CHAPTER – 7

MANAGEMENT PLAN

➢ Present Setups
➢ Future Setups and Master Plan 2021
City management has a direct and immediate effect on the quality of life of the citizens. A successful city management system should create a strategically-oriented organization that optimizes its operations to serve the city's residents in the most effective and efficient way (www.lavasafuturecities.com).

Indian Urban Local Bodies are framed to effective management and utilization of urban resources. But, by their working styles and outcome, it appears that these are not as much effective as ought to. Mumbai still floods every year during the monsoons, water supply in Delhi is still erratic, our biggest rivers still dirty & polluted and slum population in out-metros are continuously growing. City managers cannot be completely absolved of this blame (www.lavasafuturecities.com). The reasons of failure of system may be the lack of knowledge and understanding of actual problems with which the people are suffering. In India, the citizens of a city do not have a direct role in the functions and policy framing of the municipality/local body. This is a systemic error independent of the region or state and need wide discussions.

The management of city to a large extent depends on its design and planning. The old cities that have long historical evolvement, are often suffers with failure of minimum living environment in some or other parts. In India there are few planned cities. Most of the cities are historically developed with their rapid growth of population. Landuse in such cities face many problems like air/water pollution, lack of residential houses, slums and traffic congestion etc. Owing to increasing pressure of population on land, people are rushing towards cities and towns for the better employment opportunities and facilities such as education, health and other basic amenities. Consequently, many problems have risen in the Indian cities. In this light, the study of growth of the urban population and capacity of city resources to bear and sustain this pressure is of great concern to the geographers and town planners.
Good city management endeavors to provide a congenial environment to its citizens, giving them a sense of security and well-being. Tokyo, for instance, regarded as one of the best managed cities in the world with a highly efficient public transport system, low crime rate and world-class infrastructure to support business activities. Most of the European cities consistently rank high in various “Quality of life” surveys conducted across the world, on aspects such as public safety, public transportation, utility services and green initiatives (www.lavasafuturecities.com). It is needless to say that Indian cities never find a mention in the top rankers of any such rankings that are compiled on the basis of the quality of life and the status of available amenities to its citizens. The basic reason behind the fact may be the huge population of India which is also fastly migrating towards urban areas, worsening the available poor system. The urban planning interventions at right time especially in developing cities (like Hisar) would be very helpful for its long future.

City planning and management is very diverse and broad field. It is not a single discipline but a group that incorporates experience of diversified fields related with physical as well as cultural aspects. It is also a dynamic field which keeps on changing itself. The excerpts from literature of professionals explains the same in brief as- ‘During the 19th century, traditional urban planning systems based on the Master Planning Approach were absorbed worldwide through mechanisms of colonial and market expansion and intellectual exchange. Modernist urban planning approaches led to the creation of comprehensively planned cities such as Brasilia and Chandigarh. These cities, while designed with large open public spaces and monuments, offered no consideration for surrounding cultures or social norms. As this approach was focused on spatial intervention, it failed to accommodate the aspirations of the majority of inhabitants, leading to social and spatial marginalization.

The urban planning exercise is an integrated approach wherein from economic development and population diversity to social interactions, all aspects are affected. It associates not only economic growth but also many other fields of urban areas as traffic and road planning, healthcare, infrastructure, variations in demographics, landuse and education etc.
In recent years, engaging direct citizen participation has gained importance with the decentralization of the government decision making processes and ‘Inclusive Urban Planning’ has been widely promoted by organizations like the World Bank. However, its success is dependent on multiple factors such as political priorities, local capacity and the engagement of the most vulnerable sections of the society.

‘Think Globally, Act Locally’ is the new way associated with urban planning as planners have moved from their traditional technical solutions that involved only statistical estimations and forecasts to local communities. (www.lavasafuturecities.com). Cognizance of the history, culture and ecology of the region are also undertaken in this modern approach to find specific tailor-made solutions to urban planning problems.

More emphasis is now drawn towards ecological or environmental aspects in modern day urban planning process. To achieve this, built up as well as natural environment is equally focused in carving out new areas in a city and to modify already established structures. These maintained city are termed as environment friendly city which is one that minimizes waste and economizes to the maximum, for example, prioritizing the use of public transport over private transport to conserve fuel, to create awareness among citizens towards conservation of water and energy, promoting recycling of both solid waste and grey water, minimizing waste and diverting it to landfill sites and protect and plant the trees etc.

Lack of proper land use control is resulting in poor land use compatibility in most of Indian cities. The haphazard and uncontrolled developmental activities leads to overuse, congestion, incompatible landuse which creates high risk environment to the city residents in the form of deterioration of the natural and socio-economic living conditions (Babu, R. et al).

On the basis of these new approaches and aspects of urban planning and management, an attempt has been made to formulate a general strategy for sustainable development of Hisar city. In previous chapters, many type of analysis at micro and macro level were carried out. On the basis of the results, the future planning of city
has to be analysed. The present set ups as well as the future set ups of Hisar city, that would take place has been taken into account. The present setups cover the urban area of Hisar including urban growth in and out of municipal limits. The unplanned and planned area in the morphology of city has also been dealt with in this discussion. As future setups, the master plan of Hisar for the year 2021 has been taken into consideration.

7.1 PRESENT SETUPS

Present setups include the entire urban area of Hisar whether falls within or out of municipal limits. Total area covered by the city is 57 sq. kms excluding the cantonments. The main emphasis of the study is to analyse the environmental profile of different area of the city and find out possible strategy or remedies to improve the unhealthy conditions, if any. If an area is developed by proper planning agency, the parameters like sufficient open spaces, green cover or belts, recreational features as gardens, playgrounds, parks etc, are being given due considerations. On the other hand, the areas developed either itself or by unauthorized agencies; would hardly fulfill the above said environmental parameters. The environmental conditions in such areas are usually suffers from erratic planning and un-conducive living conditions.

7.1.1 AREAS OF UNPLANNED GROWTH

The areas of unplanned growth in Hisar city have poor environmental conditions which are reasoned to its unchecked growth. Lack of green spaces as well as open spaces causes the living atmosphere very stifle here. Highly congested colonies with improper and haphazard street network further exaggerate the situation. These congested structures not only enhance thermal severity in summers but also hinders the air flow through buildings due to increased friction. This, in turn makes a day warmer to surroundings because the upflow of air is retarded due to low inflow. The only cooling factor is nocturnal radiations which also upheld by multistoried buildings. Thus, the period of summer remains unbearable in the congested unplanned city. The other seasons also have many different problems. Most of this area (old city)
is covered by ward numbers 5, 6, 8, 9, 17, 18 and 19. The area is fully builtup and oldest part of the city. About 17% population of the city resides in this area and is exposed to various health problems like stress, asthma, hypertensions etc.

