

International Journal of Scientific Research and Reviews

Urban Environment Integrated with Different Land use in Bathinda: Issues and Strategies

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ABSTRACT

Punjab state is on the verge of an urban revolution. Urbanization is largely on the borders of the cities, most of it is unplanned and the city is out of the code and sub-rule, and is already charging higher costs. The unprecedented increase is leaving municipal governments with the lack of significant infrastructure and service intervals. It has been stated in the report that in India, the gap in urban infrastructure investment is estimated at \$ 827 billion in the next 20 years, which requires two-thirds for urban roads and traffic assistance. Urbanization and environmental studies have created interest from a wide range of specialists. The multicultural gamut of the subject invites ecologists from the interest of urban planners and civil engineers, sociologists, administrators and policy makers, and finally the common man. The reason for this is the rush of activities and procedures that occur every day in urban ecosystems. Although there is now a comprehensive agreement that urban environmental issues are important, there is little harmony in the way that international agencies and other people define the urban environment and identify important issues. This is not just a meaningful question, because it is intimately related to how and where money is allocated, and as a result, who can expect profit from environmental reforms. Most confusion come from the environment and what should be the meaning of this in urban terms. If urban environmental problems are widely defined and extended, then almost all urban development initiatives can be labelled as environmental. But if urban environmental problems are very less defined, then many generalizations described in the introductory paragraph are true. For example, defining urban environmental problems, due to urban urban water, air and land erosion, many environmental health problems mainly include additional-urban influences that threaten regional and global sustainability as well as it Does. In this study it basically focusing on the issues of environmental problems in different land uses in Bathinda City.

KEYWORDS: - Urban revolution in Punjab, Land Use, Urban Environment Issues, Strategies.

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1. ENVIRONMENT ISSUES IN URBAN AREAS:-

Defining urban environmental problems: -The widespread flow of migration towards urban areas in developing countries is due to the high population of these areas. The population is increasing at a higher rate than the national government's ability to provide services for a sustainable and sustainable environment. There are various implications of rapid urbanization for the infrastructure of cities and services, because in most cases urban population is increasing at rates which improve the basic infrastructure needed for housing, health care, employment opportunities and healthy living environment. But beyond any reasonable expectations.

1.1. Definition of Environment:-

'Environment' is derived from the French word Environner which means to encircle or surround. All the biological and non-biological things surrounding an organism are thus included in environment. Thus environment is sum total of water, air and land, inter-relationships among themselves and also with the human beings, other living organisms and property.

The above definition given in Environment (Protection) Act, 1986 clearly indicates that environment includes all the physical and biological surroundings and their interactions.

According to Monkhouse, "Environment is the whole sum of the surrounding external condition within which an organism, a community or an object exists."

According to S.P Agarwal "The environment refers to the surroundings of an organism, which have direct influence on the activities of the organism."

1.2. The need of the study:

1. To study the pattern of growth of Bathinda city this leads to deteriorating the environment.
2. To study the root causes and impacts environment degradation.

1.3. The objective of the study:

1. To analyze the urban environmental consequences in Bathinda city.
2. To identify extent and nature of environmentally degraded area in Bathinda city.
3. To evolve measures and propose strategies to mitigate the environmental degradation in identified areas.

1.4. The scope of the study:

1. To detail study of urban growth in Bathinda and its Environmental impacts.
2. To identify environmentally degraded areas.
3. To identify causes and consequences of environment degradation.
4. In the light of nature and extent of problem, guidelines and measures has been given to mitigate the environment degradation in identified areas.

1.5. Methodology:

Methodology is step by step procedure to carry out the study. It depicts the various stages of work lead to attain of the objectives.

1. Selection of Topic.
2. Objectives (The objective is the thing in which cover the base of the study.)
3. Theoretical Framework (It covers concept of urban growth, parameters of urban growth, concept of urban environment, environment degradation)
4. Study of urban environment with different kinds of land use in Bathinda (Residential, commercial, Industrial, Traffic and Transportation etc.)
5. Data Identification & Collection (The data need to be identified that is to be collected. The data can be collected primary (survey) or secondary (from offices and authorities).
6. Data analysis (The data is analyzed in the different kinds of maps with correlation of data with its).
7. Observation (Findings & Strategies) and Conclusion.

1.6. Limitations:

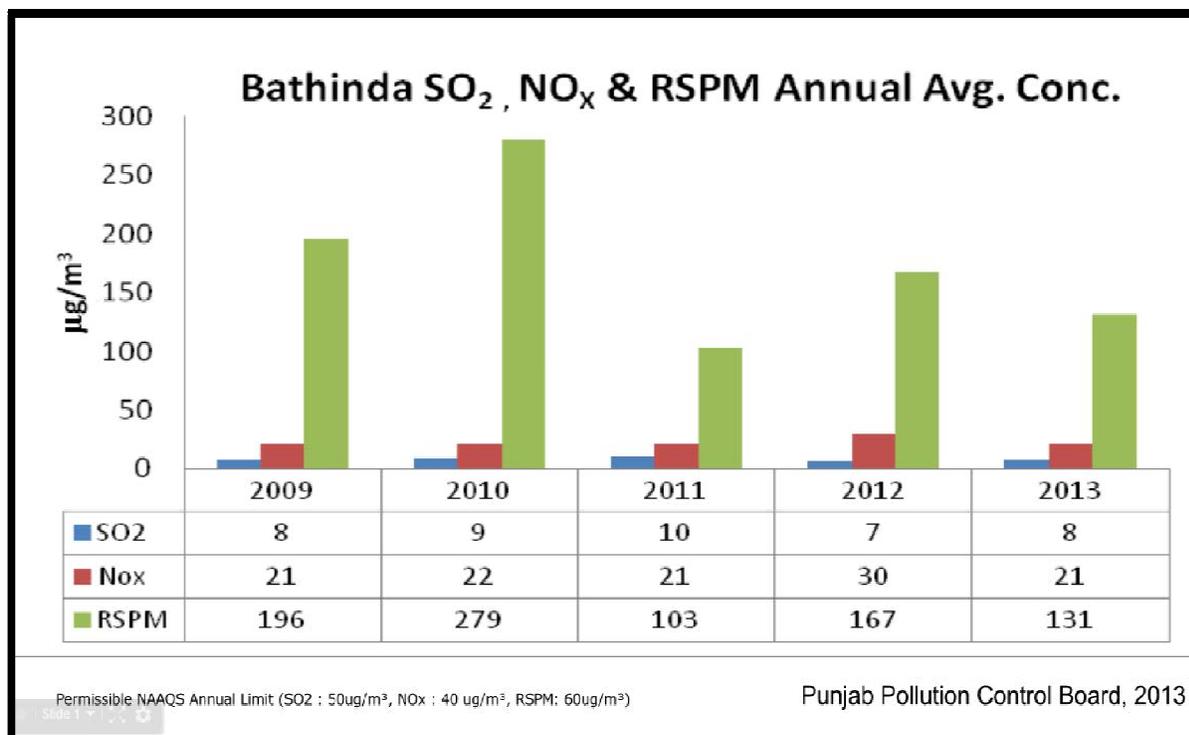
1. Study is based on the data collected in time period of 2016-17.
2. There is not have any authenticity of the maps presented from author side as existing land use map. It's just for research perspective for this study only.
3. Study is limited to the city level; no micro level planning has been done.

