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Dimensions of liveability and identification of key parameters applicable for Kerala

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***Abstract*—Liveability is considered as a guiding principle that shapes the social, economic, physical and biological urban environment of any city. Liveability is associated with dimensions like safety, climate, infrastructure, public policies, business environment and many more, making the concept multi-dimensional in nature. This characteristic has made the concept difficult to define and measure. The paper focuses on the study of various global based indices of liveability, along with different case studies from around the world on how people perceive liveability in their area. This study analyses the different dimensions of liveability and the various parameters that affect the liveability of a city. The study also tried to understand the concept of Liveability with the people of Kerala and found suitable parameters that are applicable for Kerala to assess its liveability standards.**

***Keywords*—Liveability, Quality of Life, Urban Environment, Well-being**

I. INTRODUCTION

The Liveability can be defined as, "the potential of a city to offer favourable conditions to its residents and others on the parameters of social, natural, economic and physical environment" [1]. Liveability has been considered as an important dimension for any urban city to thrive in its endeavours. It is also considered as a guiding principle that shapes the social, economic, physical and biological urban environment Liveability is concerned with urban development issues like inadequate infrastructure services, declining economic prosperity and rising social discontent among the urban population, ultimately, making the population suffer[2]. It has been associated with dimensions like safety, climate, infrastructure, public policies, business environment and many more, making the concept multi-dimensional in nature. This characteristic has made the concept difficult to define and measure, though, in general terms, it is the ability of the city to maintain and improve its viability (to attract investments) and vitality (to remain alive)[2]..

More recently, creating 'liveable cities' is a growing policy aspiration across multiple levels of government globally. This is largely in response to population projections, rapid urbanisation, and climate change, whereby designing liveable cities that promote health and wellbeing is now a global priority, as realised, for example, through the UN Sustainable Development Goals

a) Goal 3 : Ensure healthy living and promote well-being for all ages
b) Goal 11: Make Cities and human settlements inclusive , safe, resilient and sustainable
c) Goal 15 : To protect , restore and promote sustainable use of terrestrial ecosystems

II. LIVEABILITY INDEX

The liveability index determines the degree of liveability of cities around the globe, it is an array of different functions that are directly or indirectly related to livelihood of a resident. It is supported by an integrated theme containing equity, dignity, accessibility, conviviality, participation and empowerment. The Index provides insight into the quality of life available to people and provides evidence on the future state of the city in terms of its liveability. The index is a composite measure of the social, environmental, economic and civic factors that directly determine the willingness of a citizen to reside in a city and hence, the potential of the city to attract human resource and consequently industry. The EIU Index, Mercers Index and OECD Index are the major global indices present currently.

The liveability index is used as a holistic approach to understand and identify the components of liveability that are acting as a catalyst in a region's growth agenda. Different International agencies, and countries check and assess the liveability of nations and using various parameters according to their respective requirements

III. LIVEABILITY INDICATORS

Liveability can be expressed using various indicators, ranging from socio-economic to public transportation. These

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indicators are not area specific in nature. Various researchers have studied the relevant indicators for their area to formulate the most effective one to determine the liveability of the area. The indicators are categorized based on parameters which are often a blend of urban built elements and natural elements along with social aspects.

The global ecosystem, natural environment, built environment, local economy, lifestyle, community, activities and the people are the main determinants of liveability of an area. It was clarified through different perspectives on the relationship between people and environment as well as by distinguishing the different forms of liveability in a neighbourhood [3]. Liveability thus denotes the sum total of deliverables available to an individual or set of individuals in a particular location, leading to their contentment in day to day life.