**Recommendations**

The area under these wards is fully built up and mostly owned by private holdings. It is being the most cumbersome task to convince the residents to spare some portions in public interests for maintaining living environment. In such conditions, a very little can be done to control and maintain the conducive environment in unplanned area of the city. For appropriate environmental planning and management of this area, following suggestions/recommendations are proposed:

1. Old fort area which is highly congested and built within fort walls; and old town which is also highly congested outgrowth around fort walls & gate due to increased population and haphazard development (Fig.-7.1) are characterized by deep urbanity. Because of unavailability of any substantial parcel of land, the only way to enhance green space is through plantation on roads or in streets. The streets are narrowed by ramps or jutting of upper stories in the form of eaves. This practice has to be checked and the streets are to be broadened as much as they can. Trees, which grow higher, but not wider should be planted with high density along the roads or on the dividers.

2. The vertical accretions are hindrance in this region as it would further deteriorate the environment of ground floor by choking the sunlight. The smell of solid wastes & sewerages and higher moistures prevails in ground floors which can easily be cleared by providing open spaces to reach the sunlight and to flow of winds.

3. The remnants of fort/palace of Firoz shah i.e. Gujri Mahal should be protected form encroachments and developments around it. This is a great archeological site which can be developed as a tourist place. Each and every evidence of fort (may be ruins) should be preserved. The other sites of historical importance
such sa Jahaj Kothi (George’s residence), Church etc. should also be developed accordingly.

4. The congested area of old city (in north of Hisar-Delhi Railway line) is disadvantaged by poor connectivity or absence of any direct linkage to the other parts of city. Narrow and over crowded streets and roads are being used by the residents of this area to reach the other areas. More burning of fuel causes increase in temperature and deteriorating environment by more emission of pollutants. This problem can be solved by providing a wide road connection to NH-10 by crossing the railway line through an over-bridge.

5. Morning and Evening wind rose diagram (Fig.-7.2) shows that southeastern and southwestern winds are prominent in the city. The southeastern side of the old city area has some open spaces in the form of a big patch of agricultural land following a public water works (boosting station). This area can be filled with intensive green cover. Landuse of this agricultural land is expected to be changed in near future because of the urban growth process. This land can be rightly utilized for a dense plantation. This plantation can fill the gap of lack of greenery for the old city area which would lie in its down wind direction.

6. The ward no. 10-13 has not yet developed fully. Timely measure of acquiring land for recreational use and for proper road network can be of great importance. Ignorance in this regard would let the situations to the bottle necked like the other wards of old city. Industrial units along railway line in ward no. 16 are needed to be shifted as these are established in residential area. These units are related to highly inflammable fuels i.e. petrol/diesel etc. where remains high certainty of mis-happening.

7. Industrial activities are located in south-eastern side of city. As described earlier, the city falls in downwind directions of this area; wherefrom pollution spreads throughout the city. Hence, relocation of this industrial landuse is also of prime importance. As appeared form the analysis of air pollution level; the pollutants have not yet reached beyond the limits, so in this light, the present
Fig. 7.1: Old Fort area congested developments

Satellite Image by Google Earth (0.6m resolution)
Fig.-7.2: Normal Wind Rose and Landuse of Hisar City

Evening Wind Rose

Morning Wind Rose

Evening Wind Rose

Residential Area

Institutional Area

Pvt. Ag. Land

225

270

HAU Farm

Govt. Livestock Farm

Bir Hisar

Ag Ship

Residential Area

Institutional Area

Pvt. Ag. Land

225

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HAU Farm

Govt. Livestock Farm

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Govt. Livestock Farm

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Pvt. Ag. Land
industrial setup can be allowed if not possible to shift. However, it is strongly recommended that no further expansion of industries be allowed along this site; else, the city would have to face unhealthy consequences, if so happened.

8. The old city has numbers temples around CBD. There is heavy rush of visitors in morning and evening times which cause extra crowded in CBD. The option of shifting of these temples to nearby areas is perhaps not possible because of religious sentiments of people, so the other way to resolve this problem is to reorient their entry point in a manner that the market roads may not be crowded.

9. New establishment of temples and dharamshalas is also a common practice in Hisar. These types of buildings have peculiar pattern of landuse change. With main building on the road, there found a row of shops built along the road for earnings by rent. This way the roadside landuse got changed entirely. It is strongly recommended that there should be complete control over the roadside landuse change as this may effect the changes in overall landuse of the city. This type of change has already experienced in the residential area of old town which has converted to busy markets at telian pull and dogran mohalla area.

10. The people coming to market area (nagori gate - rajguru market - auto market area), the shopkeepers and the residents nearby market area are exposed to air and noise pollutions caused by gensets and vehicles which is a common phenomena in this area. This area also remains slightly hotter as compared to surrounding regions because of absence of open spaces, greenery and vehicles movements. To overcome this problem, micro road plan for the market area should be prepared, entry of vehicles to the market should be controlled and provision of parking outside the market can be done which would help to reduce the pollution and temperature as well as saving of fuel also. Moreover, promoting the habit of 'Walking & Shopping' among the citizens would also be an ecological approach for health and environment.
7.1.2 AREA OF PLANNED GROWTH

Planned city is mainly associated with NH-10 and south of railway line (Sirsa-Delhi). This is mainly composed of various sector units developed by HUDA. *Prima fascia*, these units appears with quite appropriate living conditions as these were developed under planning standards coined by HUDA. The main drawback in the development of these units is that all the sectors are established here & there around the periphery of old town. The availability of land to the close proximity of old town was given more consideration as compared to its suitable landuse. Waste or less productive land is a common phenomenon around Hisar city because of its arid topography. Use of productive agricultural land should be the last option for urban development while the same has been considered primarily for development of all sectors in the city. Although, a due consideration have been paid to provide open spaces in builtup settings through wide roads, but greenery aspects has not been duly cared of. Few parks in each sector have been proposed as recreational features. No amusement centers, playgrounds or large commercial areas have been developed anywhere. The open area in front or back side of houses in these residential sectors which was meant for greenery, have also been paved by some of residents owing to a common problem of moisture in the walls.

**Recommendations**

1. Plantation in each sector is the immediate requirement of the area. As parks, some area should also be conserved for dense plantations. Sector 15 which is the oldest residential sector of the city, has only a narrow green belt on southern side along the canal. It was developed to protect the canal. Water table is high in this area, hence eucalyptus plantation (or any other that have high water consumption) is appropriate along the roads.

