Urban Planning Proposal based on Quality of Life Index Assessment for Vapi city

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Abstract: *Quality of life Index is a multidimensional idea as it relies upon the satisfaction of the biological, social, economic and psychological requirement. The Quality of Life can be utilized to remark as often as possible on key issues that effect and add to the open discussion about how to improve the Quality of Life Index for the city. QOL is the way that determines a measure over joy and fulfillment for the government in the brain of citizen. Although it is not easy to find the most suitable indicators for the measurement of the Quality of Life Index, appropriate definitions can be made depending upon the objectives and goals of the researcher or specialist of planner. A survey is conducted for the Vapi city within a municipality boundary having an area of 22.44 sq.km and population are 1.32 lacs as per 2011 census which has a 11 No. of wards. Samples are collected within all over study areas. 385 samples are collected From study area. On the basis of analysis, the Quality of Life index has been found for study area. It is hoped that the data gathered from this research work can be used for planners of the in formulating and implementing future policies and preparation. The overall Quality of Life index is 4.29 in Vapi city due to weakest Transportation, Recreation and Storm water network, Fire services and Solid Waste management. The urban planning proposals are proposed for very poor parameter in the city and according to public priority.*

Key words: *QOL, Quality of Life, Vapi city, Urban development.*

1. Introduction

Migration of population to urban centres, particularly to the industrial cities, gives impetus to the growth of urban areas. As economics mostly depended upon industry, trade and commerce, these activities concentrated in urban centres, where skill, design and market were readily available. QoL index is play important role among social, health, economic and environmental conditions which affect human and social development.

The increase in urban population has its effect on towns and cities. Over congestion in urban areas, resulting from the developing exodus of rural population has gradually reduced even healthy and good areas into slums.

Quality of life is emerging as a central construct within many disciplines, such as those comprising the social sciences, economics, multi-medicine. Its attractions, in part, are that it offers an alternative to some traditional multi-disciplinary views about how to measure of success.

Today, most of the urban quality of life as a key concept in urban planning.[1] On this basis in many developed countries, planners are trying to show the levels of quality of life in the different geographical levels are optimal solutions can be used in this way to improve the quality of life of backward regions and they examined. One of the main concerns of every General Manager in the professional decision making activities for achieving, maintaining and improving productivity, which is the most important topics of interest to the Organization and is one of the principles of decision making for managers, performance evaluation, which shall be in the form of being scientific has an effective decisions help.[2]

2. Study area

Vapi is situated on the banks of the Damanganga River and is the largest city in the Valsad district and also the second largest city after Surat in South Gujarat, around 28 km south of the district headquarters in the city of Valsad, it is surrounded by the Union Territories of Daman to the west and Dadra and Nagar Haveli to the east.[3]

It is Very Important industrial town in south Gujarat region and largest industrial area in Gujarat in term of small industries, dominated by chemical industry plants. Growth rate of vapi is 45.85% in 2011 having population over 1,63,605 according to census 2011. Area of vapi is 22.44 sq.km divided into 11 wards and three major zone namely Chala in north, Vapi in center and Dungra in South[3].

