Deriving a Thematic Framework for Measurement of Urban Sustainability in India

Sudha Panda[1], Manjari Chakraborty[2] and S K Misra[3]

[1]*Piloo Mody College of Architecture Cuttack*
[2]*Dept. Of Architecture BIT, Mesra*
[3]*ABIT Cuttack*
E-mail: [1]sudhapanda@hotmail.com, [2]profmanjari@gmail.com, [3]santosh_ku_misra@yahoo.com

Abstract—*India has experienced rapid urbanization with the rate growing from 26% in the 1990-2000 decade, to 30% in the 2000-2010 decade. This scale of urbanization will put massive pressure on basic infrastructure and services. Urban Sustainability is an aggregate value of Economic, Social, Environmental and Institutional dimensions. This paper examines Urban Sustainability as a 3 tiered hierarchical model with several themes under each dimension. This framework measures criteria at 3 levels i.e. Policy, Theoretical, and Practical levels and derives a common set of themes under each dimension. At the Practical level, Global Initiatives like Social Progress Index, Millennium Development Goals (UN-Habitat), City Data Book(Asian Development Bank) and Global City Indicators(World Bank), FEEM Sustainability Index have been studied. The framework has been tailor-made for Indian cities which cannot use the standardized solutions of Global Initiatives.*

1. INTRODUCTION
1.1 BACKGROUND

India has experienced phenomenal growth of its cities. The rate of urbanization has grown rapidly from 26% in the 1990-2000 decade, to 30% in the 2000-2010 decade. Projecting this growth rate by 2030, the urban population will be 40% of the total projected population of 1470 million. This scale of urbanization will put massive pressure on city's natural resources and in the provision of adequate basic infrastructure and services.

When we look at the background of the sustainability issues we see that a lot of study has been done since 1987 with the Brundtland commission report when a number of efforts worldwide was made to construct the Sustainability development indicators but in India not a single city has registered any initiative for indicator development till date [1] In 1992, governments of 178 countries met at Rio de Janeiro, for UN conference of Environment and Development(also known as the Earth Summit) which was convened to address the urgent problems of environment protection and socio-economic development. There is no International consensus yet on sustainable development indicators and no recommended shortlist although UNCSD has published a menu of 134 indicators.

1.2 FORMING A FRAMEWORK FOR URBAN SUSTAINABILITY INDEX

Urban Sustainability as given by UNCSD has four components namely Economical, Environmental, Social and Institutional .The framework for determining the Urban Sustainability Index is a 3 tiered hierarchical model with several themes under each dimension and each theme has several indicators under it. The framework should measure criteria at 3 levels i.e. Policy, Theoretical, and Practical levels. As far as Policy level is concerned , as of 2014 India has developed a series of projects and programs which can be classified as important elements of National Sustainable Strategy (MoEf,2002 IBEF 2010) India however has not yet developed or published a comprehensive and consistent sustainable strategy. The Five Year Plans provide medium-term strategies for overall development. The Ministry of Urban Development has come up with a Report on the development of Sustainable Habitat Parameters on Urban Development. At the practical level a lot of global initiatives have been taken by World Bank, UN Habitat, Asian Development Bank etc. which measure the urban sustainability across countries.

2. METHODOLOGY

The methodology has been worked out under the guidelines of scientific research i.e
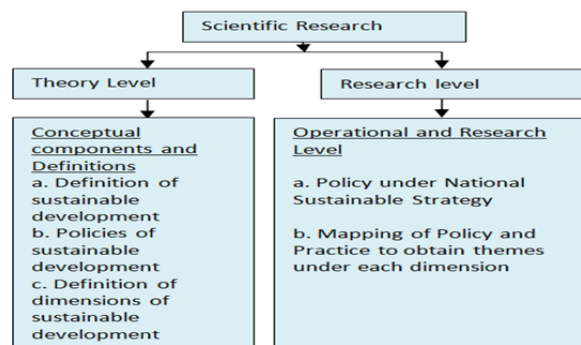
3.   THEORETICAL FRAMEWORK

3.1 Definition of Sustainable Urban Development

Probably the earliest and most comprehensive definition of sustainable development is given by Brundtland Commission, as "Development which meets the needs of the present without compromising the ability of future generations to meet their own needs."

Urban sustainability is defined as the challenge to "solve both the problems experienced within cities and the problems caused by cities", recognizing that cities themselves provide many potential solutions. The dimensions of Urban Sustainability are established by Drakakis-Smith (2000),"Sustainable urbanization refers to the well-balanced relationship between the social, economic and environmental agents in society, so as to accomplish sustainable urban development."

3.2 POLICIES OF SUSTAINABLE DEVELOPMENT

One of the policy approaches is to know the inter-relationship between the various dimensions and their inter-dependence. The integration of the economic, environmental, and social aspects of sustainable development and the relations between them have been subject to debates (Lozano, 2008). The weight given to each of the three dimensions of sustainability varies greatly and continues to cause considerable controversy [3]. Of the different theories given by Hart (2000), Daly's Sustainability triangle and Munasinghe(2007),the Equal position theory (Munasinghe ,2007) is widely followed.

