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Integrating Needs of the Urban Poor in the Development Process: Some Key Issues in Kolkata Metropolitan Area

Souvanic Roy

Abstract

A distinctive feature of the Kolkata Urban Services for the Poor (KUSP) Programme is to address multiple dimensions of poverty through inclusion of the poor and the marginalized in the planning process. Draft Development Plans (DDPs) prepared by the ULBs are envisaged as key instruments for this and will be the basis for all future interventions under the KUSP. But being first generation development plans the current DDPs have limitations in understanding the multiple dimensions of poverty and related issues. To bridge this gap fieldwork is conducted in 18 low income settlements across three towns. This article shares the experiences of these case studies and outlines the agenda for action to address the multiple dimensions of poverty within the KMA.

1. INTRODUCTION

The Government of West Bengal (GOWB) is implementing the Kolkata Urban Services for the Poor (KUSP) Programme in 40 urban local bodies outside Kolkata Municipal Corporation area within the Kolkata Metropolitan Area (KMA) with the assistance of DFID, Government of U.K. The Programme primarily aims at improving the quality of life of the urban poor by enabling access to basic services and promoting employment opportunities along with a change in the prevailing practice of urban planning and governance. A distinctive feature of the KUSP Programme is to address multiple dimensions of poverty through inclusion of the poor and the marginalized in the planning process. Draft Development Plans (DDPs) prepared by the ULBs are envisaged as key instruments for this and will be the basis for all future interventions under the KUSP and other initiatives for improving access to urban services for the poor and promotion of economic growth. Our association on behalf of the School of Ecology, Infrastructure and Human Settlement Management in Bengal Engineering and Science University, Shibpur with the formulation of DDPs in some of the ULBs prompted us to undertake a study on urban poverty in three towns of Howrah, Barasat and New Barrackpore within KMA. Being first generation development plans the current DDPs have limitations in understanding the multiple dimensions of poverty and related issues and multipronged actions necessary to address them. To bridge this gap fieldwork is conducted in 18 low income settlements across three towns. This article shares the experiences of these case studies and outlines the agenda for action to address the multiple dimensions of poverty within the KMA.

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2. POVERTY IN THE KOLKATA METROPOLITAN AREA

The Kolkata Metropolitan Area (KMA) is the tenth most populated in the world. With the highest population density in the country, it is West Bengal's and Eastern India's primate city, accounting for about 60 percent of the State's urban population. The KMA, spread over about 1,851.41 square kilometers, includes 38 Municipalities, 3 Municipal Corporations (Kolkata Municipal Corporation, Howrah Municipal Corporation and Chandernagar Municipal Corporation), 77 Non-municipal urban centers and 445 rural *mauzas* (in 165 Panchayats and 22 Panchayat Samitis) on both sides of the River Ganges.

The establishment of manufacturing industry particularly jute in the suburbia of Calcutta in about the middle of the nineteenth century led to rapid population growth in the study area. For example, between 1891 and 1911, the population more than trebled in Bhatpara, while Titagarh added 143 percent to its existing population over the 1901–1911 period.

Population continued to grow rapidly till 1951 with areas such as Titagarh, Bhatpara, and Baranagar reporting population growth of over 300 percent over the 1901-1951 period. This is primarily attributed to the following reasons:

- The early immigrants from Bihar, Uttar Pradesh, Orissa and other parts of Bengal, were peasant labour who came to work in the service sector as *palki* (palanquin) bearers, *dhobis* (washer folk), masons, etc. Later they worked in the mills in jobs that demanded few skills. Increased work opportunities created by industrial growth and demand for the service population in the rapidly growing urban areas led them to invite other kin to join them in the city.
- The influx of minority Hindu refugees from erstwhile East Bengal began with the partition and has continued intermittently ever since. Nearly half of them settled in urban areas (mainly in Calcutta and its suburbs) to engage in petty trade and cottage industry. Since 1947 about 700,000 refugees are estimated to have entered Calcutta. As the initial relocation areas like Dum Dum and South Calcutta were crowded out by the initial wave, the refugees moved to small vacant plots near the centre of the city or to marshy low lying areas in the periphery.

As per Census 2001, the Kolkata Urban Agglomeration's population was 13.2 million. Population of the poor in 40 ULBs in KMA excluding the KMC area is estimated at 2.35 million that is 30 percent of the total population based on 1998-1999 BPL survey by SUDA. The recent Quick Slum Survey undertaken by the Change Management Unit under Kolkata Urban Services for the Poor (KUSP) Program indicates that 440,893 families reside in 3,406 slums in these ULBs. According to local estimates, the overall KMA area including the KMC has more

than 9,000 slum settlements (5,600 in KMC and 3,406 in the remaining KMA area) (ILGUS, 2000 and CMU, 2005). The situation of the poor is characterized by unemployment and low levels of income, degraded physical environment, deficient levels of basic services and varying degrees of social exclusion.

The poor households in the KMA mainly comprise immigrants from various parts of the country especially the states of Bihar, Uttar Pradesh and Orissa, and refugees from Bangladesh and original residents (minority groups particularly Muslims) of the area. As stated earlier, the arrival of immigrants from the neighboring states coincided with the growth of these towns. In contrast, the influx of refugees is a relatively recent phenomenon that began with the partition of Bengal. Table 1 indicates the incidence of poverty in the KMA towns.

The number of slum pockets, as shown in Table 1, is not an accurate reflection of reality due to the lack of a common definition of a slum and the use of outdated information. Census 2001 identified fewer slums than in the ILGUS data. There are also discrepancies between the BPL and slum populations.

Table 1 Poverty in KMA Towns

Sl. No.	Name of ULB	Population 1991	Population 2001	BPL House-holds	BPL Hou-se hol-ds (%)	Slum Population	Slum Popul-ation (%)	Slum Pock-ets	SC Popula-tion	SC Popul-ation (%)
1	Kolkata*	43,998,190	4,580,544	276,170	30	1,490,811	32.55	NA	283,602	6.45
2	Bally	184,474	261,575	7,969	15	70,073	26.79	353	8,500	4.61
3	Howrah*	950,435	1,008,704	60,482	30	118,235	11.72	NA	37,326	3.93
4	Uluberia	155,172	202,095	17,785	44	119,468	59.11	276	25,322	16.31
5	Bhadreshwar	72,474	105,944	4,593	22	56,589	53.41	6	12,613	17.40
6	Baidyabati	90,081	108,231	4,048	19	NA	NA	40	9,087	10.09
7	Bansberia	94,698	104,453	7,157	34	NA	NA	60	21,905	23.42
8	Chandernagore	120,378	162,166	3,849	12	42,894	26.45	263	13,432	11.16
9	Champdany	101,067	103,232	9,726	47	75,583	73.22	94	10,699	10.59
10	Hooghly Chinsurah	160,976	170,201	9,870	29	17,921	10.53	95	23,577	15.53
11	Konnagar	62,200	72,211	4,069	28	11,026	15.27	11	3,915	6.29
12	Rishra	102,815	113,259	4,888	22	53,755	47.46	11	5,918	5.76
13	Serampore	137,028	197,955	10,121	26	61,219	30.93	169	6,559	4.79
14	Uttarpara Kotrung	101,268	150,204	8,183	27	NA	NA	8	5,210	5.14
15	Barrackpore	142,557	144,331	8,393	29	5,432	3.76	37	9,690	7.27
16	Baranagar	224,821	250,615	10,611	21	55,987	22.34	33	10,645	4.73
17	Barasat	107,537	231,515	12,233	26	NA	NA	20	9,557	8.52

Sl. No.	Name of ULB	Population 1991	Population 2001	BPL House-holds	BPL House-holds (%)	Slum Population	Slum Popul-ation (%)	Slum Pock-ets	SC Popula-tion	SC Popul-ation (%)
18	Bidhannagar	100,048*	167,848	9,006	27	49,173	29.30	NA	8,133	
19	Bhatpara	315,976	441,956	23,354	26	NA	NA	134	27,491	9.01
20	Dum Dum	40,961	101,319	2,680	13	NA	NA	20	3,582	8.74
21	Garulia	80,918	76,309	4,281	28	NA	NA	46	15,594	19.27
22	Halisahar	114,028	124,479	7,186	29	18,733	15.05	29	23,590	20.69
23	Kanchrapara	111,602	126,118	4,035	16	14,223	11.28	450	18,105	18.07
24	Khardah	88,358	116,252	13,556	58	24,303	20.91	40	3,620	4.10
25	Kamarhati	266,889	314,334	8,266	13	3,607	1.15	8	10,000	3.75
26	Madhyamgram	106,914	155,503	8,885	29	NA	NA	39	NA	NA
27	Naihati	132,701	215,432	11,871	28	NA	NA	20	15,003	11.31
28	North Dum Dum	149,965	220,032	9,691	22	2,662	1.21	25	21,405	14.27
29	North Barrackpore	100,606	123,523	4,663	19	13,774	11.15	15	15,235	15.14
30	New Barrackpore	63,795	83,183	4,106	25	19,865	23.88	26	15,999	25.08
31	Panihati	275,990	348,379	14,377	21	93,554	26.85	90	13,018	14.72
32	Rajarhat Gopalur*	162,464	271,781	8,905	16	24,817	9.13	9	NA	NA
33	South Dum Dum*	232,811	392,150	33,248	42	97,579	24.88	64	15,659	6.73
34	Titagarh	114,085	124,198	6,279	25	98,062	78.96	23	13,689	12.00
35	Gayeshpur	52,158	55,028	5,541	50	14,283	25.96	17	9,988	19.50
36	Kalyani	55,579	81,964	7,200	44	39,429	48.11	31	23,581	42.43
37	Baruipur	37,659	44,964	2,396	27	NA	NA	5	8,371	22.23
38	Budge Budge	72,951	75,465	6,220	41	26,486	35.10	18	7,718	10.58
39	Maheshtala	288,877	389,214	25,656	33	NA	NA	30	NA	NA
40	Pujali	29,530	33,863	3,102	46	NA	NA	103	NA	NA
41	Rajpur Sonarpur	229,416	336,390	18,916	28	NA	NA	375	NA	NA

Sources: Census 1991, 2001, SUDA 1998/99, ILGUS 1998–99

3. TYPOLOGY OF LOW INCOME SETTLEMENTS IN THE KMA

Historically many poor settlements grew as non Bengalis migrated from adjoining states to work as labourers in the jute mills. Population in the KMA towns also swell due to an influx of refugees in 1947 from the then East Pakistan and as a result of the War in 1971. The refugees settled on government, private and railway land, often in risky or hazardous conditions. It is broadly possible to identify the following low income settlements typologies within the KMA:

3.1 Private Self-help Housing

Constructed with self-initiative of dwellers, these settlements have mostly come up in the fringe areas of the city. The buildings are temporary or semi-permanent and are built on small un-serviced plots.

3.2 Refugee settlements

Peri-urban areas dating back to partition; others from 1971 with conditions similar to those above but with a marked difference between settlements that have achieved security of tenure and those that have not.

3.3 Conventional Bustees or Classical Slums

These have mainly single-storied structures with a mix of temporary and permanent building materials these settlements have a cluster layout (i.e. dwelling units are organized around an open space approached through a common entry). Each cluster is popularly referred to as a *badi*. The urban environmental services are usually shared between 2-3 *badis*. Conventional bustee forms the bulk of the *thika* tenancy settlements. *Thika* tenancy has a three tier ownership system, viz., (a) land owner, (b) hut owner (*thika* tenants) and (c) tenants or occupiers of huts. As the pace of industrialization proceeded the demand for such housing continued to rise and more and more *thika* tenants established slums in and around Kolkata. The lands selected for setting up slums were inferior in variety and as such the *thika* tenants got them at nominal rent. As the landowners did not have substantive interest in the land and the *thika* tenants were after maximizing returns from the business, neither of the parties took any interest in providing a healthy living environment in the slum settlements. As a result, the living environment in slum settlements became deplorable in terms of extreme deprivation of basic services coupled with urban poverty and squalor. Due to population growth and market pressure these slums in Kolkata and Howrah have been converted to multi-tier tenements. According to the provisions of *Thika* Tenancy (Acquisition and Regulation) Act 1981 ownership of *thika* tenancy land now vests with the State Government.

3.4 Jute Line Colonies

During the Colonial period, jute mill owners constructed cheap dwelling units on their vacant lands with minimal basic services to accommodate labourers. The condition of these single storied structures, mostly built with temporary material, has deteriorated over time. In many cases, even though the jute mills have closed down, the settlements still exist and often become a matter of conflict between the owner and the dwellers to claim right on the land.

3.5 Squatter settlements

The very poorest neighbourhoods with irregular settlements sited on private or government owned land. These have little or no access to services, and are frequently located in hazardous areas, under bridges or on canal banks and railway lines. Most unrecognized settlements have been occupied for a long time – at least 20-30 years. To avoid encouraging squatters GoWB policy does

not allow for the provision of infrastructure in irregular settlements. However, the WB Municipal Act provides for measures to be taken to protect public health, of citizens dwelling in such areas and in surrounding neighbourhoods. In practice, service provision is typically limited to stand posts provided outside the settlement.

3.6 Pavement dwellers

They live in the most dynamic areas of the city with a large number in and around Howrah station. Outside KMC and Howrah there are a few places where people live on the streets, as in the immediate surroundings of Dakshineshwar Temple where one finds a concentration of beggars, street children, hawkers and mentally handicapped. The people who live on the streets are a particularly vulnerable group, and are often subject to harassment and abuse.

4. THE CASE STUDIES

18 settlements in three towns were selected as case studies to understand the poverty aspects in KMA. The three towns are Howrah, Barasat and New Barrackpore. Howrah, contiguous to the Metropolitan core of Kolkata, was once a vibrant manufacturing centre (comprising of jute and engineering industries) now confronted with stagnant economy due to closed and sick industries, ailing infrastructure and growth of slums. On the contrary Barasat and New Barrackpore are suburban towns located on the outskirts of KMA with large number of refugees settled in slum like situations. Howrah slums are characterized by high density, severe environmental and infrastructural deficiencies and complex tenure relations whereas slums in Barasat and New Barrackpore have similarities with rural housing typology, moderate density and environmental deficiencies experienced to a lesser extent compared to Howrah. Out of 18 settlements across 3 towns 2 are *thika* holdings, 4 private self-help housing, 4 refugee colonies, 3 jute mill colonies, 3 illegal squatters on government service lands and 2 conservancy staff housing on municipal lands.

In following section the key concerns and priorities of the urban poor identified across 18 study locations are discussed.

5. MAJOR CONCERNS AND FELT NEEDS OF URBAN POOR

5.1 Environmental Services

About 90 percent of the households in 18 study locations depend on crowded and poorly maintained water supply facilities. About 25 percent of the households defecate in open and another 65 percent share common latrine with others. 11 out of 18 settlements do not have access to satisfactory solid waste disposal facilities and face problems of severe water logging due to inadequate drainage. The deficiencies lead to serious inconveniences and unhealthy living conditions.

5.2 Irregular Employment and Credit

Only about 30 percent of the working population in 18 study locations has access to year round employment. The predominance of irregular employment

significantly affects the household income and lead to economic hardship and borrowing during distress period.

5.3 Limitations of Occupational Skill

Skilled persons earn about Rs.2,500-3,500 per month compared to semi-skilled persons who earn Rs.1,500-2,500 per month and unskilled workers who earn Rs.1,000-1,800 per month. Skill upgradation is considered to be essential to ensure access to gainful employment opportunities.

5.4 Housing Tenure

This is of prime concern for residents in illegal squatters and multi-tier *thika* tenancy slums due to fear of eviction and limitations over access to municipal services. The uncertainty of tenure limits the capacities of the households for investing in their own houses and infrastructure and attainment of better social status. Households with uncertain tenure face difficulties to have access to voter or ration cards which in turn create problems in accessing services, government programmes and seeking school admissions.

5.5 Healthcare Services

In the absence of availability of public healthcare infrastructure in the vicinity, the slum families have to depend on more expensive and occasionally less unqualified private practitioners. For accessing inpatient public healthcare infrastructure the households incur additional cost of transport and approach ward councilors for letters of recommendations for fee waivers.

5.6 Community, Local Government and Other Networks

Internal networks within the communities are important for local decision making and resolving internal conflicts. An external linkage with ULBs, government departments and political leaders are necessary to gain access to public services and programmes to resolve tenure insecurity and occupational issues. Residents in most of the study locations mention about limited external influence to address range of issues and admit their ignorance regarding various schemes and programmes.

6. DISCUSSION OF MAJOR FINDINGS

Quick Slum Survey indicates about 22 percent of KMA population excluding the KMC area are poor and accommodated in 3,406 slum settlements in 40 ULBs. However, the study in 18 settlements suggests the figure as conservative and the proportion of poor may be higher than this. There are poor households living in non-slum, mixed locations outside but contiguous to the designated slum settlements.

There are not many variations between slum types regarding varying dimensions of poverty. However, differences are observed on account of 'status of tenure'. In refugee colonies and private self-help housing, households having secured

tenure enjoy relatively better infrastructure and have good condition of shelters compared to illegal squatters and multi-tier *thika* tenancy slums.

The analyses on ethnic and linguistic parameters suggest that settlements dominated by Muslim households are poorer compared to that of Hindus and other religious groups. Large family structure and dependence on single wage earners among Muslim households appear to be responsible for the difference. Among the Muslims Hindi and Urdu speaking households are the poorest and it is clearly evident in multi-tier *thika* tenancy slums and squatter settlements.

Uncertain tenure, lack of skills, information and employment opportunities, single wage earners or women headed households, poor environmental services and poor asset base of households are perceived by the communities as major causes of poverty. These factors lead to lack of regular employment opportunities, poor housing and services, poor health and reduced household income. The reduced household income further accentuated by influx of surplus labour from rural areas and results in distress situation causing food insecurity. To overcome the problem most households start borrowing from private moneylenders and end up in losing their assets. This further affects household incomes indirectly because high interest payments on subsequent loans. The reduced income results in higher school dropouts limiting the opportunities for improving skill bases of the communities and leads to low wages.

7. AGENDA FOR FUTURE ACTION

- Existing Draft Development Plans (DDPs) prepared by the ULBs cover only the poor living in designated slums through Quick Slum Survey (QSS). The ULBs should include all urban poor not necessarily the designated slum residents only in the planning process.
- The present practice of identification of the BPL families is primarily based on economic criteria. Along with this multidimensional aspect of poverty particularly poverty of living conditions need to be recognized.
- Uncertainty of tenure is of the prime concern for communities living in illegal squatters, multi-tier *thika* tenancy slums and city pavements. A Tenure Improvement Action Plan for prioritized slum pockets in the ULBs needs to be formulated. Updated information on land ownership, tenure, tenancy profile, associated shelter and infrastructure condition, environmental risks and other vulnerability aspects need to be documented prior to the formulation of the Action Plan.
- Creation of employment opportunities and income generation should be given priority for the slums having workforce with high level of manufacturing skills. Appropriate actions are to be initiated by the ULBs to increase the opportunity for access to institutional credit, strengthening the existing skills base by providing vocational training and creating marketing opportunities for the products and services. Formation of new self-help

groups, revival of defunct groups with thrift and credit activities to be considered as an option to develop community linkages with the ULBs, banks and other formal institutions.

- The three tier community structure i.e. CDS (Community Development Society)- NHC(Neighbourhood Committee) and NHG (Neighbourhood Group) in several cases are effectively defunct. Moreover the CDSs do not identify themselves as independent entities and are subservient to the ULBs. Strengthening of existing bodies is a prerequisite for planning and implementation of income generation and infrastructure improvement activities for urban poor.
- At present the focus of the ULBs are largely skewed in favor of engineering and or infrastructure creation. The social and institutional development aspects are severely limited. Most ULBs are without a specialist or a senior staff looking into the software issues of development and in most cases additional charges being given to TPO (Town Project Officer) or CO (community Organizer) that shoulders all the non-construction, development inputs in the ULBs. Linkages of poor households with ward councilors and ward committees are also limited and depends on their politically affiliation. Hence, the capacity of the ULBs and also the state level institutions may need to be assessed and strengthened to address urban poverty related issues, giving adequate emphasis on social and institutional development aspects.
- Educational opportunities in areas where schools are not in the vicinity or in dilapidated conditions need to be explored under the *Sarva Shiksha Abhiyan* (SSA). Establishment of vocational training opportunities is to be considered as a priority by the ULBs and other state level technical and vocational training institutions namely ITIs, etc.
- ULBs should reassess their healthcare infrastructure and services especially for out-patient care and strengthen extension services through health workers to address one of the major causes of reduced household earning and poverty.
- Environmental services, including water supply, sanitation, drainage and solid waste management, have emerged as the key concern in the study locations. Considering the impediments for sustainable provision of these services, participatory planning for their provision and strategies for community-based management (operation and maintenance) need to be explored.
- Planning and building bylaws have been violated on large scale in most of the study locations. This is particularly reflected in unplanned growth and poor housing and infrastructure condition in multi-tier slums in *thika* tenancy holdings. The potential for future intervention become severely restricted with individual holdings being developed in a piecemeal manner. The situation

demands immediate attention from planners at state level and regulation at the local level by the ULBS. The agenda for action should include:

- Sensitization regarding the rights and responsibilities of the various stakeholders including the landowner and slum dwellers living on the land apart from enforcement by government authorities who are responsible for registering land transactions and providing services.
- Development of shared understanding among various stakeholders regarding options available for mutually beneficial actions. The ULBs should act as a catalyst in exploring the options, facilitating negotiations and developing compromises taking into account the concerns and priorities of urban poor.
- The provisions of relevant existing acts particularly related to security of tenure needs to be examined and if necessary amendments are to be introduced.

8. CONCLUSIONS

As mentioned earlier about 22 percent of KMA population excluding the KMC area are poor and accommodated in 3,406 slum settlements in 40 ULBs. However, the study in 18 settlements suggests the figure as conservative and the proportion of poor may be higher than this. There are poor households living in non-slum, mixed locations outside but contiguous to the designated slum settlements.

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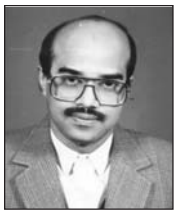

Urban Poverty and Need for Inclusive Urban Development Policies

Sibabrata Halder

Abstract

This paper seeks to expand the understanding about poverty and its causes and attempts to spell out policies to create an urban situation free of poverty in all its dimensions. It argues that major reductions in human deprivation are indeed possible when the forces of public synergy and technological advancements can be harnessed to serve the interests of the poor people. Even though current and future challenges are daunting, we have entered a new millennium with a better understanding of urban development management, but we should also recognize that there is a need for much more emphasis on solidly laying institutional and social foundations for managing vulnerability and encouraging participation of the poor to ensure inclusive growth.

1. INTRODUCTION

In September 2000, the new millennium opened with an unprecedented declaration of global solidarity and determination, penned by the heads of States from all over the world to rid the world of poverty and hunger through signing of the 'Millennium Development Goals' or MDG. The first item of the MDG read 'Eradication of extreme poverty and hunger' from this world. The declaration targeted by 2015, the proportion of people, whose income is less than US$1 a day would be halved. It was estimated that by the turn of the twentieth century out of global population of 6.1 billion, about 2.8 billion or almost half of the humanity, lived on less than US$2 a day. Of which 1.2 billion or about one fifth lived under acute poverty conditions with a meager per capita income of less than US$1 a day. In this perspective the MDG target is indeed very challenging.

Historically, poverty was concentrated in rural areas. It was rather unknown in urban areas, which mostly thrived on rural surplus. But things started changing fast since last century - as bulk of the world's population started migrating from rural to urban areas. It is estimated that by 2007 almost half of the world's population might be living in cities and for the first time in human history world will have become predominantly urban. With this massive demographic transition poverty is also increasingly becoming an urban phenomenon. Although there is no accurate global figures relating to proportionate people living under absolute poverty in urban area, the UN-Habitat estimates that two-fifth of the total urbanites in developing countries might be the poor.

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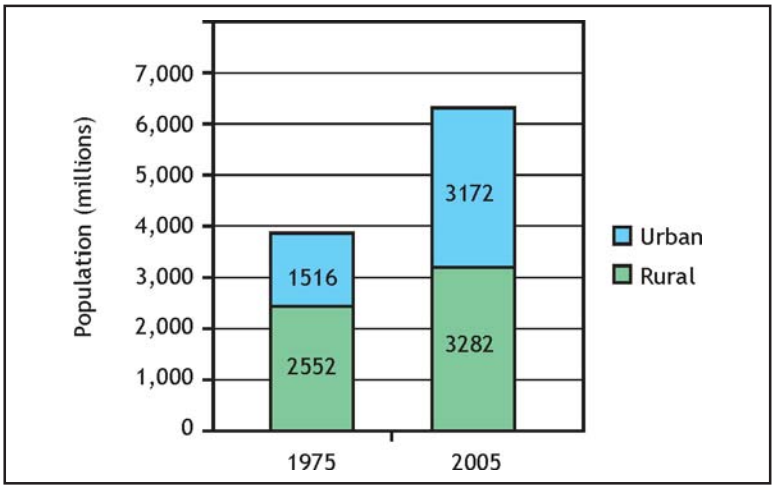
Table 1 UN Millennium Development Goals (MDGs) By the Year 2015, all 191 United Nations States have pledged to meet these goals

1.	Eradicates extreme poverty and hunger	• Reduce by half the proportion of people living on less than a dollar a day • Reduce by half the proportion of people who suffer from hunger
2.	Achieve universal primary education	• Ensure that all boys and girls complete a full course of primary schooling
3.	Promote gender equality and empower women	• Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015.
4.	Reduce child mortality	• Reduce by two thirds the mortality rate among children under five
5.	Improve maternal health	• Reduce by three quarters the maternal mortality ratio
6.	Combat HIV / AIDS, Malaria and other diseases	• Halt and begin to reverse the spread of HIV / AIDS • Halt and begin to reverse the incidence of malaria and other major diseases
7.	Ensure environmental sustainability	• Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources • Reduce by half the proportion of people without sustainable access to safe drinking water • Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020
8.	Develop a global partnership for development	• Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory. Includes a commitment to good governance, development and poverty reduction-nationally and internationally. • Address the least developed countries' special needs. This includes tariff – and quota-free access for their exports; enhanced debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance for countries committed to poverty reduction. • Address the special needs of landlocked and small island developing States, Deal comprehensively with developing countries debt problems through national and international measures to make debt sustainable in the long term In cooperation with the developing countries, develop decent and productive work for youth. In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries. • In cooperation with the private sector, make available the benefits of new technologies – especially information and communications technologies.