2. The green belt along NH-65 should be conserved. It is a very old green belt of city but still it has scanty trees with little height. Due to ignorance by concerned departments, the belt is also being used as waste dumping site at many places. It is also encroached by cobblers, hawkers, hair
dresser etc at some locations. Although, the greenery advantages for the residents of sector 15 and Defence colony are fulfilled by green area of HAU, yet this belt needs to be developed immediately. Green area, besides its environmental and healthy virtues, also has aesthetic importance. So, this belt should be brought to its innate use immediately. Likewise, planned units of ward no. 22, 23 & 26 (sec.13) are also located in dense urban milieu. Plantation sites should also be developed immediately in these wards.

3. The northern parts of city have very poor quality ground water with high concentrations of undesired salts. Sector 14, Housing Boards, New Grain Market, Sunder Nagar and Police lines are included in this area. During the shortfall of canal water, supply is usually augmented through ground water after passing from sand filters. Because of poor groundwater quality, the public water works of this area should be given a linkage from safe groundwater quality area of the city (Fig.-5.16) for smooth supply of potable water.

4. In planned localities, the rain water harvesting can be of great significance. The rain water through roof tops can be linked to a channel of conduits and drained into a central point, may be a tank or reservoir. It can also be directed to groundwater to recharge aquifer. The potential sites for this purpose are abundantly available in Hisar city. All planned sectors, New Grain Market, Cloth Market, Housing Boards, GJU & HAU Buildings and other office buildings are suitable sites for this purpose. The area with complete metalled surface is the ideal rain water harvesting site. In this context, New Grain Market and Cloth Market of Hisar city are best suited. These two units have complete metalled surface wherefrom maximum of rain water can be trapped. Likewise, other urban units can also be used for this purpose. This type of efforts can be very helpful for better availability and management of supply of good quality water to the people.
Potentialities of rain water harvesting in Hisar city can be judged by estimation of wastage of rain water that is discussed in coming discussion.

Therefore, planned and unplanned city have different types of their problems. The overall environmental conditions in the planned city are found satisfactory because of governance. But the unplanned congested area or the other area that are developed by colonizers, are prone to degradations owing to unmanageable population pressure. Regular monitoring and enforcement of building rules in unplanned area is the need of time.

7.1.3 RECOMMENDATIONS FOR CITY AS A WHOLE

The Hisar city is growing very fast. The population of the city in 2001 has increased by 7.5 times from 1951. Increasing trade, commerce and educational activities in Hisar would certainly attract more population which would cause expansion of city. Increasing population would create more pressure on urban environment which may result into its deterioration. Following recommendations have been proposed for immediate action. These recommendations or suggestions are based on analysis carried out in this study as well as pertains to general problems of the city. Para wise descriptions are as under:

7.1.3.1 Maintaining Greenery

The greenery deficient area i.e. wards no. 5, 8, 9, 17, 18 & 19 should be provided sufficient green cover. Most of built up area in these wards don’t have any direct access to green cover. Even a single tree is rarely seen in these localities. Trees are not only important for city environment but also for many other health issues like, they improve a neighborhood’s appearance, reduce pollution, and keep the area cooler during summers which attract children as well as citizens for outside playing/walking and running. As a result, it reduces the risk of obesity, type-2 diabetes, asthma, hypertension, sleep apnea and emotional distress etc. (www.washingtonpost.com).

As this area is very congested and it is very difficult to develop vast green area except for some muffler plantation (road side tree arrays). The agricultural area lying
north to railway line in eastern sides can be converted into plantation area. This is most suitable area for this purpose as per normal wind directions in the city. The congested area would always remain in the downwind direction to this area. The other site that would be suitable for dense plantations, can be south west part of city where some open land is available but it would be far away from the congested area.

A detailed analysis in this regard has been carried out in chapter 5. The greenery deficient area may be provided sufficient green cover and residents of the area should also be encouraged to preserve and protect trees in their locality. The green belts of the city mainly along the national highways require immediate attention. The thin trees have become hangers of garments and other retail articles of hawkers. This type of practices is neither good for tree health nor for urban beauty, hence, instant interventions are required from administration. There must be a regularly monitoring body comprised of administrative officers and experts of forestry/ecology for watch of green cover in the city.

7.1.3.2 Implementation of Rain Water Harvesting Technique

In urban areas, the rain water usually goes waste. This water can be recharged to aquifer and can be utilized gainfully at the time of need. The rain water harvesting system needs to be designed in a way that it does not occupy large space for collection and recharge system (Central Ground Water Board, Faridabad). In urban areas, building roof tops can act as a rain water collective pan, wherefrom the water can be directed towards reservoir or recharge point. In this way a substantial amount of rain water can be collected on minimum cost and can be utilized directly (with treatment) or may be allowed to recharge. The collection of rain water which technically termed as Rain Water Harvesting is a very simple process as shown in figure 7.3 and can be made mandatory for the buildings that have a certain roof top area.

This recently revolutionized idea of Rain water harvesting has great prospects in Hisar city. A small locality has so much potentiality that it can become self sufficient as well as can provide immense quantity of monsoon water for ground
water recharge. The planned localities have more opportunity to harvest or collect rain water as compared unplanned areas.

**Fig.-7.3: Roof Top Rain Water Harvesting Technique**

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<thead>
<tr>
<th>a) Rainwater from roof to reservoir</th>
<th>b) Rainwater from roof to aquifer</th>
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<td><img src="image1.png" alt="Diagram a) Rainwater from roof to reservoir" /></td>
<td><img src="image2.png" alt="Diagram b) Rainwater from roof to aquifer" /></td>
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(Source: Central Ground Water Board, Faridabad)

In the first stage, all the government and private buildings, as educational institutions, New Grain Market, Cloth Market, Planned markets/complexes which have more metalled surface area, should essentially be equipped with this system. All the units under the category of Institutional/Civic setups in Morphological map of Hisar city are covered under these buildings. At second stage, all the buildings in the planned area, especially in residential sectors, should be made compulsory to have rain water drainage system installed at their roof tops. In this way, the water problem of the city could be solved upto a certain level. The valuable quantity of rain water in Hisar, where rains are very less, can also amount to incredible results.

