

Quality of Life and Ranking the Cities of India

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Abstract: *The Quality of life is a great attraction of research for the concept of betterness. It is a stick yard for oneself to dream. It is a multi-dimensional measure. 33 cities of India have been considered in view of models determined based on data of 7 different determinants of quality of life. Mangalore has been derived as dream city.*

Keywords — *Quality of life, Principal Component Analysis, Factor loading, Regression, Ranking*

I. INTRODUCTION

Quality of life is a concept, which in recent years, has generated a great deal of interest but it is not only a notion of the twentieth century. Rather it dates back to philosophers like Aristotle (384-322 BC) who wrote about 'the good life' and 'living well' and how public policy can help to nurture it. In 1889, the term quality of life was used in a statement by Seth: "...we must not regard the mere quantity, but also the quality of the "life" which forms the moral end". (Smith, 2000). Baltimore journalist published a series of articles that presented the ratings of quality of life (QoL) in cities and states in 1930. His ratings included objective factors such as: 'income, education, crime rates, housing prices and infant mortality' but also subjective one's such as people's feelings about their neighbourhood and the environment (Mitra, 2003). In the 1950s two economists, namely Ordway (1953) and Osborn (1954), used the term in an argument against unlimited economic growth. Four years later Galbraith published his book 'The Affluent Society' followed by 'The Industrial State' in 1967. In these books he discussed the consequences of growth and he criticised the economic ideology behind the expansion of industry, he states: "What counts is not the quantity of our goods but the quality of life" (Snoek, 2000). Researchers focus on 'Quality of life' research in great details only after 1994. Several authors have pointed out that there are numerous definitions but no universally accepted one (Smith, 2000).

General definition of 'Quality of life' is "a person's sense of well-being, his satisfaction or dissatisfaction with life, or his happiness or unhappiness" (Ferrans and Powers, 1985). Or Martin and his colleagues who stated that it describes the: "individual's overall satisfaction with life and their general personal well-being". In these definitions "well-being" and "satisfaction" are used, which is not unusual. Quality of life, well-being, satisfaction but also health status, happiness and self-esteem are often

used interchangeably (Felce and Perry, 1995; Ranzijn and Luszcz, 2000). No consideration is given to the person's life condition: "expressions of satisfaction are themselves relative to the individual's temperament and the circumstances and experiences that have shaped their frame of reference". They strongly argue that a definition needs to assess both objective and subjective circumstances, or as Emerson (1985) defines quality of life: "as the satisfaction of an individual's values, goals and needs through the actualisation of his/her abilities or lifestyle" (Felce and Perry, 1995). The need to include life conditions was also emphasised by Clark (2000) who suggests "...that quality of life for an individual is affected significantly by his or her social environment" (Massam, 2002).

The different dimensions and aspects have been proposed; aesthetic beauty, challenge/excitement, change/variation, comfort, education, environmental quality, freedom, health, identity/self-respect, leisure time, material beauty, money/income, nature/biodiversity, partner and family, privacy, safety, security, social justice, social relations, spirituality/religion, status/recognition, work, etc. These are broadly of 3 types – physical, psychological and social covering both public and private domains. The dimensions can be illustrated as follows:

1. Physical – health status;
2. Psychological – self mastery, self-efficacy, love, satisfaction, happiness, morale, self-esteem, perceived control over life, social comparisons, expectations of life, beliefs, aspirations;
3. Social (private) – social network, social support, level of income, education, job. Social (public) - community, climate, social security, quality of housing, pollution, aesthetic surroundings, traffic, transport, incidence of crime, equality, equity.

Quality of life (QoL) is the general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical health, family, education, employment, wealth, religious beliefs, finance and the environment. It is the well-being of individuals, communities and societies. It is a comprehensive measure that can be used to evaluate efforts to improve cities and nations. The impact quality of life may be on the average life expectancy; the infant mortality; the degree to access to quality healthcare; air that is relatively free of particulates and other air pollution; a resilient supply of clean water that is free of contaminants and

chemical pollution; access to a resilient, diverse and healthy supply of food; wealth and material comfort; basic literacy, education level and access to education; access to knowledge resources such as an open internet, books and research tools; the self-reported happiness of individuals; the risks related to crime and accidents such as traffic accidents or workplace injury; the right to speak without fear of retaliation by government or organizations such as a political movement; inalienable rights such as life, personal liberty and freedom of religion; the right to communicate and live aspects of your life unobserved and unrecorded as you choose; access to green spaces, areas of exceptional nature such as beaches and land that can be used for sports, recreation, social interaction and personal reflection; a life surrounded by culture such as food, architecture, music, fashion, film and art; professional satisfaction and the ability to produce, create and innovate; robust expressions of health such as walking, jogging or dancing; access to transportation that isn't stressful or time-consuming; living close to the things you need; living in a community that is resilient to disaster and decline; the knowledge that your actions aren't damaging other people or the environment; etc.