Source: UN-Habitat

Fig. 1 The World Population Urban/Rural



Source: United Nations, World Urbanization Prospects: The 2003 revision

While issue of poverty has been in direct or indirect focus of development initiatives in many developing countries since the end of the colonial period, issue of urban poverty has gained prominence only recently during last three decades. Central purpose of this paper is to provide a broad perspective of urban poverty and generate discussions and debate on various issues of integrating the urban poor into main stream development process. Incidentally the draft Eleventh Five Year Plan of Government of India has laid enough stress for inclusive growth by integrating the poor into development process.

2. POVERTY AND POVERT LINES

2.1 What is Poverty?

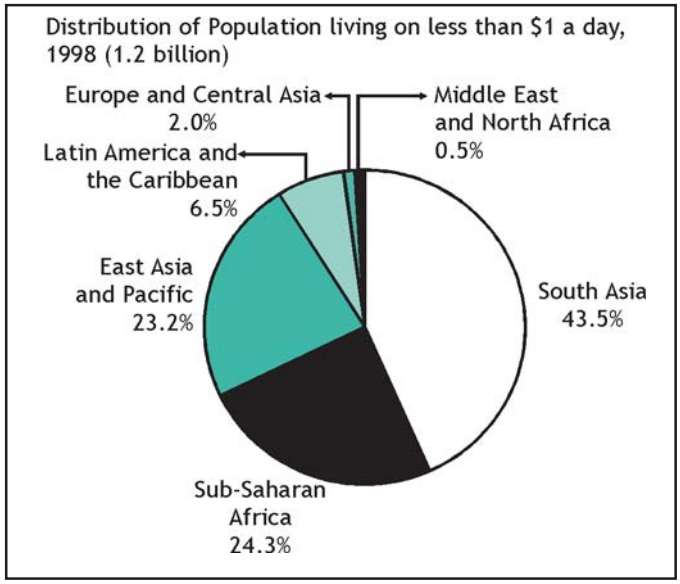
In theoretical terms poverty implies deprivation of basic minimum human needs like food, clothing, shelter, education, health facilities and other societal needs that are not met. As all of the above are marketable products or services, deprivation is generally understood to arise from the lack of purchasing power or income or assets. There are sweeping variations in the definition of poverty in different countries. Most prevalent means of measuring poverty have been and continue to be those related with money. Measures such as the poverty lines or Gini Co-efficient are used to measure poverty in terms of income and affordability. They are prevalent because such measurements are relatively easy to make and quantify even through their full justification is contentious. However, lack of money is more of a symptom of poverty rather than its cause. In most cases the poor are not without any income. What they lack is the ability to accumulate assets, for example, education skills upgradation and health, which is the key ingredients for creation of wealth and breaking the cycle of poverty.

2.2 Poverty Lines

Therefore a key building block in developing income and consumption measures of poverty is the concept of poverty line. It is the critical cut-off point in income or consumption costs, below which an individual or household is classified to be poor. In the face of differential value of purchasing power under different

economies, an international poverty line has been attempted. The current poverty standard of USD1 a day, measured on the basis of 1985 international prices and adjusted to local currency using Purchasing Power Parity (PPP) conversion factors of 1993, was so chosen because of its equivalency to the typical poverty lines in low income economies.

Fig. 2 Where the developing World's poor live



Two basic levels of poverty are identified in the development literature: absolute poverty and relative poverty. Simply put, absolute poverty (household earning less than USD1 per capita per day) is defined as the cost of the minimum necessities needed to sustain human live. Relative poverty (household earning less than USD2 per capita per day) is defined as the minimum economic, social, political and cultural goods needed to maintain an acceptable way of life in a particular society.

Poverty lines set by different governments are historically just the same as followed by Seebohm Rowntree (1901) in his pioneering study for the town of York in England. Generally it described those households whose income figures fell below a set level of consumption, which was precisely the 'income poverty'. During last century there has been little change or fine tuning to this approach.

However, the definition that sets a poverty line to divide the population into the 'poor' and 'not-so-poor' is far from rational because it attempts to simplify and standardize a highly complex, varied and dynamic concept. In fact several documents acknowledge that 'poverty' has many more dimensions other than income only.

Information regarding urban poverty is scarce globally. Beside the definitions of poverty differ from country to country making it difficult to arrive on a commonly accepted understanding. The European Union defines the relative poor as "... persons, families and households whose resources (material, cultural, social) are so limited as to exclude them from the minimum acceptable way of life in the member state in which they live".

In India, this is defined as the availability of at least 2,400 calories of food per capita per day in rural areas and 2,100 calories of food per capita per day in urban areas. Interestingly the official definition of the poverty line in this

Table 2 Urban and Rural Poverty Percentage in India

Units	Poverty Percentage	
	1995-96	2004-05
Rural	37.3	28.3
Urban	32.4	25.7
Total	36.0	27.5

Source: Yojana, May 2007

country does not incorporate such basic necessities like clothing (even for women) as essential item leave aside the needs for shelter or education or health. Even then there are 301 million or 27.5 percent people lived below the poverty line. Urban poverty is determined by the percentage of the urban population living below the urban poverty line as determined by the government. Poverty lines set up by governments are usually unrealistically low and they are nearly the same for both urban and rural areas, often neglecting the higher costs of living in urban areas.

In India, the Planning Commission has estimated that based on consumption distribution, using a 30 day recall (Uniform Recall Period) the level of urban poverty in 2004-2005 was 27.5 percent and the poverty is reducing over the years as could be seen from Table 2.

3. POVERTY AND INEQUALITY

Poverty can not be described by just as lack of income, assets, or access to economic opportunities. Poverty involves relative deprivation and inequality in access to income, opportunities, material goods and services. And these inequalities are far for more pronounced in urban areas than rural areas. In urban areas the opportunities and level of access to material goods and services, those are available, are varied. Hence sense of deprivation is also very acute.

These inequalities are striking at macro level also. It is estimated that globally roughly poorest 20 percent people, living on less that US$1 per day, account for only 1.5 percent of the world's income and 46 percent people, who live on less than US$2 per day threshold, cumulatively share only 5 percent of the world's income. Interestingly the global average of per capita income per year is US $ 5,533 (PPP), and 80 percent of its population registers their income less than that.

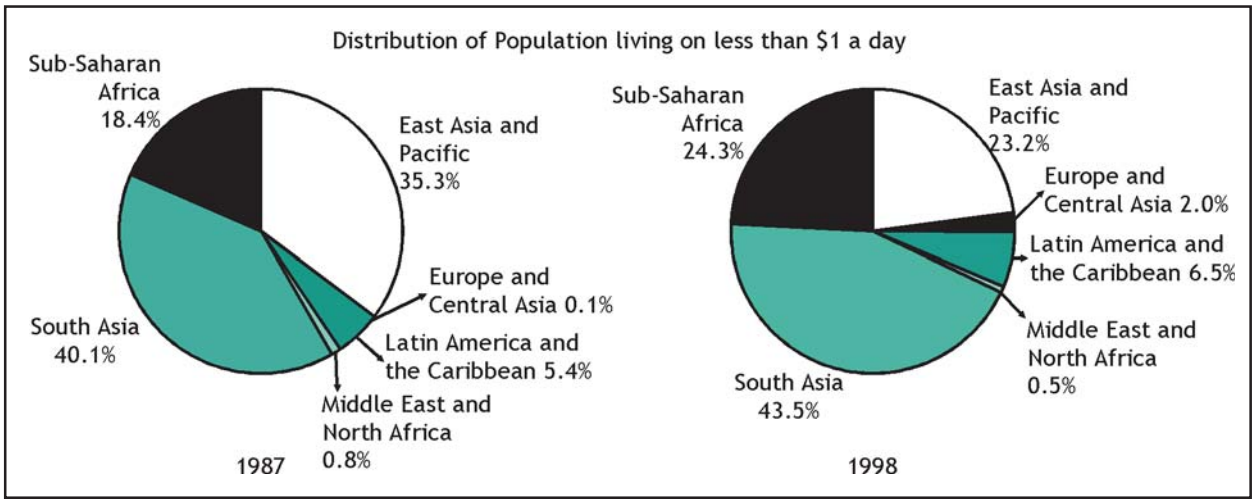
Table 3 Percentile Urban (Annual) Income in India: 2004-05

Percentile	Wages in Rs.
Bottom 20%	23,285
Next 20%	47,771
Next 20%	75,890
Next 20%	1,45,628
Upper 20%	3,78,040
National Average	1,34,113

Source : N.S.S.O.

In India this inequality phenomenon is best illustrated by one critical piece of statistics. Among the wage and salary earners, the top 20 percent of population in Urban India earns 56 percent of income while the bottom 20 percent earns a bare 3.4 percent of income. Indeed the top percentile earns more than all others put together. In a sense, inequality or lack of inclusive growth in India is similar to that of global situation.

Fig. 3 Poverty in the developing world is shifting towards South Asia and Sub-Saharan Africa



4. CAUSES OF POVERTY

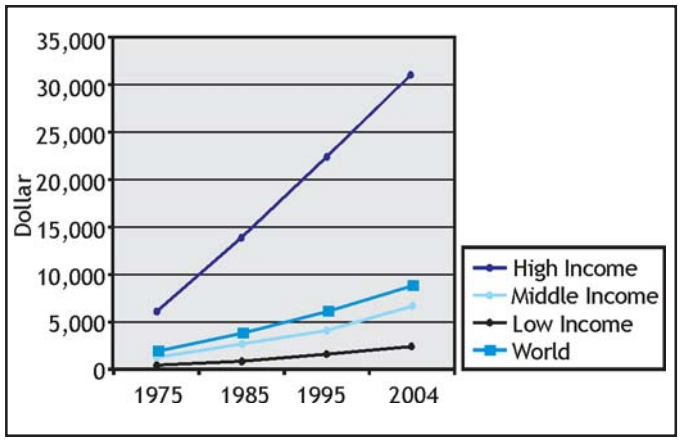
4.1 Macro Economic Causes

It is a paradox that in spite of recent improvements in living standards, increasing global wealth, improvements in connectively and advancements in technological capabilities in different sectors of agriculture, industry, communication and service sectors, poverty and destitution are rising. Urban experts believe that factors like globalization, consequent structural adjustments, economic crises, massive rural to urban migration all have converged and contributed to the proliferation in number of the urban poor, especially in South Asia and East Africa since 1980s.

In fact, the current neoliberal, growth and export oriented economic development models have miserably failed to eradicate poverty in a number of developing countries. On the contrary, it is exacerbating the political, social and economic exclusion of the majority population from the privileged few. Such policy fosters poverty, jobless growth and economic disparities, disintegrates social equilibrium, endanger environmental sustainability and governability as cheap labor, absence of any social safety net, destruction of informal sector and relinquishment of environmental management are instrumental to this policy.

The central challenge of the twenty first century is how to make both economic and social development forces of globalization work together for the benefit of all people instead of leaving few million poor behind. Fortunately our Government has realized the seriousness of this issue and reacted to this reality. In a recent meeting of the National Development Council, which met to approve the Approach Paper to the Eleventh Five Year Plan (2007-2012), the policy of 'faster and more inclusive growth' has been incorporated.

Fig. 4 GDP Per Capita by Income Groups 1975-2004



Source: World Bank, World Development Indicators Database

4.2 Micro Economic Factors

Besides these macro economic factors some micro economic factors are also vital for perpetuation of poverty and these are:

- Lack of income to attain basic necessities of life like food, clothing, shelter, education, health and physical environment. The poor people consistently emphasize gainful employment as central to improve their living conditions. With economic growth, normally income poverty falls and with economic decline, income poverty rises. However, the relationship of economy with poverty is not a direct one. The effectiveness of economic growth in generating more gainful jobs and thereby reducing poverty also depends on removing inequalities and sound governance.

- Assets that could be useful to fight poverty and exigencies are usually not available to the poor. Assets could be of several kinds like:
  - Human assets such as capacity of basic skills, labor and sound health condition for sustaining work.
  - Natural assets such as land and building ownership rights.
  - Physical assets such as convenient access to basic infrastructure e.g. access to water, sanitation facilities, electricity, etc.
  - Financial assets such as savings and easier access to credit.
  - Social assets such as contacts, networking abilities and political influence, etc.

- Increased vulnerability to adverse shocks is linked to inability to cope with them. Vulnerability is the risk that household or individual experiences as an episode of income or health poverty over time due to natural or man made disaster, crime and violence, ill health, etc. It also means probability of being exposed to number of other risks. Vulnerability is associated with material and human deprivation. The underlying cause of vulnerability is the inability of the individual or community to develop mechanisms to reduce or mitigate risks normally the poor people face. The urban poor are more exposed to the risks arising out of such vulnerability that affects them economically and thereby starting downward spiral in their living standard.

5. POVERTY AND UNDEREMPLOYMENT

5.1 Informal Sector

The term 'informal sector' arose almost four decades ago to describe the unregulated activities of the urban poor in the developing world. The so called informal sector is nothing more than the poorest stratum of working class who work in poorly paid services that make up an essential part of the urban or metropolitan economy. But the problem of proliferating urban masses, supporting themselves in invisible ways at some perceived risk to public safety is an old one. In eighteenth century, the Scottish economists wrote about the 'riffraff' of Glasgow and Edinburgh.

In cities of the developed world, more jobs are created in the formal sector and service management as a result of globalization. While in the developing world, trends point toward an increasing informalization of the urban economy, as formal sector fails to provide adequate employment opportunities to number of younger people seeking work. According to the International Labour Organization (ILO), approximately 85 percent of all new employment opportunities in the world are created in the informal economy. Consequently employment in the urban informal sector has risen sharply over the decades.

According to an internationally agreed definition, the informal sector consists of income generating households and or unincorporated enterprises, including own account enterprises and other unregistered enterprises with a unit size below a certain number of employees. Since this definition is based on the concept of unregistered or unincorporated enterprises, it has limitations. According to a broader definition, informal employment within unregistered enterprises includes employers, employees, own account workers and unpaid family workers, domestic workers, day laborers, home based workers, and unregistered employees in formal enterprises. International Labour Organization estimates suggest that more than half of the urban workforce in developing countries operates informally outside the reach of government regulation or protection. Of this vast urban informal workforce probably most are street vendors or street workers of other kinds.

Most urban informal workers are linked in some ways to the formal economy. But their contribution to the local, national, and global economy remains invisible and undervalued. The need to integrate informal economic activities into national accounts led to the formulation of a more rational concept that follows international economic classifications used by the United Nations. Urban planners should acknowledge that the urban informal workforce is here to stay, and that it contributes to national and city's economy in many ways (creates employment, produces and distributes goods and services at affordable prices). They should also realize that reducing urban poverty is not possible without supporting the urban poor working in the informal economy and to address the key constraints and needs of different categories of urban informal workers.

Table 4 World Wide Urban and Slum Population by Regions – 2001

Region	Population In billions		Slum Population in billion	Slum as % population to urban
	Urban	Total		
1. World	2.92	6.10	0.92	32.0
2. Developed Countries	0.91	1.20	0.05	5.0
3. Developing Countries	2.01	4.90	0.87	43.0
4. India	0.28	1.02	0.04	14.0

Source : UN- Habitat

6. URBAN POVERTY AND HOUSING

6.1 Dimensions of Slum

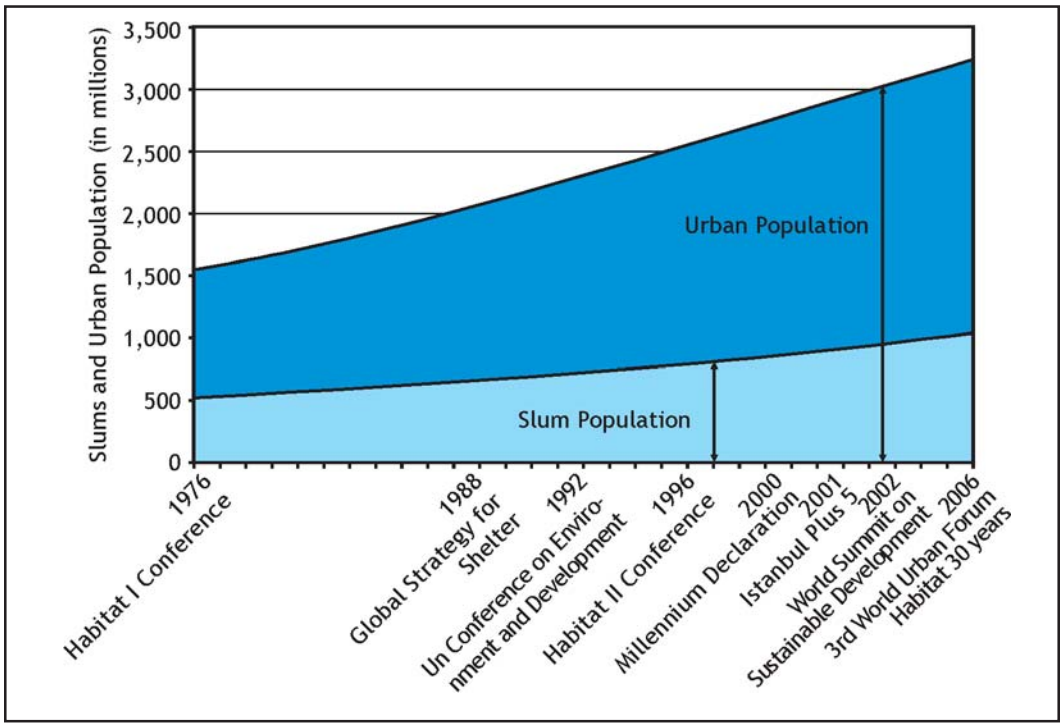
Urbanization of poverty has very tangible impact on housing environment and quality of life of the city dwellers. UN-Habitat's global audit on slums shows that in 2001 three out of ten inhabitants living in urban areas were slum dwellers. Mass poverty compelled these people to live in settlements often described as 'marginal' or slums, a solution outside the realm of modern capitalist markets. Statistically, throughout the cities of the developing world, any where between one third to two thirds of the total urban population is forced to live under some kind of substandard housing or slums. Obviously unable to afford even the lowest cost standard of housing, many urban poor have arranged their own makeshift shelters commonly referred as slums and marginal settlements, often negotiating and modifying all official physical and environment standards for their housing solutions within their affordable means. Visibly these settlements are physical expressions and manifestations of urban poverty in our cities.

Table 5 Estimated Urban Slum Population (Without Radical Action by Government)

	1990	2005	2015	2020
North Africa	21,719	21,224	20,901	20,741
Sub-Saharan Africa	100,973	199,231	313,419	393,105
Latin America and the Caribbean	110,837	134,257	152,559	162,626
East Asia	150,761	212,368	266,863	299,150
East Asia excluding China	12,831	16,702	19,911	21,739
South Asia	198,663	376,432	344,537	384,644
Southeast Asia	48,986	59,913	68,521	73,279
West Asia	28,641	46,288	63,747	74,808
Oceania	350	568	786	924
Developing Regions	660,929	946,529	1,202,597	1,355,543
World	721,608	1,010,898	1,265,644	1,416,164

Source:UN-HABITAT, Global Urban Observatory, 2005. Figures are expressed in Thousands.

Fig. 5 Slum Population and Urban Population Growth in the World (1976-2006)



Source: UN-HABITAT/United Nations, World Urbanization Prospects: The 2003 revision

Globally an estimated 920 million people lived under slums in 2001 and of these 95 percent lived in developing countries as could be revealed from Table 4. By 2020 the estimated slum population may reach 1.4 billion (Table 5) and most of them will reside in Asia and Africa. Trends of slum population and urban population growth are shown in Fig. 5.

6.2 Causes of Slum Formation

Chief cause of living in the slums is of course poverty. But there are other major constraints regarding housing investments by the urban poor:

- Evidence suggests that the people living under absolute poverty category could barely manage their daily existence by spending 70 to 80 percent of their daily total earnings on food alone. Very little money is left thereafter for meeting expenses of all other necessities of household like clothing, shelter, transport, education, health, etc; with which they could modify their levels of consumption.
- Income vulnerability is a constant companion of the urban poor. As they live under marginal income in face of any exigencies like economic distress or disease or natural or social disaster, they become extremely vulnerable. Lack of adequate assets set up a vicious downward spiral, in which actions to cope with short term remedies often worsen their long term deprivation lowering or modifying even the food budgets not to speak of housing.

- Many households (at least those under relative poverty category) can possibly repay low interest long term loans for housing. But they fail to fulfill the government or official criteria of being credit worthy as they often fail to produce proof of their employment or earning certificates or can not ensure required collateral for loans.
- Further the prevailing assumptions that most poor people have enough 'free time' to organize themselves for building their own housing and infrastructure through self help and community participation often proves to be wrong. As most of these poor people are not really unemployed but underemployed and work in informal sector jobs where working hours are very long, having no holidays or recess. Therefore, the perception of 'free time' of the urban poor is often illusive.
- Lastly, some of the urban poor can afford the cost of standard housing at periphery of the city or outside the official city limits as land is cheaper there. But that increases their cost of transportation to work and other journeys as well as. Besides it consumes more time, which they can ill-afford because of the nature of functions they usually perform in the cities.

6.3 Program for Action

The Millennium Development Goal 7 (target 11) calls for actions for significant improvements in the lives of at least 100 million slum dwellers by the year 2020. It is definitely a very welcome commitment to fight against urban poverty made by the policy makers and governments. But one need not forget two important issues of this program. Firstly, at this point of time globally there are 920 million slum dwellers. Even a conservative estimate projects that number of slum dwellers will be about 1.4 billion by 2020 (Table 5). Therefore action program for 100 million slum residents is not very justifiable. Hence there is need to reconsider the target 11 of MDG and make it more local.

Secondly, the total cost of improving shelter of 100 million slum dwellers has been estimated as USD67 billion by the UN Task Force i.e. on average of USD670 (Rs.26,800) per capita. Simultaneously finance is also needed to improve at least partially, the shelter standards of the rest 1.3 billion slum dwellers by 2020, which costs 870 billion USD at the rate of 58 billion USD per year for next 15 years. Therefore, like all good ideas, translation of the MDG commitment into reality in a practicable and workable way is the real challenge.

In India, according to the 2001 Census, about 40.6 million (22.8 percent) urban population lived in slums in 607 and towns. The Tenth Five Year Plan (2002-2007) had allocated Rs.29,719 crores to the Ministry of Urban Development and Poverty Alleviation for improvements of slums. Further under the JNNURM, government proposes to spend another Rs.50,000 crores for slum housing and related works, which is one of the major sub-missions.

It is estimated that the slum population in India might reach 60 million by 2020. For which the Government, if they follow UN-Habitat standards, will require a

sum of about Rs.160,400 crores in the next 15 years, which appears to be astronomical. Therefore for meeting the MDG target-II, at national and local levels, India needs to formulate and pursue some serious action plans and programs with specific thrust on slum upgrading and urban poverty alleviation. Interestingly the 11th Plan Approach Paper is silent on this issue.

7. POVERTY AND ENVIRONMENTAL DEGRADATION

7.1 Environmental Implications of Urban Poverty

Urbanization of poverty has serious implications for the urban environment. For one, the urban poor bear the greatest burden of urban environmental risks because of the situations in which they are forced to live whether in the sprawling slums or blighted inner city areas. The urban poor are forced to make trade-offs between affordable housing and environmental safety and protection. Proximity to work places often poses another set of risks. The 1984 world scale disaster at Bhopal is one example.

The poor also contribute to local environmental degradation mainly because the city authorities fail to provide them with basic necessary services. If solid waste is not collected, for instance, the people may dispose of their own garbage in inappropriate dumping areas. Denied access to suitable land for housing, people may settle on fragile ecosystems such as wetlands. When the urban poor engage in environmentally degrading activities, however, it is usually because they have no alternative. Beside the poor are understandably reluctant to invest heavily on improving the household or neighborhood environment since they could be evicted at any given time.

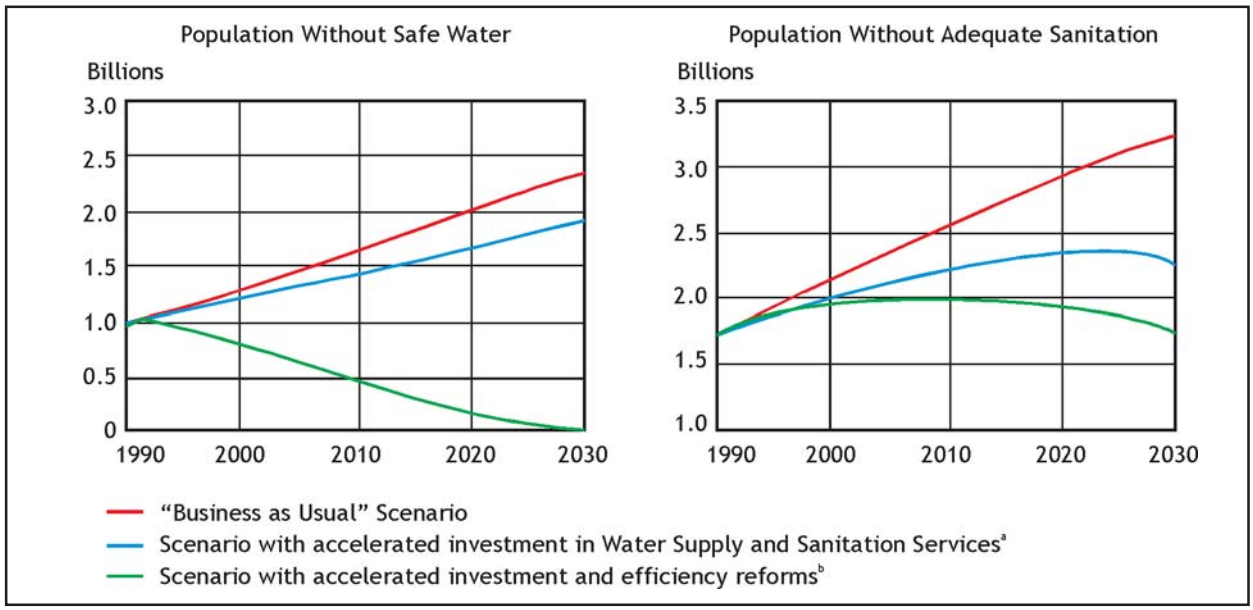
Urban environmental problems also create a range of social impacts. They may impair human health, cause economic and other welfare losses, or damage the ecosystems on which both urban and rural areas depend. Most urban environmental problems entail all three of these impacts either directly or indirectly. For example, lack of proper filtered water supply or safe sanitation, urban air pollution has a direct impact on human health, increasing the incidence of various water bourn and diseases. Its impact on the economy is mainly indirect, arising largely from productivity losses due to ill health.

The basic causes of increase in urban violence are urban growth with the marginalization of the underprivileged and insufficiency of social housing programmes and community amenities, unemployment of the young people. It is also more difficult for parents living in very poor quality housing and usually working long hours to provide children with the social support that they need both at school and at home. An unsupportive home life can lead to non-adoption at school and to lack of personal discipline and self esteem, which could increase the risk of anti-social or criminal activities.

