

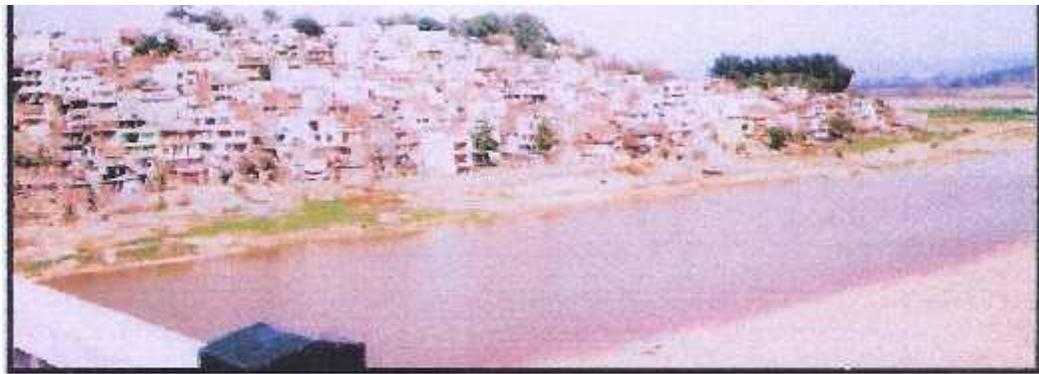
ENVIRONMENTAL IMPACT ASSESSMENT STUDY

of

URBAN SPRAWL

on

Jammu City



By
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Government of Jammu & Kashmir

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From the Editor's Desk



Mutaharra A W Deva

Urban Sprawl is the uneven expansion of land use which has happened in the Jammu city. Urban Sprawl is accompanied by many developmental and health hazards. There is virtually no piece of land left in Jammu City.

Apart from extensive pollution problems it brought with it, urban development in Jammu, of which urban sprawl is a part, may deprive the poor sections of the society of economic opportunities. When jobs, stores, good schools and other resources migrate outwards from the core of the city, poverty is concentrated in the old city and its neighbourhood that has been left behind. Urban sprawl has aggravated poverty at least for a selected group of people in old Jammu city and it may contribute to the burden of disease and mortality. Recently the emission of obnoxious gases from the manhole of one the old city school in which many children were taken ill is a point in this direction.

There is an urgent need to recognize and understand the health costs of urban sprawl, we have to design solutions in an urban planning approach that is known as smart growth characterized by higher density, more contiguous development, preserved green spaces mixed land uses with walkable neighbourhoods limited by transportation alternatives, architectural, heterogeneity and a balance of development and capital investment between central city and its periphery, which is growing at an alarming rate.

Jammu needs attention of planners and environmentalists alike so that urban sprawl is arrested.



Demography:

The state of Jammu and Kashmir is the northern most part of the region and is a Himalayan state. The state is distinctly divided into 3 photo-geographical regions of Ladakh, Kashmir and Jammu.

The broad & important demographic details of the state are as under:-

IMPORTANT DEMOGRAPHIC FEATURES OF J&K STATE CENSUS 2001 Jammu and Kashmir

| | | | |
|--|------------------------|------------|-------------|
| Area in sq. kms | | | 2,22.236 * |
| No. of Districts | | | 14 |
| No. of Tehsils | | | 59 |
| No. of CD. Blocks | | | 121 |
| No. of Villages | | | 6652 |
| Total population | | Persons | 1,01,43,700 |
| | | Males | 53,60,926 |
| | | Females | 47,82,774 |
| Decadal population growth 1991-2001 interpolated | Absolute | Persons | 41,56,311 |
| | | Percentage | 29.98 |
| Population density | Per sq.km. | | 100 |
| Sex ratio | Females per 1000 males | | 892 |
| | | | |
| Literacy | Absolute | Persons | 48,07,286 |
| | | Males | 30,60,628 |
| | | Females | 17 ,46,658 |

Source: Digest of statistics 2005(DES)

1. Including 78,114 sq. Kms under illegal occupation of Pakistan, 5,180 sq Kms illegally looted by Pakistan to China and 37,555 sq kms under the illegal occupation of China in (Ladakh) district.
2. The Population figures exclude population of areas under unlawful control of Pakistan and China where census could not be taken.
3. Population figures for 1991 are interpolated as no census was conducted in the state in 1991.

HISTORICAL BACKGROUND OF JAMMU CITY:

While hunting at the foothills of the Shivaliks near the picturesque Tawi River, Raja Jambulochan witnessed a tiger and a goat drinking water from the same pond. Fascinated by this, the king decided to build a city at this site. It is believed that Raja Jambulochan founded the city in the 14th century BC.

There is not much historical evidence of the growth of city except that the city grew around the temples and shrines constructed by Hindus and Muslims under the patronage of different kings. Growth of city is of medieval character with a wide bazaar and narrow streets and lanes, single storeyed buildings adjoining each other. The layout however indicates that there has been a deliberate effort to plan the old city in an orderly manner. The city was divided into various mohallas named after the dominant community/caste, e.g. Malhotrian Mohalla, Afghan Mohalla, etc.

Dogra rule started in 1846 with Maharaja Gulab Singh as the first ruler of the Dogra dynasty. Dogras made Jammu the capital of the state to meet administrative exigencies. Maharaja Gulab Singh constructed the old Secretariat Complex at a commanding height. The market functioned at the centre and the lowest class of the society settled on the outskirts. This is evident from the buildings like old secretariat and Palace Complex, Raghunath Bazar and Gummat Bazar in the centre and Gujjar Mohalla on the banks of Tawi River. The Dogra rulers took keen interest in the construction of temples. Development of city centred around these temples for example, Raghunath Temple in Raghunath Bazar, temples of Savitri and Devi Trikuta in Jullakha Mohalla, Mahalaxmi temple, Hanuman Temple, Laxmi Narayan temple, etc. This has given a vertical form to Jammu city which to this date dominates the city structure as a whole.

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Maharaja Pratap Singh (1885-1925) contributed to the physical development of the city by constructing Tawi bridge, hospital, schools and colleges, Silk Factory and Dak Bangalow at Residency Road. He also added infrastructure on modern lines by constructing Ranbir Canal which is a life line for agriculture of Jammu district, power house, a pumping station at River Tawi to supply piped water to the city and the Banihal cart road connecting Jammu with Srinagar. The physical character of the city improved considerably in a lateral form with the construction of new roads and provision of infrastructure. Accordingly Rehari colony was laid with regular plots, grid-iron pattern of road system and open spaces

Development oriented towards expansion of industry and provision of community facilities and infrastructure alike. Aerodrome at Satwari, SMGS Hospital and Reservoir at Parade ground were constructed. The city actually took shape in 1962 and its municipal limits extended on both banks of Tawi River over an area of 16.87 sq.km. The urban agglomeration is now expanding beyond the municipal limits and had engulfed an area of 143.52 sq.km. till 1994. The city area now extends upto Bhalol Nallah in South, Narwal Bala and Channi Himmat in east, Patoli Brahmana and Bantalab in north and village Muthi and Aquilpur in the west. The urban sprawl is at a highest ebb in Jammu city. Here sprawl is taking place right and left without any planning.

With rapid pace of urbanization and development of economic activities in Jammu, the city's influence has been increasing in range and impact.

Jammu province is one of the three provinces of the state, covering an area of 14,602 sq.km., the others being Kashmir and Ladakh. It lies between the plains of Punjab in the south and south west, the high

mountains of Pirpanjal ranges in the north and the Himalayas in the north-east. Physically, administratively and socially, the province may be divided into three regions i.e. Doda-Udhampur, Poonch-Rajouri and Jammu-Kathua.