**Estimation of Rain Water wastage**

Quality wise, the rain water is equal to distilled water. Although it may not be healthy for human beings for direct intake without treatment, as it don’t have sufficient minerals required for our body, but it is best suited for our domestic purposes. The New Grain Market area is an ideal site for collection of rain water, so its potentiality is evaluated here for example.
The new grain market area is located in north end (Sirsa Delhi by-pass) of the city beyond which there exists agricultural area. Its total area is 23.8 ha (58.64 acres). Totally built up area of this unit is composed of three type of water collecting sites that are roof tops, plinths and sheds. Normal annual rainfall of the city is 452 mm (Table – 7.1). With this annual rainfall, the grain market area receives 107,576 cubic meter rainwater in a year. It is a very huge quantity of water as far as domestic use is concerned. If, only half of this quantity i.e. ~54000 cubic meter is conserved every year, it will be sufficient for 2070 families for one month assuming the family of 6 persons with standard water consumption of 145 lt. per person per day (as standardized by Public water works). There are 340 shops/plots in new grain market meant for shop-cum-residence landuse. Neither all the shops are in use nor does each shop have a residence over it. Then too, it is estimated that maximum of 500 families would be living in this unit (some joint families may also residing). Thus, if this water be used only by the families of same locality, then it would last for 4 months for New Grain Market without supplemented by Public water works and ground water as well. Collection of rain water can be done by proper drainage system (separate from sewerage system) that would drain all the water into a tank or reservoir. The roof tops of all the buildings can be channeled into this common drainage system. From here (reservoir) the water may be used for supply system after treatment or may be allowed to percolate to recharge underground water.

Estimation of volume of rain water on the basis of monthly rainfall at Hisar is carried out for colony (table-7.1). The numbers of days have also been estimated for which the rainfall of corresponding month would be sufficient for domestic purposes to this colony. The Winter, Pre & Post Monsoon seasons have very low rainfall in the Hisar region. Only 23% of annual rainfall is received in these seasons. Hence, Monsoon season have great potentiality of rain water preservation. This season receives 77% of annual rainfall with highest in the month of July followed by August. These two months only can have so much rain water that can last for more than 4 months to New Grain
Market area. If such a system is developed that can trap 100% rain water during whole of year, than this colony would not need any other source of water supply for about 8 months. How much of this maximum limit is achieved depends upon the local government as well as residents who are really involved in this process. Therefore, mere installation of this technique not assures its fruitfulness, but regular watch, maintenance and encouragement of people is also required.

| Table – 7.1  
Normal Rainfall at Hisar & its potentialities |
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Source: Ag. Meteorology Dept. HAU  *RW= Rain Water  *NGM= New Grain Market  Sufficiency denotes that collected water would last for as much no. of days for NGM colony of 500 families (6 member each) having 145 lt./person/day of water consumption

Cent percent collection of rain water in any locality is very difficult. Proper analysis of water demand and periodic rainfall can help in the better management of water supply. In Hisar city, canal water is distributed through water works/boosting stations located in many part of city. In the time of water scarcity in peak summers, the supply is augmented with ground water which is not potable at many parts. In such a scenario, rain water can be panacea for uninterrupted supply. The New Grain Market area also faces the same problem
of canal water deficiency in peak summers from months of April to June. Form the table, the rainfall in these months is very low i.e. 96 mm. The potentiality of this amount of rainfall is that the monthly rainfall can last for 6, 16 & 30 days in months of April, May and June respectively if total rain water is collected. But it is impractical to collect whole rain water. So, if pre planning and management is done to start collection of rainwater from December or January, then it would amount to enough water that would last for 38 days if collected 50% of total rainfall in the duration of January to June. This water besides canal water supply, can help to mitigate water problems in summers. The huge quantity of monsoon water coming after summers can be allowed to recharge aquifer with proper technique that would improve ground water quantity as well as quality.

This exercise is meant to expound the substantiality of supreme quality rain water that is draining away every year unwisely. Now in the age of water scarcity, every city is suffering from deficiency of water supply for domestic usage. The problem is more severe in cities where the surface water natural resources are rarely available or contaminated, if available. Rain water is still an underestimated resource. The judicious use of this resource can make all the cities self dependent in water management. For example, in some of localities in New Delhi, Rain water harvesting technique was implemented a few years back and has proved to be very successful in these areas resulting into rise in water table.

7.1.3.3 Establishing By-Pass periphery of city

Increasing urbanization of Hisar has also resulted into heavy traffics on the roads. This has led to jam situations at many road junctions in the city. Main road starting from Aggarsain Chowk to Barwala Turn includes most crowded sites of the city like Nagori gate, Talaqi gate, Bus stand as well as Civil Hospital (nearby) which remain highly congested during day times. Heavy vehicles way to Rajgarh road have to go through this road which makes it over crowded. Due to these vehicles, whole of
NH-65 remain congested till village Gangwa, the south most end of Hisar. Likewise the other prominent site of traffic jams or high congestions includes the Delhi Road mainly form Dabra Chowk to Jindal Industries.

In this regard, a new construction of by-pass extending from Sirsa Road (North end of city) to Rajgarh Road after village Gangwa (south end of city) is the immediate requirement of the city. The same is also proposed in Master Plan 2021 of Hisar city prepared by Town & Country Planning Dept. Hisar. The other by-pass starting from south end of city i.e. beyond village Gangwa to Delhi Road near cantonment is also highly required to decrease traffic on Delhi road caused by heavy vehicle from Rajasthan to Delhi road industrial area and other stations ahead.

By establishing these two by-passes and connecting with already existing Sirsa-Delhi by-pass, there would be a complete periphery of city. These two by-passes would not only reduce the traffic in the main city but also decrease the air & noise pollution and probability of accidents in the city. This would also helpful for decreasing the road riding time of people which will ultimately enhance the productivity and commerce in the city.

7.1.3.4 Establishing parks/gardens/playgrounds in old city

Urban health problem are entirely different from general health implications. Major health problems in urban area are due to living styles which have minimum physical works. Facility full life of urban area have increased sedentarism due to quality transportation, lack of opens spaces and parks, busy working schedules, overcrowding and lack of motivations thus resulting into physical inactivity which is estimated to cause about 22 percent of ischemic heart diseases (Aggarwal, Amitesh, 2010). This have causes some diseases like diabetes, obesity, blood pressures, hypertensions, cardiovascular disease (CVD) and many psychological problems which are commonly called as Urban Diseases. Although these need typical treatments but a little change in lifestyles also can avert their possibility to great extent. Therefore, the city area which is lacking any type of parks and playgrounds can be deemed as disease prone area. These types of urban units must be equipped with green & open
units. Parks and playgrounds are completely absent in the densely populated old town area of Hisar which would have negative impact of the people. A due care should be given to increase green cover and open spaces in this area.

7.1.3.5 Establishing small forest area or Urban forestry

The city of Hisar has two big problems that can be resolved by creating a little forest area at the out side of city. The first problem is eastern half of Hisar city which is lacking in greenery. Foreseeing the future growth of the city, it can be estimated that the population pressure would be greater in old town. To maintain the living environmental conditions, development a little forest area in any part (preferably on south east or south west side) around the city is essential.