IV. GLOBAL INDICES

There are three major names in liveability ratings globally:

a) The Economist Intelligence Unit's(EIU) liveability Ranking
b) Mercer Quality of Living Index,
c) Organization for Economic Co-operation and Development(OECD) Better Life Index (BLI)

A. The Economist Intelligence Unit

The Economist Group has its headquarters in England, a decade ago they started preparing yearly global liveability ranking. EIU liveability ranking compares 127 world cities and publishes annual reports listing the top 10 best and worst cities in terms of liveability, and it is considered the most inclusive and widespread of all liveability-ranking systems. EIU has 30 liveability indicators that are grouped under five categories: Stability, Healthcare, Culture and Environment, Education and Infrastructure [4].

EIU uses various data collection and measurement tools that encompass raw quantitative data, public opinion surveys, and interviews with a broad spectrum of professionals, city officials, and urbanites. Surveys and interviews are conducted around the world, and the representative samples of respondents are drawn from Asia (30%), the Americas (30%), Europe (30%), and other parts of the world (10%) [5].

B. Mercer Quality of Living Index

Mercer Quality of Living Index has 39 liveability indicators that are grouped under ten parameter categories: Political and Social Environment, *Medical* and Health, Public Services and Transport, Consumer Goods, Economic Environment, Sociocultural Environment, School and Education, Recreation, Housing and Natural Environment.

The Mercer Quality of Living Survey predominantly assigns a premium on quality of living in over 460 cities worldwide. This survey aims to help companies and expatriate professionals assess appropriate allowances and incentives for relocation. The Mercer quality of life index is used as a guide for businesses that intend to relocate or franchise in different parts of the world. This index has branded cities and mobilized government officials to examine their socioeconomic and environmental conditions to compete on a global scale. Following mutual economic and political interests, those cities with analogous environmental characteristics identify the leading urban models on the index and devise their plans accordingly [6].

C. Organization for Economic Co-operation and Development BLI

OECD BLI has 24 liveability indicators that are grouped under eleven categories: Housing, Income, Jobs, Community, Education, Environment, Civil Engagement, Health, Life, Safety and Work-Life Balance [4]. The OECD BLI measures and compares the quality of life among 34 OECD member countries. The organization was formed in 1961 to bring together most of the developed and emerging economies of the world in addition to Brazil and Russia [7]

The BLI offers an interactive tool that engages individuals to assess what matters most in their lives and what needs to be done to improve their quality of life. The data mostly come from official sources, such as national records, United Nations statistics, and public opinion surveys. The BLI is regarded as an accurate measurement of quality of life and liveability aspects. The interactive web application that builds the index starts with some default weights, but allows users to assign, modify, and customize their own index [8].

D. Ministry of Urban Affairs, India: City Liveability Index

The Ministry of Urban Development has developed a set of 'Liveability Standards in Cities' to generate a Liveability Index and rate cities. A total of 79 indicators (57 Core Indicators and 22 Supporting Indicators) have been prescribed in calculating liveability of the cities. These have been grouped under 15 thematic categories, which in turn are part of the four pillars of comprehensive development of cities, namely institutional, social, economic and physical.[9] Based on the performance of cities against the various core and supporting indicators, various 'Category Sub-Indexes' and a composite 'City Liveability Index' is developed for each city.

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V. LITERATURE REVIEW

The liveability parameters used for different cities were studied with the main aim to understand the use of various parameters and how they contribute to evaluate the liveability of the area. This provided an insight about the various parameters chosen and their effectiveness in assessing the liveability of different areas.

A. Victorian Liveability Research Program

The notion of liveability and how best to measure it, is a key priority for the State of Victoria, Australia. Limited systematic research has examined the influence of 'liveability' on health and wellbeing, and even less attention has been paid to how best to measure liveability within a policy context [10] . The framework for the Victorian program is shown in Fig 1.

Fig 1. Victorian liveability research program structure [11]

The following seven urban liveability domains were identified:

- Employment
- Food environment
- Housing
- Public open space
- Social infrastructure
- Transport
- Walkability

A series of conceptual models were developed to map how each of the seven liveability domains are associated with health and wellbeing outcomes. Neighbourhood-level spatial measures were identified and created for each of the 'neighbourhood attributes' identified. The spatial measures selected align with Australian planning policy, and where none exist, the measures were proposed.