2.0 INTRODUCTION TO THE BATHINDA CITY: -

The city Bathinda is growing at a rapid rate. The intensity of urban development during 1981-91 was 31,679 and during 1991- 2001 it was 58,214, respectively. Naturally, the growth rate during 1991- 2001 was much higher as compared to 1981-1991¹. The volume of pollution in the city is growing every passing day and monitoring stations are rare or non-existent. There is a deficiency of

solid waste management system. Due to the lack of fluid from industrial or municipal waste, the city's water is adulterated by the discharge of excessive industrial effluents; Inadequate treatment of municipal sewage and flooding of dangerous and toxic substances in water courses. Some parts of the city suffer from large open sewers, which are filled with organic waste from industries, drains are overloaded with chemicals (nitrogen and phosphorus), pathogens, sediments, and pesticides remainder from sewers and urban areas which Ends the immensity of rapid dissolving and oxygen in the water². In addition, hygiene is a major problem affecting water quality. As the city becomes more densely populated, the amount of wastewater generated per house exceeds the local soil intrusion capacity and requires extra drainage capacity and sewer system in all parts of the city². Although the municipalities provide the necessary cleaning system, they are of traditional type and due to their poor coverage, only a small portion of the civilian population is served. Due to the heavy pressure of population, the problem of transport and traffic congestion also becomes a daily event with the associated increase of noise and air pollution². As a result of the city's high economic growth, the population has flown a large scale and many squares settlements and slums have emerged. The intensity of urban poverty has also increased numerously. The urban environment of the city has become imperfect and Bathinda is considered to be one of the most polluted cities of Punjab². This study aims at the application of environmental principles to develop an integrated urban land-use planning that could optimize the urban ecosystem. Different land-use management measures with emphases either on ecological aims or on construction are proposed.

To eliminate or mitigate the environment problems in Bathinda City, the municipal planning authority of the Bathinda has selected ecological lands such as green space and water bodies to develop an ecological network as indispensable part of urban green infrastructure. An ecological network is helpful to mitigate the nervous relationship among social, economic, and ecological factors (Ahern 1995; Weber and Wolf 2000; Tzoulas et al. 2007). Urban land planning on the basis of ecological principles is a recent trend (Turner 2006). The spatial concepts for land-use planning for sustainable development are to protect ecologically important sites and effectively connect these components (Benedict and McMahon 2002). Urban ecological could contribute in developing a sustainable land-use system (Opdam et al. 2006). The planning and management of urban greening are of significance to urban sustainable development.



Source: PPCB, 2013

Fig. 1: Shows the large quantities suspended particles in the air in Bathinda.

Given the above graph, it has been observed that there are large quantities suspended particles in the air. The presence of high levels of SPM can be attributed to the dust blending from open land, pollutants make industrial areas and lift smoke from the movement of vehicles. The Punjab Pollution Control Board (PPCB) has set up two ambient air sampling machines in Kanakwal and Phoolokhedi to determine the extent of the pollution caused by the Bathinda refinery in the area⁷. According to The Tribune news it is said, "Be careful while taking a deep breath, because toxic fumes can affect your respiratory system badly. Pollution in the city has increased in 20 to 30 percent of patients suffering from respiratory diseases in Bathinda. "In Bathinda, there are four major sources of air pollution, thermal power station, increasing number of vehicles, and the unique pride of the seasonal burning of agriculture. Waste and black-smoke emitting generator sets. Diseases such as asthma, acute and chronic bronchitis, eye irritation and skin allergies become common when the carbon content in the air merges into the dust. Even the dense clouds of smoke can be seen from the Ajit road, coming out of the chimneys of Guru Nanak Dev thermal plant - which are far from the plant. The plant burns two train loads of approximately 6,500 tonnes of coal every day to produce electricity. Generators, tractors, auto and commercial vehicle for more than 15 to 20 years do not leave the wind in polluting the air, which makes it difficult to breathe¹.

Urban Environmental planning should be also discussed in the context of participatory planning which is becoming a prevalent trend in many countries. Collaborative and horizontal modes of decision-making have replaced the top-down, centralised approach ⁹. Similarly, in environmental planning and management, the participatory approach has become a widely accepted standard of practice. In the 1990s environmental planning could still be described as centralised due to the fact that state governments were mainly responsible for formulating environmental objectives and legislation. In the following two decades many efforts have been put into integrating urban land use and environmental planning and into developing collaboration at different levels ¹⁶. Driessen et al. refer to those changes as 'shifts in urban environmental governance' [9]. Nowadays, public participation in urban environmental planning and decision-making is advocated by many planners, policy makers and academics in Bathinda city.