The other big problem is abundance of stray cattle in the city. Cow is the main animal in stray type cattle in Hisar. The other species are monkeys, dogs and cats. Cow species animals found in every part of city in sedentary mode either on roads or along the pedestrians. Their concentrations vary according to types of area where they found. In northern part of city where New Grain Market, Bus Stand market is located, their concentration is very high. Likewise, their occurrence is prominent in Sabji Mandi area, Azad Nagar Market in south, HAU area and Urban Estate II. These stray cattle can be put into forest area. A few charity cow shelters (gau-shala) that are located around the city can also be redirected around the forest area. On the other hand, the prominent zone affected by monkeys is northern parts of city. Mere establishment of forest does not serve the objective, but the fruit tree species such as guava, ber, banana, anar which can grow in Hisar climate, may also be planted in forest for survival of animals.

Animals are basic ingredients of forests and their availability in forests would reinforce the forest culture. Therefore, forest area around Hisar is its ecological demand which is of great importance. Beside ecological aspects, its aesthetic as well as medicinal virtues are equally important.

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7.1.3.6 Road Network Proposal / Arterial Road Network

Road network in a city acts as its veins for communications. Although light vehicles are more prominent on urban roads, yet their high frequency creates traffic jams at major junctions. Heavy traffics usually confined only on main roads. A hierarchal main road network of Hisar city is shown in Fig.-7.4. The main roads of the city are the two national highways (NH-10 & 65) passing through it and categorized as first order road of the city. These contain the main streams of traffic flow and also have great control over growth and landuse pattern of the city. The major roads (also called as Arterial Roads) come from various parts of the city these highways are called as second order roads.

An arterial road is a moderate or high-capacity road which is immediately below a highway level of service. Much like a biological artery, an arterial road carries large volumes of traffic between areas in urban centres. They are noted for their lack of residential entrances directly onto the road (except in older or denser communities); they are designed to carry traffic between neighbourhoods, and have intersections with collector and local streets. (wikipedia encyclopedia).

Main traffic of the city from its various parts is brought to main highways through these roads just like tributaries of a river. These roads actually indicate the connectivity of different pockets of city to main stream. Traffic from other parts of the district (town or villages) also come into city through these roads e.g. road from tosham, mirzapur & others villages, bagla road and kaimri road etc. These roads are categorized in two groups on the basis of hindrance in connectivity. First category of these roads indicates where there is no obstacle while the others represent roads which have railway crossings in their way. Railway crossing without over bridges imposes some time delay and citizens always have reluctance to use such roads hence, these decreases connectivity through them. The other approach roads, which are connecting to these second order roads are categorized as third order roads and other internal roads are termed as fourth order road. Only the important roads which are clearly visible on imagery are digitized to prepare road network of the city.
Fig.-7.4: Hierarchical road network in Hisar City
The Delhi-Sirs line divides the city in two parts. The new developments in the city chiefly concentrated along NH-10 i.e. south of the railway line. The parts lying north to this railway line have poor connectivity with new city because of this line. Same is the case with road extending form Dabra chowk to jahaj pul / parav area of the city where railway crossing come across two times to reach at either end from other point. Only the national highways have over bridges on the railway lines. As a result the congested old city area where only local/link roads are found, have very poor connectivity with other area.

The road network of Hisar requires to be reorganized for proper inter-linkages of various parts of the city. This reorganization includes renovation of existing roads as well as new constructions. The direction of city growth and its future expansions can't be ruled out while delineating road network of the city. Keeping all these aspects into consideration, total of 16.5 kms long Arterial roads are proposed to be established to ensure fast connectivity among all the parts of the city. Out of these 16.5 kms, only 5.8 kms road length is proposed as new construction whereas rest of 10.7 km requires renovation of existing roads of lower order. The alignment of this new proposed road network is presented in the map for arterial road plan for Hisar city (Fig.-7.5). This proposed network will connect the new out growth and old town congested area to the national highway stream.

The old congested town lying in northern side of railway line has very poor linkage with new town. The roads in this area are of lower order and mostly encroached on either side, hence giving them a look of streets instead of roads. Although there is a link road extending from jhaj pull to dabra chowk, but it is not wide enough to be used as a main road and also has two railway crossings. This makes this road under utilized as compared to its importance. Therefore, a thorough renovations of this road (Road-A) is required with construction of an over bridge at railway crossings. North end of this road is to be extended upto parav chowk while southern end needs to be redirected to NH-10 before dabra chowk over bridge as presented in map.
The old town lying east to this road (Road A) usually remains disconnected to the new city along NH-10. The only main road in this area is east-west road from parav chowk to NH-10 by-pass. This road get bifurcates in northeast and east directions at HTM mill area and meet NH-10 by-pass. The eastern extension has a railway crossing because of which, it is less used as compared to northeastern extension. The area south to this road is highly congested part of the city with poor urban environmental conditions such as low green cover & open spaces, high density, unplanned growth etc. In the absence of any direct connectivity to developed and planned city, this area may become a neglected zone in future. To provide a direct linkage from this area to the main city, a broad east-west road is proposed as Road-B extending from a junction at Road-A, and merging in link road of third order. This road segment is 2.4 km long in which two patches of 860 m and 310 m needs to be developed newly. Rest of road alignment exists already where no new constructions are required but needs renovation. Road-C and Road-D are also proposed to provide an intensive linkage form congested area to Road-B. With all of its link roads as shown in map, Road-B would be giving this area an easy approach to NH-10 through Road-A. The area of surya nagar has a narrow fourth order road parallel to railway line upto jindal industry including a railway crossing. Renovations are proposed for this 2.5 km stretch (Road-H) for easy linkage to NH-10. Its western end should be connected with a second order road of NH-10 through railway crossing whereas; eastern end should meet to NH-10 after over-bridge/railway crossing.

Road-E is proposed to connect the congested part of Camp-area (Patel Nagar), Chander lane and P.L.A. area to NH-10 before over bridge of dabra chowk. With further extension to Road-A, this entire area will come closer to the area of Road-A&B with a covering distance of about 20 minutes, otherwise it would be more that 1 hour when approaching through NH-65 & 10 or other second order roads. This road segment of approximately 1.8 kms, proposed as new construction parallel to Rajgarh railway line. The Road-E may be further connected with a new road segment (Road-F) of approximately 1.7 km in southern side. It is also aligned parallel to Rajgarh railway line upto 1 km and turns towards west, merging with second order road which ultimately reach to NH-65. The overview of proposed new road network
Fig. 7.5: Proposed Arterial Road plan for Hisar City
gives a straight road from old congested town to southern congested developments. This way, the city has a direct to-and-fro road from most populated area that would surely decrease burden of the NHs. The densely populated area which would be benefited by this road are old town, patel nagar, chander lane, kaimri road outgrowth, azad nagar and gangwa village area.

