SUSTAINABLE URBAN PLANNING AND DEVELOPMENT OF INDORE CITY

Vaibhav Lovaniya[1], Prof. Pawan Dubey[2], Prof. Rakesh Sakale[3], Prof. Hirendra Pratap Singh[4]

[1]PG Scholar, School of Research & Technology, People's University Bhopal M.P., India.

[2]Asst. Prof. School of Research & Technology, People's University Bhopal M.P., India.

[3]HOD, School of Research & Technology, People's University Bhopal M.P., India.

[4]Asst. Prof., School of Research & Technology, People's University Bhopal M.P., India.

ABSTRACT

This article is a review of scholarly works on planning for urban futures with special reference to sustainable Indore city. The article aims to produce an update of the challenges and current perspectives on urban planning, sustainability and development across the globe. As informed by research from the academic and scientific communities, the review provides the prospective directions and trends for securing a sustainable urban future. Within the sustainable city discourse, recent intellectual inquiry has centred on the conceptualization and knowledge production in creating sustainable cities. Though the scope of the review may not be exhaustive, the purpose is to articulate the current progress in the research front concerning concepts and definitions on sustainable cities, planning and methods for urban sustainability development and assessment. The ultimate goal is to provide local authorities, practitioners and/or city governments with some perspective and guidance in working towards urban sustainability in the future.

1. INTRODUCTION

The chapter comprises of research issues and the job. It initially situates the broader theme and context of the research, then presents the research problem along with the objectives, specific objectives and research questions. The limitations and relevance of the research are brought forth. At the end, this chapter outlines the structure of the thesis.

1.1 URBAN TRANSFORMATION AND SOCIAL SUSTAINABILITY

'Urban Transformation and Social Sustainability' which encompasses the subject of this research, constitutes a wide range of issues and concerns.

The issue ranges from socio-cultural, demographic and physical transformation of urban area through protection from crime to collective security needs. In whatever manner the city gets transformed, its growth pattern should be sustainable. Sustainability, when referred to, encompasses environmental, economic and social parameters.

City dwellers experience urban transformation through time that gradually or in a rapid evolution expose the development of the city and its architecture. The research explores this transformation through the views of dwellers and analyses them.

1.2 INDORE CITY

Unlike other cities of the state, Indore had the advantage of Holkars regarding planned development. That has been dealt in detail in literature review chapter. But due to various factors, lot of unplanned growth has occurred and became unavoidable to a large extent. For road widening and inclusion of BRTS (Bus Rapid Transit System) many old and large trees have been uprooted. Rate of transplantation has been very less comparatively. Though Google map shows lot of greenery in the city, Indore lacks small colony gardens. Apart from good quality gated townships children playing and other activities of garden are quite uncommon in the city.

Indore is a traditional city with strong cultural heritage of its own. Now it is transforming into a metro culture, having citizens from around the country.

1.3 PROBLEM STATEMENT

The core and old areas of Indore city are experiencing changes as they are transforming from purely residential colonies to semi-commercial and commercial areas. Land costs are increasing rapidly. Lots of peri-urban development is taking place, fringes are becoming part of main city. New residential colonies are coming up in the outer circle of the city. Various old residential areas are also there in Indore which have traditional set-up.

Slum and squatter arrangement is spread all around the city. The physical structures show obvious status and wealth difference. That is one of the psychological reasons which arouse the feeling of jealousy and anger among poor people, thus indulging them into crime. The residential areas are lonely in the afternoons and nights. The large residential bungalows have a boundary wall which make the street solitary and denies visual communication images.

This increases particular types of crime like burglary, thefts, home robberies and murder. Very few residences of affluent families have mechanical security arrangements or security guards.

Indore in particular has social, cultural and economic contexts which are quite different from the contexts and conditions where much of research in similar area has taken place.

With the foregoing, it is evident that an empirical study on the above subject is required for the fast growing cities of India. The studies done previously cannot be implemented to Indore city or any other Indian city for that matter.

2. LITERATURE REVIEW

2.1 INTRODUCTION

Many experts in the fields of architecture, anthropology, sociology, geography and history believe that contemporary urban settlement and its urban transformation is an outcome of long evolutionary process.