7.2 Economic Costs of Urban Environmental Degradation

In addition to their toll on human health and natural resources, urban environmental problems exact economic costs as well. All told, these problems

Fig. 6 Safe Water and Adequate Sanitation: Three Scenarios, 1990-2030



can significantly undermine the productivity that urbanization fosters. Some of these costs are relatively easier to calculate like the medical costs but the majority may prove far more problematic.

Environmental problems that affect human health, for instance, are often measured in terms of lost worker productivity. But economic losses encompass more than losses in productivity or output as conventionally measured. Impacts on human health and degradation of the natural resource base combine to undermine a city's economic productivity. In addition to increased costs of treating illness, health problems reduce productivity through lost workdays, lost educational opportunities and shorter working lives.

The productivity of cities also depends on a safe and well maintained urban infrastructure e.g. water supply and sanitation. When women have to devote considerable amounts of their time to fetching water from distant standpipes or disposing of household wastes, they have less time for income earning activities. For economic activities as well, dependable supplies of power and water, communications, and transportation networks can raise output and lower production costs. Infrastructure shortages or intermittent failures in delivery, by contrast, can exact severe economic losses.

8. POVERTY ALLEVIATION

8.1 India's Poverty Alleviation Program (PAP)

The terms such as poverty eradication and poverty alleviation are often used interchangeably in the development literature. Before discussing policies and approaches to either eradicating or alleviating poverty, it is important to distinguish what these terms imply. While absolute poverty can be eradicated,

relative poverty can only be alleviated, because what is minimally accepted today may vary over time, from villages to urban areas and from country to country. Relative poverty also varies with the levels of economic development, and the perceptions and expectations of the majority on what is minimally acceptable.

First formal attempt to experiment with the community development approach in cities was the Urban Community Development project started in 1958. The Environmental Improvement of Urban Slums (EISU) scheme was started in 1972 where central government provided basic physical facilities like safe drinking water, sanitation, storm water drains, street lighting and roads. This scheme was transferred to the state governments in 1974. Following experiments with a variety of combinations of schemes for employment generation, formation of beneficiary groups, training, community organizations and thrift/self-help groups, finally the integrated programme of Swarn Jayanti Shahri Rozgar Yojna (SJSRY) was launched in 1997.

In India, the governments tackle this potentially explosive situation of rising income poverty and increasing disparity between the rich and the poor through some Poverty Alleviation Programme (PAP) and most of these programmes end up as mere dole. It is well known that dole, even if regular, have a very limited utility as an instrument of poverty alleviation. Doles neither reduce the psychological frustration of unemployed youth nor are they economically sustainable in a developing economy like India; and the production aspect of employment anyway remains mostly unaddressed by the system on dole. Many genuinely think that the citizens should be provided with the basic requirements like, house, food, education, etc. But proper economic policies would prevent the creation of poverty itself and enable the people to build their own house and pay for their child's education. Then there would be no need to undertake these welfare programmes.

The government is running many schemes for the welfare of the weaker sections, such as for families below poverty line, free education, pensions to the elderly and so on. But much of the money spent in these schemes never reaches the beneficiary. Ironically the government system has developed a vested interest in the perpetuation of poverty.

Implementation of programmes for the urban poor is beset with enormous problems. The problem of inadequate funding has been compounded by under utilization of central funds, diversion of funds released for specific programmes, and wasteful expenditure. Monitoring at the central level has been weak and ineffective. Success stories have not been publicized or adopted on a wider scale. The understanding relating to implementation has been weak and superficial, leading to inaction in many areas that are of vital concern to the urban poor. There are few master plans and very little effort at monitoring communities. In addition, there have been too many programmes without adequate understanding of the social, psychological and other dynamics of

poverty. The beneficiaries have not been consulted nor given a voice in the implementation of programmes.

8.2 Inclusive Growth

The Approach Paper proposes several policy initiatives that will achieve a faster growth in the manufacturing sector, and within manufacturing, encourage investment in labor intensive manufacturing and also encourage units to graduate from small to medium and from the unorganized to organized sector. These efforts to generate demand for labor must be accompanied by a strategy to upgrade skills of the new entrants to the labor force by extending a social safety net by guaranteeing employment in rural areas. Programmes can also be used to build and must be used to build rural infrastructure especially if resources from other schemes are also pooled in.

While aiming at faster growth, the Approach Paper also emphasizes the need for making growth more inclusive. Inclusiveness may at first glance appear to be only a restatement of distributional objectives which have always been part of planning, most notably a commitment to reducing poverty. Poverty reduction is indeed important but the concept of 'inclusiveness' goes beyond the narrow objective of poverty reduction. It encompasses a much broader approach to distributional objectives. Distributional objectives are not to be viewed as an add-on to a dominantly growth oriented strategy. Rather, inclusiveness is an integral part of the growth strategy and indeed the structure of growth sought to be achieved is one which is most likely to achieve inclusiveness.

We need to emphasize a policy which will encourage growth of labor intensive manufacturing sector and encourage small firms to grow and enter the formal sector. Infrastructure development is a critical element of this strategy. Special Group report 2002 (Government of India) emphasizes another dimension of the problem of non-inclusive growth plaguing the Indian economy, namely the disjuncture between growth and generation of employment.

9. CONCLUSIONS

The major reductions in human deprivation are indeed possible when the forces of public synergy and technological advancements can be harnessed to serve the interests of the poor people. While current and future challenges remain daunting, we have entered a new millennium with a better understanding of urban development management. Traditional elements or strategies to foster growth and users friendly reforms are essential for reducing urban poverty. But it also needs to be recognized that there is a need for much more emphasis on solidly laying institutional and social foundations for managing vulnerability and encouraging participation of the poor to ensure inclusive growth.

Institute of Town Planners, India Journal 6 - 3, 26 - 34, July - September 2009

Financing and Management of Infrastructure in Peri-Urban Areas of Indian Cities

R. N. Datta

Abstract

As the cities grow and expand the peri-urban areas become part of the cities and new peri-urban areas are formed. This phenomenon in India is creating severe problems in terms of infrastructure delivery both in the fringe areas of the cities and the peri-urban areas. The District Planning Committees (DPCs) need to consider the special requirements of the peri-urban areas, while planning and coordinating developments of panchayats located within 5 to 10 kilometer of towns and the Metropolitan Planning Committees (MPCs) should give equal importance to the fringe areas of the municipalities and the peri-urban areas for planning and development. The central assistance for rural infrastructure is inadequate to meet the requirements of the peri-urban areas. All financing, management and capacity building instruments meant for urban areas should be made applicable to panchayats within peri-urban areas.

1. INTRODUCTION

As the cities grow and expand the peri-urban areas become part of the cities and new peri-urban areas are formed. This phenomenon in India is creating severe problems in terms of infrastructure delivery both in the fringe areas of the cities and the peri-urban areas.

About 28 percent of India's population currently resides in cities and it is expected to rise to approximately 40 percent by 2020. A significant amount of this growth will have to be absorbed in the fringe areas of the cities and peri-urban areas. The stress on available urban infrastructure is also rising not only due to the growing population but also due to the improving quality of life for a group of urbanites. The cities, specially the larger ones, are expected to be self sufficient in terms of provision and maintenance of infrastructure services. Finances are also not available on easy terms. As a result meeting the intra city demand for infrastructure services itself is an overwhelming task and consequently the peri-urban areas remain neglected. For example, the Kolkata Urban Services for the Poor (KUSP) Project that aims to 'improve urban planning and governance and access to basic services for the poor and support an enabling environment for economic growth in the Kolkata Metropolitan Area (KMA)' has been implemented in urban local bodies within KMA and not in the *panchayats* within KMA that has jurisdiction over the peri-urban areas of KMA.

In India peri-urban areas require good governance like that expected for the municipal governance as stipulated in the 74th amendment of the Constitution while falling under the jurisdiction of the *panchayats* whose major function is

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planning for economic development and social justice and implementing these plans as per the 73rd amendment of the Constitution. This dichotomy has imposed limitations for financing and management of infrastructure in peri-urban areas.

What infrastructure is demanded in peri-urban areas and what is to be provided are dependent upon what infrastructure is currently in place, who will be the users and how they will use it. The delivery of cost-effective infrastructure is a critical issue and is based on the nature of demand. Like any Indian urban area the infrastructure demand in most peri-urban areas varies between the different types of infrastructure services. Some of them are socially needed and financial cost-effectiveness can not be the chosen criterion. With the growing urban economy it is expected that peri-urban areas will change to urban areas at accelerated rates, which calls for innovative planning, regulations, technology, design, financing options and delivery that are incremental and maintainable.

2. URBAN FRINGE AND PERI-URBAN AREAS

In terms of demands for different types of infrastructure and nature of demand for land use transformations, there is little difference between an urban fringe and the adjoining peri-urban areas. Quite often land value changes take place at a higher rate in the peri-urban area. As a result land speculation in peri-urban areas is more pronounced. These areas are under the jurisdictions of two different types local governments — urban fringe under municipality and the adjoining peri-urban area under a *panchayat*.

Municipalities and *panchayats* have distinct powers and authority as endowed by the concerned state governments. Fiscal jurisdiction of these local bodies is totally decided by the state legislature and it is of common knowledge that the resource raising capacity of these local bodies are very limited. Although the Finance Commission of a state is required to recommend the distribution of funds between the state, municipalities and *panchayats*, and also suggest the determination of the taxes, duties, tolls and fees that may be assigned to, or appropriated by, the local bodies; the state commissions have felt constrained by the fact that states have not transferred functions and schemes to municipalities (Garg, 2005) and *panchayats* in the spirit of the Constitutional amendments.

Relatively municipalities whose principal source of tax revenues is the property tax are better off than *panchayats*. Government of India and state government grants for infrastructure to urban local bodies are also significantly more than what is allocated to *panchayats*. In order to accelerate and motivate the process of urban reforms, Government of India also provides reform-linked assistance to states through Urban Reforms Incentive Fund (URIF). The purpose of this program is to gear up the urban local bodies for levying reasonable user charges

with the aim of collecting full costs of operation and maintenance of municipal services. In general the municipalities are more sensitized to recover user charges compared to the *panchayats*. In short even though there is similarity in demand for infrastructure in the urban fringe and the adjoining peri-urban areas, capacities for delivery of infrastructure vary significantly.

3. RISING INEQUALITIES AND THE NATURE OF INFRASTRUCTURE DEMAND

India's current proportionate shares of GDP between primary (mostly agriculture), secondary (mostly manufacturing) and tertiary (largely service) are 24:25:51 while the labor shares between primary, secondary and tertiary are 57:18:25 'thus providing a relative income advantage to the minority' (Shariff, 2004) who mainly work in the service sector and live in cities. The absolute number of urban population in India is large (285 million in 2001). Increase of non-agricultural employment in the country in the recent years has been in the unorganized sector primarily in low productivity self-employment. This coupled with the high income of a minority of service sector employees who are employed in the IT and organized sectors has resulted in 'accentuation of inequalities in urban areas' (Kundu, 2001) evidenced by the rising inequality of per capita expenditure within urban areas in most states (Deaton and Dreze, 2002).

These inequalities have created mainly two types of urban structures within Indian urban areas. One, which tends to support a life style equivalent to that of any developed country and the other that is marked by the poor quality of life strongly exhibited in the unhygienic dilapidated conditions. Although the reflections of the inequalities on urban infrastructure are evident in all Indian cities, the demand for infrastructure provisions in both the types of areas is greater than before. There are congested roads due to high volume of traffic and also due to narrow streets, poor public transport systems, scarcity of water because of higher per capita demand in affluent areas and scarcity of supply in over crowded slums, unsatisfactory levels of sewage treatment, uncollected solid waste and also poor quality housing. When there is so much to meet within an urban area, infrastructure deficiencies in the peri-urban areas draw little attention of the states or local bodies.

4. INFRASTRUCTURE SERVICES IN PERI-URBAN AREAS ARE THE LIABILITY OF THE STATES

Infrastructure in Indian peri-urban areas is the liability of the state governments. The Constitution of India also makes it mandatory for constituting city-*panchayats* for the areas in transition from rural to urban habitation. District planning committees and metropolitan area planning bodies have the constitutional backing for preparing development plans of the entire area for which such bodies have responsibilities for coordinating development activities

that are mainly confined to the functions entrusted to them by the state legislature. It is the state government's responsibility to create legal framework for providing infrastructure services in peri-urban areas through *panchayats*, its own departments, other government agencies or private organizations. Peri-urban areas are in general under *panchayats* and a state may give *panchayats* such powers and authority for enabling them to function as institutions of self-government. The Eleventh Schedule of the 73rd amendment to the Constitution specifies 29 areas of responsibility that states may devolve to the *panchayats*. Of the 29 areas specified, rural housing; drinking water; roads, culverts, bridges, ferries, waterways and other means of communication; rural electrification, including distribution of electricity; non-conventional energy sources; education, including primary and secondary schools; libraries; cultural activities; markets and fairs; health and sanitation, including hospitals, primary health centers and dispensaries are directly related to infrastructure.

In peri-urban areas power supply is through State Electricity Boards (SEBs) owned by state governments. For improving all round efficiency the Government of India has been taking several initiatives towards power sector reforms that include unbundling of state electricity boards and private sector participation in generation and transmission (Vindal, 2002). Electronic connectivity of peri-urban areas in terms of telecom, internet and IT services is through both private and government companies. The telecommunication industry in India is going through consolidation among major operators and significant improvements in services are taking place.

Capacities of *panchayats* are awfully inadequate to finance and manage infrastructure in peri-urban areas. Subjects of local self government were assigned to states by Government of India and states are authorized to decide on taxation and other financial powers of *panchayats*, besides what functions are to be assigned to *panchayats*. States in India accordingly have followed different practices with respect to giving taxation powers to *panchayats*. In fact most of local taxes are levied by the States, thus limiting financial capacities of *panchayats*. Only minor taxes like animal tax, boat tax, toll tax, etc; and non-taxes like charges from fare, sale proceeds of trees, charges for collecting river sand, plan sanction fees, etc; have been assigned to *panchayats* in many states. The conditions of municipalities are only marginally better mainly due to the right given by the states to collect property tax on houses and commercial buildings.

Panchayats are mandated to prepare plans for economic development and social justice, and the implementation of schemes for economic development and social justice in rural areas, as may be assigned to them including those in relation to the matters listed in the Eleventh Schedule. The first step of infrastructure management in a peri-urban area is planning for the area and

panchayats lack the capacity to prepare such plans. Proper infrastructure management in peri-urban areas also involves programming of investments and expenditure, design, construction, maintenance, operation and in-service evaluation. *Panchayats* do not have the requisite technical manpower or trained personnel to carry out these functions. Thus *panchayats* can give very little attention to delivery of infrastructure in peri-urban area within its bounds. In short, *panchayat* political structure is established for rural development, but their capacity for providing, maintaining and operating suitable infrastructure, especially in peri-urban areas is extremely limited.

5. OPTIONS FOR INFRASTRUCTURE FINANCING

5.1 Fiscal reforms initiated by Government of India

There has been a considerable change in financing urban infrastructure in India over the years. Government of India has been continually strengthening the capacity of local bodies to finance and maintain infrastructure services. Government has initiated fiscal reforms for encouraging states to bring down their revenue deficits. Substantial drive is also taken for uplifting the financial condition of urban local bodies in the form of increased budgetary allocations for the issue of municipal tax-free bonds, raising the total annual cap on municipal borrowings and at the same time fixing ceiling on the states' overall borrowings. In this context it may be mentioned that due to their financial position, urban local bodies are constrained in issuing municipal bonds even for infrastructure projects that are financially viable. This situation has led to the design of Structured Debt Obligations (SDO) arrangements that allows issue of bonds on the condition that some buoyant sources of revenue are pledged by local body for debt servicing (Kundu, 2001). To reduce the debt burden of the states, Government of India has also allowed the state governments to swap costlier Government of India loans with cheaper market and small savings loans (Garg, 2005).

5.2 Twelfth Finance Commission

The Twelfth Finance Commission (TFC) has recommended grants amounting to Rs.25,000 crores (Rs.20,000 crores for *Panchayats* and Rs.5,000 crores for Municipalities) payable as grants-in-aid during the period 2005-2010 to states for rural and urban local bodies. The Commission suggests that *panchayats* are required to give priority to water supply and sanitation while urban local bodies are required to earmark at least 50 percent of the grants-in-aid provided to each state for solid waste management through public private partnerships. The Commission also suggests that *panchayats* should be encouraged to take over the assets relating to water supply and sanitation and utilize the grants for repairs and rejuvenation and also to meet the operating and maintenance costs. *Panchayats* are required to recover at least 50 percent of the recurring costs in the form of user charges, which most *panchayats* are not yet set to

implement. It is also pertinent to mention that in most of the peri-urban areas, solid waste management is either nonexistent or is in a mess.

5.3 Central Grants for Urban Infrastructure

There are also specific central grants for selected infrastructure projects like the Integrated Development of Small and Medium Towns (IDSMT) with an annual support of about Rs.100 crores; Mega City Scheme for the five big cities with central assistance limited to 25 percent; Accelerated Urban Water Supply Programme (AUWSP) with central assistance limited to 50 percent, Jawaharlal Nehru National Urban Renewal Mission (JNNURM) with a provision of Rs.50,000 crores as central assistance for a period of 7 years beginning from 2005-2006. The Mission aims to deal with the concerns relating to urban renewal, water supply and sanitation, sewerage and solid waste management, urban transport, etc. The JNNURM seeks to develop certain cities including semi-urban areas to stimulate development in a financially sustainable manner. For the year 2007-2008 Center's budgetary allocation to the JNNURM is Rs.4,987 crores. Of these the JNNURM has higher promise of financing infrastructure in peri-urban areas.

5.4 Central Assistance for Rural Infrastructure

Central assistance to *panchayats* for infrastructure projects are in the form of Rajiv Gandhi Drinking Water Mission in which Rs.5,850 crores has been allocated for the financial year 2007-2008; Total Sanitation Campaign in which allocation for the financial year 2007-08 is Rs.940 crores; Pradhan Mantri Gram Sadak Yojana (PMGSY) under which an investment of Rs.48,000 crores is expected to achieve all weather roads connectivity to 66,802 habitations through upgrading of 1,94,132 kilometers of the existing rural roads network by 2009. For rural electrification, Rural Electrification Corporation (REC) provides finance and promotes projects all over the country besides providing assistance for generation projects, transmission and distribution projects; and Kutir Jyoti Programme provides funds for electrification of households below poverty line.

5.5 State Governments' Initiatives

State governments from time to time provide some grants for infrastructure projects and their maintenance, however these are quite nominal. State governments in a big way are also involved in public private partnerships for the development of housing, shopping centers and other financially viable projects. Some state governments have set up government owned companies for infrastructure development. It has been observed that such endeavors lack competitiveness. In this context it may be noted that due to competition the telecom sector has boomed while in other sectors where government owned companies are shielded from competition, efficiencies have been less than the expected levels.

6. CENTRAL SCHEME FOR BRIDGING INFRASTRUCTURE GAPS IN RURAL AREAS AROUND TOWNS

Provision of Urban Amenities in Rural Areas (PURA) of the Ministry of Rural Development, Government of India is a pertinent scheme for infrastructure development in peri-urban areas. PURA aims at bridging the rural - urban divide and achieving a balanced socio – economic development by providing physical and social infrastructure in the identified rural clusters consisting of 10 to 15 villages within a radius of 4 to 5 kilometers around selected towns. To enhance the growth potential of these villages, PURA focuses on provision of drinking water; upgradation of existing health facilities; road connectivity, improvements in transportation; power connectivity; electronic connectivity in terms of reliable telecom, internet and IT services; establishment of good educational and training institutions; and developing market connectivity to enable farmers to get the best prices for their produce. It is contemplated that the resource allocation under PURA is for incremental gap filling where existing program allocations are not sufficient. PURA is a 100 percent centrally sponsored plan scheme with expectations that it will take about two to three years to complete the activities. So far (2004-2005 to 2006-2007) under the scheme, central government has allocated Rs.30 crores and released Rs.21 crores to seven states which have utilized Rs.12 crores. Although the Planning Commission has identified 504 towns (one town per selected District) up to a population of 1 lakh for consideration under PURA, the basic idea of the scheme is relevant to the peri-urban areas of all urban centers.

7. TERM LOANS FROM WITHIN AND OUTSIDE INDIA

Most urban infrastructure development needs long term finance, typically 15-20 year financial instruments and is largely funded through term loans. Housing and Urban Development Corporation (HUDCO) provides term loans to state governments, housing boards, municipalities and urban development agencies of the governments for urban infrastructure projects. HUDCO has funded projects on area development, sewerage, drainage, sanitation and solid waste management, water supply, roads, social infrastructure and commercial centers. Infrastructure Development Finance Company (IDFC) has been created for floating long term financial instruments in the Indian market. IDFC incorporates authorized share capital. Central government, the RBI, banks and financial institutions contribute to the share capital. IDFC acts as a direct lender, refinancing institution and also provides for financial guarantees. Term loans are also provided by some state infrastructure financing agencies like Tamilnadu Urban Infrastructure Financial Services Limited and Karnataka Urban Infrastructure Development and Finance Corporation.

In the water supply sector, sanitation sector and for slum improvements long term loans have also been received from external agencies like World Bank,

Asian Development Bank, Department for International Development UK, Japan Bank for International Cooperation, USAID and French International Development Agency. Financial Institutions Reform and Expansion – Debt (FIRE-D) program is a collaborative effort of the USAID, Ministry of Urban Development, Government of India, selected states and local governments for delivery of water and sanitation services that benefit the urban poor. FIRE-D is basically a financial competence building program for urban local bodies aimed at improving and expanding urban infrastructure. Under Community Led Infrastructure Finance Facility (CLIFF) venture capital is available from the DFID and Homeless International for community driven housing and related infrastructure for the urban poor.

In general all term loans, given against state government guarantees, require the borrowing agencies to stick to strict terms and conditions and financial discipline. *Panchayats* having jurisdiction over the peri-urban areas are yet to be geared up to meet such strict terms and conditions and adherence to financial discipline and as such are not credit worthy.

For providing complete range of services that include visioning, project formulation, technology selection, finance, development, management and implementation that are necessary for successful infrastructure projects the Infrastructure Leasing and Financial Services Limited (ILFS) has been promoted by the Central Bank of India (CBI), Housing Development Finance Corporation Limited (HDFC) and Unit Trust of India (UTI), State Bank of India, Life Insurance Corporation of India and other Institutional shareholders. *Panchayats* would require such services especially for infrastructure delivery in peri-urban areas.

8. CONCLUSIONS

If present nature of development in peri-urban areas is allowed to continue the urban areas of India will inherit further underdevelopment. There would be more narrow, meandering and unconnected roads, additional drainage problems resulting in frequent flooding, further difficulties of garbage collection and disposal, extra cost for maintaining adequate water supply, poorer sanitary conditions, unsafe and unreliable power supply, imbalances in land use due to lopsided development guided by land speculations, and also formation of newer slums from original village habitats. The capacities of *panchayats* are extremely inadequate to finance and manage the growing demand for infrastructure services in peri-urban areas.

The District Planning Committees should consider the especial requirements of the peri-urban areas in terms of land use control and development and requirements of infrastructure services, while planning and coordinating developments of *panchayats* located within 5 to 10 kilometer of towns and cities. It is also imperative that the Metropolitan Planning Committees give

equal importance to the fringe areas of the municipalities and the peri-urban areas for planning and development.

Central assistance for rural infrastructure is inadequate to meet the requirements of the peri-urban areas. All financing, management and capacity building instruments meant for urban areas should be applicable to *panchayats* within peri-urban areas. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) should earmark separate funds for peri-urban areas. The Provision of Urban Amenities in Rural Areas (PURA) should be further upgraded to specially consider the requirements of peri-urban areas in terms of infrastructure financing options and delivery that are incremental and maintainable. Alternatively financing and management instruments specially for peri-urban areas should be designed. The state governments should depute urban and regional planners, engineers and technical staff to the concerned *panchayats* when there are specific requirements for planning and implementation of infrastructure. Above all a national consensus should be built for specially drawing the attention of the governments and people towards the need for concerted efforts to provide and upgrade infrastructure delivery in peri-urban areas.

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Integrated Planning Approach for Chandigarh Metropolitan Complex

Meenakshi

Abstract

Chandigarh and its periphery, quite contrary to Corbusier's vision, have undergone much urbanization over the past few decades, thereby leading to the formation of Chandigarh Metropolitan Complex. Spread over the jurisdiction of three administrative entities, namely, Union Territory of Chandigarh and the states of Punjab and Haryana. Chandigarh Metropolitan Complex has taken the form of uncoordinated developments which might become detrimental to the character of the area in question. An attempt is made in this paper to bring forth the various issues emerging in this context, and make recommendations with a view to emphasize an integrated planning approach.

1. INTRODUCTION

Chandigarh, the city beautiful was envisaged by Nehru to be 'a symbol of free India unfettered by the traditions of the past and an expression of the nation's faith in the future'. The foundation of the new capital of the state of Punjab (the present Haryana, Himachal Pradesh, Punjab and Union Territory of Chandigarh) was laid in 1951. The Punjab New Capital (Development and Regulation) Act was soon enacted in 1952 to provide for planned development of Chandigarh. Conceptualized by Le Corbusier, the French Architect, Chandigarh was planned over an area of 70 sq km for an overall population of 500,000.

The Punjab New Capital Periphery Control Act, 1952, envisaged a permanent green belt around the city with the sole idea of regulating the development within five miles (8 km) radius beyond the Master Plan area. The Act was amended later in 1962 to extend the periphery to ten miles (16 km) radius beyond the city. As per Le Corbusier, 'In order to maintain harmony between the city and the periphery area their functions must not be interchanged otherwise chaos would prevail'. The city was to provide all the social, physical and civic amenities and the periphery was to provide a support system to the city. Thus not only a mechanism for ensuring planned development of the city was provided but enough safeguards were ensured to regulate and control the development in the periphery of Chandigarh.