The major development of the city is located in the east side of NH-65 because most of the area on other western side is acquired by HAU. In the north part around the bus stand area, congested development of old as well as new origin spread upto some kilometers west to NH-65. This area has linkages through second order roads in radial directions which meet at NH-65 around Nagori Gate area (Bus stand to Aggarsain Chowk). To provide a direct link to bus stand area, a peripheral road is proposed which is shown on map as Road-G. This can be developed by renovating the existing fourth order road of 1.2 km including a railway crossing. This would directly connect this area to bus stand area, auto market, grain market, sector-14, Chandigarh road, Sirsa road and Delhi bypass. To make it more effective, renovation of a second order road form bus stand to north end of this road is also necessary.

Landuse in urban area have dynamic role to play over traffic system. So, to have a better road network and fast movement thereon, roadside landuse control is very important. The institutions/buildings of importance like banks should be located either at common junction of roads or near to its user group. Likewise the units of independent locations such as secretariat, colleges where users have to come irrespective of their proximity concerns, should be located far from congested roads. The DN College, FC College and CAV School fall in busy market place. The markets get heavily crowded due to these academic institutions. Accidents and injuries of students are quite common on market roads. Therefore, landuse in urban area becomes a dynamic term and required to be monitored frequently.

Road network of a city is determinant of its trade and commerce also. Most of the cities in Haryana haven't any proper road network which can save precious time of their citizens. It can also lead to increased business of city, low pollution and better health perspectives.
7.1.3.7 Waste disposal system

Waste removal system is an integral part of Urban planning process. Each and every landuse is associated with different kind of waste which has to be disposed off properly. Very high density of population and built up congestions enhance the health risk and epidemics due to waste heaps. Municipal solid waste is the biggest category among all type of wastes in an urban area. Other than municipal solid waste, the following types of waste are also generated in urban centres (www.urbanindia.nic.in):

(a) Industrial Waste – hazardous and non-hazardous waste from industrial areas within municipal limits.

(b) Biomedical Waste – waste from hospitals, slaughter houses etc.

(c) Thermal Power Plant Waste – Fly ash from coal-based electricity generating plant within municipal limits.

(d) Effluent Treatment Plant Waste – Sludge from sewage treatment plants and industrial effluent treatment plants.

(e) Other Wastes – Special wastes from non-conforming areas or special units.

Responsibility of waste disposal through a system usually vests with Urban local bodies such as municipalities. In Hisar city, the Municipal council, Public Health department and HUDA are the agencies responsible for removal of waste. Sewerage lines have been deployed for liquid waste in the city. Hisar is divided into three zones for sewerage and storm water disposal system as shown in sewerage map of Hisar city (Fig.-7.6). Zone I and II fall under the control of Public Health Department whereas responsibility of sewerage removal from the area under Zone III lies with HUDA. The flat topography of Hisar city and surrounding area is a problem for proper drainage. Chocking of sewerage line is a common phenomenon in the city. As a normal practice, the sewer is channelised under the influence of gravity to a pumping station from there it is thrown into abandoned distributaries or Multi purpose channels like Ghaggar link Channel which is passing distantly from western and southern sides of city.
Fig.-7.6: Sewerage zones of Hisar city

HISAR CITY
Sewerage Zones

Zones delineated on the basis of information provided by Ex.En. HUDA, Div. 1, Hisar.

Legend
- Railway Line
- Main Roads
- MC Boundary
- Town Area

Zones delineated on the basis of information provided by Ex.En. HUDA, Div. 1, Hisar.
Each and every unit within the municipal limits had been provided with sewerage connections. The outgrowth is very high in Hisar and the areas outside its limits (except for some colonies) do not have any such system. Open conduits are established which deteriorate the living environment conditions as standing water creates smell, pollution and road damages.

All the sewerage waste in the city go untreated in the absence of any sewerage treatment plant. With a rapid growth of city, the situation become worse in future if timely measures will not be adopted. As per Town and country planning estimates, the total water requirement of the city would be 100 cusec till 2021 and 75% of it would be discharged as sewerage, hence the sewerage system for the city requires to be developed to cope with this limit and the treatment of waste should be ensured.

Like the liquid waste, not any policy/system exists for collection and disposal/removal of solid waste in the city. In the absence of any solid waste management or disposal system, the waste material is thrown away in the open ground outside of the city. A proper and scientific treatment technique is required for solid waste disposal. It includes both degradable as well as non-degradable such as polyethene or polymer items. The open heaps of wastes are indicators of bad environment and also produce an ugly face of city. If solid waste is disposed off on land in the form of open dumps or in improperly designed landfills (e.g. in low lying areas), it causes the following impact on the environment.

a) Ground water contamination through leaching generated by the waste dump
b) Surface water contamination by the run-off from the waste dump
c) Bad odour, pests, rodents and wind-blown litter in and around the waste dump
d) Generation of inflammable gas (e.g. methane) within the waste dump
e) Bird menace above the waste dump which affects flight of aircraft
f) Fires within the waste dump
g) Erosion and stability problems on the slopes of the waste dump
h) Epidemics through stray animals
i) Acidity in the surrounding soils, and
j) Release of Green House Gas (www.urbanindia.nic.in).
Type of solid waste is also dependent of landuse. The residential localities would have entirely different type of waste than the industrial and commercial type landuse. Hence, a prudent policy of time and frequency to pick the waste material is also required. Ward occupancy status as described in previous chapter can be very useful for this purpose. Wards are categorized specifically on their residential uses and different scheme to remove waste can be adopted on the basis of ward type i.e. residential, commercial etc. This can help in proper waste removal with minimum wastage of time and energy. When the solid waste is collected considering the landuse types, the segregation of waste would be easier for proper treatment.

The treatment plants (for liquid and solid waste) should also be located with a perusal of wind directions over the city. It should not be installed in south western and south eastern sides, as the city would be in down wind direction and air pollution may spread over it. For the winter months, the north western winds are prominent (wind rose diagrams Fig.-5.5). The cold temperature in the city causes stability and inversion conditions of atmosphere. Pollution will severely affect the city if the treatment plant is installed in north western direction. The other direction i.e. north eastern side is bit safer than the other sides. Hence, North eastern side is the ideal direction for installation of sewerage treatment plant for Hisar city, if desired in future.