Various cities display numerous similarities, yet equally, they have different landscapes, economies, societies and cultures. Hence, author feels that it is better to adopt a perspective that understands this diversity and also perceiving cities as having different status and functions in world culture and economy.

Literature study shows that various experts have described cities, the process of urbanization and importance of social sustainability therein.

Description of Literature Review- progression of themes:

- City- types
- Urbanization- Socio cultural aspects
- Urban Transformation- History, Dynamism, Factors, Spatial Transformation
- Sustainability-Sustainable Development, Sustainable City, Sustainable Urban Transformation, Social Sustainability
- Crime Prevention by Design and Sustainable Development- Theories
- Urban Transformation in India
- Urban Transformation in Madhya Pradesh

2.2 URBANIZATION

From review of literature, researcher found that the pioneer thinker in the area of urbanization was Wirth (1938). His theory is "urbanism as a way of life". He recognized the importance of individual's role in the city and behavior of urban dwellers from cultural perspective.

Analyzing Wirth's theory, researcher inferred that urban areas dominate rural as they have the concentration of social, cultural, political, administrative and financial institutions. Urbanism, as a distinguished mode of life, has to be understood in different points of view:

(1) As a geographical structure having certain population, a technological and ecological order.

(2) As a social system having a definite social structure, a certain type of social relationship.

(3) As a set of behavior and thinking, group of people involved in certain group activities and having a social boundation.

(4) As an area of concentrated energy source, large, dense, permanent settlement of socially heterogeneous individuals.

Transformation of urban architecture and urban society is an essential pre requisite for societies in change and for the dynamic role of cities contribution to national development.

The simplest form of architecture is barren land. It is human beings who took charge of the earth to produce new architecture. It is to fulfill his instinct and desire. Rural areas have natural boundaries; they merge with the surrounding woods. To show more power and hierarchy cities were built with boundaries and distinguished structures. (Wright, 1953).

Urban development is a time bound process, it can be a point of time, and the city may have a generous past and a graceful present. City is a configuration of spaces having spatial continuity. Elements present in a particular area are artifacts having subtle similarity and continuity. All elements show a particular nature in common, these elements are powerful enough to retard or accelerate the process of urbanization. Small parts contribute to the development of whole structure i.e. a city.

2.3 URBAN TRANSFORMATION

The term 'transformation' refers to an act, process or instance of transforming or being transformed {Webster's

Dictionary} Urban transformation is not just a passive resultant of societal order and societal change, rather it depends upon relations between individuals and the groups they from in society. The transformation that build cultural identity through distinguished design features and building types, have power to introduce new urban life and give new identity and build new concepts in the field of architecture. (Lefebre, 1996) Researcher feels that, citizens experience Urban Transformation over a certain time period with slow or rapid change in the city growth and changes in architecture. Impact of global culture is very important as cities compete to become global cities, mirroring global behavior and having new identification of global cultural significance. Urban transformation takes place due to human participation. Transformation is very difficult to be predicted as every individual has specific interest for being a participant in social, political and economic decision making. Societal interest has to overpower individual interest for the participant stake holders of urban Transformation.

Transformation tells the changes in a city over a time period; hence it is an appreciation of the significance of the history of any city's development procedure, pattern and outcome. The urban fabric of present time period is the resultant of successive generations of settlers, who keep on leaving mark in both the physical structure and in the political, economic and social institutions. (Thorns, 2002).

2.4 SUSTAINABILITY

Coined in California Institute for Smart Communities, 2001. www.sustainablemeasures.com Literal meaning of the word 'sustain' is to hold up; to bear; to support; to provide for; to maintain; to sanction; to keep going; to keep up; to prolong; to support the life of. It experts also say that it is equitable distribution of resources and opportunities. Adopting sustainability understands the interconnections among economy, society and environment. It implies to using methods, systems and materials that will not deplete resources or harm natural cycle. (Rosenbaum, 1993).