2.1 Location of Study Area:-

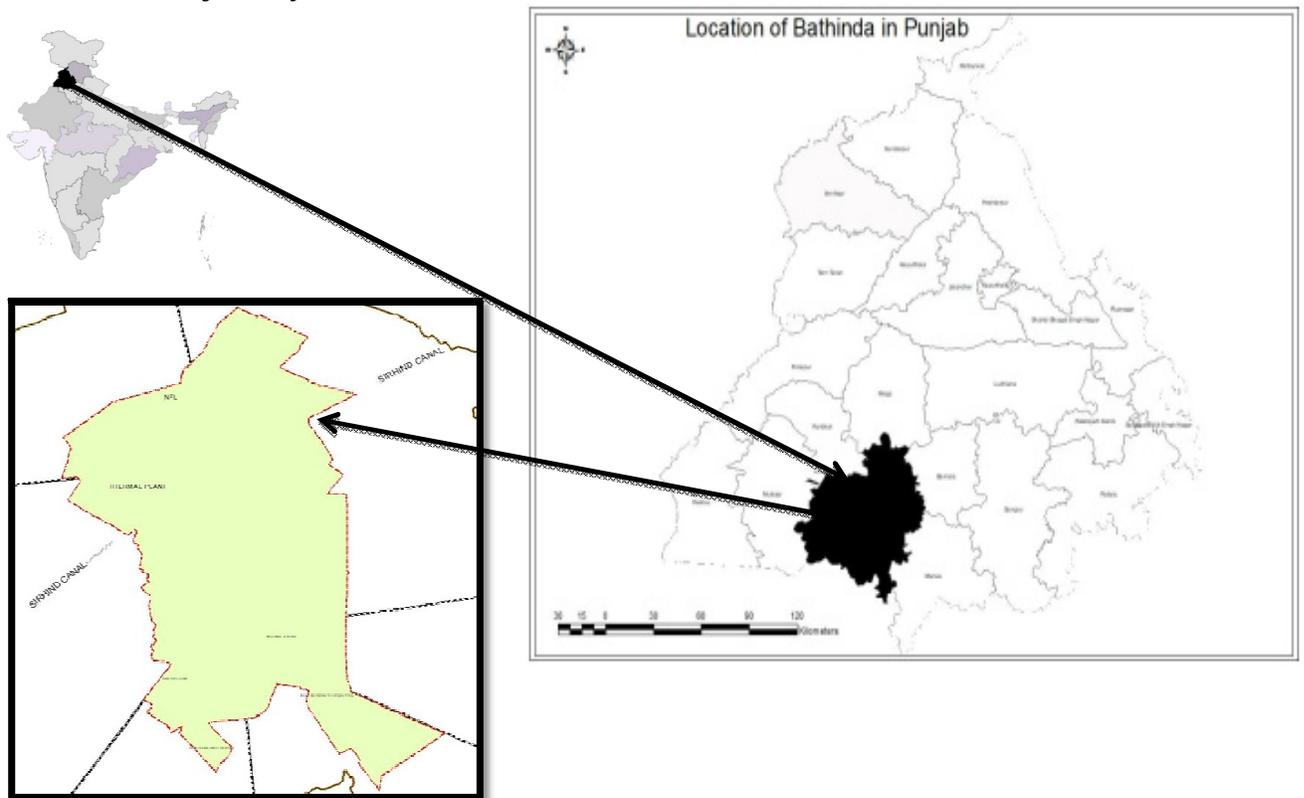


Fig 2: Location of Bathinda City

3.0 FINDINGS: -

Due to the location of the Bathinda city on moderate earthquake prone area, it is seem to be hard for the stakeholders to run the building plans on this land on large scale without maintaining

any specific or necessary safeguards. Now the times, there are about 21% of the population are forced to drink water from the municipality's water pipeline supply, which is said to be inadequate to meet the demand of water as according the existing population or dwelling units. Against the recommendations made in the city's 'Master Plan 2031', so far no industry has shifted from city to center point / industrial development centers. There is very less green areas/ green spaces are present in the city which are near to 2% only. For the reduction of the pollution from city, it should be very essential to replace the Industrial area with green spaces in between Bathinda City level. Presently, the existing manpower and infrastructure services are seem to be very inadequate to collect 100% of waste generated in the city¹.

Haphazard growth, increase in the slum areas along corridors and dumping of waste material with improper manner along the roads increases the problem of land pollution at city level. The haphazard growth of the Informal sector in the city also effect badly on the city planning as well as ecologically balance of the various commercial, residential, Circulation on the roads and institutional sites on large scale. However, environmental pollution not only affects environmental conditions but is the root cause of increases in the health problems especially Cancer due to polluted water to the people¹. So on the basis of study, the findings regarding environmental degradation due to urban growth have been given below:-

3.1 Residential Land use:-

1. Due to lack of proper open green spaces and parks, over congestion on roads and haphazard movement of vehicles on the roads without any audits or road safety an audit in Bathinda city increase the emission of carbon dioxide & carbon monoxide and also increases the level of SMOG during winters. There is lack of proper NMT (Non-motorised transportation infrastructure at residential neighborhood level in Bathinda city. There is not having any proper plan for residential to limit their traffic demand at neighborhood level to reduce the excessive emission from vehicles in residential areas. Mainly the 32.09% of the total area in Bathinda city is under residential use, which includes both planned and haphazard development¹. Because of historical considerations, problems and obstacles, the residential area surrounding the Qila Mubarak, as haphazard development, irregular and randomly constructed residential, due to which they face sewer problems in the context of sewer problems, problems of the crowd and there is no need to do sub-construction law, traffic problems, lack of parks and open spaces, low infrastructure, waste Open dumping¹.

2. The continuously increase in the slums along the corridors and near the residential areas on public/sem-public lands in Bathinda city represent deficiencies of human beings in urban settlements and most of the urban poor live in slums and sturdy settlements. Due to the industrialization or industrial plants in Bathinda, the slums are expand with increasing rate because it is not possible for the Bathinda city yet to support large numbers of migrants who are unable or not in condition to buy a piece of land or plot to build their own shelter for living with family. This thing is putting pressure on the government urban resources because the migrants from other places are incapable and in poor condition by which they are use to live on the public/semi-public lands by constructing their temporary structure on these spaces without any security of the tenure, which affect the practices of the government to run their schemes of planned development by reducing the haphazard or slum growth in the city level¹.