In the meantime in 1966, the State got reorganized into Punjab and Haryana with a common capital Chandigarh, and the city being retained as Union Territory. Consequently, the enforcement of the Periphery Control Act suffered

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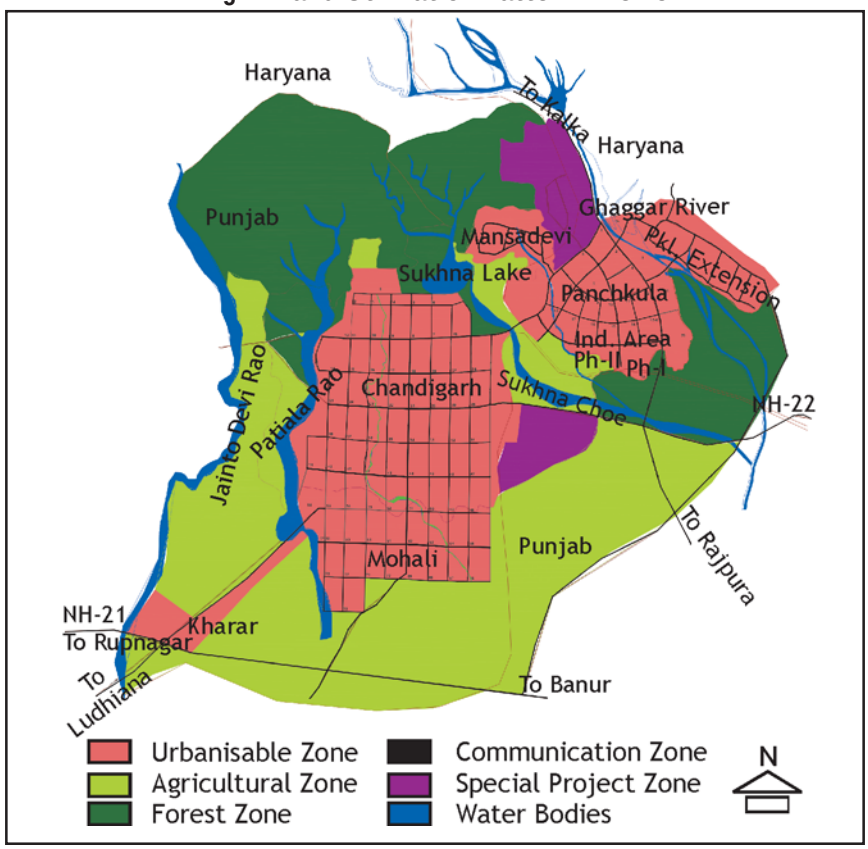
because the periphery fell in the jurisdiction of new governments of Punjab, Haryana and UT Instead of enforcing the law, the new governments built the satellite townships of Panchkula and Mohali thereby violating the Periphery Control Act. Not only that, the violation continued with the establishment of the Western Command Headquarters, the Air Force Station, Hindustan Machine Tools (Pinjore), Mansa Devi Complex and the Mani Majra Township. This resulted in the escalation of land values and further attracted new builders in colonizing the surrounding areas. These developments in turn put additional pressure on the urban infrastructure of Chandigarh leading to changes in the character of the city and its surroundings resulting into uncoordinated and uncontrolled development.

2. INTRODUCTION TO CHANDIGARH METROPOLITAN COMPLEX (CMC)

With a view to preparing the base for coordinating developments around the capital city, Ministry of Works and Housing, Government of India in 1975 created the Chandigarh Urban Complex (CUC) that incorporated Chandigarh UT and a reorganized CUC boundary in lieu of the 8 km radius mentioned above. The CUC was redefined as 'Chandigarh Metropolitan Complex (CMC)' by a private consultant in their document 'Chandigarh Inter State Metropolitan Region (CISMeR) Plan – 2001', prepared at the instance of the UT Government. The nomenclature 'Chandigarh Metropolitan Complex' emphasizes upon the population content of the urban complex which has already crossed a million population threshold. It comprises the Chandigarh UT, Mohali and Panchkula as the primary urban settlements besides several villages and smaller towns.

Fig. 1 Land Utilization Pattern in CMC



The term 'urban or metropolitan complex'

Table 1 Land Utilization Pattern in CMC

Landuse	Area in Acres	%age
Urbanisable Zone	35392	31.6
Agricultural Zone	35459	31.7
Forest Zone	24528	21.9
Communication Zone	4995	4.5
Special Project Zone	5275	4.7
Water Bodies	6350	5.7
Total	111999	100.0

Source: Computed values

signifies an approach, a planning philosophy and a strategy, and provides a frame of reference for integrated or complimentary development between different areas. Chandigarh Metropolitan Complex (CMC) is unique in the sense that it spreads over the jurisdictions of three administrative entities, viz. Chandigarh UT, Punjab and Haryana. This makes the process of integrated planning a lot more challenging.

Fig. 1 provides an overview of land utilization pattern of CMC based on satellite imageries for the year 1998 (CISMeR Plan 2021 Report). It may be observed (refer Table 1) that while 31.6 percent of the area is under urbanisable zone, 22 percent of the area is taken up by the forests and the water bodies, and 32 percent of the total area is covered under agricultural zone, most of which is in the Punjab portion of the CMC. Since any intervention in the natural systems may have adverse environmental and ecological implications, these forests and water bodies, pose a potential constraint in the expansion process.

Table2 Growth of Class-I Urban Settlements in C.M.C. (1971-2001)

Settlement	Population in lakhs				Growth rate
	1971	1981	1991	2001	1991-2001
Chandigarh	2.54	4.51	6.42	9.00	40.19
SAS Nagar	0.01	0.32	0.78	1.23	57.69
Panchkula	0.00	0.11	0.70	1.66	137.14
Total	2.55	4.94	7.90	11.89	-

Source: CISMeR Plan-2021 Report and Census of India, 2001

Table 3 Population Density in Class-I Urban Settlements of CMC

Settlement	Population	Area (acres)	Pop. Density (persons /acre)
Chandigarh	808515	17705	45.67
Mohali	123284	6330	19.48
Panchkula	165634	9495	17.44

Source: Census of India, 2001 and computed values

3. AN OVERVIEW OF THE MAIN URBAN SETTLEMENTS

3.1 Population Trends

The Table 2 provides an overview of population trends in the main urban settlements of Chandigarh Metropolitan Complex from 1971 to 2001.

The table reflects the transformation of the Chandigarh city to Chandigarh Metropolitan Complex. Mohali and Panchkula, comparatively new urban settlements, assumed a rapid growth rate in the last few decades because of their close proximity to the core city, as also high quality of life being offered in these settlements. The population density patterns (refer Table 3) in class – I urban settlements of Chandigarh Metropolitan Complex indicate a much higher value in the core city.

3.2 Land Use Distribution Pattern

A look at the land use pattern of the three primary urban settlements (refer Table 4 and Fig. 2) reveal the following:

- Public and semipublic land use dominates (15.32 percent as compared to the UDPFI standards of 12–14 percent) in the context of Chandigarh city. This is because being the capital of two states along with its own UT status; the city houses the various apex level administrative functions. Further, the high

Fig. 2 Landuse Distribution in Class – I Urban Settlements of CMC

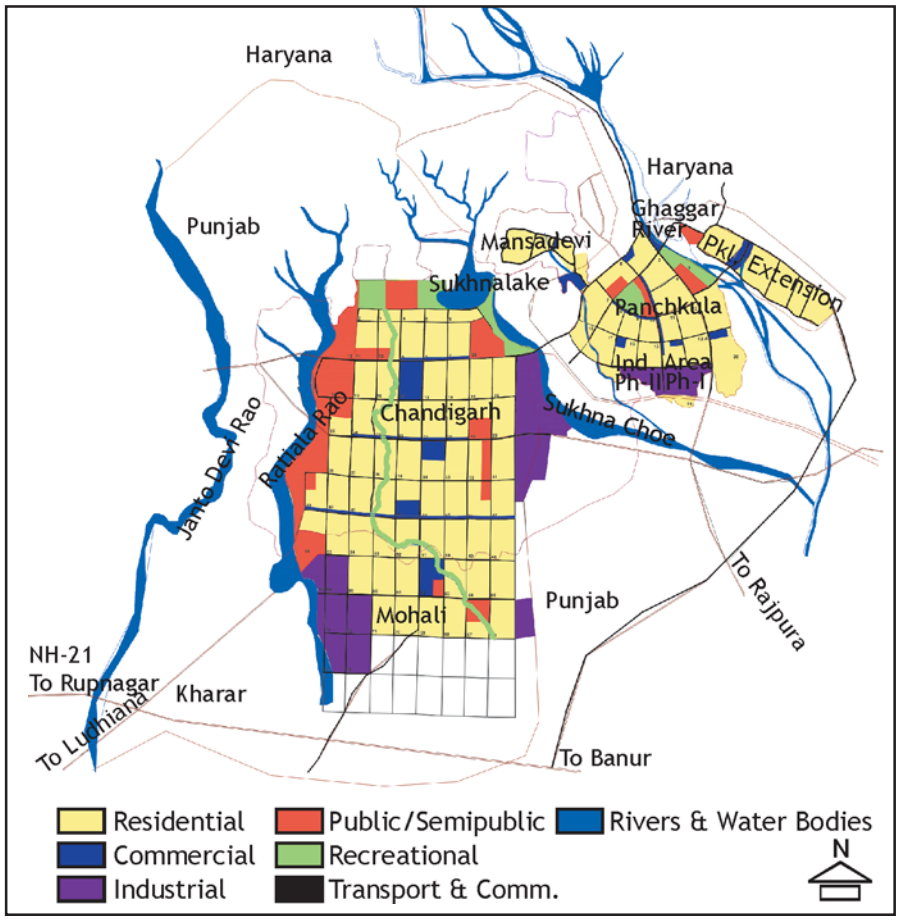


Table 4 Landuse Distribution Pattern in Class – I Urban Settlements of Chandigarh Metropolitan Complex

Landuse	%age asper U.D.P.F.I.	Chandigarh		Mohali		Panchkula	
		Area in acres	%age	Area in acres	%age	Area in acres	%age
Residential	35 - 40	6721	37.96	2030	32.07	3665	38.60
Commercial	4 - 5	880	4.97	160	2.53	561.5	5.91
Industrial	10 - 12	1303	7.36	1610	25.43	487.5	5.13
Public/ Semi-Public	12 - 14	2712	15.32	700	11.06	552	5.81
Recreational	18 - 20	1292	7.30	185	2.92	883.5	9.30
Transport & Comm.	12 - 14	3484	19.68	746	11.79	1231.5	12.97
Agr. & Water Bodies	Balance	1312	7.41	899	14.20	2114	22.26
Total	100	17705	100	6330	100	9495	100

Source: Computed values

level of subsidies combined with its status has promoted ever increasing institutional activities.

- Mohali in an attempt to exploit its close proximity to Chandigarh has excess of industrial land use (25.43 percent as compared to the UDPFI standards of 10–12 percent) which is developing at the cost of other land uses.
- Panchkula primarily attempts to cater to the residential needs of the workers employed in and around CMC. It strives to provide good quality of living to its residents while depending heavily on Chandigarh for its job requirements.

3.3 Social Infrastructure

An assessment of the status of health and educational facilities in the cities of CMC reveals an inequitable distribution which strains the existing transport networks. The inadequacy of these facilities in relation to their demand at settlement level in Panchkula and Mohali is also reflected. Tables 5 and 6 compare the town level health and educational facilities existing in the three cities with the UDPFI standards.

Table 5 Existing Town level Medical Facilities

Type	UDPFI Standards (Units/ Pop.)	Existing Medical Facilities		
		Chandigarh	Mohali	Panchkula
General Hospital	500 bedded/ 2,50,000	4 nos.	1 no.	1no.
Intermediate Hospital (Category –A)	200 bedded/ 1,00,000			

Table 6 Existing Number of Educational Facilities

Type	UDPFI Standards (Units/ Pop.)	Existing Educational Facilities		
		Chandigarh	Mohali	Panchkula
College	1/1,25,000	7	1	1
University	-	1	-	-
Technical Education Centre	1/10,00,000	8 Professional Colleges and 15 Vocational Training Institutes	7	-
Engineering College	2 Nos. in Urban Extension			-
Medical College	2 Nos. in Urban Extension			-

- Chandigarh has concentration of such facilities that serve the city as also the region.
- Mohali has 6 hospitals of which 5 are private and cater to the region at large. It has only one civil hospital which is 50 bedded. However for specialized and better health facilities, it still depends on Chandigarh. In Panchkula, health facilities are provided mainly by the private sector in terms of nursing homes and clinics.
- There is inadequacy of educational facilities at town level both in Mohali and Panchkula. Mohali has a number of private institutions, but for specialized and better education, it still depends on Chandigarh

3.4 Water Supply, Sewerage and Solid Waste Management

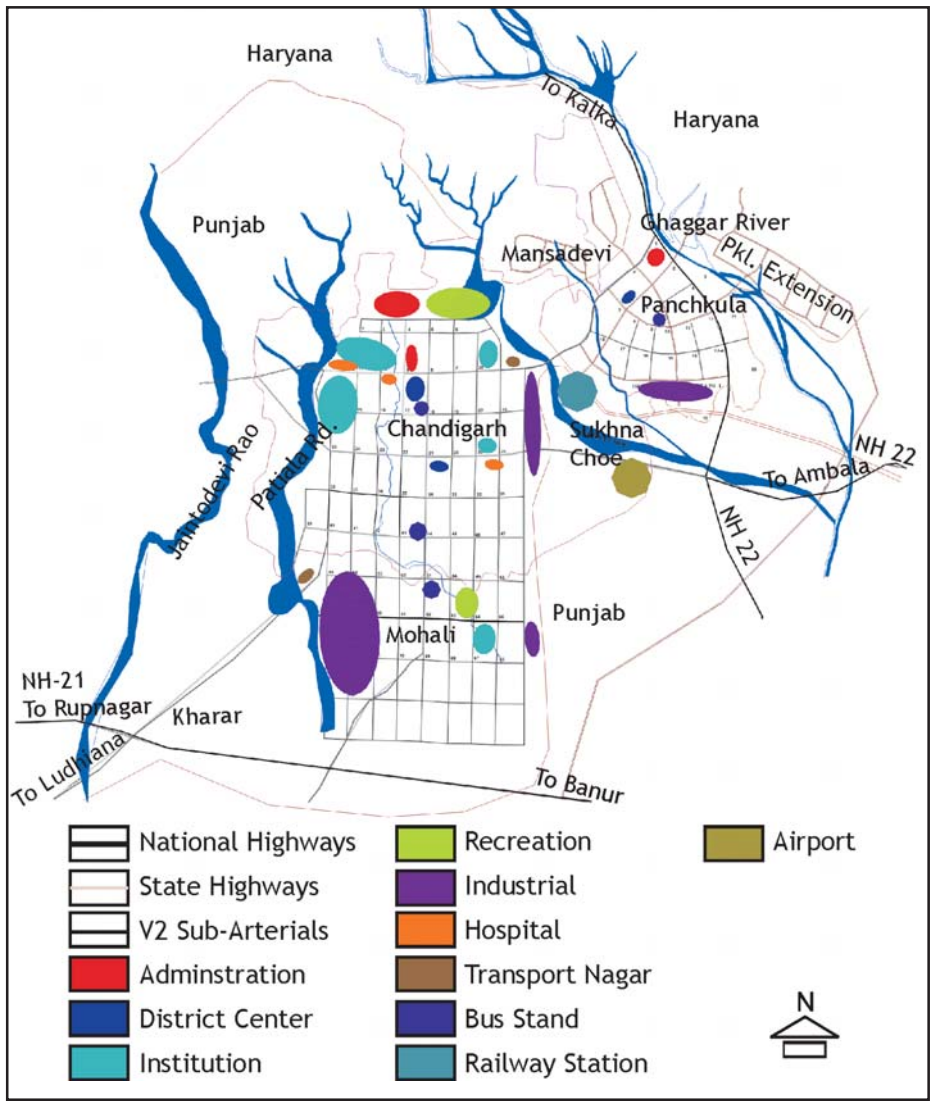
Chandigarh gets its water supply through 27 km of conveyance from Bhakra system at the rate of 62 mg per day for which pumping is a major expense and evaporation losses enroute are high. The UT also has 150 tube wells. Main source of drinking water in Mohali is the canal water through Bhakra main line and the shallow tube wells. The Haryana portion of the CMC has its own water processing systems through ranney wells in the Ghaggar riverbed supplemented by tube wells. Overall the supply of water is good, but with growing demands and higher than normal consumption, the available per capita supply is dropping, as is the water table.

Chandigarh has a sewerage system but the discharge into the Ghaggar River is only through an inadequate primary treatment plant in Punjab, south of SAS Nagar. Mohali does not have its independent sewage treatment plant. It shares the facility with Chandigarh. The waste collection and disposal system in Chandigarh leaves some percentage uncollected. New landfill sites are also difficult to find.

3.5 Interface between Transportation and Major Activity Nodes

Spatial distribution of activities and settlement areas has a direct bearing on the traffic pattern. The interface between transport and destination nodes for work, education, leisure and the distribution

Fig. 3 Transportation vs. Major Activity Nodes



trade as now emerging at the metropolitan complex level would increasingly lay a stress upon traffic network along particular stretches. In this context, some of the major activity nodes in the Chandigarh Metropolitan Complex (see Fig. 3) are Capital Complex, the north-western end of Chandigarh city, city centre and the industrial area of Mohali. These attract a large number of daily commuters from within and beyond the Chandigarh Metropolitan Complex. This has implications in terms of heavy traffic. The consequent congestion comes onto Chandigarh roads.

Further the private vehicles (two and four wheelers) are on an increase on the city roads. The mass transit nodes are generally less favored for reasons of long journey times as also high economic status of the people in the Chandigarh Metropolitan Complex. The only linkage of Panchkula to Chandigarh and Mohali leads to traffic congestion at peak office hours.

4. MAJOR POLICY ISSUES

It is observed that each state in its ambitious zeal has its own policies with respect to physical expansion as also the expansion of the economic base. While Mohali and Panchkula try to take mileage out of their close vicinity to city, Chandigarh itself by virtue of its past glorious achievements is trying to further them by adding new dimensions to its economic base. The result is the new economic policies which reflect the respective government's vested interests with least regard to its impact on the CMC environment.

- The 'change of land use' policy in Chandigarh has greatly facilitated the people to undertake land use conversions. The result is conversion of prime locations into high intensity commercial development. The introduction of single window system has made the process very quick. Many shopping malls are being planned in the industrial area. Even the city centre is destined to undergo large scale conversions.
- Punjab and Haryana too have legalized the process of land use conversions. Various charges (external development charges, license fee, conversion charges, etc.) are being introduced.
- With a view to attract investment, generate employment and leverage economy, state of Punjab has approved Industrial Policy, 2003. Under this policy, mega projects in housing, urban development, commercial, fashion technology, IT and ITES sectors involving investment over Rs.100 crore are being promoted. These mega projects are envisioned to be high intensity developments.
- Punjab New Capital (Periphery Control) Act, 1952, though adopted in principle by the two states of Punjab and Haryana, is being adapted to suit their purposes of bringing about large scale developments. Punjab while emphasizing the need to prepare a Comprehensive Land Use Plan for the entire Periphery Controlled Area, also permits change of land use as an interim measure until such a Plan becomes final in statutory terms.

These policies shall have their bearing on the intensity of activities, population densities and consequently on the infrastructure of Chandigarh Metropolitan Complex. Further, several large scale projects are in the offing in Chandigarh Metropolitan Complex which are bound to redefine its structure, viz. Sarangpur Institutional Area, IT Parks in the three cities, high rise housing projects by private builders, airport expansion project, etc. Tata Housing Development Corporation proposes high rise apartments of more than 30 storeyed in an area that is classified eco-fragile and seismic prone, and is also regulated by Punjab Capital Periphery Control Act.

5. RECOMMENDATIONS

Chandigarh being of a great significance at both regional and national level, it needs to be conserved. However, considering its vast potential to serve the region, its constraints to physical expansion and the extreme dependence of its surrounding settlements, the development would have to be ensured through coordinated efforts of three administrative entities. This would mean an integrated framework relating to population redistribution, land use pattern, environmental factors, economic activities and infrastructural facilities. The development impulse of Chandigarh must spread to the entire Chandigarh Metropolitan Complex as one unit.

- While the population targets may be fixed for the CMC as a whole, the distribution of the proposed population shall be targeted towards the achievement of uniform density patterns. This would mean that the population flow must be checked at the doorstep of Chandigarh.
- Natural constraints need to be regarded at CMC level for environmental and ecological considerations. In this context, no intervention should be allowed into the areas marked as forest zones. Safe distances along rivers or water courses have to be ensured for taking up any development. No development zone needs to be specified.
- Good agricultural land in CMC should be protected and conserved. Till a statutory development plan for the entire CMC is prepared, any interventions into the agricultural land shall be strictly banned.
- Uniform standards for social infrastructure shall be adopted in the entire CMC to avoid problems arising out of various disparities. National standards may be suitably modified to suit the requirements.
- Integrated scheme for augmentation of water supply shall be promoted considering CMC as a single entity. This might include inter-basin transfer of water through various schemes.
- In view of the limited availability of land for use as landfill sites especially in Chandigarh, there is an urgent need to find other mechanical means for minimizing waste requiring disposal. In fact zero waste output may be aimed at. The waste management has to be done in more organized, scientific, cost effective and environment friendly manner.

- Policy decisions at least for the key areas of economic concern need to be taken up and effectuated at a common platform. Strategies related to the spatial distribution of activity nodes as also the regional level facilities shall have to be spelled out at the level of entire Chandigarh Metropolitan Complex. This may also prove instrumental in checking traffic congestion on the high intensity traffic corridors.
- Unified Metropolitan Transport Authority may play a vital role for effective integrated development of land use and transportation at CMC level. It might help in reducing unnecessary traffic on the inter city road network. This would signify sustainable development while also reducing development costs. The policies may target the reduction of private vehicles on the roads, while improving upon public transport system.
- Unified Metropolitan Board for water supply and sewerage shall help in bringing down the cost of development while ensuring reduced detrimental effects to the environmental quality.
- A comprehensive development plan should be prepared for the entire CMC area that shall suitably demarcate the areas to be considered for development or conservation. Clear regulations to that effect would check the tendencies of the respective governments to benefit from their proximities to Chandigarh at the cost of environmental and ecological concerns.
- The Periphery Control Act, in the context of changed circumstances has lost its intent, and remains no more effective in controlling the developments in Chandigarh periphery. It becomes important to provide a suitable legislative base for an integrated planning approach. In this context, National Capital Region Planning Board Act, 1985 may serve a useful reference. An act specifically for the Chandigarh Metropolitan Complex may be prepared, which shall provide for the constitution of CMC Planning Board for preparation of Development Plan for the CMC; coordinating and monitoring of such a Plan; and evolving harmonized policies for control of land uses and development of infrastructure. The coordination will have to be through a high powered board in order to ensure coordinated and integrated approach in a metropolitan area which spreads over the jurisdiction of three governments.
- In the entire planning process, Chandigarh must play a major role. The gap on the part of Chandigarh itself must therefore be filled. It should be able to check the large scale conversions as also the economic activities creeping into the system that are highly detrimental to the character of the city.

6. CONCLUSIONS

The need of the hour is to realize the resource constraints in terms of land and water availability in order to sustain the development and to resolve other environmental issues, aspirations of the respective governments to have the best bargain out of the existing situation and at the same time ensure the quality and the character of the city.

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Scope and Methodologies in preparation of District Regional Development Plans: Case Study Tamilnadu

N. Manimurukan

Abstract

The objective of this paper is to present regional planning efforts in Tamilnadu. Comprehensive planning legislation in Tamilnadu was enacted incorporating regional concept of Town and Country Planning as provided in the Maharashtra Regional Town and Country Planning Act, 1966. The 74th Constitution Amendment Act, 1992 has ushered new era of decentralization whereby the district has become the key unit in the multilevel planning for various urban and rural bodies.The author argues that District Perspective Plan and District Regional Development Plan could be prepared on the model of the Perspective Plan and Development Plan as pronounced in the UDPFI Guidelines.

1. INTRODUCTION

It is a known fact that natural resources are not uniformly distributed in the Country. There are areas which have abundant resources. There are areas which have little or no resources. Areas which have abundant resources achieve a high level of prosperity far higher than the country's average. Areas which have little or no resources can not achieve that level unless some resources are transferred to them for inducing development and development in the resources rich areas are deliberately slowed down. This type of development will affect production of the country as a whole. Such reduction in imbalances could be achieved by bringing areas, which are below average economic level of the country, as nearly as possible to that level.

2. REGIONAL PLANNING

Regional planning aims to plan and guide the development of a Region. Regional planning is planning the region for developing it in a balanced manner without imbalances in regard to available scarce resources. Regional Planning involves both physical and economic planning. Physical planning is the planning of an area's physical structures such as land use, transport and communications, utilities, etc. Economic planning is concerned with economic structure of an area and its overall prosperity. Economic planning may be purely about allocation of economic resources in terms of sectors.

3. REGIONS

Regions are defined based on homogeneous economic structure as well as topographical and socio cultural homogeneity, nodality and functional linkages

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which are beyond administrative boundaries. Geographically, it should be a contiguous unit though it could be subdivided as plains, hilly tracts, coastal belts, delta regions, etc. Lewis Keeble defined the planning region to be an area that is large enough to enable substantial changes in the distribution of population and employment to take place within its boundaries and which is small enough for its planning problems to be viewed as a whole. But to define regions for planning purposes, administrative convenience assumes importance because in actual implementation of regional plans, administrative boundaries can not be ignored. Political realities and availability of data for specific administrative units like districts make this practically essential.

4. FIVE YEAR PLANS

The significance of regional planning has been realized many times at different implementation levels of planning. Spatial Development Plan for balanced regional growth was stressed from the beginning of the National Five Year Plans. The objectives of national planning during the Second Five Year Plan were to even out regional disparities in economic development. Hence, the case for District Planning has been advocated since the Second Five Year Plan. The Third Five Year Plan (1996 -1970) dealt with this objective by devoting one full Chapter on balanced regional development. Administrative Reforms Commission appointed during the Third Five Year Plan period came out criticizing centralized character of Indian planning and advocated strengthening of the machinery for planning at the state and district levels. The Third Five Year Plan explained a methodology of preparing State Plans for rural development on the basis of the district and block plans. National Planning Commission issued guidelines in 1969 for the formulation of district plans. The Fourth Five Year Plan recognized regional imbalances in development as one of the issues to be dealt with and has stated in general the approach to correcting regional imbalances during the Fourth Five Year Plan. Because of the large size of the country and the federal structure in which the Five Year Plans operate, there was a need for simultaneous analysis of the problems at the national and state levels. This related to one aspect of regional planning i.e. disaggregation of national planning downwards through different ladders of administrative hierarchy. The idea of planning from below was advocated even at the time of the First Five Year Plan (Community Development whose main aim was the promotion of rural development through provision of essential social and economic services within the framework of a hierarchy of rural centers).

With introduction of the process of national economic planning from below, there is an equal emphasis on physical planning below the state level particularly for districts and development blocks. Thus regional economic planning in a national context and regional physical planning in relation to development plans of the blocks, taluks and districts are the two distinct but related dimensions of regional planning. In November 1977, the National Planning Commission appointed a Working Group under the chairmanship of M.L. Dantewala to draw up guidelines

for block level planning. After drawing up the guidelines by the Working Group in 1978, implementation of Block Level Planning confined itself to the isolated exercises of Integrated Rural Development Programme without developing adequate links with higher level of planning.

