Public Space and Heritage Indicator, 15) Citizen Participation Indicator, 16) Unique Sustainability Indicator.

5. Institute for Urban Strategies, The MORI Memorial Foundation -- Global Power City Index

The Global Power City Index (GPCI) is Japan's first effort to analyze and rank comprehensive power of the major cities in the world. It is created under the GPCI committee, chaired by Heizo Takenaka, chairman of the Institute for Urban Strategies at the Mori Memorial Foundation¹⁰. The GPCI pays its attention to a variety of function of cities instead of focus on specific areas. And it serves as a benchmark of the strengths and weaknesses which Tokyo and other global cities possess, and be utilized as a helpful resource in the development of urban policies and corporate strategies. The GPCI selected 35 of the world's major cities and evaluated from 6 main functions representing city strength including “Economy”, “Research & Development”, “Cultural Interaction”, “Livability”, “Environment” and “Accessibility”, and 6 global actors who are leading

the urban activities in the cities including “Managers”, “Researchers”, “Artists” and “Visitors” and one local actor “Residents”. At the same time, under the 6 main functions, it has 69 individual indicators in total to compose the comprehensive ranking.

6. The Urban China Initiative —Urban Sustainability Index

The Urban China Initiative, a joint initiative of Columbia University, Tsinghua University and McKinsey Company, has published China’s first Urban Sustainability Index¹¹. It was composed of 5 components of sustainable development encompassing 18 individual indicators which covers both environmental sustainability of the cities and the level of services required by the rapid urbanization. The 5 components of Urban Sustainability Index include: 1) Basic Needs; 2) Resource Efficiency; 3) Environmental Health; 4) Built Environment; 5) Commitment to Sustainability. And for further measuring the performance of cities, the 5 component are divided into 18 relevant indicators. The initiative worked on 112 Chinese cities that have been selected by the government as the focus of sustainable development efforts¹².

7. US EPA - Green Communities

The United States Environmental Protection Agency developed a program called the Green Communities, which is a web-based toolkit and planning guide designed to help communities become more sustainable, Green Communities¹³. The program has a 5-step environmental planning framework, and two different types of indicators: domain-based indicators and goal-based indicators. The domain-based indicators are organized into three key dimensions of sustainability: environmental, economic and social, and it accentuates the linkages among the three dimensions¹⁴. The goal-based indicators are developed into a different framework—sustainability indicators, economic prosperity, healthy community, and social wellbeing-- which are more directly link to the sustainable goals of the communities. “The strength of a goal-based framework is that it reduces the number of indicators that have to be considered to only those relating to specified sustainability goals”¹⁵.

8. UK - Eco-town Standards

Eco-town Standards is developed by the Department for Communities and Local Government of the Her Majesty’s Government. The Department has set out the Government’s national policies, and Planning Policy Statements (PPS) is one of the national policies focus on spatial planning in UK. The PPS on eco-towns provides the standards any eco-town will have to adhere to and the list of locations identified with the potential for an eco-town. The Eco-town Standards covers 11 aspects, which are carbon emissions, employment, transport, local services, green infrastructure, biodiversity, water, flood risk, waste, healthy living and landscapes, totally 29 indicators¹⁶. Meanwhile, in terms of the development and management of eco-town, there are another 5 indicators, which includes master planning, transition and governance¹⁷.

9. China - Eco-city Indicators

The Ministry of Environmental Protection of China (MEP) has published the indicators of eco-city construction in 2003, and revised it in 2007¹⁸. The indicator of eco-city construction includes both prerequisites and indicators. The eco-city is required to establish “eco-city plan” and has its independent environmental organization. It is also required to achieve the targets of energy and emission reduction from the higher level of government and ranks top in the province¹⁹. In terms of indicators (2007), it stipulated that eco-city should meet the 19 indicators which cover 3 aspects: economic development (5 indicators), environmental protection (11 indicators), and social development (3 indicators). The Indicator of Eco-cities construction not only include some general urban sustainability indicators, but also establish some indicators based on the characteristic of China, such as the annual net income of peasants, the effective utilization of agricultural irrigation water, and the rate of heating.