3.2 Traffic and Transportation:-

- Latest surveys of traffic specifies that most of the road network is not crowded. In some roads like Amirik Singh Road, The Mall Road, Haji Ratan Road, Bhagu Road, Guru KashiMarg, the volume / capacity (V / C) ratio is more than 1. There is a sharp reduction in parking in particular in the traditional market areas. of city. In the absence of organized truck terminal, trucks are parked on the road for loading and servicing. There is a bus stand in the center of the city, which leads to crowding on the city streets¹.
- Due to the heavy pressure of population, the problem of transport and traffic congestion also becomes a daily event with the associated increase of sound and air pollution and the major problems related to this aspect are the hierarchy of the road, the lack of parking spaces, the obstacles of traffic, the encroachment of roads, the lack of railways on bridges and the lack of railway underpass, lack of traffic signs etc¹.
- Two-wheeler vehicles on Bathinda - Kotakpura road are 54% of the total vehicles followed by light vehicles, which is up to 26% and heavy vehicles share only 14%. This is also the case with other regional roads¹.
- The space for idle parking is very less and there is a congestion of buses in the bus stand. However, the location of the existing Bus terminal needs a critical review¹ shown as fig. 4

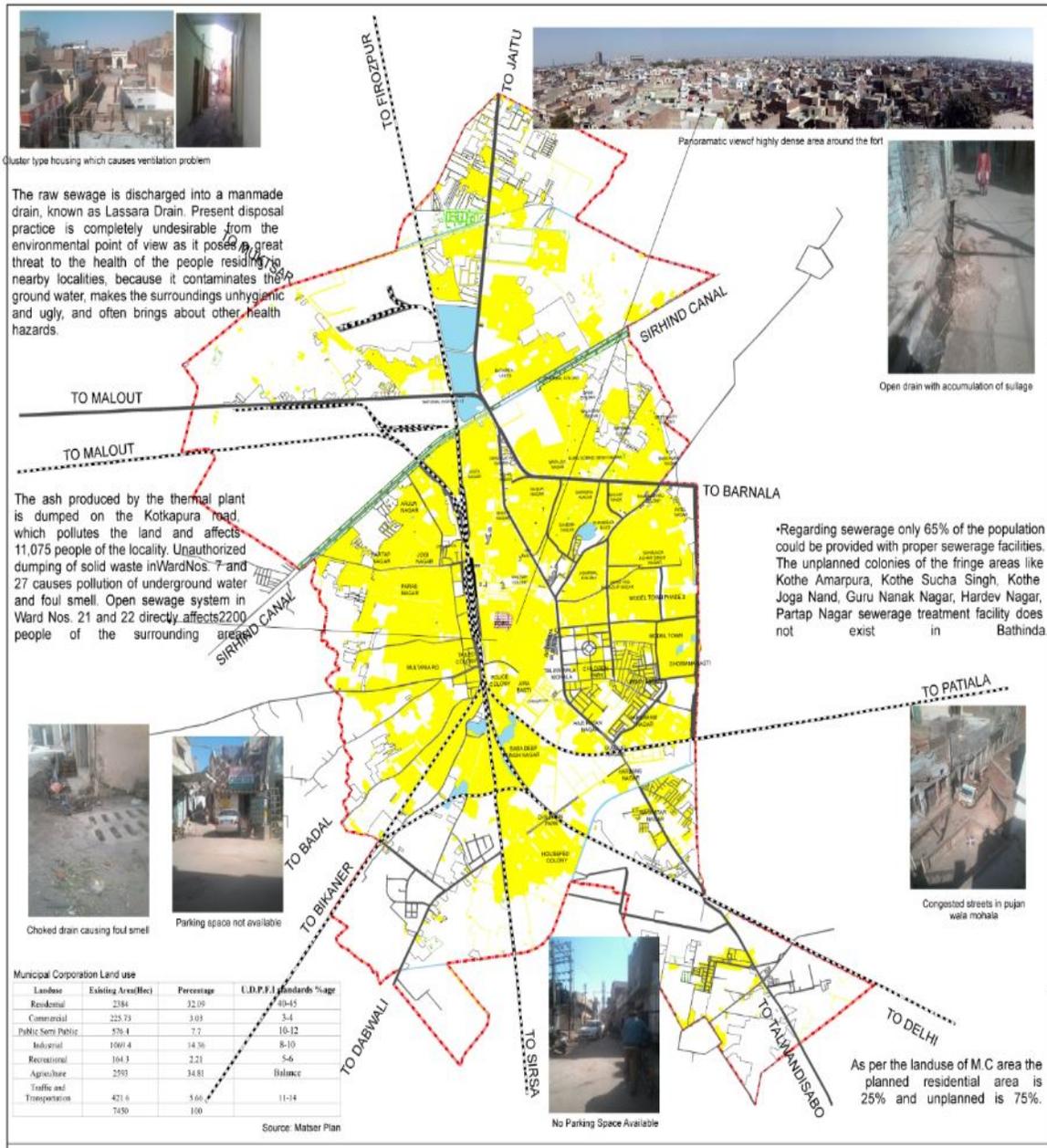


Fig. 3: Environmental Issues in Residential Land use in Bathinda City.