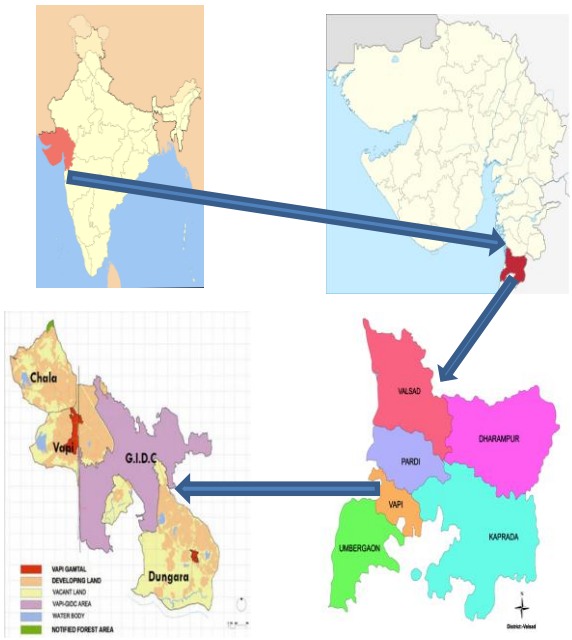

Fig.1 Location of Vapi

3. Literature Review

The conquest of happiness elaborated the concept of happiness as a relative sense of joy that varied from one culture to another and also from individual to another. Quality of Life Index is the product of the interplay among social, health, economic and environmental conditions which affect human and social development. There are certain definitions given on QOL Index including the World health Organization (WHO). The main purpose of the Quality of Life Index is to provide a tool for community development which can be used to monitor key indicators that encompass the Health, Economic, Environmental and Social dimensions of the QoL in the community.

Two approaches can measure QOL. One direct approach that is subjectively associated with people's feeling about the condition of life and surrounding physical as well as natural environment. The second, is an indirect approach with objective related to the collection of observational data from the organization[4]. Many researcher, Town planners and policy makers identify different variable to assess QOL. In this research QOL can found based on seven parameters; environment, health, economic, social, education, political, and infrastructure[5].

However, some studies, such as Das[6] and point out that there is a tenuous relationship between objective and subjective aspects and quality of life. AN example of this consistency can be seen in the study by Brereton which shows that there is a high correlation between physical-spatial aspects as group of objective aspects in Ireland and subjective characteristics.

The major purpose of the Quality of Life Index (QOLI) is to provide a tool for community development which can be used to monitor major indicators such as social, health, environmental and economic dimensions of the QoL in the community. It is intended to monitor conditions which affect the living and working conditions of people and focus community action on ways to improve health, economy and social Indicators for the QOLI include:

Social: Children in care of Children´s Aid Societies, social assistance working beneficiaries, public housing projects waiting lists etc.

Health: Low birth weight babies, elderly waiting for placement in long term care facilities, suicide rates, mental stability etc.

Economic: Number of unemployed people, number of working people, bankruptcies etc.

Environmental: Hours of moderate/poor air quality; environmental spills; tones diverted from landfill to blue boxes etc.[7]

QOL models have commonly been developed that reflect collective personal values, preferences and expectations, while at the same time, combine life conditions and statistics of a traditional nature as shown in Fig. 2.

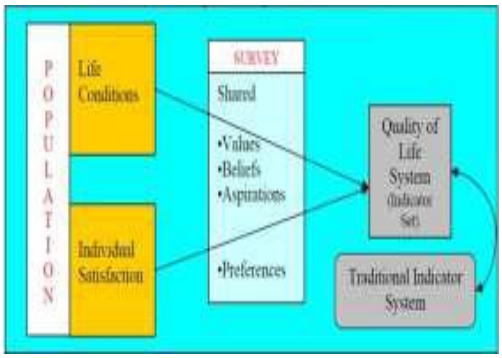

Fig. 2: QoL system model

A. Determination of index

The evolution of the Quality of LifeIndex (QoLI) was based on the model developed by Mr. Kenneth E. Hornback and others. The model has been discussed in this chapter. The following values shown in Table 1 are required to be obtained in order to evolve the life index values.

Table 1: Description of different value

Sij-	**The subjective, or satisfaction measure for all factors given by people to a normalize scale 1-10.**
Oij-	The objective measure for all the factors as given by experts also normalized to scale 1-10.
Wij-	The importance weighting which the individual attaches to a particular factor, relative to all the other factors, on a rank order scale.

All the above mentioned values were obtained from individual and experts who were permanent residents of this city. A special form was prepared based on the work of Mr. Hornback.