The sustainability concept is better envisaged as unifying factor in a comprehensive direction towards sustainable development because in a dynamic world of human society, sustainability is basically the way balance is maintained over the period of time. This transformation of both human-to-nature and people-to- fundamental balance must be maintained; sustainable development requires people relationships of spatial scale for a particular time period.

3. RESEARCH METHODOLOGY

The chapter presents the methodology adopted in the research. The chapter also discusses rationale for multi-case versus taking the city as a whole case approach, the research design and criteria for judging the quality of research. The chapter deals with identification of unit of analysis of research, sampling design which describes the process of the determination of sampling frame and the sample respondents used in the study. Further it explains method of data collection and measurement of variables. Then this chapter deals with measurement scales and data analysis tools used in the current study. Precisely, this chapter deals with the steps which are adopted to achieve the objectives of the study. The steps of the study are discussed in chronological sequence, starting from research design, to the details of the methodology adopted for the analysis of the different types of responses.

3.1 RESEARCH DESIGN

The research deals with multi- case analysis to situate the research and take it to intended study. As identified by (Yin 2003), to cover contextual conditions, which are pertinent to the phenomenon of study, one must use case study method. Case- study method is an inquiry which copes with technically distinguished situation where there are many variables of interest; the method relies on various and different sources of evidence with data which converge in triangular fashion; benefited from the previous enhancement of theoretical prepositions which forms guidelines for data collection and analysis.

Yin stress that data collection is a comprehensive research strategy covering logic of design, techniques for data collection and specific approach towards data analysis. Mainly this research is the part of learning process and no predictive theory can be established for social sciences and architecture. Also architecture cannot and has not yet produced general, theory which is context

independent, hence nothing else can be offered rather than strong context dependent knowledge. Hence case study method rightly suits to produce further knowledge. Multiple case studies have been used in the research. Again advocated by (Y in 2003) that evidence from multiple case studies is more justifying and compelling that makes the overall research more robust. Moreover the phenomenon being investigated i.e. how U.T and E.D effects S.S of any urban space, justify the use of multiple case studies technique. Indore is one of the rapidly urbanizing cities in the state and the country as well. It is largest industrial, commercial and education hub of central India. It is largest job provider city of Madhya Pradesh. Socio-economic and historical factors are rich in the city, it is progressing in both formal and informal sectors, attracting more people. Lastly due to high rate of crime which is a matter of serious concern, it needs special attention from researchers, hence relevance to the subject of study.

CASE STUDY AREA AND UNIT OF ANALYSIS

Selection of study area was a major challenge in the research, because the choice should ascertain the limit to which one can generalize and it needs to be justified proving case of Indore city as a whole.

In this study four neighborhoods were selected forming two sets according to economic and social status selected from census details of Indore city. The choice was also guided by the fact that in Indore cloth mills and spinning mills were main centers of commerce for a century till 1997. The places where mill workers lived, got secluded with the closure of mills during 1995 to 1997 and there areas became secluded and were more vulnerable to crime. This shows a dominants culture of the city, hence two areas were selected of mill background, namely Nehru Nagar and Bhagirathpura.

Secondly, Indore is growing towards multi-culture, education centre; people are flourishing with their own business. Rather than selecting old business cores Rajwada and Sarafa which have slow rate of transformation, new growing residential commercial areas have been selected as forming second set of cases for the study, namely Sapna-Sangeeta area and Zangeer wala to 56 shops.

The two areas in one set bear similar character in terms of social –cultural background economic and environmental contexts.

Unit of analysis has been a single respondent who has witnessed transformation over the period of two decades. Questionnaires have been the important sources of evidence in the case study strategy of inquiry in all four selected neighborhoods. Eighty respondents have been selected from each location, leading to total number of respondents being three hundred and twenty.