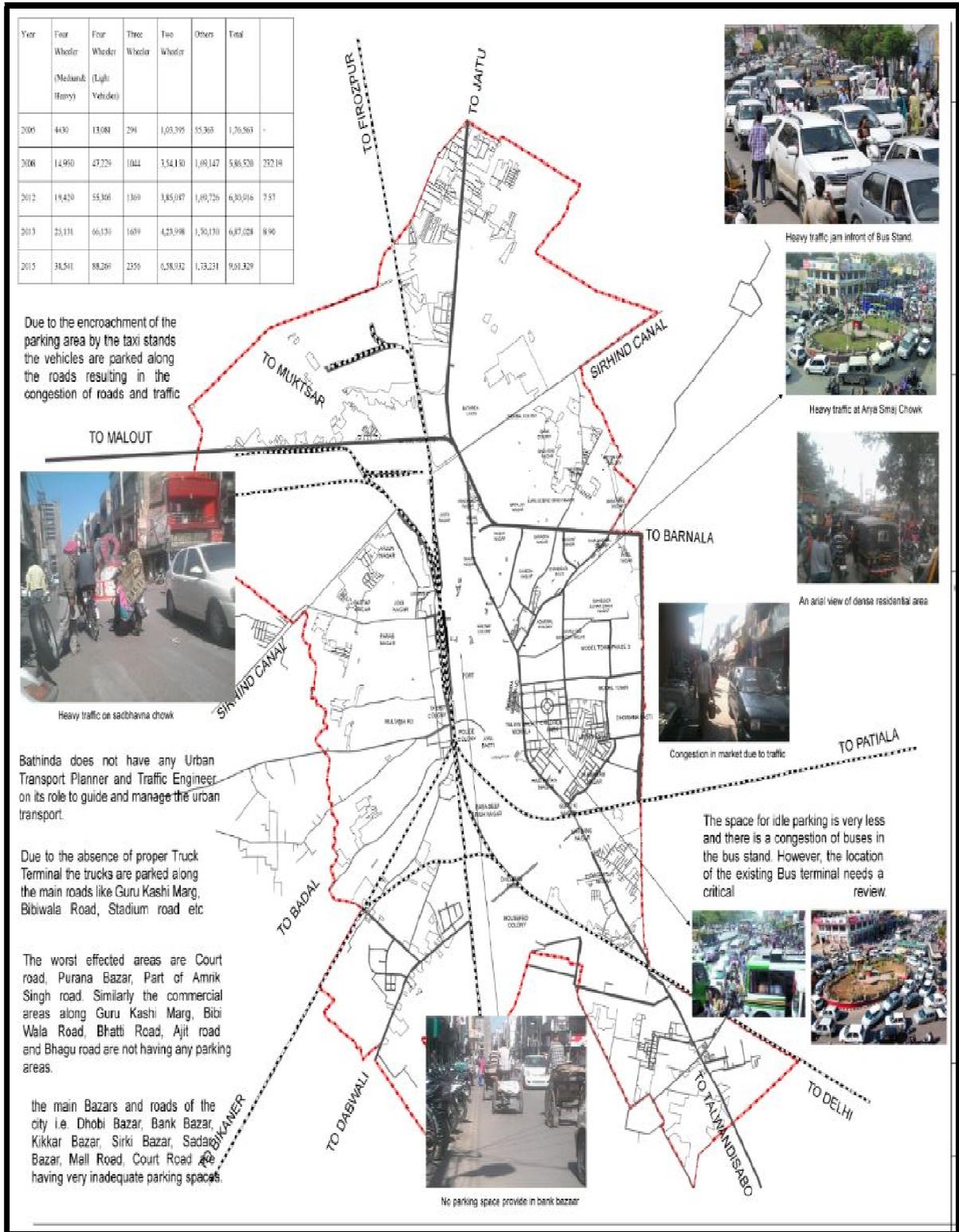


Fig. 4: Environmental Issues related to traffic & transportation in Bathinda City.

- As according to the survey conducted by the Kumar Gaurav, Kaur Amandeep on “Public Transport and urban mobility: Perception of people on services of public transport in Bathinda city”, Punjab, India in 2014, “Public transportation in the city is controlled by both public and Private stakeholder Public stakeholders are central government, State Government, Municipal Board, Bathinda Development Authority (BDA), Punjab Roadways Transport. There is a group of corporations (PRTC) and private stakeholders such people include auto-rickshaw, bicycle-rickshaw, taxi. There are 10 city bus services in the city etc, Controlled by MCB and PRTC and it was started in June 2012. Due to presence of inadequate and unorganized system Most of the public transport in the city use them Individual mode of transport for intra-urban movement 12 Apart from this, the intermediate mode of transport is Responsible for increasing problems like crowding Accidents, parking as well as pollution. Most respondents traveled on a daily basis that they get easily and they have no problem in travel time taken by buses and auto When it was asked that 'if The distance of travel increases, because they change the mode of transportation ', Most Respondent Answers' Yes' It was also saw that striking and political rally at the time of routine travelers face difficulties coming late or coming for their work college and they arrive home late in the night women become insecure for travelers. It was also analyzed if public transport is service and networking increased people are going to get more profit. People from Jogi Basti, Janata Nagar, Parasamabasti and other slum due to the unavailability of the public, the areas have to face very difficulties transportation. They have to walk to catch the city buses in the railway station. Since those areas do not have a fixed auto stand in auto and the rickshaw demands a lot of money inappropriately. Wherever prices of a fixed auto stand are also fixed but wherever it is not sure, people do not like to use auto. This is problem students and students of the college also have to face who are not themselves private vehicle At night time high costs are charged by auto drivers in the morning in areas where demand is low or high. Was also revealed from some auto drivers refused to go to slums areas where the road conditions are not good. Public transport needs people's activities and in carrying goods from one place to another They are employment, education is essential for improving access, other urban services for health, and improvement of the welfare of urban Poor and low income families Though number of private The number of vehicles is increasing everywhere due to factors but demand for public transport has never diminished”³.

3.3 Commercial Land Use:-

- The main main center around Qila Mubarak is centered with the main market. The main commercial center of Bathinda, which serves as the CBD of the city, is located on both sides of the Dhobi Market, such as Sadar Bazar, Post Office Market, Bank Market, Kickker Market and Sikri Market, these shoppers have encroached the roads. Which reduce the effectiveness of the available road network width and crowd is air and noise pollution ¹.
- There is a problem of sewerage in the Syri market, in the Dhobi market there is water problem in rainy season, Mehna Dhobi has more crowds during the peak time, hence the problem of jam due to slow and fast traffic is problematic, There is also parking problem (as shown in fig. 5).
- According to the market committee, due to heavy traffic movement in the area of approximately 230000 people / day from the local and regional level ¹.

3.4 Parks and Open Spaces:

- There are only three neighborhood parks in the city, in a railway colony (which is also used for sports activities), in the second, the Urban Estate is in Phase-I and the other is Urban Estate Phase-3 Part-2. Except for some of these parks, there is no proper park, these parks cover an area of about 23 hectares¹.
- In the interior of the city there are not particularly central business districts, pujaanMohalla, Tallian villa Mohalla, MohallaJhatti Patti, MehnaMohalla, SadiyanWalaMohalla, HarijanBasti, Birla Mill Colony, New Basti, Guru Nanak Para Mohalla etc. Any park or open place. Similarly Guru Ki Nagri, Harbans Nagar, Matti Das Nagar, Balraj Nagar, Deep Singh Nagar, Sanjay Nagar, Jiwi Nagar, HajuraKapura Nagar, Balla Ram Nagar, National colony, Farid Nagar, Jujhar Nagar on eastern side of Railway lines and entire Nagars and Mohallas on western side of railway lines do not have any park(as shown in fig. 6)¹.