II. METHODOLOGY

Quality of life is a broad concept that encompasses a number of different dimensions (by which we understand the elements or factors making up a complete entity that can be measured through a set of sub dimensions with an associated number of indicators for each). It encompasses both objective factors (e.g. command of material resources, health, work status, living conditions and many others) and the subjective perception one has of them. The latter depends significantly on citizens' priorities and needs.

National accounts aggregates have become an important indicator of the economic performance and living standards of our societies. This is because they allow direct comparisons to be made easily. Gross Domestic Product GDP, one of these aggregates, is the most common measure of the economic activity of a region or a country at a given time.

Based on academic research and several initiatives, the following dimensions/domains have been defined as an overarching framework for the measurement of well-being. Ideally, they should be considered simultaneously, because of potential trade-offs between them: material living conditions (income, consumption and material conditions), productive or main activity, health, education, leisure and social interactions, economic and physical safety, governance and basic rights, natural and living environment and overall experience of life. These are also related to the indicators of progress though progress is not exactly quality of life. In this communication, attempts has been made to find relationship among the established indicators used to

measure Quality of Life index and to compare a number of cities in India.

The indicators used are purchasing power index(X1), safety index(X2), health care index(X3), climate index(X4), cost of living index(X5), property price to income ratio(X6), traffic commute time index(X7) and pollution index(X8). 33 cities have been considered for which data on all such indices are available as on 2016-2017 including quality of life index(Y). 33 cities considered are Mangalore, Bhubaneswar, Trichy, Trivandrum, Coimbatore, Calicut, Rajkot, Surat, Kottayam, Thane, Jaipur, Nagpur, Indore, Kochi, Amravati, Ahmedabad, Jabalpur, Kolkata, Lucknow, Pune, Chennai, Jalandhar, Hyderabad, Bangalore, Guwahati, Mumbai, Patna, Noida, Delhi, Solapur, Kanpur, Faridabad, Ghaziabad in the states Assam, Bihar, Delhi, Gujarat, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odissa, Punjab, Rajasthan, Tamil Nadu, Telengana, Uttar Pradesh, West Bengal.

III. RESULT

The ranks of the cities are as follows –

Table – 1 showing the ranks of the variables for all 33 cities

City \ Index	Y	X1	X2	X3	X4	X5	X6	X7	X8
Ahmedabad	17	12	16	13	33	25	24	13	16
Amravati	16	28	28	6	22	6	19	6	15
Bangalore	13	1	24	15	1	29	25	25	24
Bhubaneswar	2	24	8	22	32	11	20	2	2
Calicut	18	32	2	2	10	4	8	32	6
Chennai	21	13	19	11	29	23	10	20	21
Coimbatore	14	26	15	10	2	7	15	24	5
Delhi	29	8	30	18	23	31	5	26	29
Faridabad	30	22	29	8	19	26	18	28	32
Ghaziabad	33	6	32	33	13	17	27	19	33
Guwahati	32	16	27	21	7	9	29	33	25
Hyderabad	10	7	13	12	3	16	30	14	23
Indore	23	27	5	27	5	19	16	21	13
Jabalpur	5	29	4	1	11	13	14	31	17
Jaipur	8	10	7	14	24	18	17	16	11
Jalandhar	26	33	33	23	15	30	7	7	22
Kanpur	25	17	26	24	9	5	4	12	31
Kochi	6	9	11	4	26	8	23	18	14
Kolkata	28	25	25	26	21	22	11	29	18
Kottayam	3	18	1	16	27	2	22	8	9
Lucknow	11	11	23	3	18	20	26	10	19
Mangalore	1	5	3	5	12	12	33	9	1
Mumbai	31	14	21	19	6	33	1	27	26
Nagpur	4	4	14	25	28	15	32	4	12
Noida	22	3	31	9	20	32	31	23	28
Patna	20	30	12	29	17	14	3	1	27
Pune	9	2	17	17	4	28	21	15	20
Rajkot	15	20	20	28	31	21	12	3	7
Solapur	27	31	22	32	16	10	13	5	30
Surat	12	23	18	20	25	24	28	11	8
Thane	19	15	6	30	8	27	2	22	10
Trichy	24	21	9	31	30	3	9	30	3
Trivandrum	7	19	10	7	14	1	6	17	4

The top 10 cities with respect to each index are –

Purchasing Power Index	Safety Index	Health Care Index
Thane	Jabalpur	Lucknow
Kochi	Rajkot	Rajkot
Kolkata	Mangalore	Indore
Bhubaneswar	Lucknow	Kottayam
Mangalore	Nagpur	Mangalore
Ghaziabad	Chennai	Amravati
Coimbatore	Trivandrum	Jaipur
Noida	Calicut	Jalandhar
Kottayam	Bangalore	Kolkata
Trivandrum	Jaipur	Ahmedabad