A Committee on *Panchayati Raj* Institutions headed by Ashok Mehta was appointed in December 1977. Ashok Mehta Committee in 1978 suggested decentralization to the revenue district level below the state level because of the availability of higher order expertise for rural development. Planning Commission set up a Working Group under the chairmanship of C.H. Hanumantha Rao, Member, Planning Commission in 1984. The objectives of the Committee were: (i) to define the scope and content of State Planning, (ii) to decide the procedure for decentralized planning at the state level to make the concept of District Planning operational, (iii) to devise various steps for District Planning, (iv) to suggest methodology for integrating block level planning with district planning, (v) to suggest procedure for nesting the district plans into the state plans. The Working Group set up sub-groups to go into the various aspects in district planning in depth. The deliberations of these sub-groups formed the basis of the report of the Working Group submitted to the Planning Commission in 1984. The concept of District Planning adopted by the Working Group was the integrated area planning.

The Ninth Five Year Plan Approach paper advocated formulation of long term spatial strategy at state, district and local levels to sustain urban development which can not be achieved without regional planning.

5. REGIONAL PLANNING EFFORTS IN TAMILNADU

A comprehensive planning legislation in Tamilnadu was enacted in 1973 incorporating regional concept of Town and Country Planning as provided in the Maharashtra Regional Town and Country Planning Act, 1966 and the enacted Tamilnadu Act provide for preparation of Regional Plans. Even before the enactment of the Act, in the early seventies, Tamilnadu Town Planning Department was the first department in the entire country to have prepared regional plans for 8 viable planning regions which were delineated based on physical and socio-economic characteristics like topography, resources, backwardness, contiguity. But no follow up actions were taken except conducting regional planning seminars and constituting regional planning authorities for 8 regions with district collectors of major districts in each region as chairmen. Later on 15 district regions were notified for fifteen erstwhile districts in 1984. Regional planning authorities for those 15 district regions were not constituted at that time.

5.1 Urban and Rural Local Bodies Acts in Tamilnadu

The 74th Constitution Amendment Act, 1992 has ushered in the new era of decentralization whereby the district has become the key unit in multilevel

planning for various urban and rural local bodies. It has also bestowed on municipalities and *panchayats* legal functions to enable them to function as effective democratic self-government institutions. The 74th Constitution Amendment Acts, 1992 provide for the constitution of the District Planning Committees for consolidating the Development Plans prepared by the panchayats and municipalities and to prepare the development plans for the districts. The amended Urban and Rural Local Bodies Acts of Tamilnadu in 1994 provide for the preparation of development plans and constitution of district planning committees for the districts. Amended Urban and Rural Local Bodies Acts of Tamilnadu in 1994 also provides for the preparation of the Development Plans for Town *Panchayats*, Municipalities and Corporations, Village *Panchayats* and *Panchayat* Unions (Blocks). *Panchayat* Unions (Blocks) will include the Development Plans for Village *Panchayats* and prepare Development Plans for *Panchayat* Unions (Blocks). District *Panchayats* will include the Development Plans for *Panchayat* Unions (Blocks) in the districts and prepare Development Plans for the districts and submit the same to District Planning Committees for consolidating the Development Plans prepared for Town *Panchayats*, Municipalities, Corporations and District *Panchayats* and to prepare Development Plans for the Districts as a whole.

6. THE UDPFI GUIDELINES

The UDPFI Guidelines have suggested changes in the Model Urban and Regional Planning and Development Law prepared by the TCPO providing for the constitution of District Planning Committees, manner of preparation and approval of long term Perspective Plans and medium term Development Plans for Districts as per the 74th Constitution Amendment Act, 1992.

7. THE PRESENT SCENARIO IN TAMILNADU AND THE UDPFI GUIDELINES

The amended Rural Local Bodies Act of Tamilnadu in 1994 viz. amended Tamilnadu *Panchayat* Act, 1994 provides for the preparation of Development Plans for the Districts and constitution of District Planning Committees for the Districts. Tamilnadu Town and Country Planning Act was not amended for the preparation of the Development Plans and constitution of District Planning Committees for the Districts as per the changes suggested in the UDPFI Guidelines in the Model Urban and Regional Planning and Development Law prepared by the TCPO. The District Planning Committees were constituted for all the districts in Tamilnadu as per the amended Tamilnadu *Panchayat* Act, 1994 with District Collectors as Chairmen and Chairmen of the District *Panchayats* as Vice-Chairmen.

With decreasing land man ratio, agriculture may not sustain the existing workforce in agriculture sector. Chennai Metropolitan Area and the major five cities viz. Coimbatore, Madurai, Trichy, Salem and Thirunelveli are developing fast. Major share of foreign, central and state government investments are made in Chennai Metropolitan Area and the above major five cities and the

rest of the state are sharing the balance funds. About 50 percent of annual budget of the central and state governments and 50 percent of foreign investments were made in infrastructure without proper support of spatial perspective plans in the state. Thanks to the present Jawaharlal Nehru Urban Renewal Mission of Government of India which insists on the preparation of City Development Plans for Chennai, Coimbatore and Madurai for sanctioning of funds for infrastructure projects.

A majority of industries are sprawling along the national and state highways of the state and the above five cities leading to uncontrolled and haphazard developments with deficient social infrastructure resulting in regional imbalances. Developments along major transportation corridors will result in demand for housing, amenities and infrastructures. Such developments are going to create tremendous chaos over and above what is happening in the Chennai Metropolitan Area and the above major five cities. This additional chaos will further enhance the regional imbalances if we do not correct them in time. Rectification at a later date will not be possible and will be a expensive affair. Spatial planning at the state and district regional levels is the only answer which will need a coordinated effort of all the concerned departments.

Tamilnadu does not have mechanism including qualified personnel for regional planning for dealing with provision of space for economic activities and physical infrastructures including transportation linkages. This may be because the Government has other important priorities. Regional planning is the lowest priority of the State Government.

7.1 Agenda for Action for Regional Planning in Tamilnadu

From the present scenario in Tamilnadu, it is understood that there is a need to formulate State Perspective Development Plan with necessary spatial inputs of proposals from the District Regional Development Plans at lower level. The District Regional Development Plans should indicate basic thrust areas, settlements where the population has to be restrained; settlements which can be developed further and indicate locations for the new industries. These District Regional Development Plans should be able to guide the development of basic infrastructure facilities and amenities at state level. The District Regional Development Plans should indicate the environmental conservation areas, pin point location of the institutions, etc., suggest measures to strengthen the environmental conservation areas, mining areas, forests, agriculture, etc. Such District Regional Development Plans would be helpful in developing an efficient transportation network in an integrated manner and should include integrated development of infrastructure. Thus, these District Regional Development Plans should be prepared as spatial plans and plans for economic development and social justice as envisaged in Tamilnadu *Panchayat* (Amendment) Act, 1994. The Town and Country Planning Board as envisaged in Tamilnadu Town and Country Planning Act should be constituted. The State Town and Country Planning Department should assist Town and Country Planning Board in the preparation

of State Perspective Development Plan. The State Town and Country Planning Department should also scrutinize District Regional Development Plans and submit to the Government. Regional Directorate of Town and Country Planning in the Districts should function as secretariat to the District Planning Committees and should assist the District Planning Committees in the preparation of the District Regional Development Plans. It is high time to appoint qualified Town and Country Planners in Tamilnadu who could prepare District Regional Development Plans for District Planning Committees. The District Planning Committees has to be reconstituted for all the districts as per the amended Tamilnadu *Panchayat* (Amendment) Act, 1994 with the Chairmen of District *Panchayats* as Chairmen in tune with spirit of the provisions of 73rd and 74th Constitution Amendment Acts, 1992 delegating powers to the elected representatives of urban and rural local bodies.

7.2 Scope of District Regional Development Plans

The UDPFI Guidelines has provided for the preparation of Perspective Plans and District Regional Development Plans for the district. The Perspective Plan for a district will present the intentions of District Planning Committee regarding development of the district in the next 20-25 years coinciding with the term of national and state five year plans. Scope of this plan covers social, economic and spatial development goals, policies and priorities relating to all those activities that have spatial implications or in other words requires land for their location and desired functioning. It will cover long term policies regarding development of infrastructure and resource mobilization that are necessary to promote these activities. Basic purpose of the Perspective Plan for the district is to provide a policy framework for further detailing and it will serve as a guide for the District *Panchayat* in the preparation of District Regional Development Plan for the next 5 years coterminous with national and state five year plans. The scope of the District Regional Development Plan could vary according to physical, economic, social and political factors. For example, the scope of the District Regional Development Plan for a hilly area or a coastal zone would be distinct from each other as well as from the plans being prepared for plain areas. Similarly the scope of the District Regional Development Plan for a buoyant District would be different from that of an economically backward District. The scope of the District Regional Development Plan covers an assessment of current issues, prospects, priorities and proposals for development of the District including employment generation, economic base, transportation and land use, housing and other infrastructure, and matters like environment, conservation and ecology. It also contains implementation strategies agency-specific schemes and projects, development promotion rules and resource mobilization plan with particular reference to finance, land and manpower and provides an efficient system of monitoring and review.

7.3 Methodologies for Preparation of District Perspective Plan

Perspective Plan for a district is a policy document and effort should be made to identify programmes for socio-economic development and their implications

in setting a trend of spatial development of components of the district. Elaborate and comprehensive details should be avoided which will form part of the District Regional Development Plan to be formulated subsequently.

Perspective Plan: Existing characteristics and potentials of the district with (i) Physical characteristics consisting of location and regional setting, climate, land use, environmentally sensitive areas, heritage sites and buildings, (ii) Demography consisting of existing population, migration and household characteristics, (iii) Economic base and employment in formal sectors of primary, secondary and tertiary and informal sectors of trade, commerce, transport and household industries, issues relating to decentralization of economic activities (iv) Housing and shelter in formal and informal sectors, (v) Transportation -mode of transportation by road, rail, air, water, network of roads ,railways, waterways and transport terminals, (vi) Facilities like Education, health, recreation and religious (vii) Infrastructures like water, drainage, sanitation and solid waste management, energy, communication, police and fire protection, burial and burning grounds, (viii) Natural and man made disasters, (ix)Resources consisting of fiscal, manpower and land, (x) Development management consisting of institutional set up, inter department cooperation and integration of development efforts and legal support, (xi) Major policy issues.

The above data when synthesized would form the basis for identification of the policy issues.

Projected requirements should be made for a period of 20-25 years with further classification of 5 year periods coterminous with State Five Year Plan period and should cover extent, population, economic base and employment, housing and shelter, transportation, facilities, infrastructure, resources, land (i) Shelter,(ii) Commerce and trade(iii)Industries (iv) Public and semi-public facilities (v) Roads and streets(vi) Infrastructure (vii) Special activities like Tourism and pilgrimage which result in increase of floating population and demand for facilities and infrastructure. The projected population and economic activities should be a function of environmental and infrastructural sustainability of the District Region. Through policy initiatives the unsustainable activity project should be diverted to the other settlements in the District Region where it would be sustainable and relevant projected figures for the settlements in the District Region should be adjusted accordingly.

Development aims and objectives pertaining to each of the major policy issues identified above and the future requirements and priorities to be outlined for:

- Development of economic base and employment generation covering formal and informal sectors and special sectors like Tourism and pilgrimage;
- Infrastructure development covering utilities like water supply, sewerage, drainage, solid waste disposal, education, health and recreation facilities, postal and telephone communication, police and fire protection;

- Housing and shelter development;
- Transportation and intra-city mass transportation system;
- Environmental protection;
- Spatial development covering proposed land use indicating direction, growth of the settlements in the District Region and its components like residential, commercial, industrial areas, net work of roads, conservation of environmentally sensitive areas, historic sites and monuments and tourism, phasing of development;
- Implementation and monitoring consisting of priorities and monitoring mechanism; and
- Capacity building for fiscal, manpower and land resource mobilization.

7.4 Methodologies for Preparation of District Regional Development Plan

Conceived within the framework of the Perspective Plan for a District Development Plan for a district, is to be prepared for 5 years distributed in such a way that its first 3 years fall during and up to the end of term of the District *Panchayat* in Office and the next 10 years fall during the term of the following or subsequent District *Panchayat*. Development plan should be prepared with the following sub heads:

- Existing conditions and development issues with
  - Physical characteristics and natural resources consisting of location and regional setting, climate, land use, environmentally and ecologically sensitive areas, heritage sites and buildings;
  - Demography consisting of existing population, migration and household characteristics;
  - Economic base and employment in formal sectors of primary, secondary and tertiary sectors and informal sectors of trade, commerce, transport and household industries, issues relating to decentralization of economic activities;
  - Housing and shelter in formal and informal sectors;
  - Transportation: mode of transportation by road, rail, air, water, network of roads, railways, waterways and transport terminals;
  - Facilities like Education, health, recreation, religious and socio cultural;
  - Infrastructures like water, drainage, sanitation, and solid waste management, energy, communication, police and fire protection, burial and burning grounds;
  - Natural and man made disasters;
  - Resources consisting of fiscal, manpower and land;
  - Development management consisting of institutional set up, inter department cooperation and integration of development efforts and legal support; and
  - Major Development issues.

- Projected requirements should be for a period of 5 years with further classification of periods of 1 year each. The annual classification of projected requirement would help in preparation of annual plans and budget. Projected requirements should cover population, economic base and employment, housing and shelter, transportation and intra city mass transportation system, facilities including specialized hospitals and specialized education and research centers, infrastructure, land requirements for residential, commercial, industrial, public and semi public, transport and communication, heritage and conservation areas, scenic beauty areas, disaster prone areas, agriculture, water-bodies, special activities like tourism and pilgrimage which result in increase of floating population and demand for facilities and infrastructure. Population projection should be guided by environmental and infrastructure (especially drinking water) sustainability and holding capacity of the District Region. Dispersal of economic activity also guides population projection. Dispersal of Industries or restriction of specific type of industries considering pollution level, environmental sustainability should be also done wherever necessary.
- Development aims and objectives of development of the District Region covering each of the issues identified above.
- Development proposals should focus on:
  - Concept of hierarchy of Urban Centers and spatial development of various Urban Centers and Urban Nodes, Facility Centers and Transport Network;
  - Commercial Activity Nodes;
  - Industrial Activity Nodes;
  - Residential Uses;
  - Higher Order Facilities and Facilities Centers;
  - Public and Semi Public Offices;
  - Transport Network; and
  - Proposed Land Use
- Resource Mobilization
  - Proposals for fiscal resource mobilization including grants and aid, internal revenue of district *panchayat*, institutional finance, market borrowing, private sector finance;
  - Proposals for land resource mobilization including acquisition of lands; assembly of land through, land pooling, transferable development rights; and
  - Proposals for manpower resource mobilization including technical manpower.
- Implementation
  - Define priorities as under essential, necessary, acceptable and deferrable

- Phasing of development in two parts:
  - Phase I: Three years up to the end of the term of District *Panchayat* which formulated the District Regional Development Plan; and
  - Phase II: Two years up to the end of the five year plan period and to be implemented by the subsequently elected District *Panchayat*
- Identification of projects by phase and implementing agencies including private, cooperative and corporate sectors development promotion rules and regulations.
- Monitoring and Review
  - Monitoring system should provide review of District Regional Development Plans.

8. CONCLUSIONS

The 74th Constitution Amendment Act, 1992 has ushered new era of decentralization whereby the district has become the key unit in the multilevel planning for various urban and rural bodies. It has also bestowed a constitutional status on the urban and the rural local bodies to enable them to function as effective democratic self government institutions. However, District Perspective Plan and District Regional Development Plan needs to be prepared on the model of the Perspective Plan and Development Plan as pronounced in the UDPFI Guidelines.

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Regional Planning Vis-à-Vis Practice

A.R. Sankhyan

Abstract

Even after 61 years of independence, Regional Planning discipline continues to face rough weather in terms of its acceptability by the masses. It is already too late to look at development as a holistic, sustainable and integrated affair at local, regional, state and national levels. An irreparable harm to Regional Planning, environmental and heritage has already been caused by piecemeal, haphazard and lopsided development. Sectoral economic planning has led to enormous disparities and gaps. Author argues that for a developing country like India, where there are vast disparities, Regional Planning is the only alternative to overcome these disparities.

1. INTRODUCTION

The 73rd and 74th Constitution Amendments of 1992 and accordingly enactment of *panchayati raj* and municipal legislations in most of states of the country, once again focus on planning from bottom to top has been firmly placed. Consequent upon globalization, liberalization, privatization, standardization, competitiveness and upcoming real estate sector, spatial planning has assumed greater significance and urgency. Fast means of transport and communications have further added to physical planning and accordingly systematic development requirements. However, complexities of the system have made spatial planning in general and Regional Planning in particular, a challenging affair. Thus district planning, by addressing various sectors, departments and stakeholders are still a stupendous task.

Village, ward, *panchayat*, town, block, district and state level plans are required to be prepared for the benefit of the masses, the same are beyond their comprehension in the present set up. On the basis of State Plans, the National Five Year Plan has to be contemplated. Ironically, however, perspective plans at all these levels are still a far cry. In order to ensure time bound preparation of plans and accordingly to affect economy, functionality and aesthetically, the focus on plan preparation and accordingly implementation process need no emphasis.

As a real tribute to the dreams of our freedom fighters, real democracy and commitment to the national goals, by now surely a national development plan, all state, district, block, *panchayat* and village or town development plans could

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have been prepared by public participation and effective checks on sectoral allocations could have been imposed. Ironically, as throughout the country as well as in states and even at local levels as 'system resists and adhocism persists' due to predominance of vested socio-political forces, this target assigned by the Constitution could not be achieved. Instead of long lasting effect of holistic, sustainable and perspective development, piecemeal and sectoral economic development continued to direct the vicious scenario, the impact of which has been short term, limited or even negative. With the persisting sectoral approach and accordingly vicious development scenario, the discipline is required to be geared up to meet with these challenges.

2. MANDATE IN VOGUE

Although most of the town and country planning acts of states provide for Regional Planning, yet there has been a focus on town planning only due to the need of immediate redressal of problems of urban areas, lack of committed approach and limited qualified manpower available with the states for regional planning purposes. As in real sense even town planning has been facing rough weather in our country due to casual approach of the government and overwhelming role of sectoral forces. Under such circumstances how regional planning, which is broad based and cumbersome, could have commenced. As a matter of fact, dilemma persists in our country as well as the states for ensuring comprehensive land use pattern in accordance with spatial plans and accordingly holistic and sustainable development. Everybody wants amenities, but no one wants to sacrifice anything for the same. After all everything has to come on the land. Blind sectoral race for development has caused more harm than good. Fast environmental degradation has caused a vital concern at town or local, regional, state and national levels. In general, people are confined to their own premises and are generally violating the spatial planning norms, rules and regulations, thereby grossly affecting the heritage and environmental imperatives. It is already too late to look at things on merit and ensure redressal. The redressal of environmental, heritage and spatial planning concerns, therefore, is required urgently.

Metropolitan cities as well as their regions are fast growing. Considerable population from countryside is migrating to them for want of employment opportunities and multifarious pursuits. Quite sizable population in metropolitan and other cities is living in slums. Lack of basic infrastructural amenities in urban areas is the prime concern. Most of the urban areas have crossed their thresholds and have become very costly to live. Similarly, whereas developed regions or states like Punjab, Haryana, western Uttar Pradesh, West Bengal and Kerala are fast growing, other states are not keeping pace in development. The valleys in hill states as well as areas around their hill stations are also developing fast in comparison to vast tracts of land amidst them. Regional imbalances are however required to be tackled by preparation of national, state and regional plans.

Holistic and sustainable planning is required to be assured in view of well established geographical regions of the country, namely the Himalayas, Plains, Plateau and Coastal regions. Long term transport network plans for roads, railways, air and water transport, addressing all states and micro-regions of the country are warranted. All the sectoral plans are required to be brought within the framework of holistic spatial plans for states or regions and that of the country.

Actions of authorities for various administrative units remain confined to their areas only. Ironically, however, integration of plans at various levels of village, *panchayat*, municipality, block, district, state and nation are inevitably required.

3. CONTEXT OF HIMACHAL PRADESH

The hill state of Himachal Pradesh is popularly known as the tourists' paradise and 'apple state'. It is also fast emerging as a power state. With a variety of natural and cultural heritage, peaceful environs, numerous pilgrimage places, it is a preferred destination for most of the tourists and travelers from all over the country as well as abroad. Ironically, however, its degrading environs, threats posed to heritage, ribbon developments, blind race for housing, intrusion and collision of trade and commerce, confusion and illusion of tourism and industry, crowding institutional complexes, haphazard infrastructural development and traffic and transportation chaos in towns and on vital arteries are the prime issues which require immediate redressal.

So far as the regional planning perspective of the State is concerned, although in view of the 73rd and 74th Constitution Amendments of 1992, *panchayati raj* and municipal acts have been enacted in 1994, yet the planning process at various levels including districts continues to be a distant dream. Only a few district plans have been prepared. Shimla Capital City Regional Plan with a focus on planning and development of tourism, institutional, educational and health complexes has been prepared and notified for the public objections and suggestions. A Central Himachal Countermagnet Regional Plan was also devised and notified for public objections and suggestions. This plan provides for planning and development of complexes including multiplexes, industrial and transport complexes. In order to safeguard eco-sensitive areas of the State on northern, eastern and southern sides including Kangra, Kullu and Balh Valleys, Dalhousie-Chamba region, Shimla-Solan-Sirmour region, it is imperative that a countermagnet belt from Ranital in Kangra District to Kunihar in Solan District amidst the outer Himalayas and Shivalik in the west and Central Himalayas in the east is planned and developed. The outline State Transport Network Plan highlights that instead of developing both latitudinal and longitudinal arteries, only latitudinal roads have come up with the passage of time. Although Kalka-Shimla railway line developed with 103 tunnels, recently declared as heritage by the UNESCO sets guidelines that entire development of roads and railways in

Himachal Pradesh would have been done through tunnels, yet the same has not occurred accordingly in view of the hill State's physical and ecological imperatives. Whereas, major parts of the State were required to be connected by railways, hardly any headway has been made in this regard for development during the post-independence era. Similarly, instead of road development through tunnels, most of the hill slopes have been dug, leading to massive environmental degradation, negative effects on longevity of dams.

4. CONCLUSIONS

Regional Planning and accordingly perspective holistic and sustainable development has considerably been delayed. This realization is required to be ensured at national, state, district and block levels. Professionalism is required to be inculcated and spatial plans including regional plans have to be prepared on top priority basis. Complete check on sectoral allocations of funds is warranted. All the stakeholders as well as public at large are required to come forward to accomplish this stupendous task for the cause of present as well as future generations, on one hand and environmental and heritage imperatives, on the other.

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Role of Expert Systems in Town Planning

T. Aruna and S.P. Sekar

Abstract

There are number of factors which influence land use. To have a flexible influencing land use factors and changing development trend according to the fast growth dynamics and to propose land use in a very short time period, there is need to develop a system to asses these contributing factors. This article attempts to develop such a planning support system i.e. 'expert system' which is the collection of programs or computer software that solves problems in the domain of interest. The expert system - a new technology has tremendous potentials with many possibilities in urban planning.

1. INTRODUCTION

Planning of towns and cities in India, although dates back to the Vedic times, town planning as a conscious and specific professional discipline is of relatively recent origin. However, the idea of a plan for a city is not new to India and there are various examples like Mohenjo-Daro and Harappa dating back to Indus valley Civilization. In the post Second World War period and particularly after independence, dimensions and perspectives of planning have changed distinctly. Increase in immigration to urban areas and natural growth of the towns and cities turned to pressurize land and land has become scarce commodity especially in urban areas. Normally the plans for the towns and cities are in the form of master plans. These master plans depict land uses of compatible variety for a plan horizon with possible updates and the trend on the ground vary beyond thresholds. However, in practice it would be Herculean task for updates and land use plans are more good to answer the question of 'where' the development should come rather very little it answers about 'why and how' over a period of time. Time phase influencing factors has to be worked out to simulate 'why' in a given area development of X may pick up. There are number of factors which influence land use. To have a flexible influencing land use factors and changing development trend according to the fast growth dynamics and to propose land use in a very short time period, there is need to develop a system to asses these contributing factors. Hence there is a need to develop a planning support system, which would assess these influencing factors for a given area. This enables the planners to interact with, and decide on the suitability of land use. This article attempts to develop such a planning support system.

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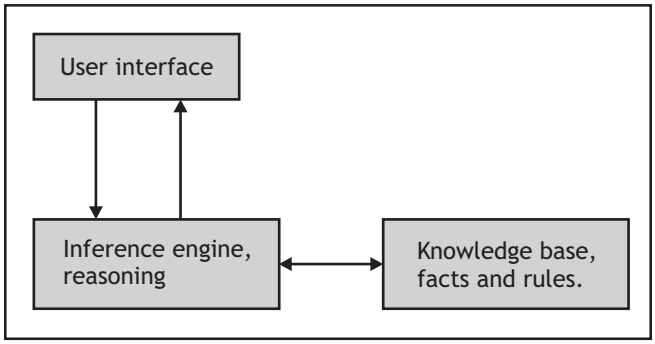
2. EXPERT SYSTEM

The expert system is the collection of programs or computer software that solves problems in the domain of interest. It is called a system rather than just a program because it contains both a problem solving component and a support component. The most common form used in expert and other types of knowledge based systems is the production system also called rule based system in the form of production rules.

Fig. 1 Components of expert system

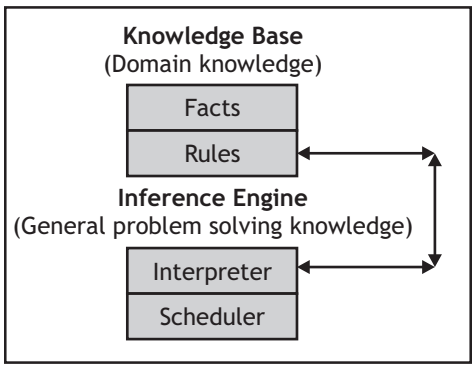


The expert system is still regarded in urban planning as new technology with many possibilities. Important components of the expert system include the knowledge base and the inference engine. The knowledge base usually stores expertise captured from domain experts (in this case the principles of town planning) in the form of a rules and the inference engine finds a solution by driving the knowledge base through some reasoning processes, mostly deductions, which are similar to the reasoning processes of a human being. The inference engine accepts user input queries and responds to questions through the I/O interface and uses this dynamic information together with the static knowledge stored in the knowledge base. The knowledge in the knowledge base is used to derive conclusions by the user's input as shown in Fig. 1.

Before we understand the process in the expert system we have to be clear about the structure of an expert system.