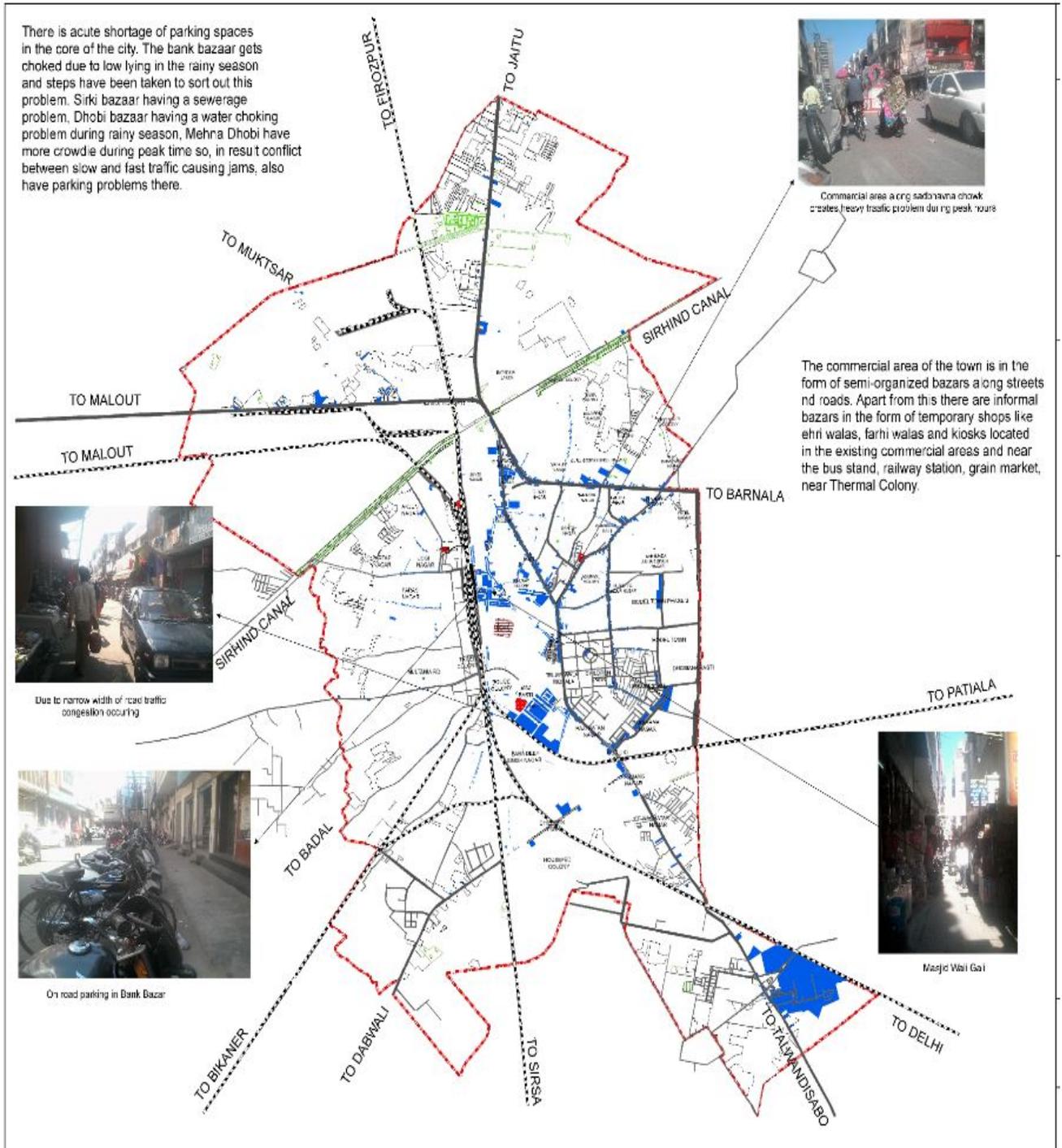


Fig. 5: Environmental Issues in Commercial Land use in Bathinda City.