B. Liveability in Spain

The liveability notion for Spain was to formulate a composite index to assess the degree of sustainable urban liveability. They proposed a concept of sustainable urban liveability that includes the need to meet a minimum number of environmental conditions in terms of resource consumption and the deterioration of the environment. The use a non-compensatory aggregation technique in order to construct the composite index was deiced. The methodological approach to the concept of sustainable urban liveability is based on a proposal for a composite index constructed using a multi criteria aggregation method based on goal programming [12].

Conceptual framework of sustainable urban liveability as adopted Spain is shown in Fig.2. Urban liveability is a multi-dimensional and abstract concept, it must be estimated rather than measured directly.

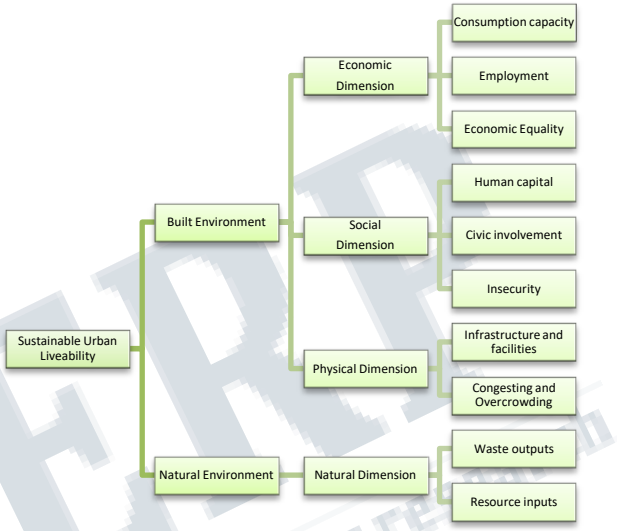

Fig. 2 Conceptual framework of sustainable urban liveability [7]

The composite indicator is based on an approach to the various dimensions included in the concept through the application of one or various empirical variables known as "partial indicators." The partial indicators that are representative of each dimension are weighted and aggregated in a single concept measurement known as a composite indicator. [7]

C. Liveability Mapping of 37 Cities of India

This study is a methodical comment on quality of living conditions Indian cities offer. Rather than approach the issue monolithically, the report undertakes a statistically robust splintering of the liveability into multiple dimensions [13]. The parameters were chosen according to the availability of data from relevant sources with respect to the predefined parameters set by global indices.

The major parameters chosen that would satisfy the need on understanding the liveability of Indian Cities were as follows.

a. Economic Environment and Standard of Living
b. Socio-Cultural Environment
c. Education
d. Health and Medical Standards

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e. Natural environment
f. Public Service
g. Recreational possibilities
h. Consumer Goods
i. Housing Option

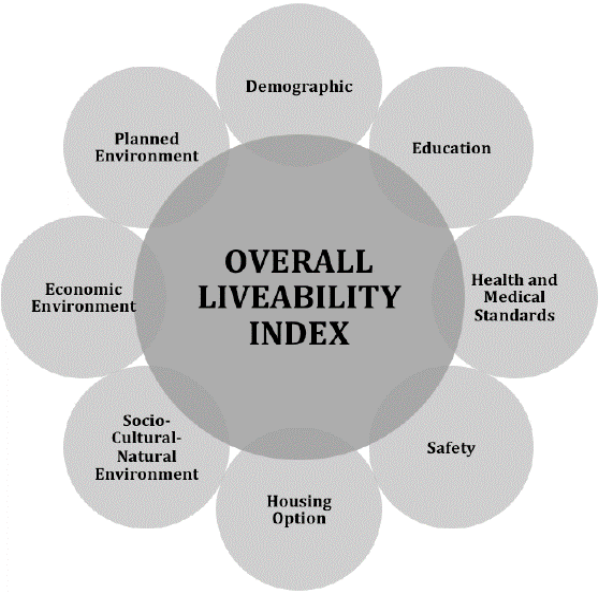

Fig. 3 Parameters Chosen for Liveability Index Calculation [13]

The term liveability has progressively broadened to include a range of different issues that are underpinned by a common set of guiding principles: accessibility, equity, safety, comfort, available services, walkability, transit, and participation that give substance to the concept of liveability [14].