Three regions of Jammu Province:- viz. Doda-Udhampur, Poonch-Rajouri and Jammu-Kathua, cover 62, 16 and 22 of the total area of the province respectively. Jammu province has population density of 103 persons per sq.km. against density of 59 persons per sq.km. of the state. Rural population in Jammu Region has grown by 29.26, whereas urban population has increased by 49.03 during the decade 1971-81. Trend of urbanization in various districts of Jammu region are as under:

URBAN POPULATION IN DISTRICTS OF JAMMU REGION

| S.No. | Districts | Percentage of Urban Population to Total Population | | |
|--------------|----------------------|--|--------------|--------------|
| | | 1961 | 1971 | 1981 |
| 1. | Jammu | 24.54 | 25.81 | 29.64 |
| 2. | Udhampur | 6.41 | 8.38 | 9.53 |
| 3. | Kathua | 7.49 | 9.08 | 11.38 |
| 4. | Rajouri | 3.59 | 3.80 | 4.97 |
| 5. | Poonch | 6.60 | 8.80 | 6.32 |
| Total | J&K State | 16.66 | 18.26 | 21.05 |

Source: Digest of Statistics 1996.97. Directorate of Economics & Statistics, Govt. of J&K State.

DISTRICT-WISE FOREST AND GEOGRAPHICAL AREA AS ON 2005

| S.No | Division | District | Geographical Area | (Sq. Kms) | |
|------|---------------------|----------|-------------------|------------------------------|--|
| | | | | Forest area by working plans | Percentage of Forest area to Geographical area |
| 01 | Jammu | Doda | 11691.00 | 5555.00 | 47.52 |
| | | Udhampur | 4550.00 | 2343.00 | 51.49 |
| | | Kathua | 2651.00 | 991.00 | 37.38 |
| | | Poonch | 1674.00 | 951.00 | 56.81 |
| | | Rajouri | 2630.00 | 1267.00 | 48.17 |
| | | Jammu | 3097.00 | 959.00 | 30.97 |
| | Total Jammu: | | 26293.00 | 12066.00 | 45.89 |

Source: Digest of statistics 2000 & working plans

Note provisional

* Excludes area under illegal occupation of China.

**Excludes area under illegal occupation of China & Pakistan. @Estimated figures, No working plan exists for Leh & Kargil.

Note:-

Total geographical area of J&K State is 2,22,236 Sq. Kms and it includes 1,20,849 Sq. Kms area under illegal occupation of China and Pakistan.

| <u>The break-up of this area is given as under:</u> | <u>Sq. Kms</u> |
|--|----------------|
| ../ Area under illegal occupation of Pakistan. | 78114 |
| ../ Area under illegal occupation of China in District Leh | 37555 |
| ../ Area illegally handed over to China by Pakistan | 5180 |
| ../ Total | 120849 |

SALIENT FEATURES OF FOREST AREA

| Year | Geographical area (Sq.Krns) | Forest Area(Sq. Kms) | age of Forest area to Geographical area () |
|---------|--------------------------------|----------------------|--|
| 1947 | 2,22,236 | 26,900 | 12.10 |
| 1950-51 | 2,22,23 (101387) | 20,800* | 20.52 |
| 1960-61 | 2,22,236 (101387) | 20,800* | 20.52 |
| 1970-71 | 2,22,236 (101387) | 20,857* | 20.57 |
| 1980-81 | 2,22,236 (101387) | 20,174 | 19.89 |
| 1990-91 | 2,22,236 (101387) | 20,182 | -19.90 |
| 2000-01 | 2,22,236 (101387) | 20,230 | 19.95 |
| 2005 | 2,22,236 (101387) | 20,230 | 19.95 |

Note:

1. Figures in parenthesis indicate Geographical area under Actual Control
2. * Includes Forest area under Administrative Control of Wildlife Department as reported in Forest Digest 2000

METEOROLOGICAL INFORMATION

Climate and Rainfall:

Five broad macro-climatic zones have been differentiated as sub tropical, valley temperate, dry temperate, cold arid and intermediate zones, while defining the climate of the state of J&K.

Sub-tropical Zone:

The mean height above the sea level ranges from of 300 meters to nearly 1350 meters. These areas constitute the parts of Jammu, Kathua, Udhampur, Poonch and Rajouri Districts. Monsoon is the source of precipitation; Hot summers and relatively dry, but pronounced, winters are experienced.

Valley temperature zone:

The mean height above sea level ranges from 1560 meters to about 4200 meters. The zone essentially covers the Kashmir Valley and inner Himalayan Valley, mid height altitudes of Temperature Zone. Wet and cold winters, relatively dry and moderately hot summers are its main features.

Dry Temperate:

Altitude ranges' between 1350 meters to more than 3000 meters includes all the areas above the outer hills, including major parts of the district of Poonch, Rajouri and Doda Districts. Monsoons being the source of precipitation; relatively wetter and colder weathers are experienced.

Cold Arid Zone:

Includes high altitude areas of inner Himalayas with severe cold but dry winters and moderately hot and dry summers. The zone covers the districts of Ladakh and Kargil in the East and Gilgit and Adjacent areas in the North West. The altitude ranges from 2900 meters to peaks ranging from 7200 meters to more than 8400 meters.

Intermediate Zone

Broadly covers mid and high altitude areas of Doda, Poonch, Rajouri and Udhampur. From October to June, the rainfall pattern resembles closely to that of the valley Temperate Zone. The summer rainfall, however, resembles the precipitation pattern of sub-tropical zone. The tables contain / Station-wise Number of rainy days/rainfall and month wise temperatures recorded.



Haphazard Structures are coming up everywhere
No piece of land is left in jammu where construction
activities are not taken up



ANNUAL RAINFALL IN JAMMU PROVINCE

| S.No | Station | Rainfall in (mms) & number of rainy days | | | | | | | |
|------|----------|--|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | | 2001 | | 2002 | | 2003 | | 2004 | |
| S.N | Station | No of rainy days | Total rainfall | No. of rainy days | Total rainfall | No. of rainy days | Total rainfall | No. of rainy days | Total rainfall |
| 1 | Mansar | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 386.0 |
| 2 | Udhampur | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 789.0 |
| 3 | Kathua | 56 | 1467.0 | 41 | 964.0 | 53 | 1807.0 | 49 | 1052.0 |
| 4 | Basoli | 85 | 1938.7 | 82 | 1158.8 | 80 | 1662.0 | 63 | 1784.8 |
| 5 | Rajouri | 63 | 818.4 | 0 | 0 | 66 | 996.7 | 0 | 0 |
| 6 | Akhnoor | 54 | 1327.4 | 46 | 959.8 | 68 | 2074.0 | 51 | 1637.9 |
| 7 | Khore | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 773.3 |
| 8 | Poonch | 73 | 1058.0 | 0 | 0 | 56 | 721.0 | 66 | 649.0 |
| 9 | Billawar | 87 | 1668.0 | 77 | 1119.14 | 91 | 1761.0 | 16 | 01496.0 |

Source:- Digest of Statistics 2004-05(DES)

Mean Maximum & Mean Minimum Temperatures at Jammu

| S.No | Month | Mean Minimum | | | | Mean Maximum | | | |
|------|-----------|--------------|------|-------|------|--------------|------|------|-------|
| | | 2001 | 2002 | 2003 | 2004 | 2001 | 2002 | 2003 | 2004 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 01 | January | 5.9 | 7.9 | 5.5 | 8.9 | 17.3 | 19.7 | 14.8 | 18.0 |
| 02 | February | 10.6 | 10.4 | 10.8 | 10.9 | 24.2 | 25.5 | 22.5 | 23A |
| 03 | March | 15.2 | 16.0 | 14.7 | 17.3 | 28.7 | 28.1 | 26.1 | 31.4 |
| 04 | April | 20A | 21.8 | 20.1 | 23.1 | 33.4 | 34.7 | 33.4 | 34.6 |
| 05 | May | 26.1 | 26.2 | 24.3 | 24.2 | 38.9 | 40.5 | 37.7 | 38.8 |
| 06 | June | 25.1 | 26.7 | 26.5 | 25.9 | 35.1 | 38.7 | 39.2 | 36.9 |
| 07 | July | 25.4 | 26.0 | 25.3 | 25.1 | 33.0 | 37.1 | 34.1 | 35.2 |
| 08 | August | 25.5 | 25.8 | 25.2 | 24.8 | 34.1 | 33.4 | 33.6 | 33.2" |
| 09 | September | 22.9 | 22.1 | 23.5. | 24.0 | 33.2 | 31.7 | 32.8 | 33.5 |
| 10 | October" | 19.9 | 19.1 | 18.4 | 17.8 | 32.2 | 30.7 | 30.2 | 29.5 |
| 11 | November | 13.8 | 13.8 | 13.1 | 13.4 | 27.5 | 27.0 | 21.8 | 26.7 |
| 12 | December | 9.3 | 10.5 | 9.6 | 10.0 | 22.2 | 22.3 | 20.8 | 21.8 |

Source:- Digest of Statistics 2004-05(DES)

SPRAWL IN JAMMU:

The problem created by the haphazard and unrestricted growth of a city is what is called an Urban Sprawl which give rise to problems like unhygienic slums, polluted environment, paternities development of residential industrial and commercial areas resulting in traffic bottle necks and many other problems all known and felt by the residents of the city. A particular proceeds lead to a particular pattern. In turn the process its<it)s dependent an serial factors like the history of the region, its site and situation, the social curtains, the population, the administration, so and so forth. An insight into the problems created by the haphazard growth of a city can be engaged from all these different variables.