The best fitting multiple regression is with 7 factors instead of 8 factors (excluding cost of living index as it affects much GDP) as follows –

Table – 2 showing regression results

Variable	Co-efficient	t-value
Intercept	94.94879	8.24
X1	0.36096	6.11
X2	0.52738	5.78
X3	0.44991	9.07
X4	0.25931	2.59
X6	-0.102289	-5.30
X7	-0.46434	-11.40
X8	-0.65594	-8.51
Probability level	Lower 95% conf. limit	Upper 95% conf. limit
0.00	71.2226	118.6750
0.00	0.2393	0.4826
0.00	0.3396	0.7152
0.00	0.3478	0.5520
0.01	0.0537	0.4648
0.00	-1.4201	-0.6256
0.00	-0.5482	-0.3804
0.00	-0.8147	-0.4972

Climte Index	Cost of Living Index	Property Price to Income Ratio
Thane	Jaipur	Kanpur
Ahmedabad	Jabalpur	Chennai
Coimbatore	Bangalore	Patna
Kochi	Rajkot	Mumbai
Nagpur	Mumbai	Noida
Kanpur	Amravati	Jaipur
Solapur	Ahmedabad	Guwahati
Chennai	Kottayam	Rajkot
Mumbai	Solapur	Bangalore
Rajkot	Delhi	Pune

The principal component analysis using rotated varimax has been run and the factor loading for 1st factor and the communalities are as follows –

Table -3 showing results of principal component analysis

Variable	Factor Loading(F1)	Communality (F1)
X1	-0.10803	0.01167
X2	0.87185	0.76012
X3	0.59195	0.35041
X4	-0.03299	0.00109
X6	-0.15390	0.02368
X7	-0.00494	0.00002
X8	-0.86629	0.75045

To compare the quality of life index as available has been cruised with a number of alternatives like – regression index(Y1), principal component factor rotated varimax factor (F1) loading index(Y2), principal component rotated varimax communalities coefficient index(Y3). A relative comparison has been attempted also.

Quality of life has been estimated using the 3 models and ranks of the cities are.

Table – 4 showing ranks of the cities under different models

City	Y3	Y2	Y1	Y
Ahmedabad	17	12	14	14
Amravati	26	15	15	16
Bangalore	15	24	13	24
Bhubaneswar	28	4	2	4
Calicut	2	2	19	2
Chennai	10	20	21	19
Coimbatore	23	9	12	10
Delhi	18	30	28	27
Faridabad	6	27	29	28
Ghaziabad	33	33	33	33
Guwahati	21	26	32	26
Hyderabad	5	17	9	15
Indore	9	10	16	11
Jabalpur	1	3	18	3
Jaipur	14	7	6	7
Jalandhar	31	29	26	30
Kanpur	13	31	25	31
Kochi	7	8	5	9
Kolkata	25	23	27	22
Kottayam	3	5	3	6
Lucknow	12	18	10	5
Mangalore	32	1	1	1
Mumbai	8	25	31	25
Nagpur	24	16	4	23
Noida	16	28	23	29
Patna	4	22	22	20
Pune	11	21	8	21
Rajkot	29	19	17	18
Solapur	22	32	30	32
Surat	27	11	11	12
Thane	20	13	20	13
Trichy	30	14	24	17
Trivandrum	19	6	7	8

The top 10 ranked cities are different under different models.

Table – 5 showing top 10 cities under different models

Y	Y1	Y2	Y3
Mangalore	Mangalore	Mangalore	Ghaziabad
Calicut	Bhubaneswar	Calicut	Mangalore
Jabalpur	Kottayam	Jabalpur	Jalandhar
Bhubaneswar	Nagpur	Bhubaneswar	Trichy

Lucknow	Kochi	Kottayam	Rajkot
Kottayam	Jaipur	Trivandrum	Bhubaneswar
Jaipur	Trivandrum	Jaipur	Surat
Trivandrum	Pune	Kochi	Amravati
Kochi	Hyderabad	Coimbatore	Kolkata
Coimbatore	Lucknow	Indore	Nagpur

Thus, it is observed that cities with better quality of life are in order Mangalore, Bhubaneswar, Kottayam, Trivandrum, Jaipur, Kochi, Coimbatore, Calicut, Nagpur, Jabalpur, Lucknow, Surat, Pune, Hyderabad, etc..

IV. CONCLUSIONS

Quality of life is multi-dimensional indicator covering all aspects of life and it is function of multiple factors. The weights for combining the factors are not unique and cannot be pre-fixed. Three different attempts/models have been tried and the 33 cities of India have been ranked. The most preferred city for best quality of life may be ‘Mangalore’ compared to all cities of India. Micro analysis for each of the factors may also be done separately.

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