4. Methodology

First step is to define the study area or decide boundary of the study area. In this study city of Gujarat state i.e. Vapi has been defined as a study area within their municipality boundary. Second step is to decide study goals and objectives. Third step is the literature review collection. Literature is to be collected as well as studied related to QoL. Fourth step is data collection. There are two types of data i.e. Objective data and Subjective data. Objective data are collected by visiting municipality offices whereas Subjective data is being collected by field survey means visiting that particular area. Fifth step is to analysis the collected data. Sixth step is to prepare a mathematical model for the assessment of QoL. From this model QOL Index has been found in various income groups and as well as ward wise for the whole city. Seventh step is to find influencing parameters for QOL Index. Finally planning aspects have been proposed for the improvement of the QoL Index. Essential recommendations and suggestions are also made for the betterment of Quality of Life Index. And additionally gave an urban planning proposal for weakest parameters to inprove the quality of city.

5. Data Collection

Sample sizes decide on the basis of population and also area. So 375 samples are selected for Vapi city and divided the city into eleven different study areas (wards) so as 35 samples are to be taken for each study area and additionally these 35 samples are further divided into 5 different income groups like HIG, HMIG, LMIG, LIG and EWS equally. Analysis is done with the help of the Microsoft Excel Programme, and SPPS software by two ways like ward wise analysis and income group wise analysis and preparing a graph for all 27 parameters according to area wise and income group wise. Find out the QoL index for 11 study areas. On the basis of analysis, found a weakest parameter as well as what is the public demand to improve which parameters initially.

6. Result Analysis

In this study, an attempt has been made to evaluate the „Quality of Life Index" for Vapi city, by making use of the mathematical model developed by Kenneth E Hornback and others. The value of the index is measured on a scale normalized to 1-10. The value of index nearer to 10 indicates an excellent QoL, whereas the value nearer to 1 indicates the worst QoL. In this way, the QoLI for all study zones has been evaluated as shown in Table 3. Table 3 shows that Study Ward no. 2 is having the highest Quality of Life Index i.e. 5.60 due to rapidly increasing that residential area, whereas Ward no. 10 is having the lowest one i.e. 3.45 in Vapi . On the basis of analysis, it was found that QOLI of Vapi 4.28.

Table 2: Ward wise Factor Index

Wards	Major Factors (Fj Value)						
	Environment	**Health**	**Economic**	**Social**	**Urban Gov.**	**Education**	**Infrastructure**
1	5.19	5.37	5.16	5.2	5.6	5.82	5.77
2	5.14	5.38	5.37	5.21	5.83	6.13	5.92
3	4.5	4.65	5.03	4.3	4.55	5.34	4.12
4	4.35	4.5	4.78	4.44	4.94	5.61	4.3
5	4.18	4.09	4.55	4.19	4.71	5.4	4.03
6	4.06	4.24	4.77	4.21	4.2	5.78	4.53

7	4.4	4.61	5.27	4.54	4.02	5.87	4.52
8	4.46	4.8	4.82	4.72	4.27	6.08	4.54
9	4.44	4.28	4.53	4.34	4.28	5.81	4.33
10	4.02	4.24	4.35	4.2	4.34	5.37	4.13
11	4.5	4.59	4.77	4.67	4.5	5.69	3.96

Table 3 QoL Index

Sr. No.	Ward Name	QOL Score	Rank
1	Vapi-Chala Road	5.46	2
2	Dunger Faliya	5.6	1
3	Chhadwada Road	3.98	6
4	Kaparali Road	3.56	10
5	Dungra-Vapi Road	3.67	9
6	Koliwad	4.46	4
7	Geeta Nagar	3.94	7
8	Kachi Gam	4.78	3
9	Desaiwad	4.38	5
10	Sulpad	3.45	11
11	Pirmora-Dungra Road	3.76	8
	Vapi city	4.29	

7. Urban Planning Proposals

QoLI for Vapi city is 4.28 and Urban Planning proposal is to be given for the weakest parameter for Vapi city. But here urban planning proposals are given as per public demand and according to UDPFI guidelines. All physical and social infrastructures are according to the needs of the people and UDPFI guidelines. Accordingly given three urban planning proposals are Transportation, Solid Waste Management, Recreation, Fire Services and Strom Water. Proposals are given for short term (5 Years).