Demographic pressure is the main cause of expansion, the sprawl of Jammu has promoted an urge to correlate the population with the spatial expansion. Population acts on lead through a spectrum of activities which can broadly be classified as agricultural, commercial, industrial, transportation, administration. Amenities and daily needs of individuals, which has a permanent impact on urban growth. The factors like rugged topography, water barriers, river are central sprawl of a city. The urban process especially in the developing countries are the result of a very complex system with varied and numerous elements acting in two different directions, one in the direction which provides the way for growth and lead to engulfment of the surroundings and the other regards quality of urban life like pollution to suggest suitable planning process to count the undesirable consequences of urban sprawl on the city's land pattern and quality of life.

The main emphasis in any plan of urban land use is on the planned location and development of important land users like residential,

industrial, commercial and transportation areas. All these complex and interacting and under dependent elements in urban land use and growth can form an inter urban analysis system checks the expansion.

Nothing of this sort has happened in Jammu, while planning. The need is to bring these diametrically offered elements to a neutral and common point and then re-direct in a desired manner in Jammu Planning.

In this direction, achieving a correct approach towards urban sprawl of Jammu City we need to :

.../ To identify the process of sprawl.

.../ To attempt a typology of urban sprawl.

.../ To analyze the relationship between urban sprawl and emerging land use pattern in Jammu .

.../ To probe into the relationship between urban sprawl and determinants

The spatial pattern of urban activities and physical setting of sprawl is closely associated with land use types. The traffic nodes are assured to be most important factor for the begging of a settlement hence most important factor i.e. governing the rate and growth of an area. With the establishment of the industry population is attracted from various directions in search of economic activities service, commercial and other activities follow to buzzing around the area.

Vehicular Population:

The tablesl data shows tremendous increase in Vehicular Population when it is a direct indication of urban sprawl due to large scale car dependent communities are developed.

| STATEMENT SHOWING THE VEHICLES POPULATION REGISTERED IN | | | |
|--|---------------------------------|---------------|------------------------------|
| JAMMU DISTRICT AND JAMMU DIVISION UPTO 31.01.2009 | | | |
| S.No | Items | Jammu | Total Jammu Division. |
| 1 | REGISTRATION OF VEHICLES | | |
| a | Buses | 5547 | 5720 |
| b | Mini Buses | 6721 | 8672 |
| c | Cars/St. W | 69697 | 75139 |
| d | TaxiiTS/MV | 3653 | 5825 |
| e | Jeeps/Gypsy | 6465 | 6887 |
| f | 3-wheeler(P/LC) | 13037 | 14756 |
| 9 | 2-wheeler | 227461 | 248239 |
| h | Tractor(Pvt) | 8611 | 10339 |
| i | Trailers | 101 | 330 |
| j | Trucks | 22005 | 23250 |
| k | Others | 5271 | 5930 |
| | Total: | 368569 | 405087 |

**STATEMENT SHOWING THE TOTAL NUMBER OF VEHICLES POPULATED
YEAR-WISE OF JAMMU REGION**

| S.No | Items | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | Total | Average |
|-------------|---------------|----------------|----------------|----------------|----------------|----------------|---------------|----------------|
| 1. | Buses | 112 | 94 | 60 | 101 | 106 | 473 | 95 |
| 2. | Mini Buses | 520 | 429 | 210 | 248 | 250 | 1657 | 331 |
| 3. | Cars/StW | 4298 | 5512 | 5820 | 6155 | 6497 | 28282 | 5656 |
| 4. | Taxi/TSMV | .184 | 405 | 658 | >340 | 254 | 1841 | 368 |
| 5. | Jeeps/Gypsy | 163 | 53 | 43 | 253 | 46 | 558 | 112 |
| 6. | 3-wheeler (P) | 266 | 317 | 393 | 312 | 206 | 1494 | 299 |
| 7. | 3-WheelerUC | 573 | 527 | 878 | 1178 | 925 | 4081 | 816 ' |
| 8. | 2- Wheeler | 14862 | 15810 | 12632 | 1743 | 15262 | 75998 | 15200: |
| 9. | Tractor(Pvt) | 610 | 626 | 593 | 565 | 589 | 2983 | 597 |
| 10. | Trailers | 15 | 14 | 8 | 3 | 17 | 57 | 11 |
| 11. | Trucks | 969 | 926 | 919 | 843 | 1532 | 5189 | 1038 |
| 12. | Tanker | .35 | 22 | 39 | "96 | 18 | 210 | 42 |
| 13. | Ambulance | 74 | 88 | 22 | '39 | 30 | 1253 | 51 |
| 14. | Others | 67 | 122 | 35 | 11 | 212 | 447 | 89 |
| | Total: | 22748 | 24945 | 22310 | 27576 | 25944 | 123523 | 24705 |

**STATEMENT SHOWING THE VEHICLE POPULATION AS ON
31.03.2007**

| | 31.03.20 06 | 04/06 to 061 06 | 071 06 | 08/06 | 09/06 | 101 06 | 11/06 | 12/06 | 01/07 | 02/07 | 03/07 | G total |
|-----------------|----------------|-----------------------|-----------|-------|-------|-----------|---------|-------|-------|-------|--------|---------|
| | | | | | | | | | | | | |
| U -I | 5528 | 24 | 13 | 8 | 3 | 5 | 7 | 9 | 10 | 4 | 23 | 5334 |
| | 7066 | 70 | 23 | 23 | 24 | 15 | 30 | 21 | 12 | 15 | 17 | 7316 |
| | 54454 | 1703 | 707 | 481 | 560 | 520 | 50 4 | 430 | 373 | 696 | 523 | 60951 |
| | 4425 | 76 | 28 | 22 | 19 | 26 | 15 | 28 | 12 | 11 | 17 | 4679 |
| | 6751 | 19 | 6 | 2 | 8 | 0 | 0 | 0 | 0 | 5 | 6 | 6797 |
| | 11488 | 373 | 104 | 60 | 68 | 105 | 85 | 141 | 50 | 69 | 76 | 12619 |
| | 206697 | 4191 | 1302 | 1183 | 1462 | 131 1 | 1598 | 1053 | 851 | 1214 | 1097 | 221959 |
| | 8875 | 155 | 75 | 50 | 66 | 37 | 40 | 38 | 34 | 50 | 44 | 9464 |
| | 288 | 1 | 0 | 1 | 3 | 3 | 1 | 0 | 5 | 1 | 2 | 305 |
| | 19532 | 340 | 124 | 99 | 168 | 155 | 15 5 | 107 | 98 | 158 | 158 | 21094 |
| | 4501 | 6 | 7 | 0 | 29 | 4 | 56 | 32 | 42 | 1 | 53 | 4731 |
| 329305 | 6958 | 2389 | 1929 | 2410 | 2181 | 2491 | 1859 | 1487 | 2224 | 2016 | 355249 | |

When the regular service began in the Jammu city, suburbs continued to develop slowly but steadily due to the transportation advances such as commuter trains and street cars. As automobile ownership became widespread sub urban growth continued. In recent years rapid expansion of the metropolitan area has been referred to as urban sprawl referring to a complex pattern of land use, transportation and social economic development. As city of Jammu has extended into rural areas, large tracts of land are developed in a leaf frog low density pattern. Different land use housing, retail stores, industries recreational facilities and public spaces such as parks are kept separate from each other extensive roads needs to be constructed for sub- urban dwellers. Most trips even to buy a news paper or a quart of milk, you need to drive a car. Shifting to new suburbs requires demographic changes and in the form of our environment might also be expected to have health implications both positive and negative. Some of these effects relate directly to heavy reliance an automobiles, air pollution and accidents are common. Other effects relate to land use pattern that typically sprawl are sedentary life style, threats to water quality and quantity. Finally some mental health and social capital effects are mediated by the social dimension of sprawl. Many of these individual health effects are individually recognized as environmental health issues and certain aspects of sprawl such as reliance an automobiles have been analyzed as public health issue. Yet the broad phenomenon of sprawl, a complex of issues related to the land use transportation, urban and regional design and planning, has been the intellectual property of engineers and planners.