4. DATA ANALYSIS

4.1 DATA ANALYSIS FOR OBJECTIVE I

Introduction: In reference to the methodology proposed to be carried out for research in objective I in chapter 4, the data was collected with the help of questionnaire. A sample of 400 respondents was selected, out of 400, 320 responses were found suitable for further analysis. Objective wise data analysis outcome and discussions are as below:

The data was collected on 5 point Likert Scale and for analysis, Factor Analysis technique is used to study "Urban Transformation" and "ANOVA" is used to study "Comparative Analysis of four locations in Indore city." The relevant measurements were done on 5 point Likert scale, the data analysis is as listed below:

Study of Urban Transformation: To study Urban Transformation, five elements were considered, the first element was Architecture and Urban Planning, second was Population, third was Policies, fourth Legislation and fifth was Economy. For Architecture and Urban Planning, there were 17 questions and similarly for population there were 19 questions, for Policies 6 and for Legislation 7 and for Economy there were 8 questions representing various dimensions of the aspects/issues defining the development of the urban area in last 20 years.

The first issue studied by researcher was to identify the most prominent aspects in each of the 5 areas occurred in Indore in last 20 years. This question answers the issue that what transformation has actually occurred in Indore in last 20 years. To find this reply, factor analysis is used by researcher. The outcomes are as below:

In area of Urban Transformation for Architecture and Urban Planning, factor analysis on SPSS results that:

(i) The Kaiser Meyer Test value reported by SPSS 17 is 0.769. It means that the sampling adequacy is good. Bartlett's Span Test shows the outcome with the significance level is 0.000, it means that there is no sphericity/ or no significant sphere city in the proposed data set. The communalities extracted ranges from 0.415 to 0.895, express very good possibility of extraction of factors based on the questions.

(ii) Eigenvalue: For extraction of the factors, Eigenvalue is considered as the criteria. The components/factors which have eigenvalue more than 1 are considered significant components. For the current analysis, there were 4 factors which were extracted. These four factors explain 72.867% of overall variance.

(iii) Rotated Component: The rotated component matrix rotated by 45˙ or Varimax method was used. In each of the component, the members are being identified for the value more than 0.6 in rotated component matrix. In this way, the first component comprises of questions UTA1, UTA2, UTA3, UTA4, UTA5, UTA6 and UTA9.

This is further deduced that the construction pattern of buildings has remarkably changed in last 20 years, similarly uses of modern building materials has increased over the period of time, more permanent buildings have come in last 20 years and their periodic maintenance have taken place. It is further been experienced that the road width has increased in last 20 years and the micro climate of the region has changed. If we see the nature of these equations, they

all represent issues related to construction, building materials and maintenance.

The second factor extracted involves UTA10, UTA11 and UTA16, out of these three members, UTA10 & UTA16 has negative signs, this further represents that many of the areas with mixed used has increased drastically in past 20 years. The question was also worded negatively, thus the negative sign represents only negative aspect. Further the question UTA11 says that most of the buildings have transformed into mixed use in last 20 years. Similarly the neighborhood moving towards ruralization in last 20 years has been rejected by the respondents very strongly.

The Component 3 has only three members i.e. UTA13, UTA14 and UTA17. UTA13 says that do you have more sufficient parking space in nearly areas in last 20 years, which has been accepted by the respondents, UTA14 says that market place has reached nearly areas. UTA17 says that the sound pollution as a burden has increased.

The fourth component comprises of 2 elements only UTA8 and UTA12. UTA8 says that garden areas have increased in last 20 years and UTA12 says dependency on public transport has increased in last 20 years. In reference to importance assigned by respondent, Factor No. 1 is most important and subsequently 2, 3 and 4 are hierarchically less in the importance of happening for UT in Indore in last 20 years.

The Factor Analysis for Architecture and planning issue reveals that modernization has taken place in reference to construction pattern, uses of building material, permanent building construction, periodic maintenance of buildings, increased road widths and change of micro climate. These outcomes are in coherence with reviewed literature about changes in Indore in last 20 years.

So development in Indore has remarkably taken place and has created some benefit to the people.

In area of Population, factor analysis on SPSS results that:

(i) **The Kaiser Meyer Test** value reported by SPSS 17 is 0.758. It means that the sampling adequacy is good. Bartlett's Span Test shows the outcome with the significance level is 0.000, it means that there is no sphericity/ or no significant sphericity in the proposed data set. The communalities extracted ranges from 0.262 to 0.868, express very good possibility of extraction of factors based on the questions.