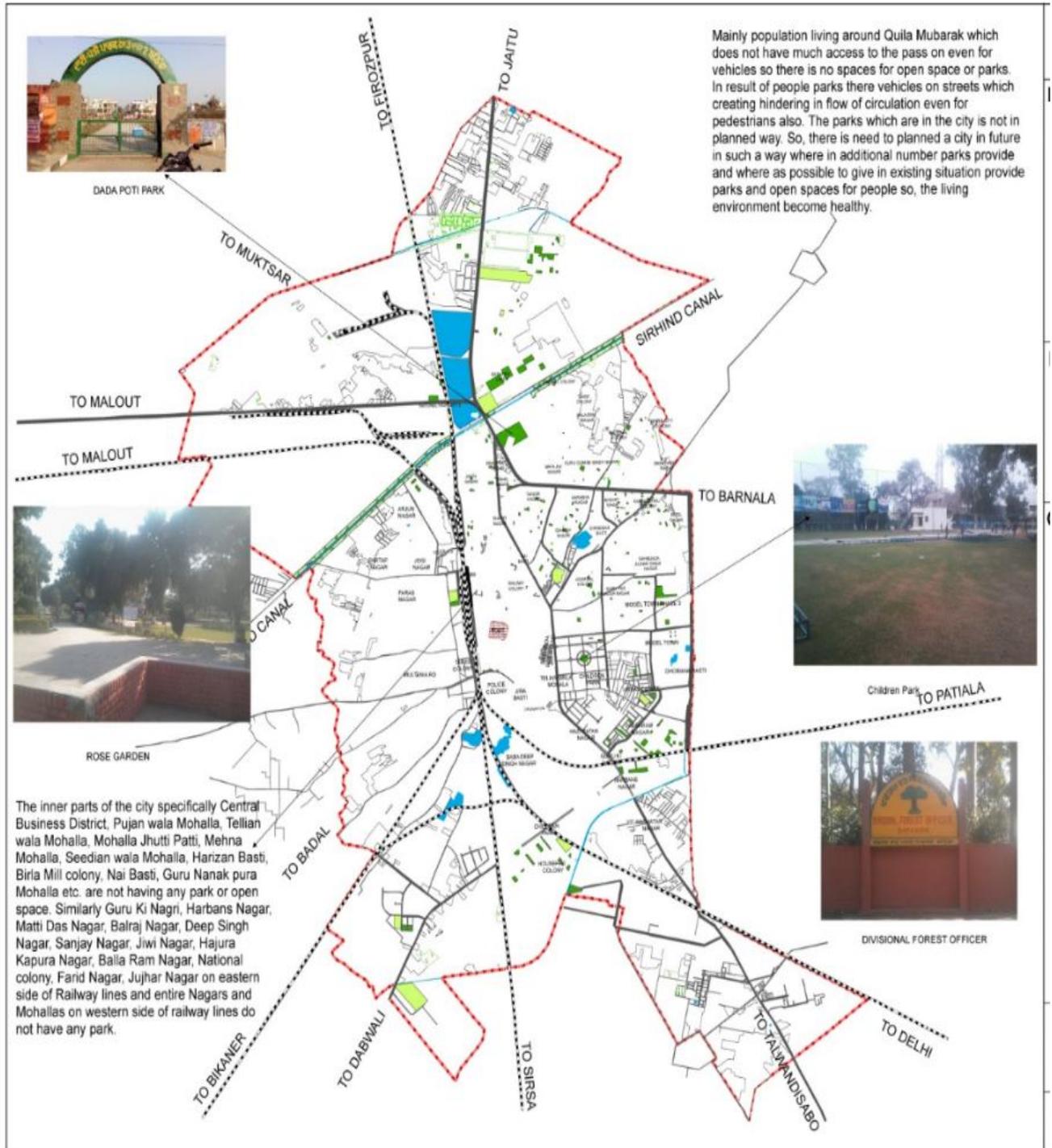


Fig. 6: Environmental Issues in Open spaces/Parks Land use in Bathinda City.

3.5 Public & Semi Public Land use:-

3.5.1 Solid Waste Management:-

- Waste is generated at approximately 110-15 mts per day. Due to the increase in population and the increase in the living standards of the general public, the generation of garbage is constantly increasing. Rate increase is estimated at 3% per year. Therefore, if a proper processing facility is not established, then the land available on the current dumping site will be covered by a pile of waste in another 5 years and the acquisition of more land for the garbage collection. The question is not only of land, the current system of waste dumping is a serious threat to ground water pollution and air borne diseases. Once the land used for the disposal of wastes spoils automatically, because of its poor engineering properties, no structure can be prepared, it cannot be used for farming. So, for the dumping of solid wastes, the new land will always be required, if the same action is not taken (as shown in fig. 7)(1).
- Removing wastes is done arbitrarily without following any properly laid down system. Cleaning of roads has not been found satisfactory and dumping the waste by the public has been found to be highly unsatisfactory. In this process, solid waste management has emerged as a major issue in the management of the city(1).
- No ward Unauthorized dumping of solid wastes in 7 and 27 cause pollution and funk of ground water. Open sewage arrangement in ward no. Directly affect 2200 people in 21 and 22 adjoining areas¹.
- Manpower reduction is responsible for this delayed collection and the residual waste becomes a breeding land for flies and mosquitoes, which eventually leads to an increase in the incidence of diseases like malaria, typhoid and diarrhea¹.
- Apart from this, in the absence of defined boundaries, animals like pigsetc waste on vegetation. In addition, due to the unscientific disposal of waste, due to the presence of organic wastes polluting the environment in the process, there is a lot of odor. In the system of sanitary landfill, there is no treatment of solid waste during the required dumping process. The site does not have any kind of fence or complex wall. This has created a threat to children or animals in the area¹.

3.5.2. Water Supply and Pollution:-

- Bathinda branch of Sirhind Canal is the only supply line for surface water, but it is presently in danger of pollution. Generated from the work of Ropar Head, it passes through the vast areas of many cities and villages and it has been seen that some settlements leave their wastewater in the canal. Due to the above facts, the water flowing in this canal has become

contaminated, in which there are many chemicals, such as some chemical materials and suspended particles².

- More research is required in the relationship between the use of income and water. While many studies have found a positive connection between the use of income and water (Beatty et al., 2006; IPART, 2004), alone, an important driver is not visible for income demand. Due to the increased incidence of equipment like pool, there is a positive impact of income on the use of external water. However, higher incidence of homes is more partially away from water efficient devices. The implications of IPART's findings for planning are that the strategies that enable large block sizes or promote high levels of different housing water consumption. Plans to plan for small sizes and living in units can result in less water intake¹³. Some areas like Amarpura Basti, Lal Singh Basti, Udham Singh Nagar, Dhillon Colony etc. are supplied with ground water, which is not recommended for human consumption due to high level of fluoride etc¹.
- In this area, groundwater contains high levels of fluoride and chloride which make the ground water ineligible for human consumption and also accumulate life. Therefore, the residents of the unsafe groundwater city are at risk of water borne diseases. Due to the use of brackish ground water for agricultural works, soil erosion has occurred and the presence of heavy metals in the soil and vegetables crops grown in the region has taken place¹.