Embedded Structure(Hart,2000)

Sustainability Triangle (Daly)
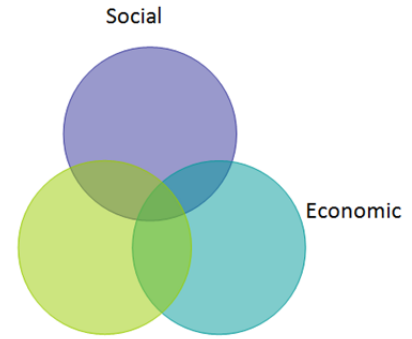
Equal Position Theory (Munasinghe)

3.3 Definitions of Dimensions of Sustainable Urban Development

UN Habitat (2004) gives the fourth Dimension of Institutional Link between environmental, social, economic sustainability. It defines Sustainable urbanization is a dynamic process that combines environmental, social, economic and political institutional sustainability. It brings together urban and rural areas, encompassing the full range of human settlements from village to town to city to metropolis, with links at the national and global levels .
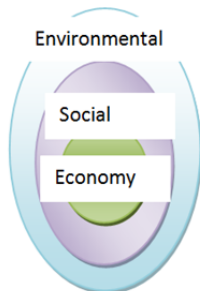
i.   Social Sustainability

A strong definition of social sustainability must rest on the basic values of equity and democracy, the latter meant as the effective appropriation of all human rights – political, civil, economic, social and cultural – by all people (Sachs (1999: 27)). Development (and/or growth) that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups while at the same time encouraging social integration, with improvements in the quality of life for all segments of the population.(Polese and Stren(2000: 15-16)).What emerges as a common element among all the definitions of Social Sustainability is well being and quality of life, health and safety, basic needs including housing and environmental health ,poverty, equity , employment, education and skills.

ii.   Economic Sustainability

Economic sustainable development is growth that puts the profit into action in order to create a more sustainable society, such as higher wages, ecological modernization, more effective technologies and so on (Munier 2005). In conclusions one could say that economic sustainability sees the solutions of the earth's problems (both social and ecological) in the market, which generate both competition and trickle down effects.

iii.   Environmental Sustainability

The most comprehensive definition is given as Ecological sustainability through the urban ecological system that connects social-economic-natural/ecological aspects to a complex system. This theory can be seen in connection with
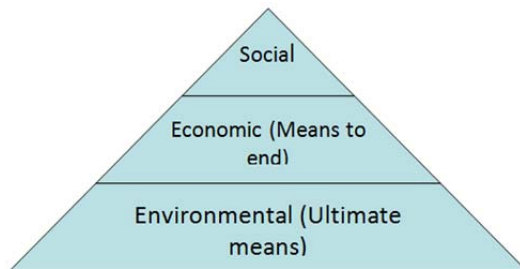
the utopian vision of the eco-city which connects all aspects of sustainable development (Xu et al. 2008)

iv. Institutional Sustainability

UNCHS (1999) defines urban governance as the processes that steer and take into account the various links between stakeholders, local authorities and citizens. It involves bottom-up and top-down strategies to favor active participation of communities concerned, negotiation among actors, transparent decision-making mechanisms, and innovation in strategies of urban management policies. Drawing on measures defined by authors such as Mehta (1998) and the UNCHS (1999) Institutional Sustainability which include: (1) consumer satisfaction (survey/complaints); (2) openness of procedures for contracts/tenders for municipal services; (3) percentage of population served by services; and (4) access of the public to stages of the policy cycle.

4. RESEARCH FRAMEWORK

4.1 Policy Under National Sustainable Strategy

Urban policies should generate an equitable system to achieve sustainable human development that is employment generating, resource recycling, waste minimizing, socially sustainable, and politically just. These four dimensions have to be approached simultaneously in the process of development and not, as at present, with one dimension taking precedence over the others within a fragmented and sectoral approach to sustainable development.[4] .It needs to look specifically at the nature of the urban crisis in India.

The Report of the Sub Committee On Development of Sustainable Habitat Parameters in the Field of Urban Planning by Town and Country Planning Organization Government of India Ministry of Urban Development July, 2011[2] lays down a broad approach to achieving and enhancing the sustainability of human habitats in India.

4.2 Mapping of Practice and Policy to form a Framework of Themes under Each Dimension

The global initiatives studied are Social Progress Index [5] , Global Urban Indicator database [6], Millennium Development Goals [7] , City Data Book [8], Global City Indicator[9], FEEM Sustainability Index [10], International Urban Sustainability Indicators List [11]. If any theme is common across more than three global practices is taken as a common theme.

A study of Global sustainability practices and policy framework revealed the commonly accepted themes under the Social Sustainability dimension as health, access to basic needs , housing, personal safety, education , equity , demography and poverty.(Table 1).