VI. DESIGN OF PARAMETERS FOR KERALA

The major parameters of liveability identified from the literature review has been compared. These are analysed to find out the parameters which are considered of primary importance in understanding the liveability of Kerala, the southern state of India.

All the liveability parameters are linked with quality life benefits Table I discusses the linkage. Improving the liveability standards for cities have now become of prime importance as studies have shown it would help in the overall growth of the city.

Table I Livability Factors & Quality of Life Benefits [3]

	Livability Factors	Quality of Life Benefits
Economic Development	Availability of jobs, services	Disposable income, recreation and leisure
Housing	Affordability, location, typology	Shelter, safety and security
Environmental Quality	Air quality, aesthetics, noise pollution, water quality, open spaces	Physical and meal health, protection from natural hazard
Community Development	Community cohesion, historic and cultural resources, education opportunities	Sense of belonging , community resiliency
Transportation	Availability of multimodal connected networks; mobility, safety	Independence of movement
Equity	Equitable distribution of amenities	Sense of social justice, exposure to diverse ideas

A. Comparison of Parameters

The liveability parameters were chosen in accordance to the reason for survey and their preferences. The table shows the comparison of various indices and the parameters, it also compares the MoUD parameters and the country standards studied in the case studies.

Table II. Comparison of Parameters

PARAMETERS	EIA	OECD	Mercer	Australia	Spain	India	MoUD
Safety/Stability	✓					✓	✓
Health	✓	✓	✓			✓	✓
Culture and Environment	✓	✓			✓		✓
Education	✓	✓	✓			✓	✓
Infrastructure	✓			✓			
Life Satisfaction		✓					
Civil Engagement						✓	
Employment		✓			✓		
Housing		✓	✓	✓		✓	✓
Political Environment			✓			✓	✓
Public Transportation/Services			✓	✓	✓		✓
Recreation							
Consumer Goods			✓				
Income		✓			✓	✓	
Food Environment		✓			✓		
Demographic character				✓		✓	

EIU's index does not consider climate or the cost of living as a factor in evaluating the liveability of a city. The Mercer's Quality of Living Survey is used to help governments and key corporations place personnel on international assignments. The liveability index should be able to cover a wide range of indicators that can be considered good determinants of the liveability level of the residents in the areas.

A pilot survey was carried out with the identified major

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parameters to understand the concept of liveability with the perspective of the people of Kerala. The major parameters identified during the study were:

a) Socio – Cultural Activities
b) Education
c) Housing
d) Good Governance
e) Safety
f) Consumer Goods
g) Food Habits
h) Public Services
i) Health
j) Income and Employment
k) Environment
l) Transportation
m) Pollution

B. Pilot Survey Analysis

100 responses were used to for a prime parameters survey was conducted using these said parameters**.** From analyzing the results it was seen that majority , 75 percent expressed Health as a major factor and good governance was considered of least importance in calculating the liveability of Kerala with only 33 percent opting for it. Transportation: 67 percent, Safety: 61 percent, Education: 57 percent, Housing: 55 percent, Employment: 52 percent and Socio-Cultural activities: 40 percent were the other scores as shown in Fig. 4. The survey was conducted such that the respondents were able to choose the prime factors that that felt would help determine the liveability of Kerala.