Mobile sources account for approximately 30 emissions of oxides of nitrogen and 30 of Hydrocarbon emissions.

The recent research establishes that sprawl as measured by low residential density, low employment density, low connectivity and other indicators is associated with less walking and bicycling and with more automobile travel than denser communities low level of activities threaten with both health directly

as well as indirectly. A sedentary life style is well defined risk factor for cardiovascular and other such diseases.

Sprawl may threaten with quantity and quality of water supply. As forest cover is cleared and impervious surface built over large areas, rainfall is less effectively absorbed and refused to ground water acQifer instead relatively more storm water flows to streams and rivers and is carried downstream, one study found that 4 of rainfall on undeveloped grass land captured with 15 of rainfall on sub urban land was lost a run off. The same is true of snow melt.

High density development patterns can reduce peak flows and total run off volumes with less ground water recharge communities that depend on ground water for their drinking water may face shortage. Water quality may be effected in several ways. Water pollution has emerged as the major threat to water supplies. Non-point source water pollution occurs and water quality and quantity are directly affected by land use and development patterns and evidence suggests that sprawl contributes to these problems in very specific ways.

One of the original motivations to the suburbs was access to nature. People like trees, birds and flowers are more accessible in the suburbs than in dense urban areas. More over contact with nature may offer benefits beyond the purely aesthetics and it may benefit with mental and physical health. Certain aspect of sprawl such as commuting may exact a mental health toll. For some time automobile commuting has been a source of street stress related health problems and even physical ailments.

The heat effect that is on warm days in urban areas can be 6_8⁰ C warmer than surrounding areas, the effect known as an urban heat island. It is caused by two factors. First dark surface such as road ways and rooftops efficiently absorb heat from sunlight and reradiate it as thermal infrared radiation. There surfaces can reach temperatures higher than surrounding area. Secondly urban centres are relatively devoid of vegetation, especially trees that would provide shade and



Old City of Jammu presenting a very congested look
Direct view of Gujarnagar on River Tawi



cool the air, through evapo-transpiration. As cities sprawl, outward heat inland effect expands both in geographical extent and intensity. This is especially true if the pattern of development features extensive tree cutting and road construction.

In Jammu metropolitan expansion involves a positive feed back loop that may aggravate the heat island effect. Sprawling metropolitan areas with greater travel distances generate a large amount of automobile travel which inturn results in more fuel consumption with more production of Carbon Dioxide and consequent contribution to climate change.

There are 2 area of Jammu city. Trans Tawi a natural feature makes a boundary between old city and new city. The new city is exploding and old city is static and is cultured around Raghunath Bazar etc.

The rate, type, direction of urban sprawl is governed by the Geology, climate, history, demographic trends and population growth.

Urban sprawl is directly linked to population growth and an awkward and irregular spatial growth of a town mainly due to increase in population can be termed as urban Sprawl. Hence, if an area is under the jurisdiction of municipality and boundary and grows outward without any check, it's considered as sprawl. The area which the increasing population occupies and the infilling of vacant lands within any area is an example of under bound sprawl.

Jammu, the city of temples and the winter capital of J&K state has a distinct image due to its heritage, location and linkages. With the enactment of the J&K Urban development Act 1970, the Jammu Development Authority was constituted in 1971. The Authority prepared the first Master Plan for Jammu for a 20 year perspective plan.

The city has in recent years, faced unprecedented growth of population due to influx of migration from the valley and rapid growth of commercial and industrial activities. The demand for serviced land increased tremendously to accommodate the increasing population and diversified economic activities in and around the city. The increased demand of serviced land could not match with supply. As a result, the city experienced large scale development on private land without any planning norms which are now causing severe environmental problems. The old city has been further densified alongwith commercial activities thereby increasing the problems of traffic congestion, water and power shortage and environmental degradation this scenario has led to a severe urban sprawl.

An environmental plan is required to be planned to limit urban sprawl to achieve an appropriate balance between the spatial allocation for various activities i.e. housing, employment, social infrastructure, organized shopping centres, transport, adequate arrangements and reservations to accommodate different kinds of physical infrastructure and public utility systems.

Jammu has two distinct natural features viz., the River Tawi and Forests. No further infringement of the forest area should be allowed. River Tawi needs to be channelised for making available and freeing large areas, to be developed for recreational uses to be integrated with other developments so that the river forms an integral part of the city, physically and visually. Natural forests need to be protected to maintain ecological balance. Jammu also has a number of rain-fed nallahs which need to be channelised for rain water harvesting.



The old city area and its extensions which constituted Planning Division-A of Master Plan 1994 is highly congested and thickly populated with a variety of misuse zones and the pattern of development is unique compared with other parts of Jammu. All economic, social, government and cultural activities are concentrated in this area, on one hand and many unauthorized housing colonies have mushroomed, on the other hand, in the area extending upto Janipur Nallah from to the west of B.C. Road. The pattern of development is such that there is no scope of further development in this area on the basis of standard planning policies and controls.

The two districts of the region viz. Jammu and Kathua have shown greater increase of urban population than Udhampur and Rajouri districts. Due to disturbances on the border areas, the urban population in Poonch declined during 1971-81. The trend of fast urbanization in Jammu district is mainly on account of urban sprawl of Jammu. Jammu alone accommodates 79.81 % of urban population of Jammu district.

Jammu district had total population of 9,43,395 persons in 1981 which comprised of 4,91,972 males and 4,51,423 females. The distribution of population in rural and urban areas and number of villages and towns at tehsil level of Jammu district is reflected.

| Population as per census of 2001 | | | | | | | |
|----------------------------------|----------|---------|-------|---------|---------|---------|---------|
| S.No | District | Rural | Urban | Total | Rural | Urban | Total |
| 9. | Jammu | 2969.5 | 127.5 | 3097.0 | 887554 | 701218 | 1588772 |
| 10. | Udhampur | 4529.9 | 20.1 | 4550.0 | 626882 | 116627 | 743509 |
| 11. | Doda | 11655.5 | 35.5 | 11691.0 | 644234 | 47695 | 691929 |
| 12. | Kathua | 2634.7 | 16.3 | 2651.0 | 1356 | 78728 | 550084 |
| 13. | Rajouri | 2612.0 | 18.0 | 2630.0 | 449629 | 33655 | 483284 |
| 14. | Poonch | 1663.6 | 10.4 | 1674.0 | 348635 | 23978 | 372613 |
| Total Jammu | | 26065.2 | 227.8 | 26293.8 | 3428290 | 1001901 | 4430191 |

Source: Director Economics & Statistics/Digest

The Jammu tehsil tops all other tehsits both in the size of population and the number of villages within its jurisdiction followed by Samba tehsil. All other tehsils have a small urban component, the least being in Akhnoor. District of Jammu is bounded by Udhampur district in its north, Gurdaspur district of Punjab in south and the border of Pakistan in south.west. It is spread over an area of 3097 sq.kms its northern part comprises of Shivalik hills with extensive forest cover. Its southern belt of 1931 sq.km. has rich agriculture due to alluvial soil. Administratively, the district has been divided into five tehsils viz. Jammu, Akhnoor, Samba, RS. Pura and Bishnah with headquarter at Jammu.