(ii) **Eigenvalue:** For extraction of the factors, Eigenvalue is considered as the criteria. The components/factors which have eigenvalue more than 1 are considered significant components. For the current analysis, there were 4 factors which were extracted. These four factors explain 66.299% of overall variance.

(iii) **Rotated Component:** The rotated component matrix rotated by 45˙ or Varimax method was used. In each of the component, the members are being identified for the value more than 0.6 in rotated component matrix. In this way, the first component comprises of questions UTP5, UTP7, UTP8, TP16, UTP18 and UTP19.

Means value of Urban Transformation of Economy at Zangeerwala is 4.3000, that at Sapna Sangeeta Area is 3.3101; Mean at Nehru Nagar is 4.6672 and same at Bhagiratpura is 3.2328. The means are not significantly different to statistically reject the hypotheses, but close observation shows that Zangeerwala area and Nehru Nagar area are slightly better in case of Urban Transformation of Economy than Sapna Sangeeta Area and Bhagiratpura.

It further means that political development and international economy have affected the day to day life activities which are dependent on economic status of individuals. The affordability levels of citizens of Indore city have improved. The infrastructure strength has increased in last 20 years. The financial security mediums adopted by the people, like their banking ways have changed in last 20 years. People have become more aware towards education in all the four areas of Indore and they have started investing more in education activities and progressive medium than they did 20 years.

Table 1 Summary Sheet for ANOVA of Objective No. I (2)

S.No.	Hypothesis Statement	Significance Level	Hypothesis Judgment
1	There is no significant difference of Architecture and Planning at four locations of Indore city.	0.000	Accepted
2	There is no significant difference of Population at four locations of Indore city.	0.000	Accepted
3	There is no significant difference of Policies at four locations of Indore city.	0.000	Accepted
4	There is no significant difference between Legislations at four locations of Indore city.	0.000	Accepted

5	There is no significant difference between Economic Transformation at four locations of Indore city.	0.000	Accepted

SUMMARY:

It has been observed from the results of ANOVA that Urban Transformation has taken place in all the four areas of Indore city and **there is no significant difference between the intensity or process of transformation**. Zanzeerwala and Sapna Sangeeta are comparatively more developed area than Nehru Nagar and Bhagirathpura, so the level of sophistication and lavishness may be different but changes have taken place in all four locations. The kind of transformation is different but the mean of comparative change from their past conditions is not significantly different. This further signifies that Urban Transformation is taking place in all 4 areas of the city in terms of Architecture & Planning, Population, Policies, Legislation and Economy and the difference in pace is not significant. Architecturally and Planning wise good areas are getting better and worse areas and getting better and worse areas are becoming good.

Population of the morphologically and demographically developed areas is getting more developed and undeveloped areas are getting developed. Policy makers are paying attention towards the betterment of those areas where policy implementation was already there and also towards those areas where policies were not implemented properly before last two decades.

Legislations are working towards the legally good areas of Indore city and also towards the areas where law and legislations were not followed properly.

Economic level of the citizens of all the 4 locations is getting better than what they used to be 20 years back. Finally Urban Transformation is happening dynamically at all the four areas selected for study at speed which is not much different. Less transformed areas are getting transformed and already transforming areas are getting more transformed but change is at its job.

5. CONCLUSION

5.1 INTRODUCTION

Though the research comes to a conclusion but it is conditional to this particular extensive study. The research has been carried out to study Urban Transformation of Indore city and comparative analysis of four locations of Indore city. It was revealed that modernization has taken place in reference to Construction Pattern, uses of Building Materials, Periodic Maintenance, Permanent Buildings and Wider Roads. Advancement has taken place in relation to migration due to job opportunities, health and education facilities.