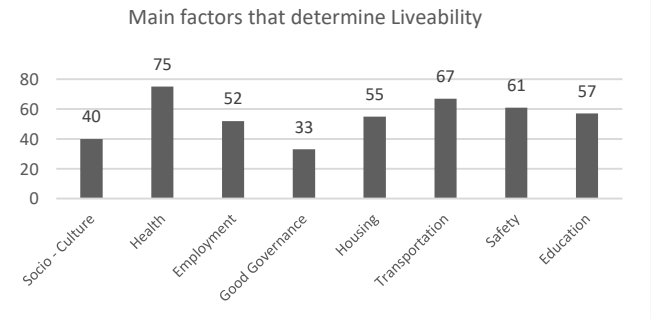

Fig. 4 Main Factors in Liveability

A Priority Analysis was conducted using these prime parameters. The priority was analyzed by the questionnaire survey, in which the respondents were asked to give a weightage to the various factors. A scale of 1-5 with 1 being the highest priority and 5 being the least was selected and each parameter was rated according to the preferred priority of the respondent. The survey conducted asked for the priority for different parameters, which were then given due weightage to arrive at the following conclusion shown in Fig 5.

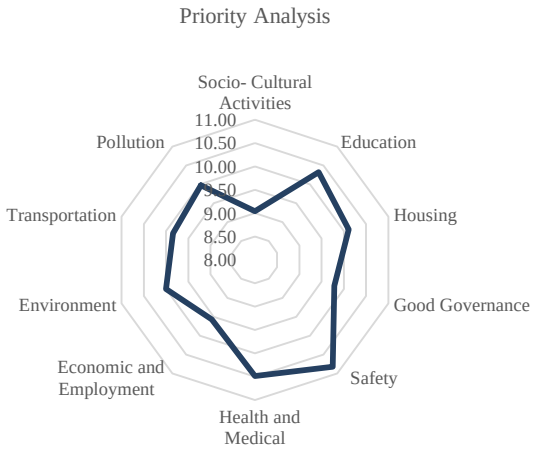

Fig. 5 Priority Analysis Survey result

The Priority Order which was obtained was:

a) Safety
b) Health
c) Education
d) Housing
e) Environment
f) Transportation
g) Pollution
h) Income and Employment
i) Socio-Cultural Activities

The results showed that the major priority point was Safety and Governance criteria did not make the top 10 priority list.

VII. DISCUSSIONS AND FINDINGS

Sense of community and safety is much desired for liveability which is perceived in Indian perspective through likeminded people living together. Encroachment on roads and parks along with disturbing elements like liquor shops, commercial activities are not desired for safety as well as ambience reasons. In Kerala, though the basic amenities and services are available in most of the residential areas but the facilities are not well maintained and lack the quality, which is required to satisfy the desired liveability. People unanimously emphasized on maintaining quality of amenities and services provided in residential areas. They felt that the two aspects one, physical infrastructure and public amenities; second, socio psychological needs of the residents should be planned in integration for desired liveability.

Hence liveability in Kerala context refers to a good

quality and well maintained infrastructure and public amenities, a clean and pollution free environment which would also instil a sense of identity, safety and community living amongst residents.

VIII. CONCLUSION

The concept of urban liveability is complex in that it comprises multiple dimensions. It is mainly centered on the analysis of two environments that make up an urban system: the built environment and the natural environment Literature in this area considers that the agglomeration of people has a positive impact on certain aspects such as consumption capacity, employment and economic activity. The social dimension provides a support network enabling urban residents to communicate with one another and take part in community life. The physical environment supports coexistence and provides a setting for urban residents.

The objective to study the dimensions of liveability and the measurement methods were carried out by studying the EIU Index, Mercer Quality, OECD Better life index and the MoUD formulated Liveability Standards, along with different global and national case studies from Australia, Spain and India. The final objective for identifying parameters for Kerala was done through the extended literature study and the pilot survey. Sense of community and safety is much desired for liveability which is perceived in Kerala followed by Health, Education, Housing, Transportation and Environment. The key parameters of liveability are generalized for all the regions but as emphasized in the study, due to vast variation in the regions with respect to topography and socio-economic development, the same approach is not applicable to all the regions.

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