DECADAL CHANGE IN DISTRIBUTION OF POPULATION IN JAMMU DISTRICT

| S. No. | Tehsils of Jammu Distt. | Percentage of decadal variations (1971-1981) | | |
|--------|----------------------------|--|---------|----------|
| | | Total | Rural | Urban |
| 1. | Jammu | + 25.85 | +16.45 | + 36.02 |
| 2. | Samba | + 37.32 | + 20.30 | + 354.84 |
| 3. | R.S. Pura | + 24.81 | + 22.85 | + 61.35 |
| 4. | ~khnoor | + 34.66 | + 35.11 | + 26.03 |
| 5. | Bishna | + 46.11 | + 50.03 | + 30.53 |
| 6. | Total | + 30.16 | + 24.42 | + 46.15 |

Source: Census of India 1981, District Census Handbook, Jammu

The Table above reveals that Jammu district has registered a growth rate of 30.16 in population in the decade 1971-81 which is slightly higher than the growth rate of the state as a whole which stands at 29.69 .The growth rate is 46.15 of urban population is significantly high. It is significant to note that Samba has the highest growth of urban population mainly due to the notification of Vijaypur and Bari-Brahman as urban agglomerations. Bari- Brahamana has become part of Jammu city's urban sprawl and Vijaypur, a satellite township of Jammu. Urbanizing trend in the various districts of Jammu region and tehsils of Jammu district indicate that Jammu town has considerable influence on other towns in the region.

URBANIZATION TREND IN JAMMU DISTRICT:

Growth of Jammu urban agglomeration has been very fast. Many villages falling under Bishnah, Samba and Jammu tehsils have now come under urban sprawl of Jammu city. The impact of urbanization on Jammu district with the growth of the city can be adjudged from the trend of decadal change in urban population in adjoining districts of Jammu city.

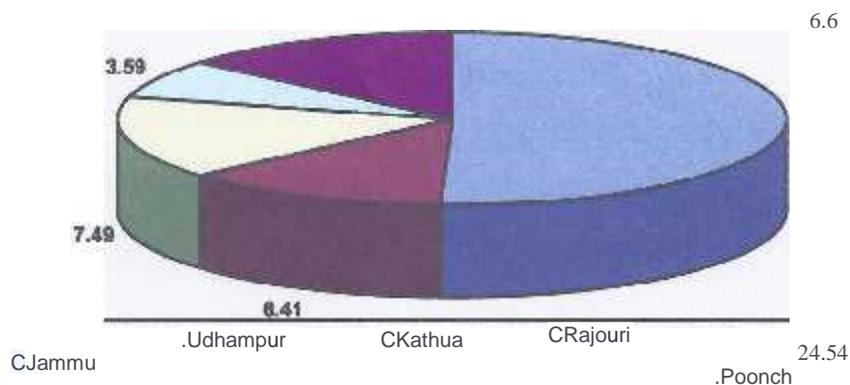
**PERCENTAGE DECADAL VARIATION IN POPULATION
SINCE 1901 FOR JAMMU**

| S.No | State/ District | Percentage decada/ variation | | | | | | | | | |
|------|-----------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | 1901-11 | 1911-21 | 1921-31 | 1931-41 | 1941-51 | 1951-61 | 1961-71 | 1971-81 | 1981-91 | 1991-01 |
| 1. | Doda | +8.10 | +0.87 | +13.68 | +7.38 | + 16.52 | +14.18 | +30.38 | +24.27 | +28.09 | +27.03 |
| 2. | Udhampur | +7.54 | +4.45 | +6.37 | +8.62 | +10.28 | +9.32 | +31.61 | +32.37 | +29.32 | +27.73 |
| 3. | Poonch | +9.80 | +5.13 | +8.25 | +10.17 | +5.01 | -.+4.78 | +10.52 | +31.27 | 929.40 | +28.44 |
| 4. | Rajouri | +7.74 | +7.22 | +5.52 | +10.79 | +3.40 | +3.52 | +26.73 | +39.16 | +26.38 | +26.41 |
| 5. | Jammu | +4.24 | +2.26 | +10.96 | +15.03 | +10.23 | +9.28 | +41.25 | +30.16 | +29.78 | +29.77 |
| 6. | Kuthua | +1.60 | +1.59 | +4.64 | +10.27 | +8.40 | +7.75 | +31.74 | +32.91 | +21.94 | +22.21 |

This table shows that in Jammu district the decadal increase is as under:

| | | |
|---------|---|---------|
| 1901-11 | = | + 4.24 |
| 1911-21 | = | + 2.26 |
| 1921-31 | = | +10.96 |
| 1931-41 | = | +15.03 |
| 1941-51 | = | +10.23 |
| 1951-61 | = | + 9.28 |
| 1961-71 | = | + 41.25 |
| 1971-81 | = | + 30.16 |
| 1981-91 | = | + 29.78 |
| 1991-01 | = | + 27.77 |

GRAPH SHOWING DECADED VARIATION OF URBAN POPULATION IN YEARS IN DISTRICTS OF JAMMU REGION



AREA, POPULATION AND DENSITY OF DISTRICTS OF JAMMU PROVINCE (1981 CENSUS)

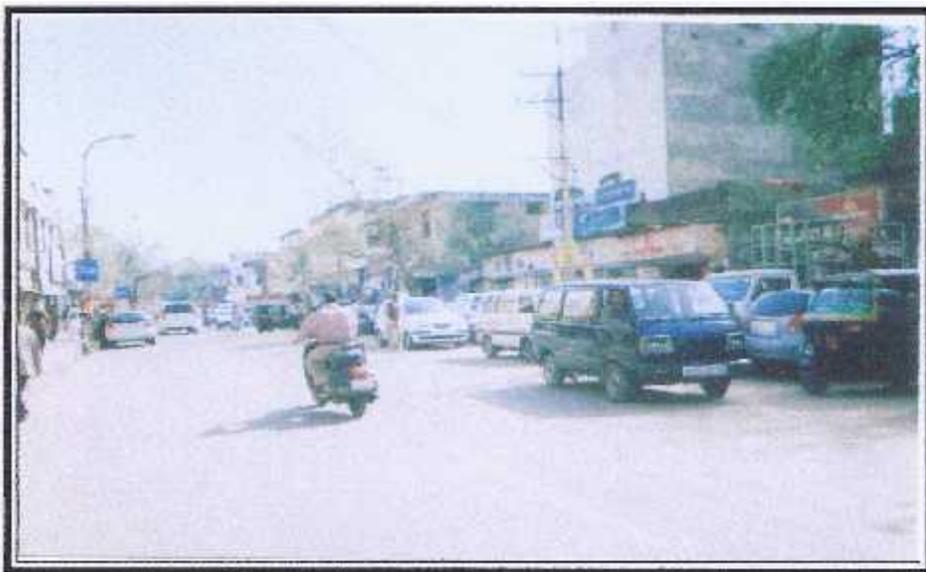
| Sl. No. | District | Area (Sq.Km.) | Total Population | | Density Per sq.km. | |
|------------------------------------|-----------------------|---------------|------------------|-----------|--------------------|-------|
| | | | 1981 | 1991@ | 1981 | 1991@ |
| 1. | Jammu | 3097 | 9,43,395 | 12,07,936 | 305 | 390 |
| 2. | Udhampur | 4550 | 4,53,636 | 6,02,807 | 100 | 132. |
| 3. | Kathua | 2651 | 3,69,123 | 4,92,288 | 139. | 186 |
| 4. | Rajouri | 2630 | 3,02,500 | 4,17,333 | 115 | 159 |
| 5. | Poonch | 1674 | 2,24,197 | 2,92,207 | 134 | 175 |
| 6. | Doda, Kishtwar Region | 11691 | 4,25,262 | 5,25,326 | 36 | 45 |
| Total Jammu Province (1+2+3+4+5+6) | | 26,293 | 27,18,112 | 35,37,897 | 103 | 135 |
| J&K State | | 2,22,236 | 59,87,389 | 17,18,700 | 59 | 76 |

Source: Digest of Statistics 1994.95 J&K Govt., Planning & Development Deptt. (Directorate of Economics & Statistics).