III. Conclusion

The planning and management of cities are critical to global sustainability. This paper covers an overview of various urban sustainability indices which are practically implemented to measure sustainability performance at local levels. These

criteria stretch across a range of economic, social and environment. Although there are various international efforts on measuring sustainability, an integral set of indicators measuring urban sustainability of local level is needed. Indicators of urban sustainability should be selected and negotiated based on the local situation by the appropriate communities of interest.

IV. References

- 1) Newman, P. and Jennings, I.(2008). *Cities as Sustainable Ecosystem: Principles and Practices*. Washington, D.C.: Island Press.
- 2) United Nation University/ Institute of Advanced Studies.(2003). *Defining an Ecosystem Approach to Urban Management and Policy Development*. Retrieved May 16th, from www.ias.unu.edu/binaries/UNUIAS_UrbanReport1.pdf
- 3) Alberti M. (1996). *Measuring Urban Sustainability*. ENVIRON IMPACT ASSESS REV 1996;16:381-424
- 4) Singh R. K., Murty H.R. , Gupta S.K. and Dikshit A.K. (2009). *An overview of sustainability assessment methodologies, Ecological Indicators*; 9: 189-212.
- 5) Global City Indicators Facility Website: <http://www.cityindicators.org/> , last accessed May 28th.
- 6) Bhada P. & Hoornweg D. (2009). *The Global City Indicators Program: A More Credible Voice For Cities*. Retrieved May 6th, 2012, from the World Bank Website:
<http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1226422021646/Directions4.pdf>
- 7) Siemens. *European Green City Index: Assessing the environmental impact of Europe’s major cities*. Retrieved May 1st, 2012, from http://www.siemens.com/entry/cc/features/urbanization_development/all/en/pdf/report_en.pdf
- 8) Forum for the future. (2010). *The Sustainable Cities Index 2010: Ranking the 20 largest British cities*. Retrieved May 6th, 2012 from
http://www.forumforthefuture.org/sites/default/files/images/Forum/Projects/Sustainable_Cities_Index/Sustainable_Cities_Index_2010_FINAL_15-10-10.pdf
- 9) Mega, V. and Pedersen, J. (1998). *Urban Sustainability Indicators*. European Foundation. Retrieved May 26th, 2012, from <http://eurofound.europa.eu/pubdocs/1998/07/en/1/ef9807en.pdf>
- 10) The Mori Memorial Foundation. (2011). *Global Power City Index 2011*. Retrieved May 1st, from
http://www.mori-m-foundation.or.jp/english/research/project/6/pdf/GPCI2011_English.pdf
- 11) The Urban China Initiative. (2010). *The Urban Sustainability Index: A New Tool for Measuring China’s Cities*. Retrieved May 2nd, 2012, from <http://www.urbanchinainitiative.org/userfiles/PdfFile/usi.pdf>
- 12) UCI Launches China’s First Urban Sustainability Index. (2010). Urban China Initiative. Retrieved May 4th, 2012, from
<http://www.urbanchinainitiative.org/article.aspx?id=205537>
- 13) *Basic Information – Green Communities*. U.S. Environmental Protection Agency Website. Retrieved May 6th, 2012, from <http://www.epa.gov/greenkit/basicinformation.htm>
- 14) *Indicators – Green Communities*. U.S. Environmental Protection Agency Website. Retrieved May 6th, 2012, from
<http://www.epa.gov/greenkit/indicator.htm>
- 15) Hart M. (1999). *Guide to Sustainable Community Indicators*. 2nd edition. Hart Environmental Data.
- 16) *Eco-towns: an introduction*. Directgov Website. Retrieved May 6th, 2012, from
http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenercommunityandwork/DG_189786
- 17) *Communities and Local Government*. (2008). *Draft Planning Policy Statement: Eco-towns – Consultation*. Retrieved May 6th, 2012, from <http://www.communities.gov.uk/documents/planningandbuilding/pdf/ppsecotowns.pdf>
- 18) Gu P.Y. & Li Y. (2011). “Environmental Model City”. “Ecocity” and “Low-carbon city”: Policies and Practices in China. *Reports of the City Planning Institute of Japan*; 10:87-92. (in Japanese)
- 19) MEP. (2007). *The Announcement of Indicators of Eco-county, Eco-city and Eco-province construction*. Environment and Development. Retrieved May 28, 2012 from http://www.mep.gov.cn/gkml/zj/wj/200910/t20091022_172492.htm (in Chinese)