• Remarkable change in construction patterns and maintenance of buildings and roads.
• Increase in mixed use buildings.
• Increase in parking spaces and sound pollution.
• Sufficient garden spaces and increased dependency on public transport system.
• Betterment in education and health facilities, demographic and morphological change.
• Migration from all around the country.
• More migration in last 20 years.
• Increase in percentage of young population, citizens became more educated and cultured.
• Changed governing body, satisfaction of citizens, and development of neighborhoods.
• Changed building bye laws, construction norms, traffic regulations and public private partnership in infrastructure development.
• Changed social functions and increased infrastructure status.
• Citizens' economic status development changed banking ways and more investment in education.
• People are satisfied with the work of governing bodies. Law amendments have affected social functions and infrastructure facilities. Economic development has taken place, people have more sustainable financial growth medium. Placing comparative analysis of four locations, all the locations did not show significant difference in the process and outcomes of Urban Transformation. There is no significant difference of Architecture and Planning at four locations of Indore city.

• There is no significant difference of Population at four locations of Indore city.
• There is no significant difference of Policies at four locations of Indore city.
• There is no significant difference between Legislations at four locations of Indore city.
➢ There is no significant difference between Economic Transformation at four locations of Indore city.

Next objective was to study Social Sustainability of Indore city and comparative analysis of four locations under study. It was found that there has been noticeable change in citizens' standard of living due to urbanization and people are satisfied being parts of their neighborhoods. Their basic needs are fulfilled with convenience. There has been educational up gradation and noticeable rise in life standard and socio-cultural change due to urbanization. Citizens are satisfied with social justice system of neighborhoods. Health facilities are also sufficient to satisfy the citizens of Indore city.

➢ Social security based upon public services and neighborhoods of mixed use are safe.
• Reduction in the frequency of domestic crime.
• Sufficiency of medical services and healthy lives of citizens.
• Gender equality and equal opportunity to work and education.
• Occurrence of more social marriages and 40% women going out for work
• Awareness towards girl child upbringing in positive direction.
• Cohesion in neighborhood and psychologically happening.
• Sources of entertainment within neighborhoods.
• Selfless integration.
• Trust in city authorities and respect for senior citizens.
• Satisfaction for social justice level.

Although crime records tell that crime rate in Indore city is high, but citizens of locations under study feel that frequency of theft, burglary, chain snatching and eve teasing have reduced over the period of twenty years. This brings to the conclusion that one cannot make absolute judgment on the basis of F.I.R. Population has increased in higher rate, crime rate has increased in lower percentage; and the assumption is that 100% crimes are reported. There is overall reduction in fear of crime, hence better Social Sustainability.

• There is no significant difference of Social Sustainability of Basic Needs at four locations of Indore city.
• There is no significant difference between Social Sustainability of Safety at four locations of Indore city.
• There is no significant difference between Social Sustainability of Health at four locations of Indore city.
• There is no significant difference between Social Sustainability in case of Gender Equality at four locations of Indore city.
• There is no significant difference between Social Sustainability of Participation at four locations of Indore city.
• There is no significant difference between Social Sustainability of Justice and Welfare at four locations of Indore city.

It has been proved in the research through statistical analysis that Urban Transformation and Environmental Design have their impact on Social Sustainability; a model has been evolved showing their relationship. Through the course of research, objectives are answered; hypotheses are tested, justified and answered. Finally, the title is answered- 'Urban Transformation and Sustainability Modeling, Evaluation of Indore city'.

5.2 AREAS FOR FURTHER RESEARCH

The research opens fields and avenues for further studies by other research scholars. How Social Sustainability is been formed by physical living conditions and physical environment of a place, the cultural and value systems – they are

been left for further studies. The areas can be – to find out whether social values are changing due to urbanization or urbanization ways are changing due to social values. Happiness of life creates value systems and value systems generate Urban Transformation and Environmental Design; or do the process of Urban Transformation and ways of Environmental Design create value systems. These may be the areas for further research.

5.3 LIMITATIONS

Even though the research has undergone rigorous literature reviews, analysis of literature for forming database of study, preparation of questionnaire, data collection, analysis and interpretation. Still there are certain limitations which this research had to restrict itself to. Sample size had been taken as 320; 320 is not a representative fraction of 20 lacs, which is present population of Indore city. Moreover, only four locations of Indore city have been studied, which cannot represent Indore as a whole; this has been due to limited time and resources with the researcher.

The research has been limited within itself because it is more about trying and testing of theories rather than finding a professional solution.

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