Therefore, it is strongly recommended that due attentions has to be paid on waste management and its proper removal or disposal or treatment for proper management and functioning of urban environment of Hisar.

7.1.3.8 Landuse Planning

Landuse for urban area is a dynamic term which has strong control on overall functioning of the city. A little change in landuse has various type of effects. For example change in the location of a bank would lead to change in traffic flow. The impact on traffic flow is also dependent on popularity/business of bank. Likewise some common units as Secretariat, Bus Stand, Retail Market, Grain & vegetable market, educational institutions in an urban area also have frequent interactions with
city and surrounding area. The land use of city should be intensively examined in the urban and environmental planning of a city.

Landuse of Hisar has changed rapidly after the formation of Haryana. Commercial area of city has shown a remarkable change which indicates trade and commerce characteristics of city. Almost all the major roads of city have linear stretch of commercial buildings on either side. The city has come up with mix-landuse classes in its different parts.

Except for some planned sectors, mixed landuse classes prevail everywhere in the city. No segregation of different types of units has appeared. Such types of asymmetrical arrangements are not supportive for proper utilization of available facilities in an urban area. Owing to these understandings, following recommendations are proposed for better management and utilizations of resources:

Establishments of new units of temple and dharamshalas (inns) especially around CBD area should be precisely checked by planning agencies as these units have great role in changing landuse because of their locations. These units generally make small tightly-built shops for earnings by rent which entirely change the landuse of surrounding area and soon become a congested market. In Hisar such practice is also very common which should be checked properly.

City landuse is very dynamic in nature. Some micro level landuse have great influence over general landuse. These types of landuse units can also be termed as forced landuse where users have to visit essentially, irrespective of their locations and inaccessibility or inconvenience of visit. On the contrary, other units can be termed as convenient landuse where users have an option to visit these units. The convenience or options may be in the form of accessibility, intervening opportunities, proximity etc. Markets, amusement centers, parks, residential areas, playgrounds etc. are the examples of such units. The Secretariat, colleges, government offices, hospital type of units can be attributed as forced landuse because users haven’t any substitute of these institutions. A prudent estimate is essential while defining their locations in an urban area. Forced types of units should be located near to a centre of common transport
system (bus stand etc.) because beside the people of city, whole of the district is concerned with these units. If these are located in deep city area, it would result in heavy traffic load from bus stand to these units, which makes unnecessary wastage of fuel, causing pollution.

In Hisar city, the secretariat is located on NH-65 which is far from bus stand. Persons wishes to visit this have to travel from bus-stand to secretariat by auto-riksha. In this way, they have to pass through nagori gate market area, the whole of CBD and fawarrwa chowk which causes not only traffic congestion but have to waste their time also. The other government offices are also distributed here and there in the city without any proper planning. In the same way, educational institutions should be close to bus stand instead of CBD. Not any institution or any public office has an ideal location in Hisar on the parameter of landuse planning.

The locations of hospitals are satisfactory concerning the accessibility from outer area of city, but city population residing in north east and south western directions do not have good medical facility in their close proximity. The facts mentioned above are just some of many misfits.

7.2 FUTURE SETUPS AND MASTER PLAN 2021

Area of Hisar city is expanding rapidly wherein the maximum expansion can be seen in the south of new city. Existence of major government research institutions around the city are the main constraints in its uniform expansions in all the directions. Owing to this reason, pockets of development/growth have emerged out in various parts of the city. Medium to high class group have tendency to settle in developed colonies (sectors) of HUDA whereas, the people of low income group are more attracted towards low valued residential colonies in old town and at fringe of the city.

A total of 1 million population is expected in Hisar city by the year of 2021. The estimates of Town and country planning department of Hisar are also the same. Most of villages such as Satroad Khurd & Kalan, Gangwa, Dabra, Kaimri, Shikarpur and Raipur etc. located nearby shall become the part of city by this time. Satrod
Khur and Gangwa village have already merged in the city. The Hisar city is developing very fast as a nodal city in western Haryana. It has also been identified as counter magnet city of Delhi in NCR regional plan and estimated to have 10 lakhs of population by the year 2021 (TCP Notifications, 2006). To accommodate such a huge population, a master plan for 2021 has also been drafted by Town and Country Planning department, Hisar (Fig.-7.7). In this plan, various landuse categories have been planned in control the surrounding area of municipal limits or in the vicinage of existing landuse units.

Residential area is planned in the north western side surrounding Sector 14. Control area in between NH-10 and Sirsa railway line have been proposed as residential zone with 6 new residential sectors in tuning with sector-14. Likewise on other side of NH 10 till NH 65, other residential area with 5 new sectors is also proposed. Hence, beyond municipal limits, the north western control area of city would have 11 new residential sectors along with some commercial setup on NH 65 and public utility centres on NH 10. Six residential sectors have been proposed within municipal limits in the eastern side beyond GJU and HTM, along Hisar Jakhal railway line. Residential activities are centered in north western side of existing city in this master plan. This area comes under the Govt. livestock farm as well as bir forest of keekar plantation is prominent in this area. This plantation or forest area, which is close to the proximity of city, may be destroyed in this way which would be more important and demanding for estimated million population of 2021.

The southern growth of city is completely ignored. It is clear (Fig.-3.1 & 3.2) that city is growing in southern side along NH 65 and kaimri road. Congested type of localities has been evolved in this area with a passage of time. By a southern by pass as proposed in master plan, this area would be more close to Delhi road and industrial area thereon. Moreover, from environmental point of view, there is preponderance of waste land patches available in the form of dunes, undulating topography in this area around Gangwa village, which can be used for urban development. Developing residential sectors in the north would unnecessarily destroy the forests as well as agricultural land.
The northern (western) sides of city are also low-lying and assumed to be buried path of a river (might be *chetung*). Although, evidences of low land are not found/observed by visiting this area, but water-logged patches appears time to time during more rains, justifies this fact. The relief map and DEM also distinctly shows a channel path as yellowish tone from north of Hisar towards western and southwestern area (Fig.-7.8). The map is generated by remote sensing (radar) based elevation information provided by Shuttle Radar Topography Mission (SRTM) data with 3 arc second (90 meters) spatial resolution. Even minute variations in relief can be seen in different shades and a stretch of same kind has appeared in the figure as path of paleo channel. A tributary of this river coming from north east, also meet at a short distance from city in the west. It can be said that Hisar was established at the bank of a river which is now extinct. The soil of this area is also not fit to construct high rise buildings. Such a low area with weak soils can’t be said fit for urban development. This area, where new residential zone is proposed in master plan 2021, is prone to high rise in water table and water logging in seasons of heavy rainfall in Hisar or in the upper parts of this extinct river. In addition to this, this northern side development would lie in the down wind direction hence and urban as well as industrial pollution will always remain in its local climate. South western and south eastern winds are prominent in Hisar city. The south eastern area is allocated for industrial activities; hence, south western area would be fit for urban residential development instead of northern area. Hence, it is suggested that the residential area should be established in southwestern parts of city as shown in fig.7.9.