Table 1: Mapping Policy with Practice (Global Initiatives) in Social dimension

Themes	S P I	GUID	MDG	C D B (ADB)	Global City Indicator	FEEM SI	IUSIL	Policy Relevance with NSS	Common themes
Health									
Access to basic needs									
Housing									
Personal Safety									
Education									
Equity									
Demography									
Poverty									
Culture									
Recreation									
Pedestrian public space									
Access to credit									

Similarly the commonly globally accepted themes under the Economic Sustainability dimensions are Infrastructure for Economic Development ,transport efficiency, Income and distribution and Stability of growth .(Table 2).

Table 2 Mapping Policy with Practice (Global Initiatives)in Economic dimension

Themes	S P I	GUID	MDG	C D B (ADB)	Global City Indicator	FEEM SI	IUSIL	Policy Relevance with NSS	Common themes
Infrastructure for economic development									

Transport efficiency								
Income and Distribution								
Stability of growth								
Global Partnership for development								

The commonly globally accepted themes under the Environmental Sustainability dimensions are Soil Pollution , Air Pollution , Water Pollution , Green spaces , Energy Consumption and Land Use Patterns (Table 3).

Table 3: Mapping Policy with Practice (Global Initiatives) in Environmental dimension

Themes	S P I	GUID	MDG	C D B (ADB)	Global City Indicator	FEEM SI	IUSIL	Policy Relevance with NSS	Common themes
Soil Pollution									
Air Pollution									
Water Pollution									
Green spaces									
Energy Consumption									
Land Use Patterns									
Disaster Mitigation									
Noise pollution									
Geographically balanced settlement									
Freshwater									
Biodiversity									

The commonly globally accepted themes under the Institutional Sustainability dimensions are Governance and Participation, Local Government (Table 4)

Table 4: Mapping Policy with Practice (Global Initiatives) in Institutional dimension

Themes	S P I	GUID	MDG	C D B (ADB)	Global City Indicator	FEEM SI	IUSIL	Policy Relevance with NSS	Common themes
Personal Rights and Choice									
Governance And Participation									
Local Government									

5. CONCLUSIONS

The Urban Sustainability framework has to be tailor-made for Indian cities which cannot use the standardized solutions of Global Initiatives like World Bank, UN habitat etc. In other words one size cannot fit all. Most of the development in India has been on a ad-hoc basis often in response to the Economic growth and population explosion .Therefore housing and Infrastructure has become inadequate. However India's advantage is its ability to manage scarce resources.

The official vision of sustainable urban development is limited to seeing this as an environmental issue, which is then linked to the development infrastructure through independent funding. The Urban Sustainability framework should measure Social, Environmental, Economic and Institutional dimensions at multiple levels i.e

a)   Theoretical
b)   Policy
c)   Practical

The analysis to derive the resultant list of themes is obtained by comparing various global initiatives (like Social Progress Index, World Bank Indicators , UN Habitat Indicators , Feem Sustainability Indicators, IUSIL indicators) The common themes are mapped with India's urban sustainable strategy given by a Report on the development of Sustainable Habitat Parameters on Urban Development by Ministry of Urban Development.

REFERENCES

[1]   Salk Hippu, Nathan Kristle, Reddy Sudhakar B 'Selection Criteria for Sustainable Development Indicators "Indira Gandhi Institute of Development Research.

[2]   Report of the Sub Committee On Development of Sustainable Habitat Parameters in the Field of Urban Planning by Town and

Country Planning Organisation Government of India Ministry of Urban Development July, 2011

[3] Anna Dimitrova, Katarina Hollan, Daphne Laster, Andreas Reinstaller, Margit Schratzenstaller, Ewald Walterskirchen, Teresa Weiss (WIFO)," Literature review on fundamental concepts and definitions, objectives and policy goals as well as instruments relevant for socio-ecological transition ",September 2013

[4] Mahadevia,Darshini," Sustainable urban development in India: an inclusive perspective" Development in Practice, Volume 11, Numbers 2 & 3, May 2001

[5] Stern Scott,Wares Amy,Orzell Sarah,O Sullivan Patrick, Social Progress Index 2014 Methodological Report,2014

[6] Global Urban Indicators Database(Version 2) by Global Urban Observatory,United Nations Human Settlements programme(UN-Habitat),2000

[7] Urban Indicator Guidelines "Better Information ,Better Cities "Monitoring the Habitat Agenda and Millenium Development Goals-Slum targets, July 2009

[8] Urban Indicators for managing Cities, Matthew S Westfall, Victoria de Villa, Asian Development Bank, Aug 2001

[9] Global City Indicators Program Report Submitted to the World Bank(ERM) 2008

[10] Carlo Carraro, Francesca Ciampalini, Caterina Cruciani, Silvio Giove, Elisa Lanzi "Aggregation and Projection of Sustainability Indicators: A New Approach" The 3rd OECD World Forum on "Statistics, Knowledge and Policy"Charting Progress, Building Visions, Improving Life Busan, Korea - 27-30 October 2009

[11] Shen Li-Yin, Ochoa J. Jorge, Shah Mona N. Zhang Xiaoling "The application of urban sustainability indicators e A comparison between various practices" Habitat International 35 (2011) 17e29