A. Transportation

Transportation parameter is very poor as compare to other parameter in all wards. The development strategies for traffic and transportation in Vapi are worked out with the aim to support the concept of making Vapi City Region a „Global City". The strategies also aim to engage safe and economical commuting between place of origin and destination, convenient and quick access to all areas, reduction of pollution and congestion, energy efficiency and conservation, safety for all parts of the road and transport facilities users. The strategies are identified at regional level and at the level of planning area and are as follows:

The regional transport corridors are overstressed due to the commuting traffic. These corridors mainly include the following viz. Vapi – Chala road, Vapi Daman main road, National Highway- 8 connecting Vapi GIDC and Dungra, National Highway- 8 as well as State haighway 48 connecting Vapi and Salvasa (Dadranagar Haveli), Inner city road connected to Chala, -Vapi-Vapi Gidc-Dungra roadetc. It is necessary to strengthen these corridors, augment the existing transport facilities and open out new transport facilities.

B. Parking Infrastructure

As an alternative to surface and multi-storied car parking facilities, automated car parking system is proposed. In this system of car parking, cars are lifted to the parking lots by means of a lift and from the parking stall by means of wheeling or mechanically operated transfer dollies or cradles.

C. Pedestrian Facilities

Walking is such a basic human activity that it has frequently been overtaken in the quest to build sophisticated transportation environment. As a result, accidents involving pedestrians are a regular phenomenon in most of the urban areas. Improving the pedestrian environment on a street-by-street, neighborhood-by-neighborhood basis should be undertaken on priority basis. The pedestrian facilities

that need to be considered are:

- Sidewalks or walkways
- Marked crosswalks and enhancements
- Pedestrian Overpasses/Underpasses
- Road side appurtenances

Bus terminals are provided in areas where it is easily accessible for public. A self-financing and revenue generating model for bus terminals and stops through a combination of commercial floor space and advertisement rights is proposed for Vapi City.

Accordingly, private operators will be allowed to operate both terminals and bus stops with revenue accruing to them from commercial floor space and advertisement rights. The terminals and bus stops will have all the passenger amenities and adequate information system regarding bus arrival and departure timings etc. Parking facilities are provided in areas where there are lot of traffic congestions, such as bus terminals, markets and shopping complexes. It is provided according to guidelines and norms.

D. Recreation

Recreation parameter also plays an important role in bringing down the factor (Fj), which is identified by conducting survey in Vapi city. So as to improve this parameter some planning proposals has to be given. There are many issues regarding recreation whereas no open space available to use as a recreation within the main city area. Children are not having playgrounds or parks nearby their residents and there is no sufficient places are there in the city where people can go for the weekends. Improper management of recreation department, lack of awareness related to sustainability are major issues. Open spaces form an essential part of urban land use which provide for social and environmental needs in addition to passive & active recreational demands. In planning, open spaces mainly constitute playgrounds, parks, and other recreational areas. It is seen that the open spaces within the city are not evenly distributed. A significant feature of the land use of Vapi is the high proposition of agricultural land within urban boundaries. The vacant spaces owned by state and currently not put to rational use can be utilized as green cooling areas of the city. It is strongly suggested that the roads going to come up in the urban areas ought to have professionally planned green shoulders. Even on existing roads, wherever space constraints do not imperiously stand in the way, such green strips can be incorporated. Important measures should be taken to increase public open spaces, parks & playgrounds as the present area which comes under open spaces is far below the standards. The available area as open space in the Vapi City Region is to be increased up to 247 Ha by demarcating different areas. These areas included is also much less than the standards, which is 10 m^2 per person as per Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines and the per capita green areas & open spaces are a direct indicator of the environmental quality.