2.1 Structure of an Expert System

Fig. 2 Diagram on structure of expert system



The knowledge base in an expert system contains facts as the basis for decision making. The inference engine contains an interpreter that decided how to apply the rules to infer new knowledge and a scheduler that decides the order in which the rules should be applied (Fig. 2).

Knowledge acquisition concerning the representation of conditional rules is the way to obtain groups of rules from experts in a system domain, which has a premise and a conclusion. These premises and conclusions can be considered as the elements of a knowledge system and be expressed in a digraph or topological map (Table 1).

Table 1 Identify the Residential Zone

Premises	Conclusion
Green field is a lot.	Living environment is good.
It is not near main road.	Traffic noise is light.
Traffic noise is light.	Living environment is good.
Traffic noise is light.	Excusive residential district I
Living environment is good.	Excusive residential district I

Building an Expert System for Site Selection: After deciding the premises and conclusions, the following process has to be carried out to build a successful expert system for site selection and site analysis:

Step I: The system considers as if a potential site has a lot large enough for the users requirement. If a potential site does not have a lot available, this site is excluded from further analysis and the system considers the next potential site, the system continues further analysis only for the potential sites contain the size lot required.

Step 2: The system performs in selecting appropriate weights (data from the reference data base) depending on the initial users input. For instance, this paper considers 13 components derived from 32 locations factors (see Table 2). For 13 components, weighted tables for product type, foreign ownership, and employment size were used in this case study with their own respective variables.

Step3: To develop an index for each of the 13 components by applying various rules to the profiles of potential sites. The profile data used in this case study is a sample of three potential sites.

Table 2 Factors and its Rate in Determining the Weightage

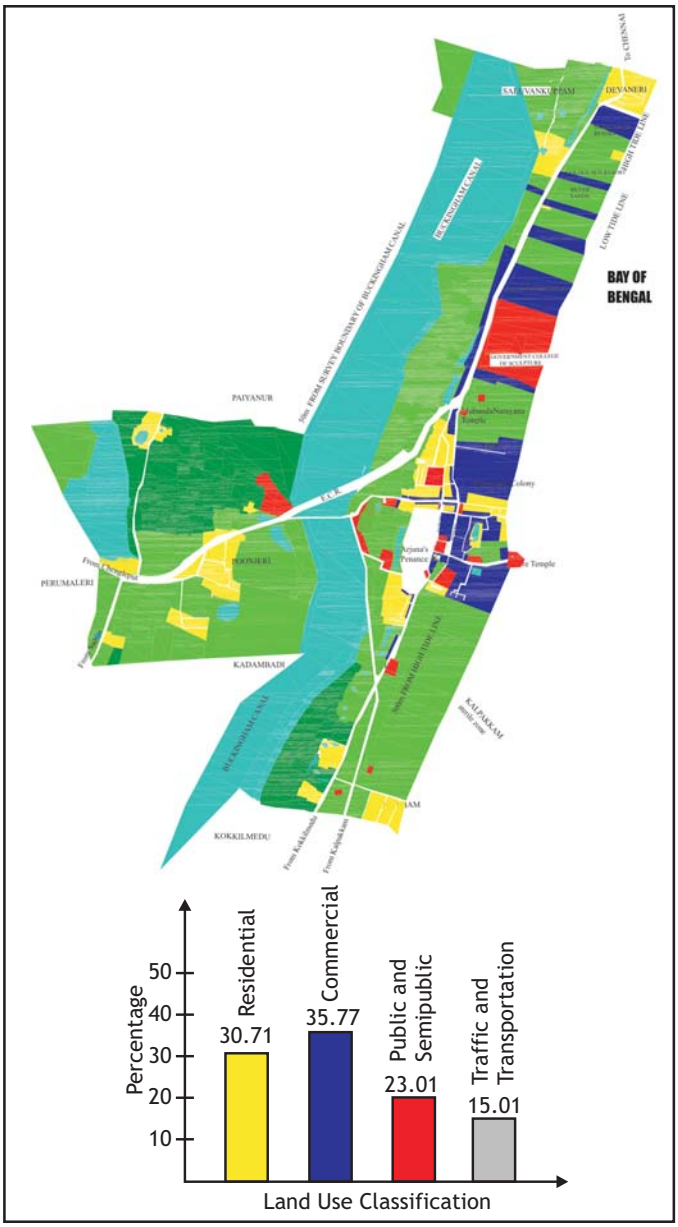
Factors	Mean rate	Rank
Availability of transportation services	3.701	1
Labor attitudes	3.665	2
Ample space for future expansion	6.652	3
Nearness to markets	3.647	4
Availability of suitable plant sizes	3.594	5
Availability of utilities	3.375	6
Cost of suitable land	3.330	7
Attitudes of local citizens	3.290	8
Cost of construction	3.277	9
Labor laws	3.232	10
Availability of skilled labor	3.192	11
Cost of utilities	3.125	12
Salary and wage rates	3.120	13
Cost of transportation services	3.103	14
State tax rates	3.036	15
Local tax rates	2.982	16
Education facilities	2.938	17
Attitudes of government officials	2.924	18
Availability of technical personnel	2.911	19
Police and fire protection	2.880	20
Availability of unskilled labor	2.781	21
Housing facilities	2.750	22
Proximity to suppliers	2.741	23
Facilities for importing and exporting	2.656	24
Proximity to raw materials	2.531	25
climate	2.375	26
Govt incentives	3.321	27
Cost of local capital	2.281	28
Availability of local capital	2.228	29
Nearness to home operation	1.795	30
Proximity to export markets	1.755	31
Nearness to operation in a 3rd country	1.219	32

Step 4: To calculate the combined weighted index for a site, that is total index for site. It was assumed that the combined effect of all the components can be described by a linear function of the weighted individual indices of each component.

Step 5: To compare the indices of different sites to recommend alternate sites in rank order.

The performance of an expert system depends on the knowledge it contains. With better knowledge base calibrations it would reach better results. Advantages of using expert systems over other conventional computer programs include the rules that constitute the knowledge base, both relative and absolute notions as well as rule of thumb. Bearing in mind the limitations on applying expert system in urban planning, consideration of four characters regarding the use of expert system in urban planning is important before starting to solve the problem.

Fig. 3. Existing Landuse of Mamallapuram - 2004



- The only thing planners can do is spend much more time on identifying a few suitable urban planning problems that satisfy the basic requirements of ES development.
- The expert systems are not acceptable to most planners because developing ES is not cost effective. Addressing the cost side it is true that building an ES is a time consuming process that also requires significant monetary investment.
- The limitations on the applications of expert system in urban planning are mainly due to the technical and theoretical limitations.
- Only the integration of different technologies can effectively solve urban planning problems.

3. APPLICATION OF EXPERT SYSTEM IN MAMMA-LAPURAM

Mamallapuram is situated about sixty km south of Chennai on the Bay of Bengal coastline and can be reached from Chennai mainly by road along the seacoast

via Kovalam. Mamallapuram can also be reached via kelambakkam and Tirupporur from Chennai. It is within Thirukkazhukundram taluk and of Kancheepuram district. The average annual population growth rate is 3.93 percent. The annual growth during 1991-2001 was 2.18 percent which led to significant growth rate compared to an average town of this state.

The town experiencing the linear type of development (Fig. 3) due to natural constraints such as heritage zones, coastal regulation zone, sterilized zone of Atomic Power station of Kalpakkam. Agriculture activity is agglomerated in Poonjeri village. The trend in the entertainment activity is developing in the ECR corridor. Land around the OMR road is experiencing the fast development due to IT corridors. Encouraging any development in the southern side is very less due to sterilized zone. The commercial activities are more due to tourism potential. The planning effort should be directed to provide the infrastructure necessary to meet the expanding tourist needs. It has been estimated that on an average about 10,000 people visit Mamallapuram per day during holidays.

3.1 Influencing factors for Land Use in Mamallapuram

Influencing factors (Fig. 4) for land use vary depending on the city and its physical setting. Accessibility is the most direct link between transportation and land use. The concept of accessibility is the key to understanding how transportation and land use relate to each other. Transportation promotes spatial interactions between activities or land uses. This interaction is measured by accessibility, which reflects both the attractiveness of potential destinations and ease of reaching them. The pattern of land uses is important because it determines the opportunities or activities that are within the range of a given place. The potential for interaction between

Fig. 4 Factors that Influences Land Uses

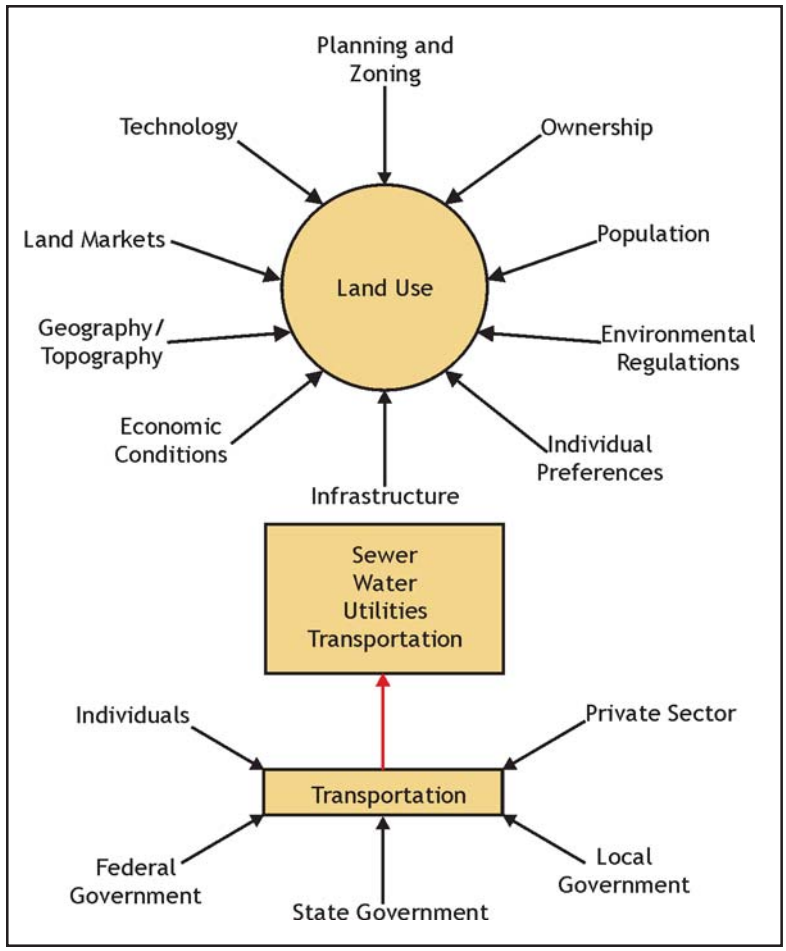


Table 3 Factors and its Influence on Various Land Uses

S. No.	FACTORS	RESIDENTIAL										COMMERCIAL									
	Environmental regulation factors	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
1	Sterilized area																				
2	CRZ 200 - 500M																				
3	CRZ 200M																				
4	Canal regulation 50m																				
5	Prohibited area (100 m from protected area)																				
6	Regulated area (100 m to 200m from protected area)																				
Physical infrastructure factors																					
1	Location of major highways																				
2	Location of major transport terminals																				
3	Availability of drainage service area																				
4	Availability of water facilities																				
5	Location of major nodes																				
6	Location of water bodies																				
Social infrastructure factors																					
1	Location of school service area																				
2	Location of health service area																				
3	Location of market centers																				
4	Location of major work areas																				
5	Location of tourist areas																				
6	Location of public service area																				

any two places increases as the cost of movement between them, either in terms of money or time, decreases. Consequently, the structure and capacity of the transportation network affect the level of accessibility.

Based on the literature and on the field surveys done, the following variables are used to measure the land use pattern (Table 3) in Mamallapuram. There is no limit in identifying new variables and depends on the sensitivity of the variable, the end result would vary. Therefore, the selected sensitive variables would yield better results.

3.2 List of Variables

- Location of water bodies and areas subject to flood.
- Location of major highways.
- Location of major work areas.
- Location of water service area.
- Location of sewer service area
- Location of fire protection service area
- Location of police service area.
- Location of school service area.
- Location zoning jurisdiction.
- Location subdivision control jurisdiction.
- Location of mixed land use.
- Location of blighted residential areas.
- Location of recreational areas.

3.3 Production Rules

Rule based system depict domain knowledge producing a synthesis of the information gathered in terms of IF, THEN, ELSE statements. A rule states that certain conclusions will occur if specified conditions are met. When the antecedent is true, the consequent is accepted as true.

3.4 Derived Production Rules for Residential Use (sample)

- If the land is 500 in terms of radius from water service area then it is suitable for residential development.
- If the land is other than 250 m from major highway and it is 500 m from water service area then it is suitable for residential development.
- If the land is 500 m from school service area then it is suitable for residential development.

3.5 Derived Production Rules for Commercial Use (sample)

- If the land is 250 m from major highway and it is 500 m from water service area then it is suitable for commercial development.
- If the land is 500 m radius from market centers then it is suitable for commercial development.

- If the land is 250 m radius from major nodal points then it is suitable for commercial development.

4. EVALUATION TECHNIQUE

Multiple attribute utility technique (MAUT) based on decision theory, makes it possible to integrate factor weight and production rules. It is essentially an evaluation of outcomes where values in numerical form are attached to outcomes. The essence of the MAUT is that it identifies each rule to be used for the evaluation and its relevancy to each of the use category. This relevancy can be determined by a procedure that may consist of experimentation, judgment or some combination of these. The weights of the categories of criteria are also determined. These weights are judgmentally obtained numbers that describe the importance of each of these categories. The resultant weight of the rule is then a combination of relevancy measure and weights.

The implementation of the MAUT comprises five steps:

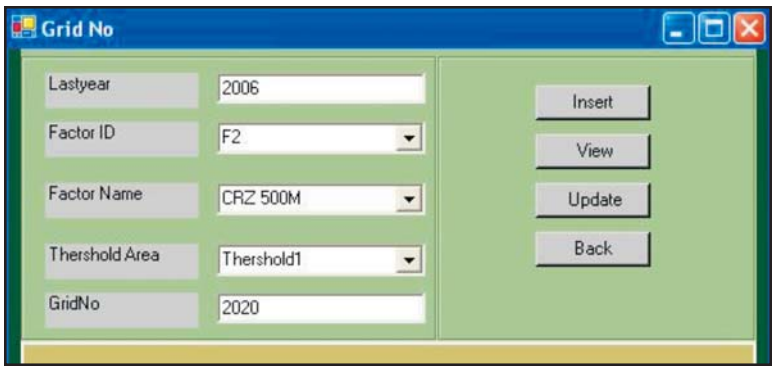
- Identify the aspects of the problem to be evaluated
- Identify the relevant categories of criteria (identification of factors)
- Rate the importance of each criterion category
- Measure the relevance of each rule to each criterion category
- Calculate the weights for rules

The production rules for residential and commercial land use (Table 4) are measured for their relevance with respect to each factor. This gives the weightage for each rule with respect to factors. Then the average weight from all the rules with respect to each factor gives value for both residential and commercial. The grid cell having the maximum weight decides the type of land use in future.

4.1 Steps for Designing the Expert System

Step 1: The map is digitized with existing land use and it is converted into grid pattern.

Each grid of size 50M X 50M i.e. 2,500 sq m where the area of each grid is 0.25 hectares



Step 2: Each grid is given the number as the system has the capability to identify only the number of each grid as an address.

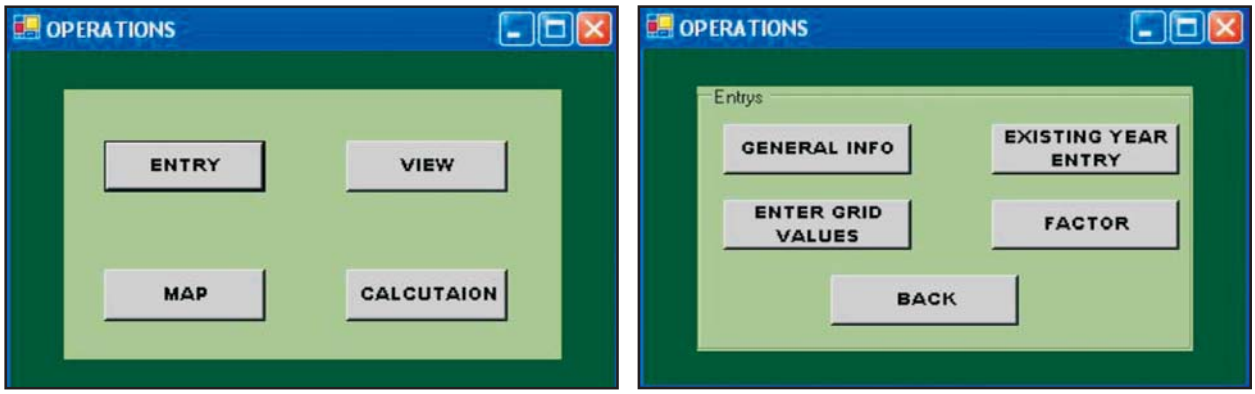
Step 3: This numbered grid sheet is overlaid with the existing land use to get the each grid cell land use respectively and store into the database.

Table 4 Commercial Relevancy Measure for Each Rule

Rule No.	Conditional Rules(Commercial)	Factor Weights	Relevancy Measures					
Rule 1	If the land is 250 m from major highway and it is 500 m from water service area then it is suitable for commercial development.	F_W	F	0	1	2	3	4
		0	F1	■				
		5	F2		■			
		0	F3	■				
		0	F4		■			
		7	F5		■			
		5	F6		■			
		9	F7					■
		9	F8				■	
		8	F9			■		
		8	F10					■
		9	F11			■		
		8	F12				■	
		7	F13			■		
		7	F14			■		
		9	F15			■		
		6	F16			■		
		8	F17			■		
		5	F18			■		
	Total rule weight		254					
Rule 2	If the land is 500 m radius from market centers then it is suitable for commercial development.	F_W	F	0	1	2	3	4
		0	F1	■				
		5	F2		■			
		0	F3	■				
		0	F4		■			
		7	F5			■		
		5	F6			■		
		9	F7				■	
		9	F8			■		
		8	F9		■			
		8	F10			■		
		9	F11			■		
		8	F12		■			
		7	F13			■		
		7	F14				■	
		9	F15					■
		6	F16			■		
		8	F17			■		
		5	F18			■		
	Total rule weight		285					

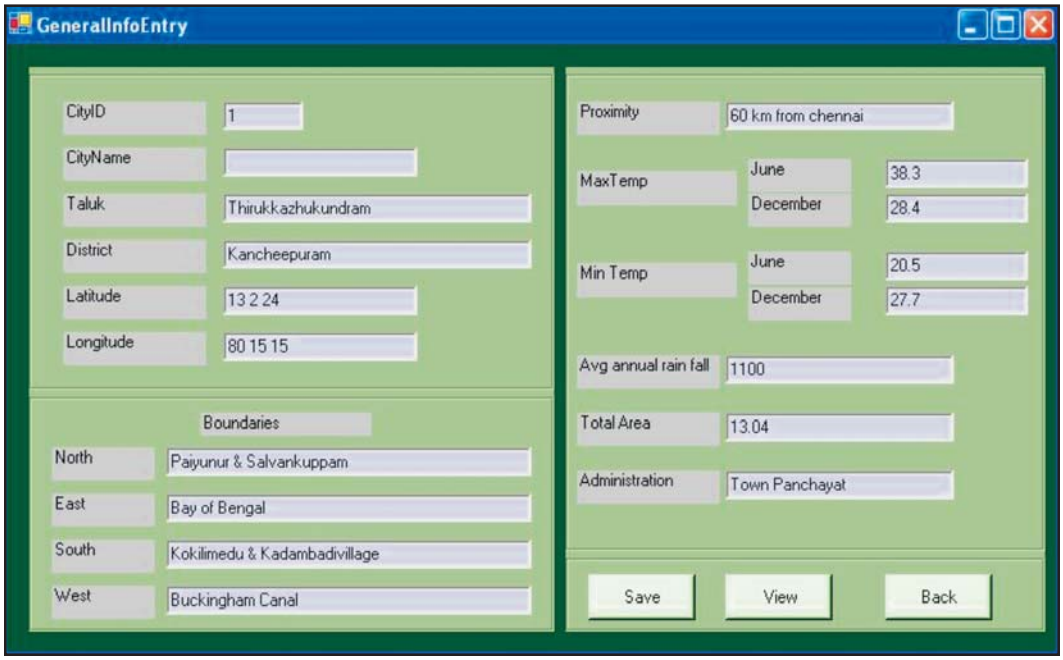
Step 4: The front page is designed in such a way that the general entries about the town should be given and should have the provision to enter the data.

The ENTRY dispatch displays the town profile detail.
The map dispatch displays the proposed land use after all calculations.



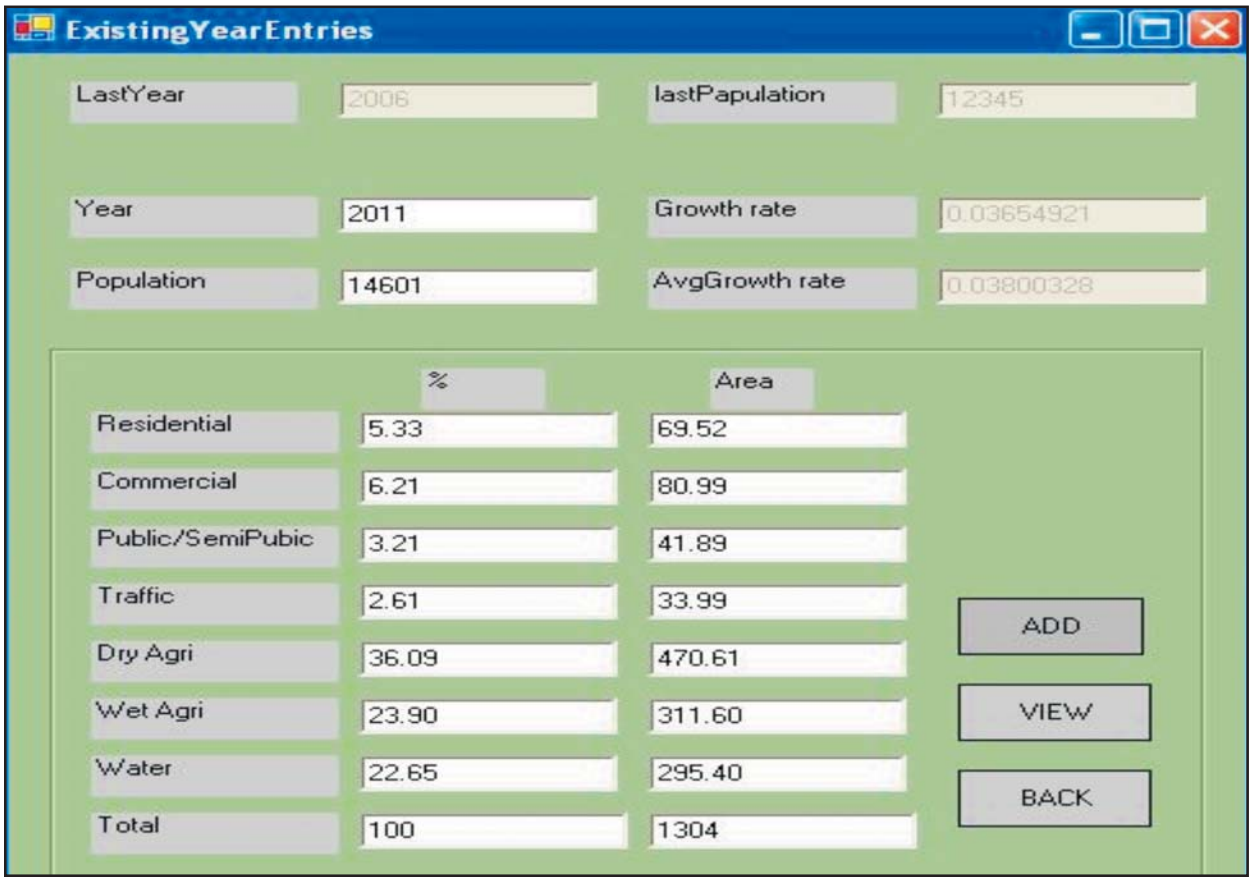
Step 5: By clicking the general information the menu box will be displayed to enter the details about the city. This is very flexible and can capability to store any number of towns.

Fig. 5 General Information Entry Menu



Step 6: It is important to calculate the projected population for the given period of years. This needs to store the temporal population data in the database.

Fig. 6 Existing Year Entry Menu for Land Use and Population



The system is deigned in such a way that it will project the population in three methods such as

- Arithmetic increase method
- Geometric increase method.
- Incremental increase method.

This is used to compare the projected population with the past years to select the suitable method and to precede the land use projection.

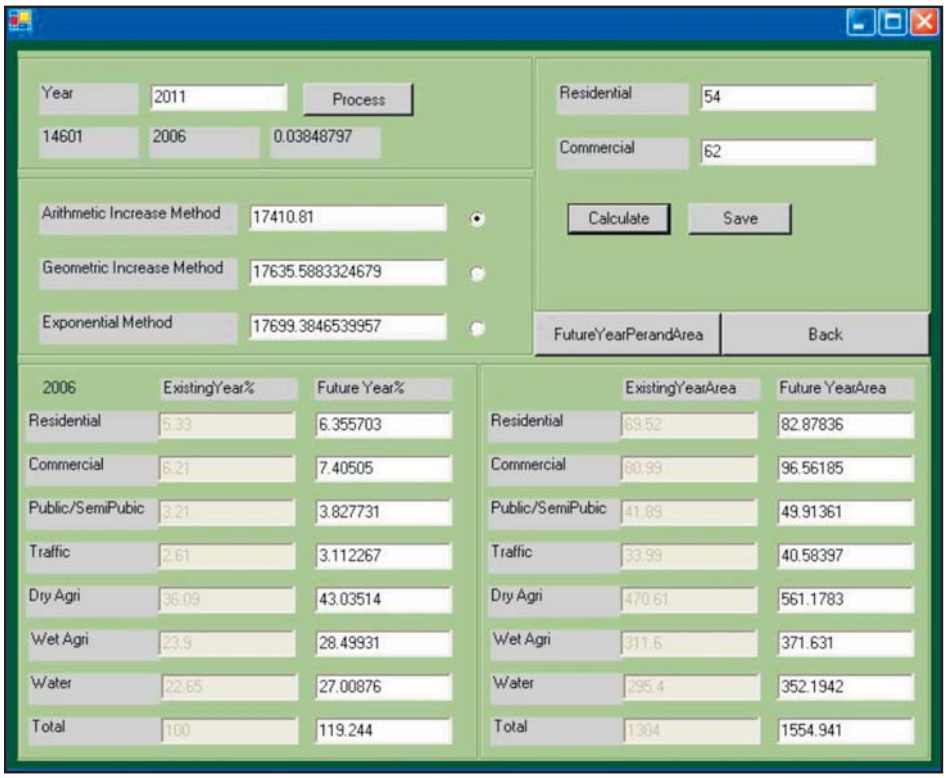
Step 7: Enter the factor names and their respective weights for residential and commercial land use in the database. The weights of production rules with the relevance to the factors are also stored in it.