@1991 Figures are as per estimates based on the total estimated population of the state published by the Census Deptt.



Huge roads and buildings of Bahu Plaza
Boom of Concrete Structures in Bahu Plaza Area



LITERACY:

Literacy rate in Jammu district was 42.6 percent against 26.67 for the state as a whole. Break up of literacy rate of population of Jammu district is given as under:

LITERACY RATE OF JAMMU DISTRICT (1981)

| Area | Literacy rate | | |
|-------|---------------|--------|-------|
| | Male | Female | Total |
| Urban | 66.45 | 52.19 | 59.75 |
| Rural | 46.62 | 24.05 | 35.74 |
| Total | 52.60 | 32.24 | 42.86 |

Source: Census Handbook Jammu 1981.

Literacy rate in urban Jammu was 59.75 which was significantly higher than 35.74 for rural Jammu. Literacy rate among urban females was also quite high, but urban males outnumber the females. Jammu (Me) tops all other towns of the district, with a literacy rate of 63.79, which is the highest in the state.

The rural area of Jammu on the periphery of the city has special significance. Jammu district has 1192 villages, out of which 1054 are inhabited. More than 1/4 th of the villages are within a radius of 15-20 kms from Jammu city. Rural areas in the periphery of Jammu city provide sufficient scope for the current urban sprawl. Under the Master Plan 1974-94, 47 villages adjoining the city, were included in the urbanisable limits. The city is expanding very fast in size and shape. The urban extensions have engulfed many more rural areas especially towards the south side.

As a rough estimate, more than 1000 hectares of agricultural land is being converted to urban use every year. Urban sprawl is also depleting forest reserves. Ribbon development is occurring towards south on NH-1A and along the railway line. Outgrowth of satellite townships i.e. Bari Brahman, Samba and Birpur is also occurring and the land pockets with defence establishments around the city periphery are also a part of the sprawl.

The Ranbir Canal irrigates most of the agricultural land from north west to south and south-west of Jammu district. The area is highly rich in agriculture, famous for basmati rice which are not only locally consumed but also exported.

Urbanization offers opportunities for increasing employment. Increasing workforce participation rate in Jammu during last three decades shows that diversification of economic activities has attracted migrants from rural areas and other parts of the state.

WORK FORCE PARTICIPATION RATE, JAMMU

| Year | WFRR (%) |
|------|----------|
| 1971 | 24.85 |
| 1981 | 27.84 |
| 1994 | 28.82 |

Source: District Census Book Jammu, 1981 and Household Survey, 1994. JDA,

The extension of area under urban use was necessitated on account of phenomenal growth rate of population in Jammu after 1961. Population of Jammu (including Cantonment) was 1.08 lakh in 1961 which increased to 1.64 lakh in 1971, showing decadal growth rate of 51.68 and it further increased to 2.231 lakh in 1981 with decadal growth rate of 36.02. Census for 1991 could not be conducted in J & K. However, JOA conducted a

Household Survey in 1994 as part of the Master Plan exercise. On the basis of data collected, the population of Jammu (excluding Cantonment) was estimated as 7.28lakh, showing an increase of 226.42 during the last 14 years. This unprecedented growth rate of population may be attributed to huge influx of migration from valley after 1989 due to militancy, migration of work force from rural areas of Jammu and other states of the country, increase in the number of pilgrims to Yaishno Devi during recent years resulting in rapid expansion of commercial and transportation activities.

The genesis of growth of Jammu lies in the rapid urbanization as is evident from the spatial growth of the city after the seventies. Jammu was spread over an area of 18.30 sq.km. in 1969 which increased to 21.42 sq.km. in 1973 at the time of preparing the Jammu Master Plan 1974-94. Satellite imageries taken in 1986, 1990 and 1995 reveal that Jammu urban agglomeration has spread over an area of 73.12 sq. km., 93.42 sq.km. and 143.52 sq.km. respectively. Satellite imageries also revealed that Jammu is facing lateral expansion of corridor type, along the roads towards the south, south east and south west. Studies have revealed that rural areas especially towards south have undergone extensive transformation from agricultural use to urban use. A large number of rural properties are being divided and sub-divided to be used for residential, industrial and commercial purposes. The agricultural areas falling within the limits of the Jammu Master Plan 1974-94 have extensively been converted into unauthorized residential colonies. The green belt has been eroded. Area under protected forest is being encroached upon by the unscrupulous colonisers. This urban sprawl brings with it unprecedented problems.

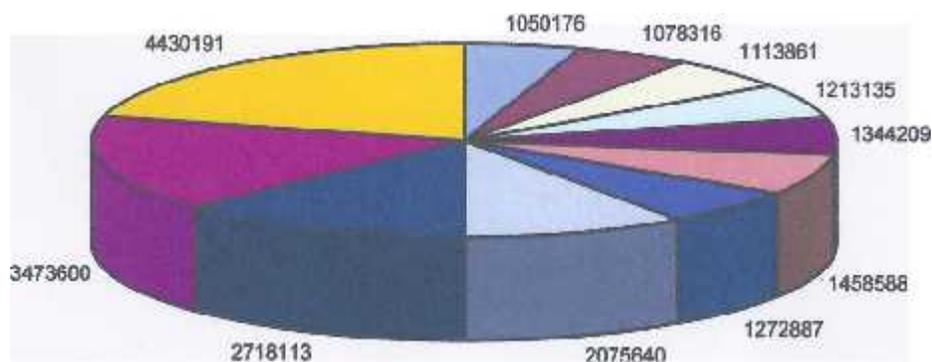
The more the city grows, the more complex become its problems of land, housing, transportation and provision and management of essential

infrastructure. Jammu at present is facing all these problems and if a well planned strategy is not adopted to contain sprawl, the city problems may become alarming and unmanageable. Therefore the strategy lies in limiting urban growth within a specified boundary to save agricultural land and channelising growth to bring relief to the 'core city'. This calls for regional development planning approach by developing Akhnoor, Gajansoo etc,

Growth in Population during Ninety Years.

| S.No. | District/Region/State | Year | Persons | Decadal Increase | Decadal Increase |
|-------|-----------------------|------|----------|------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Jammu & Kashmir State | 1901 | 2139362 | - | - |
| | | 1911 | 2292535 | 153173 | 7.16 |
| | | 1921 | 2424359 | 131824 | 5.75 |
| | | 1931 | 2670208 | 245849 | 10.15 |
| | | 1941 | 2946728 | 276520 | 10.36 |
| | | 1951 | 3253852 | 307124 | 10.42 |
| | | 1961 | 3560976 | 307124 | 9.44 |
| | | 1971 | 4616632 | 1055656 | 29.65 |
| | | 1981 | 5987389 | 1310757 | 29.69 |
| | | 1991 | 7803900 | 16511 | 30.34 |
| | | 2001 | 10143700 | 2339800 | 29.98 |
| 2 | Jammu Region. | 1901 | 1050176 | 28140 | 2.68 |
| | | 1911 | 1078316 | 35545 | 3.30 |
| | | 1921 | 1113861 | 96275 | 0.64 |
| | | 1931 | 1213135 | 134074 | 11.08 |
| | | 1941 | 1344209 | 134074 | 11.08 |
| | | 1951 | 1458588 | 114339 | 8.51 |
| | | 1961 | 1572887 | 114339 | 7.84 |
| | | 1971 | 2075640 | 502753 | 31.96 |
| | | 1981 | 2718113 | 642473 | 30.95 |
| | | 1991 | 3473600 | 755489 | 27.79 |
| | | 2001 | 4430191 | 956591 | 28.87 |

Growth in Population during Ninety Years.



01901 .1911 01921 01931 .1941 01951 .1961 01971 .1981 .1991
02001

PHYSIOGRAPHY

The Greater Jammu area falls in sub Himalayan region. It can be sub-divided into two physiographic units; the Outer Plains and the Outer Hills of Shivaliks.