Here provided open spaces in the form of gardens, Play grounds and other recreational activities. It is provided according to the norms and guidelines and also easily accessible by public in each wards for spending their free time in weekends. Separate play areas for children are also provided, also provide proposal of neighbourhood garden from the open space of Societies when societies given land to municipality to improve land as recreational facilities.

E. Solid Waste management

Solid waste management plant is essential in Vapi city as per URDPFI guidelines, and as the gap analysis suggests 1 plant of 53 tonne capacity considering the future population.

The waste generated is taken to the disposal site, includes 70% wet waste, 80% dry waste. Bio-medical waste generated is directly transported to Surat, as per the contract with the agency.

For the transfer of solid waste in Vapi, there are 4 tractors, 1 tempo and 31 labors in door-to door collection disposal. There are proposal for 10 CNG rickshaws by Vapi municipality.

The paper waste, tin, aluminum, plastic waste, e waste is been offered to the scrappers, and other inorganic wastes like plastic waste is sent to the Vapi GIDC, because the amount of waste generated cannot be managed at such scale. Major organic waste is being disposed by Vapi Municipality itself.

Presently about 36 MT of solid waste is generated daily in VAPI Municipal area Municipality is disposing the waste in the low-lying plot at the site at Chandor village (Sr.no.113 -116 and 118) near Daman Ganga river. The

area of site is approximately 1.39 acres. The solid waste is dumped at site and there is no any kind of special treatments required for disposing of solid waste.

Conclusion

Quality of life is a very comprehensive concept that is enhanced by increasing the level of public satisfaction with the services provided by the government. In urban areas, QOL has been a major concern for researchers in this area. The main objective of this study was to find out the level of various parameters and the quality of life of the city of Vapi. In this study to use of all data the comparisons between population and factors, In this study, an attempt has been made to evaluate the 'QOL Index' for Vapi city. The composite value of the index obtained on analysis is a result of the combination of the following factors: (a) Natural Environment (b) Physical Environment (c) Health (d) Economic Sector (e) Social Sector and (f) Urban Governance Sector (g) Education Sector (h) Infrastructure Sector.

The combination of industrial area and urban area is make vapi as more intrusting city for study of quality of life. Vapi city is the major industrial capital area in Gujarat . This study has indicated that the QOL Index for Ward no 2 (Dunger Faliya) having highest rank and Ward no 10 (Sulpad) is having lowest rank among the Wards of Vapi city. Vapi city having QOL Index as 4.29. The industrialization and related urbanization are therefore not the indicator of improvement in the living conditions of the people. It is therefore desirable to use the QOL index of the urban dwellers as a tool to guide the development and in preparation of the master plan of the Vapi city.

References

[1] A. F. Azad, M. karimiyan Bostani, and M. R. Anvari, "Assessment of the life quality of urban areas residents (The case study of the city of Fahraj)," IOSR J. Eng., vol. 5, no. 07, pp. 31–36, 2015.

[2] U. Planning and U. Planning, "Analysis the quality of life for the citizens in the level of the Zabol city .," no. 1, pp. 72–78, 2015.

[3] V. D. Plan, "Vapi Development Plan Contents."

[4] L. Slavuj, "Urban Quality of Life – a Case Study: the City of Rijeka," Hrvat. Geogr. Glas. Geogr. Bull., vol. 73, no. 01, pp. 99–110, 2011.

[5] N. N. Patel, S. N. Patel, and K. A. Chauhan, "Quality of life index assessment for Surat city of India," IMETI 2011 - 4th Int. Multi-Conference Eng. Technol. Innov. Proc., vol. 1, pp. 94–98, 2011.

[6] D. Das, "Urban quality of life: A case study of Guwahati," Soc. Indic. Res., vol. 88, no. 2, pp. 297–310, 2008.

[7] F. Fahy and M. Ó. Cinnéide, "Community-based quality of life indicators for urban areas as derived in Galway City, Ireland," WIT Trans. Ecol. Environ., vol. 93, pp. 691–702, 2006.