South western area of the city, where new residential area proposed has a very little green cover. Therefore, to fill this ecological gap of this area and to create congenial environment in proposed residential site, a green belt of dense plantation is also suggested in rest of control area surrounding this site. The dense plantation would remain in windward sides and retarding high speed hot winds to some extent by generating some friction in boundary layer. This residential site would also fall upon proposed by passes in master plan that would link it to industrial units and Delhi road in east. Moreover, NH-65 and Kaimri road would also pass through the site; hence it
Fig. 7.8: Path of buried river (palaeo channel) around Hisar City

3D view of Hisar District

Path of old river (extinct)

HISAR CITY

VE 200 times
Hisar City
Modifications in
Master Plan, 2021

Legend
- National Highway
- TCP Proposed Road
- Railway Line
- Urban Area
- Controlled Area
- TCP Proposed Residential
- TCP Proposed Industrial
- Environmentally Stressed Area
- Industrial, Recommended
- Residential, Recommended
- Plantation, Recommended

TCP = Town & Country Planning Dept., Hisar
would be intensively connected to main city. So, this would be an ideal site of residential developments instead of on northern sides.

Commercial area in the city is increasing very fast as identified about 130 hectares in 2005. New commercial units of 291 ha have been proposed in the master plan of 2021. Although the area allocated in new plan is appropriate, but its location have very significant role in long term landuse pattern as well as traffic load. At present, commercial activities in city are concentrated around Bus stand and Nagori Gate area and extending along all the main roads of the city. In new plan, some sectors have been exclusively designed for commercial activities. These sectors should have direct linkage with main market or CBD for their better performance. Relocation of transport center or bus stand in north eastern sides of city on NH-10 by-pass, as proposed in master plan 2021, will make a huge change in landuse pattern of the city. Traffic load will also change accordingly. Shifting the bus stand in itself will decrease traffic burden on the main roads in northeast part of the city. Southern parts of city like Sector 15, Azad Nagar, Mini Secretariat and Gangwa extensions will go farther from bus stand. Due to location of Mini Secretariat and District Court in this region, where people moves in from all around the district, a direct link road from new bus stand to railway station upto Gangwa village, equipped with to-and-fro mass rapid transport system (MRTS) like fast & frequent bus services, metros etc. is essential. In the absence of it, main roads alongwith other link roads would remain chocked with heavy traffics, way to this region. This in turn, would cause pollution.

Industrial activities are mainly concentrated in eastern parts of city along NH-10. In the new plan, 343 ha land has been allocated for industrial activities. The new zone for industrial activities is planned in the surroundings of existing industrial area of the city. The present location of industrial area is not appropriate for environmental conditions of the city as lying in its windward sides. Hence, new planned industrial area would also create the pollution in the city because of this reason. The other site which is suitable for industrial activities lies in north eastern sides of city. In this regard, area along mirzapur road would be the best suitable for industrial activities. As per wind rose diagram, incoming winds from this area are least. Moreover, the
industrial waste can also be given an easy northern passage following natural slope of the area. The forest area in the north would also compensate the pollution because of industries. There would not be any connectivity constraints also as the area lies over NH-10 by pass and have direct approach to Delhi road. Thus, this would be the ideal location for future industrial setup in Hisar. Hence, it is proposed that the new industrial area which is planned in surrounding of existing industries in master plan, should be shifted towards mirzapur road as shown in proposed land use plan (Fig.-7.9). Area falling on transportation lines such as roads and railways, are preferred sites for industries. This proposed location falls on NH-10 (by pass) and extended along mrizapur road and Ludhiana railway line. Buffer of 1 kilometer around road and railway line has been generated within control area and proposed as most appropriate industrial site (Fig.-7.9). Further, area remaining between this site and the bir forests area can also be used for industrial purpose.

Agro based small mills/factories are located here and there, either close to CBD or at the fringe of city. Some small industries or godowns are also got established around NH 65 along north and south exits of city. Likewise, same types of activities have also come up on fringe area along all the roads radiating out of the city like NH 10 (Sirsa Road), Bagla Road, Kaimri Road, Tosham Road etc. No site has been proposed for the agro based/small industrial setup around these roads in new master plan. Small area should be designed for these activities in all the directions with proper linkage to main market and all other industrial areas.

The other thing which is quite exasperating in the master plan is the continuous development around old congested city lying north to Sirsa-Delhi railway line. In previous analysis, the old town come out with alarming environmental conditions and requires some open spaces around it with considerable green cover. But in master plan, the surrounding region is designed for residential purposes. This practice would further deteriorate the environment of old city and also enhance the UHI effects. Therefore, the open chunk of agricultural land which is proposed as residential/commercial use in master plan, is proposed fit for green space. If lush
green area be installed here, the old congested part of city would lie in down wind
direction and living environment would become better in old city area.

Haryana is an agriculturally dominant state and have a significant contribution
in the central pool of agricultural production. The entire district has highly productive
land with flat topography except for some area in south western sides. Snatching of
agricultural land for urban development have been remained a very crucial issue for
state politicians as well as environmentalists. The researcher also have reservations
upon the acquisition of agricultural land for urban development as later have nothing
to do with soil productivity. Hence, it would be wise to identity unproductive or waste
lands in the state, especially within proximity of urban area, which can be used for
urban development. This should be given priority so that a minimum of agricultural
land be disturbed.

Agriculturally, Hisar too is a very productive district. Area surrounding the
city is agriculturally good except for pats at Rajgarh road in south. Location of the
city is at the fringe of Thar desert of Rajasthan. All the north and east ward area of
city is leveled and with the help of canal irrigation whole of the area is enjoying good
crops during full year. Identification of waste and less productive land should be
carried out on priority basis to demarcate area for further urban development.

Centrality of Hisar city is increasing with its growth. No doubt, it would be
playing a significant role in future in western Haryana. With the incorporation of
ideas as mentioned in this study and taking care of environmental aspects, the Hisar
city would be the most planned city in the state after Chandigarh and Panchkula. By
whole of the analysis, it can be concluded that environmental aspects are very
important in urban studies and should be given due considerations in modern day
urban planning.