Step 8: The selected population method is saved to store in the database. Then the projected

Fig. 7 Factor Input Screen

land use is calculated according to the population using the interpolation method. To have the projected land use store the existing land use in both the percentage and areas in acres or any other unit comfortable to the user. Make sure to give the correct entry as such that the total land use should add up to 100 percent of the total area. Hence the correct distribution of each land use is important to project the future land use.

Fig. 8 Projected Populations and Land Use Menu



Step 9: The projected land use is calculated both in terms of percentage and area. The projected land use is subtracted from the existing land use to know only the required land for the future. The system has the capability to find the number of grids needed to accomplish the require task rather than finding the area needed. This is done by dividing the total grid number by the area of single grid to get the number of grids needed for each land use.

Fig. 9 Land Use Suitability Calculation Menu

Step 10: The dry area grid numbers are taken as the first priority to check the suitability of land use. This selection of dry area is given preference from the first threshold and followed with the second and third.

Step 11: After finding the dry grids in the first threshold area, it will take the surrounding 20 grids to check the suitability measure. This is needed to decide land uses with the surrounding land use by checking the conditions given to each grid. Some of the sample coding is given here to check the suitability for both residential and commercial uses.

4.2 Residential Suitability Checking Coding: (sample)

Private void checkBox1_CheckedChanged (object sender, System.EventArgs e)

```
            {
                  string []
botmval={t1,t2,t3,t4,t5,t6,t7,t8,t9,b1,b2,b3,b4,b5,b6,b7,b8,b9};

                  foreach(string a in botmval)
                  {
                        if(a==”F1")
                        {
                              textBox201.Text=”0";
                        }
                        else if(a==”F2")
                        {
                              textBox202.Text=”1";
                        }
                        else if(a==”F3")
                        {
                              textBox203.Text=”0";
                        }
                        else if(a==”F4")
                        {
                              textBox204.Text=”0";
                        }
                        else if(a==”F5")
                        {
                              textBox205.Text=”0";
                        }
                        else if(a==”F6")
                        {
                              textBox206.Text=”1";

                        }
                  }
```

Step 12: Then it will check the factors' weight corresponding to each grid land use and measure the relevancy the each rule. This will give the average weight of each grid with respect to the residential and commercial. Taking the maximum weightage to the respective grid the type of land use is decided (Fig. 10 and Fig. 11).

Like this, it will keep on checking the required number of grids calculated for residential and commercial land use. If the grid is not sufficient to decide with in the first threshold either for residential or commercial, it will move to the second threshold to decide the proposed land use. The proposed land use is indicated here in the way that the proposed Residential is orange and proposed Commercial is blue.

Fig. 10 Finding Grid Suitability Menu 1

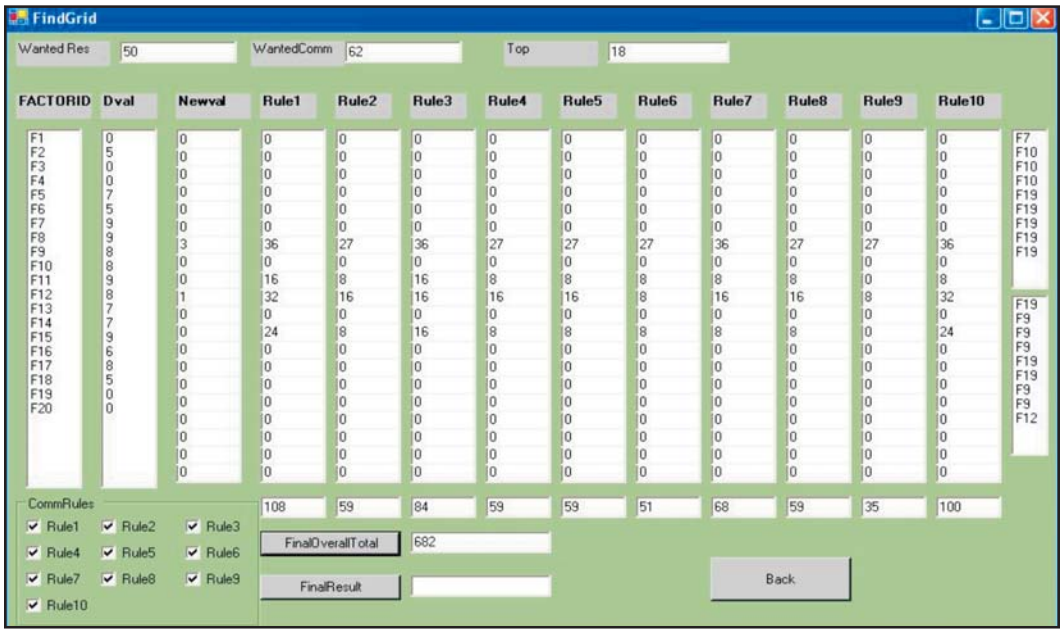
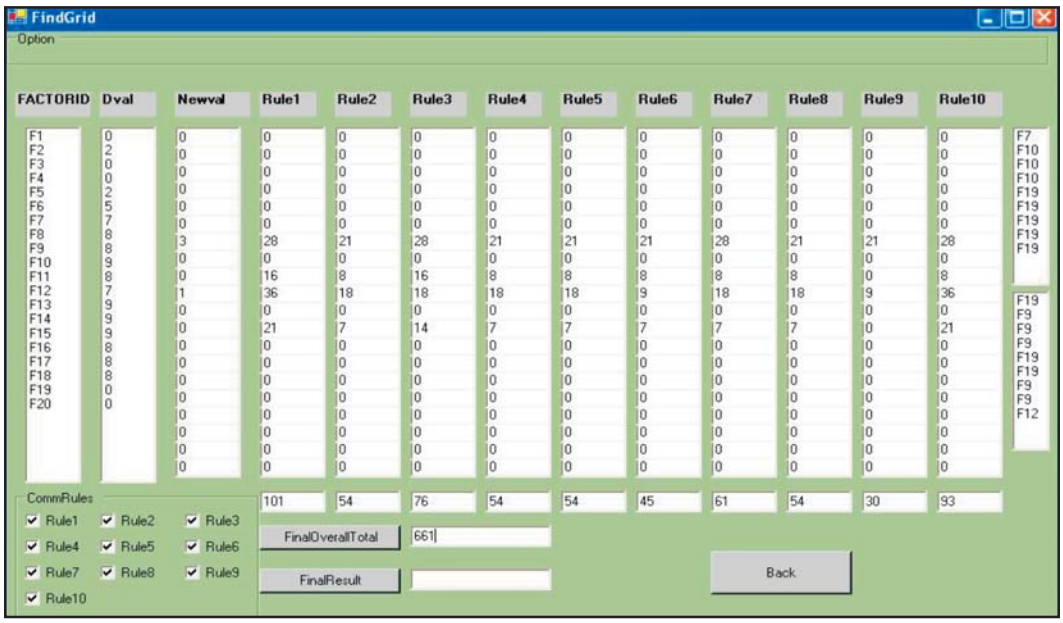


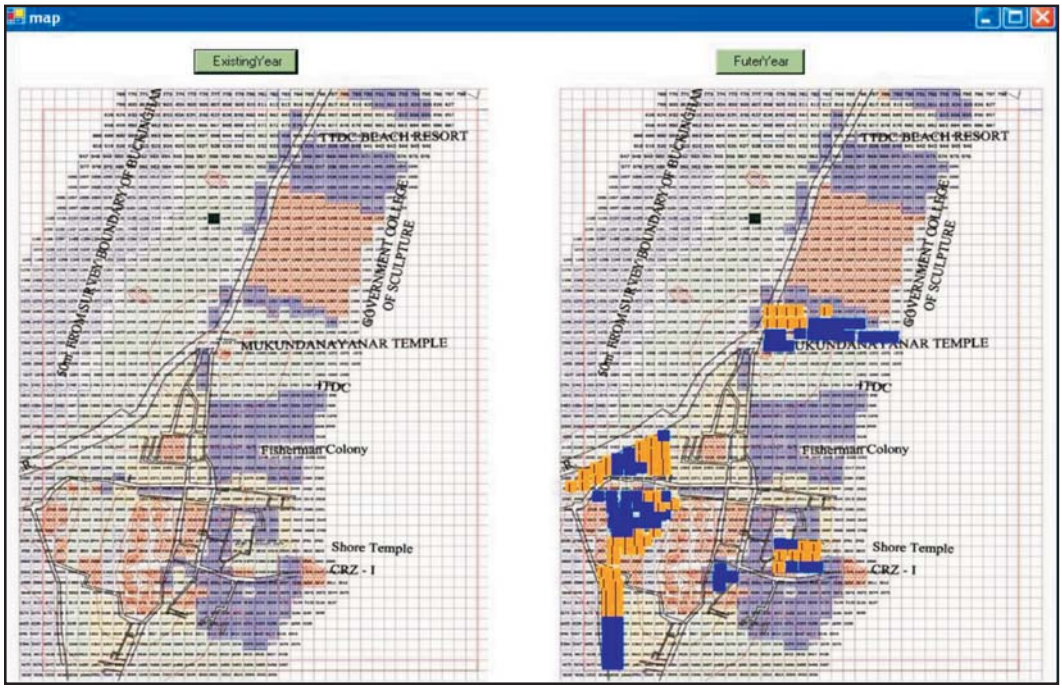
Fig.11 Finding Grid Suitability Menu 2



Step 13: These grids, which are decided for residential and commercial land use, are marked in the map to show it spatially upto 5 years.

The final output is given here by running the conditions. This way we can give the output for different period of time. Due to time limitations, the proposed land sue map is given for 5 years.

Fig.12 Existing and Simulated Proposal Land Use, 2011



5. CONCLUSIONS

The performance of an expert system depends on the knowledge it contains. Advantage of using the expert systems over other conventional computer programs allows adoption of rules that constitute the knowledge base and can include both relative and absolute notions as well as rules of thumb. But still there are limitations with the technology at present. Hence the land use projected for 5 years is shown spatially in the map, but more than 5 years projections are shown in the charts.

Continuing research effort indicates that expert systems have matured and are not simply the latest gimmick but a real step in the direction of research that will make easy to use and work for real experts.

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The Conflict of Conservation

Kavas Kapadia

Abstract

This paper is a rejoinder to the paper titled 'Whose Heritage, Why Conservation, Whose Ends?' by Prof. Ashok Kumar and published in the special issue of the ITPI Journal in Vol. 6, No. 2. Drawings on the various global examples, the author argues that heritage conservation is an emotive issue. He stresses that the conservationists have appealed to the nationalistic sentiments and used painful technologies like 'ethnic cleansing' for displacement. Broadly agreeing to 'the morality of heritage conservation' as pointed in the above mentioned article, the author appeals for making an objective assessment of the heritage works worth conserving.

1. INTRODUCTION

From time to time the whole concept of heritage conservation gets embroiled in a debate which is on the one hand a journey into self discovery and on the other raises some very profound concerns about the expression of the identity of the people concerned. Heritage is but a part and parcel of our lives and history. So we must, by right, examine the validity of the rules, methods, items and other related concerns with the topic of heritage conservation. Since buildings best define the category of heritage, let us begin with the built heritage. The UNESCO defines the monuments to be conserved on the following criteria.

A UNESCO World Heritage Site is a site (such as a forest, mountain, lake, desert, monument, building, complex or city) that is on the list maintained by the international World Heritage Programme administered by the UNESCO World Heritage Committee, composed of 21 state parties which are elected by their General Assembly for a four year term. A world heritage site is a place of either cultural or physical significance.

The programme catalogues, names, and conserves sites of outstanding cultural or natural importance to the common heritage of humanity. Under certain conditions, listed sites can obtain funds from the World Heritage Fund. The programme was founded with the Convention Concerning the Protection of World Cultural and Natural Heritage, which was adopted by the General Conference of UNESCO on 16 November 1972. Since then, 185 state parties have ratified the convention.

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2. SELECTION CRITERIA FOR CULTURAL AND NATURAL HERITAGE

Until the end of 2004, there were six criteria for cultural heritage and four criteria for natural heritage. In 2005, this was modified so that there is only one set of ten criteria. Nominated sites must be of "outstanding universal value" and meet at least one of the following ten criteria.

2.1 Cultural Criteria

- **I**. "to represent a masterpiece of human creative genius";
- **II**. "to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design";
- **III**. "to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared";
- **IV**. "to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history";
- **V**. "to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change";
- **VI**. "to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria.)

2.2 Natural criteria

- **VII**. "to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance";
- **VIII**. "to be outstanding examples representing major stages of Earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features";
- **IX**. "to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals"; and
- **X**. "to contain the most important and significant natural habitats for in-site conservation of biological diversity, including those containing threatened

species of outstanding universal value from the point of view of science or conservation."

Several different countries make a nominal adjustment to suit their own definition, holding onto the basic premises that any element, natural or manmade that deserves to be conserved for posterity must be conserved. States lay down rules and regulations to ensure compliance. Cities, states and countries vie with each other in levels and techniques of conservation of heritage property and a lot of information is exchanged on how the whole process can be made more effective.

What may be noticed is that there is no information on what deserves to be conserved if the yardstick is composed of benchmarks of morality, ethics and or commitment to the cause of humanity (Kumar, 2009). This debate assumes importance when you witness the conservation of those monuments by countries and nations which would fail the test of moral ethical buildings.

The notion of heritage conservation is linked to the idea of Nationalism. The concept of the 'nation' is a recent phenomenon even though the idea of the 'state 'has existed in several cultures since ages. Nation is a collective identity of peoples united under different circumstances - some coming together as an ethnic group, others as a reaction to the ouster of the oppressive regime which has exploited it for a period of time. Some others still, due only to a specific geographical location that gave an identity to the place.

Every miserable fool who has nothing at all of which he can be proud, adopts as a last resource pride in the nation to which he belongs; he is ready and happy to defend all its faults and follies tooth and nail, thus reimbursing himself for his own inferiority(Arthur Schopenhauer, Aphorisms).

The present day political world as we know it today did not exist till late Iron Age. History of humankind is replete with the story of man exploiting man. The story of bloodshed, butchery, deceit, revenge and inhumanity runs step by step, parallel with the story of progress, largess and development. Examples of inhuman treatment meted out by man to his fellow men would make it difficult to allocate a gradation to such acts. A brief recall of such events would include the systematic forays into India by the plunderers from Mongolia and the resulting ravaging, the Spanish conquest of the Inca empire in the 16th century and deceitful murder of the king Atahualpa, and killing of millions of his subjects with him after assuring him of his liberty if the entire gold reserves were paid to the conqueror Herman Cortes, the slaughter of the Tutsis of Rawanda by the Hutus, the killings carried out by the Bosnian Serbs. The list is so long that one can only be accused of leaving out more than can be covered.

The abhorrent term "ethnic cleansing" has become a legitimate expression. Conservation is a very emotive issue. Buildings evoke strong emotions. A nation's heritage defines its history and inspires its future. A large part of the world today referred to as the developing (or underdeveloped) world was till a few decades back politically and economically subjugated by a handful of the so called developed world countries. This is the stark reality. It is also acknowledged that in these so called underdeveloped countries some of the most advanced and developed civilizations had and continue to exist. A lot of the ancient 'nations' have lost their national identities and have been reduced to tribal or racial groups.

Indigenous and tribal people have all but been removed from their original inhabitations. The red Indians of US, the Aborigines of Australia, the Bakhtaran, Lurs and Qashkais from Iran, the Sami from North Scandinavea, Ainu from Japan, Veddah form Sri Lanka, the Mayan, Chiapas, Yacatan from Mexico the San from Namibia, the Inuit and Metis of Canada, the Sentineles and the Jawra from Andaman … a lot these groups have lost their identities while others rendered refugees in their own erstwhile lands.

Since heritage conservation has a lot to do with the relations that these groups have with the buildings – most permanent structures in a particular era would be symbols of oppression and repression. Triumphant arches, victory monuments, leisure palaces, mausoleums and other edifices are as objectionable as the spate of statues of elephants and living political leaders cropping up in the heartland of India today. In our present day culture which thrives on inequity, dominance and conspicuous consumption, possession of material goods determines one's social status. Similarly the location of buildings also enhance, what Doreen Massey calls the "power geometry of spaces."

Emotions often run high when it comes to sharing these spaces. A case in point is the *Chattri* – the canopy vacated by removing the statue of King George IV at the India gate hexagon in New Delhi.

A strong debate raged on whether the canopy should house the statue of Mahatma Gandhi. At long last, wisdom prevailed and the Mahatma's statue was made to sit in a more suitable location. At least one of the reasons given was that the Father of the Nation was too simple a soul to be accorded the place inside a royal 'Chattri' and it would therefore be a misfit. No such wisdom guided the opposition to the dismounting of the original statue of King George, a very elegant piece of sculpture designed to modulate the space within the Chattri. Since the removal of the statue, the Chattri has been rendered incomplete and aesthetically impotent. But it is doubtful if many citizens have the good sense required to view the artistic contour of such a sculpture without the emotive response to the face on the body.

As a nation we fall woefully short here. The switched names Mumbai from Bombay, Chennai from Madras, etc; are acts of 'accomplishment', to download collective political guilt in the face of recurring non performance on other significant fronts. A culture that takes solace in the misplaced belief that by removing or altering the markers of history, the people would feel more liberated has not been fully realized from the burden of the bondage of history and surely has misplaced notions of patriotism. These very ideas of patriotism then filter down to regional levels prompting local political parties to proclaim that a particular metropolis 'belongs' to a particular community or party and that the others are not welcome, in fact asked to pack up and get out.

The complete destruction of the giant Buddha statue in Bamiyan by the Taliban fanatics was an act in the same category. The often heard cases of religious tensions that arise with regularity due to the desecration of statues of gods, goddesses and leaders are illustrative of this argument. The recent discord in South India on the proposed installation of the statue of Charlie Chaplin confirms the self righteous belief of the devil's advocate.

This prompts me to speculate on a story that comes out of an epic. What should have been the fate of the statue that Eklavya made of his teacher in absence, Dronacharya, and practiced the art of archery to perfection? On learning about this situation the great teacher Dronacharya acted in a manner most unbecoming of a gracious teacher in asking for the right thumb of the pupil in '*gurudakshina*', knowing fully well the consequence of such a disabling demand. As pointed out by Kumar (2009) a typical dilemma of qualifications on ethical and moral grounds persists.

For a poor country like India how does one justify the thought that heritage preservation and development are complementary and must in fact grow simultaneously? The value of a historic monument for a homeless person is only in the capacity of the monument to provide him the shelter. The slightly better off would view the monument as a potential source of building materials or better still urban land which could be put to better use by completely removing the monument. This is not a conjecture but happens often in places such as Delhi. Monuments in far out remote areas survive on their own.

It stands to reason then that buildings and places evoke a higher level of reaction. The symbolism of the building is by far more provocative than the brick and mortar put together in the form of the building. The famous instruction of Sir George Birdwood to his architects on New Delhi: "New Delhi, like Rome must be built for eternity …". The targeting of the World Trade towers and the Taj Hotel by terrorists, Babri Masjid by religious fanatics and the historical

storming of the palaces in Russia, Paris, Iran, Baghdad, Philippine and Ethiopia is reminiscent of the middle ages when the city wall was targeted to be broken down as a situation of complete sense of helplessness of the vanquished.

This brings us back to the 'collective' notion of the sense of place. In a democratic system especially like in India that has wrested its freedom from a foreign power by use of the power of 'Ahimsa', perceptions about spaces with a historical context will vary. The job of conserving the ancient monuments and spaces will be rendered mush simpler if it were devoid of personal perceptions about the significance of the historic events. Rather the event itself is the driving force for the decision to conserve. This way, both the Cellular Jail of Andaman Island and the Rashtapati Bhavan in New Delhi will qualify for conservation for our future generations to make judgments upon.

3. CONCLUSIONS

It would appear that we have picked the specific items such as "threatened species, conservation of biological diversity, terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals, areas of exceptional natural beauty and aesthetic importance" out of the UNESCO charter to destroy. If the importance of heritage was to be understood in its potential for saving human species on earth, then more than anything else the natural elements deserve to be conserved.

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Diagrams and sketches should be neatly drawn, labeled and sent as soft as well as hard copy.

Editor

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Urban Poor Friendly Development Promotion Rules and Building Byelaws

S.C. Gupta

Abstract

For providing affordable housing to different categories of urban poor, the availability of land and the cost of construction are the core issues. The development promotion regulations and building byelaws plays significant role in this direction. Therefore, development promotion regulations and building byelaws for the urban poor should be city specific, site specific and more flexible. The author also argues in this paper that land needs to be reserved and developed for the urban poor as specific zone in the city.

1. INTRODUCTION

For any discussion on urban poor friendly development promotion rules and building byelaws, the first and foremost requirement is to define the urban poor for whom habitats are intended to be planned and developed with friendly development control regulations (DCR) and building byelaws.

Poverty is a situation in which a section of community is unable to acquire or get even the basic necessities of life such as food, clothing and shelter. In India the poverty line is recommended on the basis of nutrition requirement of 2,100 calories in urban areas per person per day as per the Planning Commission. The lowest level of poverty line falls in the category of beggars, unskilled daily wage earners, cycle rickshaw pullers and others. These categories constitute about 75 percent of the urban poor.

As per estimates of Town and Country Planning Organization (TCPO), as informed by the Honorable State Minister in Lok Sabha, in reply to a Parliamentary question in 2007, the slum population in Indian cities as in 1981 was 27.9 million; in 1991 it was 46.2 million; and in 2001 it was 61.8 million and in Delhi 1.85 million (l8.7 percent), in Greater Mumbai it was 6.47 million (54.1 percent), in Kolkata 1.48 million or 11.7 percent. The trends in slum population are given in Table 1.

2. POPULATION BELOW POVERTY LINE (BPL)

As suggested by the National Institute of Urban Affairs (NIUA) for Asian Development Bank (ADB) support to poverty programs in urban India (Technical Assistance No. 3480 -IND to India 2001), population below poverty line is considered as core poor, intermediate poor and transitional poor i.e. the population just above the BPL.

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Table 1 Trends in Slum Population (TCPO)

S. No.	Name of Metropolitan Cities	State/Union	Total Population	Total Slum Population	%age of slum population to total population
1.	Greater Mumbai	Maharashtra	11,978,450	6,475,440	54.1
2.	Pune	Maharashtra	2,538,473	492,179	19.4
3.	Nagpur	Maharashtra	2,052,066	737,219	35.9
4.	Thane	Maharashtra	1,262,551	351,065	27.8
5.	Kalyan-Dombivli	Maharashtra	1,193,512	34,860	2.9
6.	Nashik	Maharashtra	1,077,236	138,797	12.9
7.	Pimpri Chinchwad	Maharashtra	1,012,472	123,957	12.2
8.	Kanpur	Uttar Pradesh	2,551,337	367,980	14.4
9.	Lucknow	Uttar Pradesh	2,185,927	179,176	8.2
10.	Agra	Uttar Pradesh	1,275,134	121,761	9.5
11.	Varanasi	Uttar Pradesh	1,091,918	137,977	12.6
12.	Meerut	Uttar Pradesh	1,068,772	471,581	44.1
13.	Indore	Madhya Pradesh	1,474,968	260,975	17.7
14.	Bhopal	Madhya Pradesh	1,437,354	125,720	8.7
15.	Ahmadabad	Gujarat	3,520,085	473,662	13.5
16.	Surat	Gujarat	2,433,835	508,485	20.9
17.	Vadodara	Gujarat	1,306,227	186,020	14.2
18.	Kolkata	West Bengal	4,572,876	1,485,309	32.5
19.	Haora	West Bengal	1,007,532	118,286	11.7
20.	Delhi	Delhi	9,879,172	1,851,231	18,7

Source: *Spatio-Economic Development Record*, Vol. 14, No. 5, September-October, 2007

- **Core Poor**: The city's Core Poor population exists on their day-to-day earning basis and they mainly live along pavements and marginalized lands. They generally cluster at places where work and food is available. Night shelter built by the government may be more feasible to accommodate such urban poor.
- **Intermediate Poor**: The city's Intermediate Poor population is the largest segment of urban poor. Basically they fall in category of semi-skilled informal sector. Their habitations generally comprise of squatter colonies near the work places and primarily located in the inner city or at intermediate urban locations and even on the urban periphery. Access to land and work are their key requirements. In the process of upgrading squatter colonies in-situ, a portion of the site for an identified project may be used for relocation of such population either through cluster housing or a site and services scheme.
- **Transitional Poor**: The city's Transitional Poor population generally comprises of settled families and mainly falls under the skilled informal sector. This gives them flexibility in location. They generally occupy more established

squatter colonies. The site and services schemes for the relocation of transitional poor may be more feasible.

The annual income of an urban poor family is around Rs.50,000. Most of their income goes for meeting the basic requirements of meals. Therefore, it is difficult to say that such population can afford to construct any meaningful shelter.

Earlier experience of getting land for construction of houses for the urban poor in each neighborhood or locality based on a reservation of 2 percent area for service personnel, in group housing societies and other schemes failed. Most of the schemes where there was integration of dwelling units for the urban poor with other middle or high income groups were also not successful. It is observed that where squatters are allotted land, in resettlement colonies, in most of the cases they sold their plots to others and reoccupied the public land near their work places. A 25 sq m to 30 sq m permanent constructions of housing for the urban poor including land cost would cost around Rs. 1.5 lakh which no daily wage earner can afford.

3. NATIONAL URBAN HOUSING AND HABITAT POLICY, 2007

The main features pertaining to availability of service land or dwelling units for urban poor under the above policy are as follows:

- The core focus of this policy is the provision of 'Affordable Housing for all' with special emphasis on vulnerable sections of the society such as the Scheduled Castes/Scheduled Tribes, backward classes, minorities and other urban poor.
- The urban poor have limited access to basic services.
- This policy seeks to assist the poorest of poor who can not afford to pay the entire price of a house by providing them access to reasonable good housing on rental and ownership basis with suitable subsidization.
- The policy aims to promote development of cost effective, quality approval building materials and technologies with a view to bringing down the cost of EWS and LIG houses.
- 10 to 15 percent of land in every new public and private housing project or 20 to 25 percent of FAR whichever is greater is to be reserved for the EWS and LIG housing.
- Specially designed slum improvement programs to be encouraged focusing on upgrading the basic services and environment improvement of urban slums with a participative, in-situ slum rehabilitation approach.
- Transferable Development Rights and additional FAR to be considered for private investment in provision of shelter to the poor.
- The policy argues for shelter to the urban poor at their present location or near their work place.