The elevation of this tract varies from 280-400 MSL. The outer plains lie parallel to the mountains in Jammu. The streams, ravines and gullies issuing from these mountains run across this plain which is dissected into



Sprawling neighbourhood of areas adjoining Narwal



Population explosion on the sides of River Tawi

series of plains. The lower slope of Shivalik hills having an attitude of 320-400 MSL constitute what is called Kandi area, which is formed due to the reworking of upper Shivalik boulder beds. This region is characterized by thirsty soils, very deep water table and acute shortage of water. Every shower of rain deprives the soils of its clay contents and more and more pebbles, boulder beds are exposed due to rampant erosion. Gandhi Nagar, Shastri Nagar, Sanjay Nagar, Satwari, New plots, Patla, Paloura, Railway Station & University Campus fall in Kandi belt. For most of the year, these ravines, locally called Khads are transformed into gushing torrents. The areas located on left bank of River Tawi and area between Jewel Chowk and Shori (Talab Tillo) on the right bank of River Tawi fall in the outer plains of Jammu.

To the north of outer plains, stands the outer most range of the Shivaliks. These are also called the foot hills. The Shivalik hills slope gently and slopes are covered with boulders and pebbles. The Shivalik hills like the outer plains, are also dissected by ravines and on this account they represent the appearance of isolated hills and broken hills ranges. Most parts falling on right bank of River Tawi such as Mubarkmandi, Pacca Danga, New Janipur, Roopnagar & Bantalabstie on these hills.

Ghomanasa, R.S. Pura, Arnia, Sishnah, Vijaypur, Samba, etc., where work centres may be created to attract work force from urban areas of Jammu and provide education, health facilities, recreation, cultural activities and physical infrastructure

POPULATION:

Jammu was a small town before fifties but started growing in size and shape after 1971. The growth of population in Jammu since 1941 is given below:

CENSUS POPULATION OF JAMMU CITY

| Census Year | Population | Decadal growth (in age) |
|-------------|------------|----------------------------|
| 1941 | 58,847 | - |
| 1951 | 83,551 | 41 .98 |
| 1961 | 1,08,257 | 29.56 |
| 1971 | 1,64,207 | 51.68 |
| 1981 | 2,23,361 | 36.02 |
| 1991 @ | 5,88,412 | 163.43 |
| 1994* | 7,27,940 | +225.90 |

Source: Census District Handbook, Jammu. @ Estimated 1991 census was not conducted in J & K state. Estimated by Household Survey conducted by JDA. Population growth in 1994 over 1981

With rapid industrialization, urbanization and mass migration from Valley, (between 1989 to 1994), the population of Jammu grew to 7,27,940 representing 225.90 increase over 1981 population. Now Jammu is one of the fastest growing city in India in terms of population and area. Besides this increase in residential population, the floating population of pilgrims to Mata Vaishno Devi, military and para military forces and their families stationed at Jammu also add to the population of Jammu.

Jammu is located in the extreme corner of the country. The city is surrounded by subsistence agricultural and industrial economies and protected by stringent regulation against settlement by outsiders. Socio-economic and political compulsions have been pushing intra-regional migration to the city which is one of the main reasons for phenomenal growth of population. In fact, in-migration to the city from hinterland is directly proportional to the impoverishment of rural economy. Subsistence agricultural practices, fragmentation of land holdings and steep rise in

population have pushed more and more people out of the rural economy in search of employment in the city. Annual rate of intra-regional migration is estimated between 29 to 35. The city faced unprecedented migration of about 2 lakh. During the period 1989-94. On going militancy in the state has pushed out a large number of Muslim families from Valley to settle in the city. The migrants have purchased land either to settle permanently in Jammu or have an alternative house. Because of legal restrictions, there was check on inter-regional migration. In order to fill the gap of demand and supply of labour in the fast diversifying economy and flourishing construction activity, more than 40,000 to 50,000 workers have migrated to Jammu from Bihar, AP and MP in search of employment. Besides in-migration, floating population which constitutes pilgrims to Mata Vaishno Devi, Amarnath Yatra military and para military forces and their families is also adding about 2 lakh people to the population annually. Darbar Move brings about 18000 families from Srinagar to Jammu for six months of winter.

POPULATION GROWTH:

Jammu was a very small town in 1901. Over a period of time, it has developed in structure and size. The increase in its size can be judged from the decadal growth of population from 1901 to 1981 as given below:

CENSUS POPULATION OF JAMMU CITY

| Year of Census | Population | Decadal Growth Rate |
|----------------|------------|---------------------|
| 1901 | 36,130 | |
| 1911 | 31,726 | (-) 02.29 |
| 1921 | 31,506 | (-) 00.69 |
| 1931 | 42,794 | (+) 35.83 |
| 1941 | 58,847 | 32.51 |
| 1951 | 83,551 | 41.98 |
| 1961 | 1,08,257 | 29.56 |
| 1971 | 1,64,207 | 51.68 |
| 1981 | 2,23,361 | 36.02 |
| 1991 | 5,88,412* | 163.43 |
| 1994 | 7,27,940 | |

a

Source: District Census Handbook, Jammu District, 1981 .. Estimated as 1991 census was not conducted in J & K. 1994 figures are based on Household Survey.

The above table demonstrated that the growth rate for the first two decades(viz. 1901-11 and 1911-21) was negative. From 1931 growth rate is positive but the trend is fluctuating from "highest growth rate of 51.68 during 1961-71 to lowest 29.56 in its proceeding decade i.e. 1951-61.

ROAD LENGTH & COMPOSITION IN JAMMU

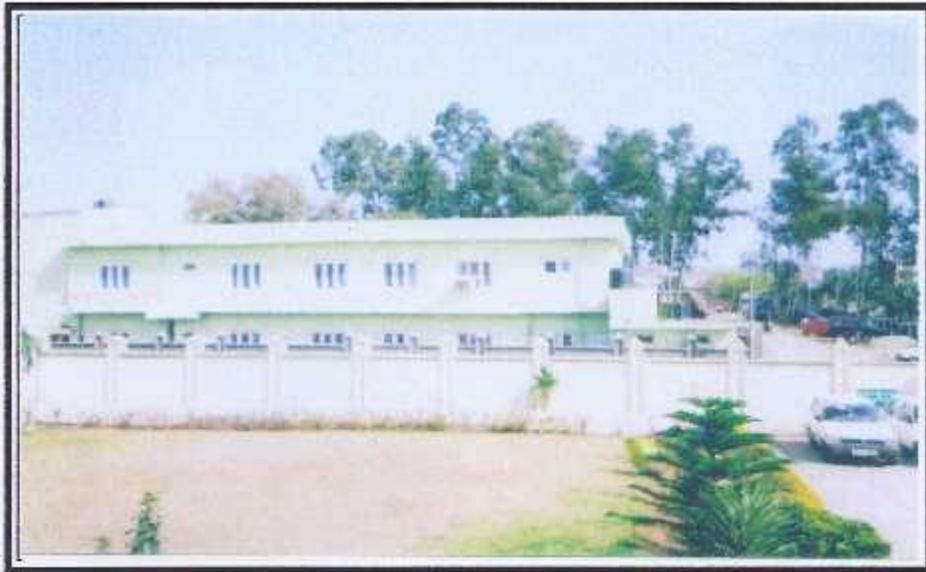
ROAD LENGTH MAINTAINED BY R&B DEPARTMENT EXCLUDING NATIONAL HIGHWAYS IN JAMMU DIVISION

| | | | | | | | |
|--|--------------------------|---------------|---------------|--------------|----------------|----------------|----------------|
| 1 | Jammu/samba | 2184.41 | 64.93 | 32.93 | 2282.27 | 176.90 | 2459.17 |
| 2 | Kathua | 836.23 | 8.15 | 10.71 | 855.09 | 136.40 | 991.49 |
| 3 | Udhampur reasi | 584.63 | 207.82 | 98.47 | 890.92 | 339.54 | 1230.46 |
| ~ | Rajouri | 345.42 | 13.77 | 0.00 | 359.19 | 159.15 | 518.34 |
| 5 | Poonch | 201.81 | 103.29 | 84.67 | 389.77 | 242.35 | 632.12 |
| 6 | Doda/kishtwari Ramban | 334.95 | 308.39 | 25.23 | 668.57 | 434.99 | 1103.56 |
| TOTAL | | -87.45 | 706.35 | 25201 | 5445.81 | 1489.33 | 693514* |
| -Including 527.60Km road length under PMGSY(Annexure Enclosed) | | | | | | | |

ROAD MILEAGE IN JAMMU -DISTRICT

| S.No. | District | BT | MT | FAIR WEATHER | Total |
|--------------|-----------------|-----------|-----------|-------------------------|--------------|
| | | | | | |

| | | | | | |
|----|--------------|---------|--------|--------|---------|
| 1. | <i>Jammu</i> | 2169.06 | 143.07 | 284.56 | 2596.69 |
|----|--------------|---------|--------|--------|---------|



A common site in Jammu City now

IMPACT OF EXTRANEIOUS FACTORS IN URBAN SPRAWL:

Besides natural growth of population, Jammu faced some important extraneous factors which cannot be ignored. These factors are: in-migration from valley, In-migration of labour, darbar movement and. inflow of tourists, yattris, etc.

The statistics of the migrant families as provided by the Relief Commissioner (Refugees), Jammu as on April, 1999 is given below:

| | | |
|---|----------|---------------|
| ~ Migrants families registered at Jammu | = | 29,074 |
| ~ Migrants families registered at Delhi | | 19,338 |
| | = | |
| ~ Migrants families registered with other states= | | 2,743 |
| TOTAL | = | 51,151 |

MIGRATION FROM VALLEY

| Year | No. of families | Population |
|------|-----------------|------------|
| 1991 | 50,000 | 2,75,000 |
| 1994 | 38,500 | 1,92,500 |
| 2001 | 32, 000 | 1,60,000 |
| 2011 | 32,000 | 1,60,000 |
| 2021 | 32,000 | 1,60,00 |

Interview with migrants revealed that there is little possibility of return of Hindu families to Valley, even if normalcy is restored in the near future. At present; Muslim families are also migrating to Jammu and many of them have constructed their residential houses in Jammu. Even if peace is completely restored in Valley, the migrants may like to keep their second residential house in Jammu. In view of these ground realities, the number of migrant families have taken as constant i.e. 32,000 for future decades.

LABOUR MIGRATION TO JAMMU

| Period | Decadal Labour Migration (in No.) (based on DGR of 31.12) | Annual Labour Migration (in Nos.) (based on AGR of 3.12) |
|-------------|---|--|
| 1981-1991 | 99,106 | 9,910 |
| 1991- 2001 | 1,53,288 | 15,329 |
| 2001- 2011 | 2,25,670 | 22,567 |
| 2011-2021 • | 3,32,223 | 33,222 |

At present 8000 employees move with Darbar. Interviews with employees at Jammu revealed that 1/3rd of these employees belong to Jammu province and rest 2/3rd come from Valley. The families of Jammu based employees reside in Jammu city or rural areas of Jammu Province. As such the valley based employees. Approx. 28,000 population is added to Jammu's population during six months of winter. This estimation will hold good in future also. In addition to population of Darbar Movement, floating population is attracted to Jammu.

FLOATING POPULATION:

The total floating population including tourists and yattris of Vaishnodevi and other religious places has been 66,000 per day at peak

period in 1981. Assuming 20 increase per decade, the floating population works out to 1.76 lakh.

Conservation of Natural Features:

Conservation of major natural features in a settlement is of utmost importance to sustain the natural eco-system. Forests in the north and north east edges of Jammu, Tawi River flowing through the city; orchards and irrigated agricultural areas falling in the north-west of Akhnoor Road and southwest of NH-1A towards R.S. Pura are the major natural features in Jammu. Conservation of these enforcing strict measures will control urban sprawl to a large extent.

Jammu has more than 100 small and big dry khads which have flash floods during rainy season. These seasonal nallahs should be channelised by making check dams to harvest rain water in small ponds. This will not only help in raising the ground water level but will also improve the ecology and make available some land for urban uses.

Through Ranbir canal, ice-cold water of Chenab River flows through the city area. Along this canal, there are some patches of land, which can be developed into beautiful parks and picnic spots. As a development policy, besides using canal water for drinking purpose both sides of the canal may be developed for recreational use. If River Tawi is channelised, Jammu can have a distinct image. Channelisation will also free large areas for recreational use integrated with other development so that the River becomes an integral part of the city both physically and visually.

Jammu represents a mix of medieval congested settlement, planned colonies and unauthorized settlements with poor infrastructure. The environmental problems of these settlements differ from each other but

have common problems of poor physical and transportation infrastructure. As such it is imperative to take up the existing residential areas one by one for environmental improvement through:

- ./ Plantation and landscaping
- ./ Improvement in infrastructure: physical and social, and provision of proper access where lacking .
- ./ Exploring the possibility of infrastructure management through local residents or associations of the residents .
 - ./ Efficient public transport system need be made efficient.
 - ./ Intersection improvements.

Urban sprawl in Jammu is engulfing more and more villages in its fold. About 117 more 'villages will be added to urbanisable limits under the Master Plan: 2021. These rural settlements are having a completely different character and are now getting merged into the urban environment. These settlements should also get the modern services and amenities and allow to cater for their cultural style. Development of villages, therefore, should be made integral part of the development scheme of the area. Education, health care creational facilities and work areas around these settlements should be developed for the benefit of the village population. Urban Sprawl has to be limited.

Conservation and regeneration is required in case of the old city. The old city has a historical past. Its feudal design is noticeable even today in Purani Mandi and Mubark Mandi Complex. The old Secretariat (in Mubarak Mandi), Hari Singh Palace, Library, Museum, Raghunath Temple, Ranbeshwar Temple, Panjvakather Temple and many other temples and shrines in the city are very old and have heritage value. To preserve

heritage, these historical places are required to be listed and conserved. Urban sprawl should not reach there sites.

LAND POLICY AND LAND STATISTICS

Urban land being scarce, the allocation of the most appropriate land uses are important economic and social decisions. On such vital decisions depend, the future development of the urban area and its influence on surrounding rural hinterland. It is all the more essential in the case of a town like Jammu with its unique spatial characteristics, that the policy relating to the development of urban land is devised to cater to the genuine demands of the people for land to be used for residential, commercial, industrial, defence and other purposes. The urban land policy should also take into consideration the perspective of economic development likely to take place in the next 20 years.

The basic intention of urban land policy is to minimize the misuse of land and rationalize the conversion of agricultural and forest land into non-agricultural uses.

| Item | Area in hectares |
|--|-------------------------|
| ∴ Total area according to village papers | 320119 |
| ∴ Area under Forests | 40238 |
| ∴ Land put to non-agricultural users | 30556 |
| ∴ Barren and uncultivable land | 70800 |
| ∴ Total | 101356 |
| ∴ Permanent pastures and grazing land | 13609 |

| | |
|--|--------------|
| ∴ Land under miscellaneous tree crops not included in area sown | 2227 |
| ∴ Culturable waste land | 31487 |
| ∴ Total | 47323 |
| ∴ Fallow land other than current fallows | 1359 |
| ∴ Current fallows | 25824 |
| ∴ Total | 27183 |
| ∴ Net area sown | 104019 |

DISTRICT -WISE FOREST AREA

| | |
|----------------------------|-----------------|
| ∴ Jammu Forest | 957 Sq Kms |
| ∴ Wildlife Area | 256.50 Sq. Kms. |
| ∴ Banjar Kadeem | 1120 |
| ∴ Banjar Adhoc(Waste land) | 16210 |
| ∴ Kah Charie | 22800 |
| ∴ Ghair Mumken | 84479 |
| ∴ Janglat | 3809 |
| ∴ Meazan Kul | 162818 |
| ∴ Non agriculture | 162818 |
| ∴ Total Agriculture | 266946 |