3. MASTER PLAN DELHI - 2021: SHELTER FOR URBAN POOR

Master Plan for Delhi – 2021 (MPD-2021) provides that about 54 percent of the housing component in the next two decades will for the urban poor i.e. for EWS and LIG. It would comprise of about 25 percent in the category of Slum and Jhuggi-Jhompri schemes- in-situ rehabilitation and relocation and reconstruction, about 14 percent as part of group housing scheme and about 6 percent component in unauthorized regularized colonies and about 4 percent in planned residential areas on independent plots and part of redevelopment scheme.

To achieve the above targets, the MPD-2021 proposed to adopt a multi-pronged housing strategy for provisions of service land and housing stock for delivery by the private sector, public agencies and cooperative societies, etc.

Planning norms, land use zoning, density, FAR, and building controls have been reviewed as part of the Master Plan for targeting the projected housing requirements of the urban poor in new areas and for redevelopment of the existing areas. The planning norms as suggested are keeping in view the options to achieve both density and FAR within 3 to 4 storeyed walk up structures. Slum and JJ redevelopment minimum size of the plot, maximum density, mixed land use, minimum residential component of the land area for rehabilitation of squatters and other population are to be taken into consideration.

3.1 Housing for Urban Poor

To accommodate the above categories of the urban poor, the built space requirement would be mainly in 1 and 2 room units with plinth area ranging between 25-40 sq m. A net residential density of 500-600 dwelling units per hectare, therefore, is to be planned for new residential areas and redevelopment schemes.

- Therefore, housing for the urban poor are to be planned as squatter settlements and informal service providers – domestic helps, hawkers and venders and low paid workers.
- Rehabilitation and relocation of slum and JJ clusters and existing squatter settlements are to be reviewed and the sites which are not required for public projects in-situ upgradation for such pockets may be taken up.
- The sites required for project are to be cleared and the present occupants have to be relocated.

While developing new residential areas to accommodate the community service personnel, EWS and lower income categories of urban poor, minimum 15 percent FAR and 35 percent of dwelling units are to be planned. Also in case of old built up areas while formulating redevelopment schemes, similar pattern is to be followed.

Social infrastructure is to be provided on reduced standards for primary schools, senior secondary schools, multipurpose community hall, Health Center, and other facilities, informal trade units, weekly markets.

4. PLANNING FOR INFORMAL SECTOR - ECONOMIC ACTIVITIES

At appropriate locations, sites for economic activities in informal sector need to be identified at the different levels of planning. In fact the informal sector units locate themselves strategically near work centers, commercial areas, outside the boundaries of school colleges, hospitals and transport nodes and near large housing clusters. As there are large numbers of informal sector units in urban areas, there is a need to provide for organized informal sector places for such informal units at various locations in the city. These could be in the form of informal bazaars and weekly markets. Planning norms for informal trade may also be incorporated in the planned schemes of various use zones while formulating detailed development plans.

4.1 MPD 2021: Planning Norms for Informal Trades

- 3 to 4 units per 10 formal shops in case of commercial areas, wholesale market and transport complexes.
- 5 to 6 units per 1000 employees in government and commercial offices and industrial areas.
- 3 to 4 units per 100 beds in hospitals and for primary school sites.
- 8 to 10 units near the entry in parks and other open spaces.
- 1 unit per 1000 population in residential areas.

In addition to the above, open platforms and sites may also be provided temporarily for the informal sector.

5. SLUM REDEVELOPMENT SCHEME IN GREATER MUMBAI

In Greater Mumbai, Slum Rehabilitation Authority (SRA) was set up by amending the Slum Area (Improvement, Clearance and Rehabilitation) Act, 1971. The SRA formulated the policy for slum redevelopment. Main features of this policy are:

- All slum and pavement families are eligible to get a free 225 sq ft tenement. The FSI, as per DCR of Greater Mumbai in the city is 1.33 and 1 in the suburbs. However, for Slum Redevelopment Scheme permitted FSI is 2.5 for both areas. Any sanctioned FSI beyond 2.5 in any such area could be taken in the form of Transfer of Development Rights (TDR) i.e. in certain circumstances, the development potential of a plot of land may be separated from the land itself and may be made available to the owner of land in the form of Transfer of Development Rights at another site. The owner can use that TDR either for actual construction or sell it in the market but the only restriction is that TDR can be used only north of the plot where it was

generated so that the southern areas of Mumbai do not get further congested. Prices of TDR fluctuate according to market conditions.

- The FSI upto 2.5 is planned in the existing sites for rehabilitation of slum dwellers and for disposal in the market. In case the availability of disposal FSI is less than 1.33 in the city area and 1 in suburbs, for that the owner is entitled to a TDR certificate.

In order to promote a healthy and balanced development, it is necessary to apply reasonable limitations on use of land and buildings. Therefore, for desirable development, the city is divided into a number of 'use zones' such as residential, commercial, industrial, recreational, etc; for each use zone, specific regulations are provided for. A single set of regulations can not be applied for the whole city.

The development promotion control regulations deal with the extent of the physical development in various use zones. These regulations are mainly to specify the quantum of construction, specific location of structures in various use zones for activities to be developed and provided.

Zoning and development promotion regulations are generally too many, very complex and difficult to comprehend and enforce. Therefore, there is a need to have simplified such regulations so that these are adoptable and enforceable within the changing socio-economic and physical development in various cities and towns.

Development control norms are evolved to create a healthy living environment and deal with designated use zones and use premises. These regulations also deal with various promotional aspects for designing of comprehensive schemes and various buildings in different use zones. These mainly govern density, plot coverage, FAR, height, parking, setbacks and margin lines, open spaces, etc. For identified low income schemes, it is necessary to have a minimum and flexible set of such regulations which recognizes self help, incremental upgrading, affordable sanitation and a combination of compatible work-cum-home activities.

Simplified zoning and development promotion regulations include:

i. Zoning and Development regulations including urban land use classification
ii. Land use zoning regulations
iii. Development, promotion and control regulations

In MPD 2021, the following development, promotion, regulation and guidelines are provided for urban poor:

- **Density**: Dwelling unit size to accommodate 4.5 persons and for servant quarters to accommodate 2.25 persons.

- **Coverage and FAR**: The coverage and FAR to be utilized for urban poor as part of area level planning to be determined on the basis of the density of such scheme both for urban poor and for normal housing.
- **Height**: Ground plus 3 or 4 storey structures without lift.
- **Size of dwelling units**: 1 and 2 rooms units with average plinth area of about 25 sq m to 40 sq m.
- **Parking and Circulation**: As part of the area level planning to have proper access for emergency services and facilities and parking at appropriate locations.

A few variations, as given below, may be applied for such identified pockets for redevelopment schemes when planned for the urban poor:

- Vehicular circulation and parking primarily to ensure access of emergency vehicles and to cater to essential services and facilities.
- Plot coverage to be fixed to ensure light and air ventilation and no compulsory plot level open spaces.
- Easy access to the space around buildings and neighborhood activity areas and low rise structures to be planned.
- Urban poor settlement or housing to be planned at the area level planning unit adjusting the overall coverage, FAR, height, parking, circulation, social and physical infrastructure, applicable as per norms and standards at the area level planning pockets.

6. NATIONAL BUILDING CODE: PROVISIONS FOR HOUSING FOR THE URBAN POOR

Special requirements for low income housing in urban areas have been worked out in the National Building Code - 2005. These requirements are as follows:

- **Planning**: The type of development for low income houses may be met in plotted development and/or group housing on cluster pattern.
- **Layout Pattern**: The land to be developed for housing may be planned for mixed size less than 60 sq m per dwelling unit in metropolitan cities and 100 sq m in other towns and hill areas. In case of group housing, at least 75 percent units should not exceed 40 sq m.
- **Plot Size**: Plot size with ground coverage upto 75 percent should not be less than 40 sq m in small and medium towns and not less than 30 sq m in metropolitan cities.

  However, in case of cluster planning, the size of the plot may be 15 sq m with 100 percent ground coverage and FS1 2 applicable upto plot size 25 sq m.

- **Density**: Densities are specified for various kinds of developments as shown below:

Type of development	Range of Densities
a. Plotted development	65-120 plots per hectare
b. Mixed development	
i. Small towns	75-100 dwelling units per hectare
ii. Cities	100-125 dwelling units per hectare
iii. Metropolitan cities	125-.150 dwelling units per hectare

  Development with 15 sq m per unit, a maximum density 500 dwelling unit per hectare has been specified.
- **Height:** Height of the building low rise height not to exceed 15 units.
- **Cluster Housing:** Size of cluster for 20 houses per unit
- **Plot and Plinth Area for Slum Resettlement:** In case of slum settlement on the same site, minimum area may be reduced to 12.5 sq m with potential for adding another 12.5 sq m floor space on the first floor with an internal staircase.
- **Group Housing:** Group housing may be permitted within cluster housing concept. However, dwelling units with plinth areas up to 20 sq m should have the scope for adding a habitable room. Group housing in a cluster should not be more than 15 m in height.
- **Size of Cluster:** In ground and one storeyed structure not more than 20 houses should be grouped in a cluster. Clusters with more dwelling units may create problems relating to identity, encroachment and maintenance.
- **Size of Cluster Open Space:** Minimum dimensions of open spaces shall not be less than 6 m or three fourth of the height of buildings along the cluster open space, whichever is higher. The area of such cluster court should not be less than 36 sq m. Group housing around a cluster open space should not be normally more than 15 m in height. Maximum cluster courtyard with the width and breadth should be 13 m.
- **Other requirements:** like fire safety, structural safety design, building services, and plumbing services should be as per the Code.

The general building requirements are as follows:

- **Plotted Development:** Height of plinth to be regulated on the basis of environment and topographical conditions.
- **Size of rooms habitable:** Habitat room 2.1 m to 2.4 m.
- **Water closet, bathroom, kitchen, balcony:** are to be provided as per the standard based on the design with the specific areas.

- **Light and ventilation:** to be provided in accordance with norms.
- **Staircase and circulation area:** to be provided in accordance to minimum standard.

Standards specified for good practices to fulfill the requirements of the urban poor are given below:

Code	Title
IS - 8888 (Part 1) 1993	Guide for requirements of low income housing in urban area
IS - 13727:1993	Guide for requirements of cluster planning for Housing

7. CONCLUSIONS

For different categories of urban poor, the availability of land and the cost of construction are the core issues to provide affordable housing. The development promotion regulations and building byelaws for the urban poor should be city specific, site specific and more flexible. Land should be reserved and developed for the urban poor as specific zone in the city.

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Peri-Urban Areas: A Question on City Sustainability

Supriya Vyas and Ashutosh Sharma

Abstract

While the positive aspect of peri-urban areas is that they provide outlets to the growth pressure on the city, at the same time peri-urban areas are primarily affected by the non-provision of water supply, sewage facilities, electricity, roads, schools, medical facilities, etc. Infact unplanned peri-urban areas put adverse effect on city sustainability. Peri-urban should develop in a certain order, in a manner which resources are used efficiently and do not compromise the options of future generations. Because, these unplanned areas tomorrow will be part of city itself, the authors aurgue.

1. INTRODUCTION

Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. A sustainable community believes that today's growth must not be achieved at tomorrow's expense." A sustainable city enhances the economic, social, cultural and environmental well-being of current and future generations. A sustainable city is "one in which its people and businesses continuously endeavor to improve their natural, built, and cultural environments at neighbourhood and regional levels, whilst working in ways which always support the goal of global sustainable development".

Sustainable development can never be achieved in one day or with one project, it requires a number of initiatives that cover a wide range of development issues. A sustainable city should have functioning infrastructure. It needs people with vision and these people should be responsive to the needs of the people. The city must be a part of the wider sustainable context. It should address alternatives from a wider perspective and require active citizenship and good governance. It must have the capacity to identify problems and produce concrete solutions. It should listen to the children, old people and minorities. Sustainable cities are based on citizens' sense of ownership and responsibility. These are convivial - enjoyable and fun places to live and visit.

Urban expansion is a major reason for the destruction of nature. The disappearance of farmlands in agricultural villages, the loss of rice paddies, and the destruction of forests harm the circulation of rainwater and cause loss of species found in the ecosystem as a whole. The sprawl results in the growth

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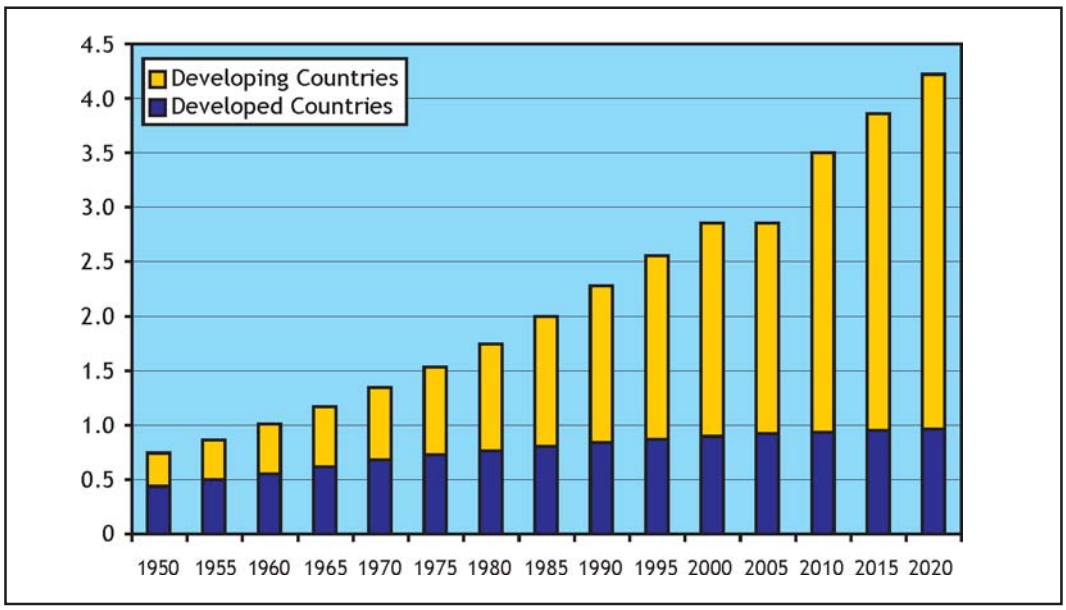
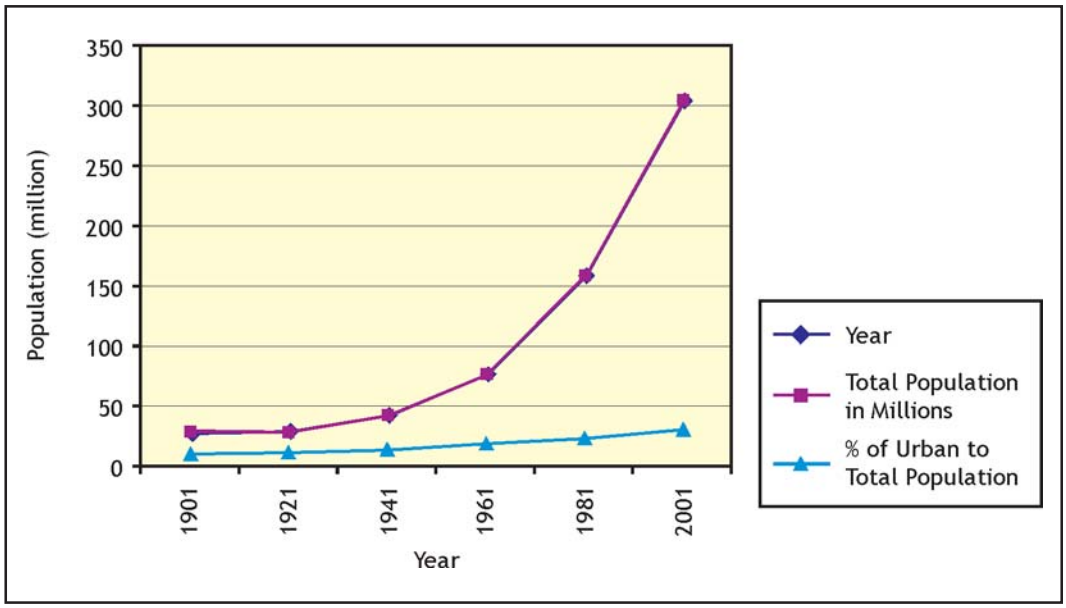
Fig. 1 World Urban Population, 1950-2000 with Projections to 2020 (in billions)



of villages into towns, towns into cities and cities into metros. Developing countries are going through a major phase of urbanization (Fig. 1 and Fig. 2) resulting into increasing Metropolitan cities. In 1991, India had 23 metropolitan cities, which has increased to 35 in 2001.

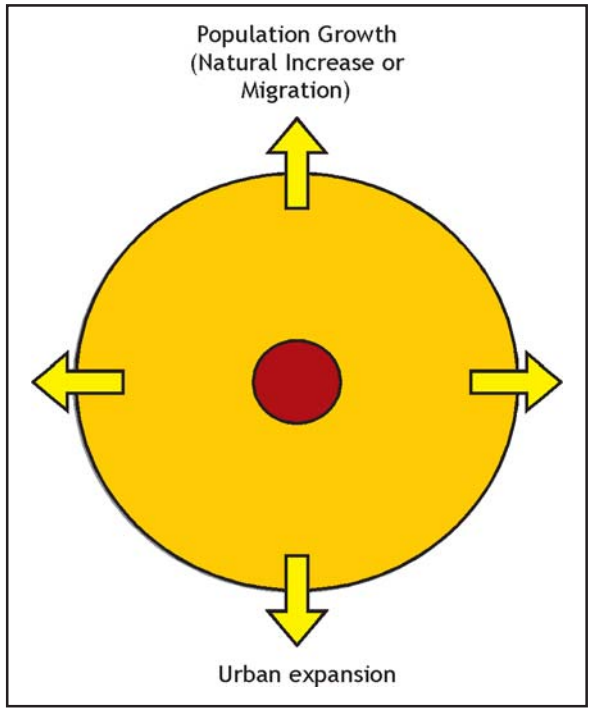
Sustainability of a Metropolitan city depends on the planned growth of its fringe areas/Peri-urban areas. The formation of peri-urban areas provide outlet to

Fig. 2 Increase in Urban Population of India



the growth pressure on the city, and urban expansion (Fig. 3). But there are many negative features that are cause of concern. For a sustainable city, the peri-urban areas should develop in a certain order, in a manner which resources are used efficiently and do not compromise the options of future generations.

Fig. 3 Formation of Peri-Urban Areas



3. WHAT ARE PERI-URBAN AREAS?

Peri-urban areas are outside formal urban boundaries and urban jurisdictions which are in a process of urbanization and which therefore progressively assume many of the characteristics of urban areas.

Fast and unplanned growth into these areas is resulting in, amongst other things, negative environmental health issues and environmental degradation Due to lack of prior planning these outgrowths are devoid of basic amenities like water, electricity, sanitation, etc; resulting in inefficient and drastic change in land use affecting the ecosystem. Infrastructure services in these areas are inadequate to meet even basic needs.

Well functioning and efficient infrastructure ensures our development is environmentally sustainable and climate friendly. Planning and building guidelines and regulations, are not applied in these areas. Managing how and where this growth/expansion occurs are very critical in creating a sustainable city.

4. PHYSICAL CHARACTERISTICS OF DEVELOPMENT IN PERI-URBAN AREAS

These areas are faced with the issue of deteriorating infrastructure. What exist in these areas today are just houses and colonies. There are several residential settlements but the social, physical infrastructures are still lacking.

- As per the surveys done, the following are usually found lacking in these areas:
  - Fire station
  - Main Post office
  - Government Hospital
  - Government Higher Secondary School
  - Government College
  - Playgrounds
  - Gardens

- Water supply, sewage systems, etc.

- Hardly 10 percent colonies are developed after getting permission from Town and Country Planning Department in most of the peri-urban areas.
- Aggregate of open spaces in only some colonies comes near about 10 percent.
- Many of the layout plans were prepared by diploma architects or civil engineers without following development norms.
- Hierarchy of roads is not followed, majority of roads are not tarred and poorly maintained.
- Being outside the boundary of the Master Plan and absence of any institutional structure for provision of infrastructure, peri-urban areas lack proper roads, street lights, drainage and sewerage system, stable power supply, educational and health services, open spaces and recreational areas.
- Such areas are generally within the jurisdiction of the panchayats which neither have neither the financial resources nor the technical expertise to manage them.
- Sewage system - Sewer lines are connected to septic tanks but further disposal from septic tank is done from directly into the adjoining river or other nallas without any treatment. As sewer lines are not designed for high density development, choking problem is common.
- Water supply - All colonies get boring water. This problem is aggravated in summers. Tankers charge very high for water provision.
- Surface drainage - Nowhere or very less provisions for surface drainage have been made.

There are several reasons for fast developments outside municipal limits, some of which are stated below:

- Easy permission process (compared to within limits)
- Low land values
- Not much legal control
- Non-responsive attitude of local bodies.

The incorporation of these areas within municipal limits will require more initial investments than returns to municipal corporation, which is already over-burdened with responsibilities of other areas.

5. MAJOR ISSUES OF PLANNING AND DEVELOPMENT

5.1 Physical

- The development is taking place in a non-contiguous manner. Private developers make developments on small pieces of land. This also creates

the problem of inefficient or almost absence infrastructure. No agency is held responsible for infrastructure development in these areas.

- There is high cost of services provided in scattered settlement, which lead to low level of service provision. Development and building permissions are easier in these peri-urban areas.
- Most of residential land uses are converted into commercial uses by various land owners for profit sake. Mostly there is a linear development along the main roads with commercial activities. A large percentage of land is lying vacant for speculation.

5.2 Organizational

- There is a multiplicity of organizations involved in urban development with overlapping functions. Overlapping functions of different agencies create confusion. Sometimes two agencies are performing the same function. Outside municipal area and within planning area Town and Country Planning Department is entitled to give planning and development permissions whereas *Sarpanch* at *Gram Panchayat* level is also entitled for it under *Gram Panchayat Adhiniyam*. These overlapping functions of various authorities create confusion.
- There is lack of coordination with poor flow of information between the agencies, which results in non-sequential development**.**

5.3 Financial

- There is no system of resource flow in development plan. Funds for urban development are highly inadequate and annual targets and budgets of different agencies are independent of development plan.

5.4 Legal

- Large scale violations of building regulations have taken place in this peri-urban area.
- Non-applicability of construction as per building byelaws.
- Generally there is neither any monitoring nor supervision of the development process.

6. SOME SOLUTIONS: SMART GROWTH POLICIES / URBAN CONSOLIDATION POLICIES

City outskirts are subjected to fast growth which is unplanned and unregulated. In order to control urban sprawl, certain growth management techniques need to be followed.

Smart growth, good growth, sustainable development, whatever the terminology, the goals are the same: to preserve and enhance the quality of life for the

region's citizens. Good growth does this by promoting a sense of community in new and expanding areas while protecting the integrity and vitality of existing communities thereby strengthening the region as a whole. It is a new term for an old idea – growth management, which is a strategy that communities have used for approximately forty years. The idea behind smart growth is to create compact cities and a compact city means less urban sprawl into peri-urban areas. Some of the primary tools used in growth management include zoning, development buffers, urban growth boundaries, cluster development, etc.

6.1 Urban Growth Boundary

An urban growth boundary or UGB is a regional boundary set in an attempt to control urban sprawl by allowing the area inside the boundary for higher density urban development and the area outside for lower density development. The UGB is line drawn on planning and zoning maps to show where a city expects to grow. By law, it is required to maintain a 20 year supply of land within the boundary.

Land outside the UGB will remain rural. The amount of land to be included in the UGB depends on how much the city is expected to grow. With regard to the city's expansion it is this area that will eventually be developed. The first phase of this development is the planning and execution of urban services like sewers, streets, etc; and finally urban development takes the course.

The boundary controls urban expansion into farm and forest lands. They have saved a great deal of farmland from urban sprawl. They have led to better coordination of city and county land use planning. And they have brought greater certainty for those who own, use, or invest in land at the city's edge. The UGBs virtually force a town to undertake a more sophisticated, long term structural approach to fostering economic and community vitality rather than just letting sprawl happen.

Land inside the urban growth boundary supports urban services such as roads, water and sewer systems, parks, schools and fire and police protection that create thriving places to live, work and play. The urban growth boundary is one of the tools used to protect farms and forests from urban sprawl and to promote the efficient use of land, public facilities and services inside the boundary.

Each of Oregon's 241 cities is surrounded by an 'urban growth boundary'. Hence, the Urban Growth Boundary or UGB is a proactive management tool to contain, control, direct growth in order to promote more compact, contiguous development thereby reducing the cost of service provision. US States like Oregon, California and Washington have successfully implemented UGBs.

6.2 Build Mass Transit

If a city has good rail and bus lines, then development can be concentrated around mass-transit stops rather than spread out all over the countryside.

Public transport is still a tough sell in the U.S., but rail lines in most of the world have kept sprawl from being even worse than it is. Says Tony Burton, a member of the Council for the Protection of Rural England: "The dilemma is, if you don't build roads, what you do? Well, for a start, you prevent sprawl." Curitiba, Brazil, is an up-and-coming city in which an efficient bus system has helped hold down road building.

6.3 Compact Development

Creating environments that are more compactly built and use space in an efficient but more aesthetic manner can encourage more walking, biking, and public transit use. The 'compact' city increases the proportion of high density city living.

6.4 Restore Inner Cities / Use Existing Assets

For decades to come, population growth will put more pressure on our wide-open spaces. So before the human race gobbles up any more land, we could make much better use of what we've already taken. Focusing development in communities with vacant land or intensifying development of underutilized land can make better use of public infrastructure, including roads.

7. CONCLUSIONS

Urban areas in developing countries are growing fast and they are indeed very dynamic. The limitation of resources, especially land, and the demand of basic urban infrastructure should be considered before it turns to be a serious problem. In spatial context, urban structure and land use pattern tends to growth expansively and become uncontrolled urban sprawl and conurbation which converse agricultural land with any impacts that occur. This fact is far from the compact city concepts, which is believed as a sustainable urban form in developed countries. Sustainable development and sustainability have become important concepts in today's urban planning field, with the recognition that current consumption and living habits may be leading to problems such as the overuse of natural resources, ecosystem destruction, urban heat islands, pollution, growing social inequality and large-scale climate change. The challenge facing today's urban planners' lies in the implementation of targeted policies and programs, and the need to modify existing urban and regional institutions to achieve the goals of sustainability. Until and unless these sprawls are not regulated, city sustainability shall be put to a question.