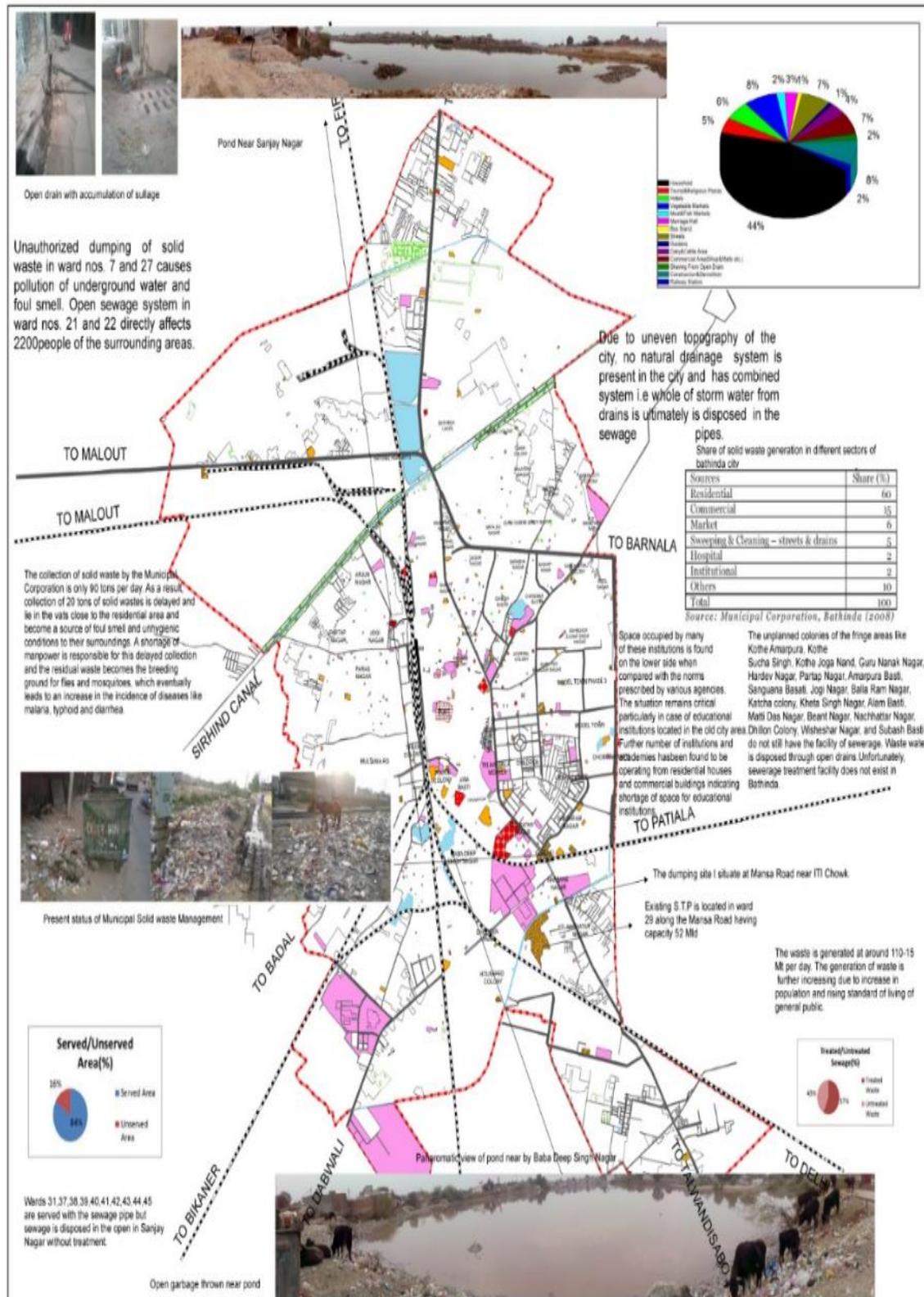


Fig. 7: Environmental Issues in Public/Semi-public Land use in Bathinda City.

- The existing ponds in various areas also increase the pollution problem in the city. Dirty water, including sewage, is poured in these ponds in normal days and in the rainy season, the size of ponds usually increases and they are filled up to the edge of the ponds. These ponds become the center of mosquitoes and cause many other diseases. In addition, the dirty water of these ponds pollutes the sub-soil water of these areas. The most affected areas are Chandasar Basti, KhadarBhandar Street, Agrawal Colony, Vasant Vihar, AmarpuraBasti, SangunaBasti, Lal Singh Basti, Deep Nagar, Sanjay Nagar, Balraj Nagar and Awa Basti etc. All these ponds have their own cleaning and proper requirements. Long-term management in an environmentally friendly manner (1) (as shown in fig. 7).

3.5.3 Sewerage System

- Appropriate sewerage is very important for disposing of huge wastes generated from domestic, industrial, commercial and institutional units. The first work of laying underground sewerage in the city was in 1963-64. In the last 43 years, only 65% of the population could provide proper sewerage facilities².
- Whereas Amarpura, Where Suchka Singh, Where Joga Nand, Guru Nanak Nagar, Pratap Nagar, Amarpura Basti, Saguna Bacity, Jog Nagar, Balla Ram Nagar, Kutcha Colony, Kheta Singh Nagar, as unregulated colonies of Fringe areas, Alam Basti, There is no facility of sewerage in Matti Das Nagar, Beant Nagar, Nachtar Nagar, Dhillon Colony, Visheshwar Nagar, and SubashBasti².
- Open drains are mainly in use for the disposal of waste because sewerage treatment serices is not allowed everywhere in the Bathinda City. So the people mainly uses the raw sewage to discharged into a man-made Lisara drain. But this method of disposal of waste water or draining of dirty water is not safe for the health of the people of surrounding areas because it can cause the bad effect on ground water and also effect badly on the health of people by causing diseases to them. According to Feedback Venture Pvt Ltd (F.V.L.), waste of the city is settled through 8 temporary pumping stations located in different parts of the city².

3.5.4. Air Pollution:-

- Emissions generated by fuel burned by industries have contributed to reducing air quality. In order to clearly assess and monitor the ambient air conditions and quality in Bathinda, the data collected and analyzed is being done by the Punjab Pollution Control Board regarding the quantity of suspended particles, SO₂ and NO₂ present in the air¹.

- The major sources of air pollution in the city are thermal plants, NFL, automobiles and other industries that emit smoke and gas in the atmosphere more than the specified range².
- Thermal Plant emits huge amounts of gas due to poor quality of coal and thus generates about 600 tonnes of ash per day, which has no proper place for dumping and disposal. It has been dumped along with Kotakpura road and it is causing serious health hazard by contaminating the water bodies located in it².
- Vehicle pollution is approximately 80% of total air pollution. There is a pollution monitoring station near the railway station, which records the level of various pollutants (SPM, SO and NO). The main conclusion is that there is a large amount of particles suspended over the year above the permissible limit of 120µg / m³ in the air. Its credit can be given to dust from the open land, smoke from the pollutants of industrial areas and the movement of vehicles. So, NO has been found within permissible limits (as shown in fig. 8)².

4.0. STRATEGIES:

- This area is located at Punjab. This natural reserve has the ecological function of protecting bird habitats and the safety of drinking water resources. It is prohibited to build municipal motorways around here, and sound barrier is needed to isolate noise disturbance to the birds. The foregoing analysis shows that issues of urbanization and environmental sustainability are very complex. If local results are desired, then they will have to be resolved at the local and state level. The following measures have been suggested for avoiding environmental risks and stability in Bathinda city:

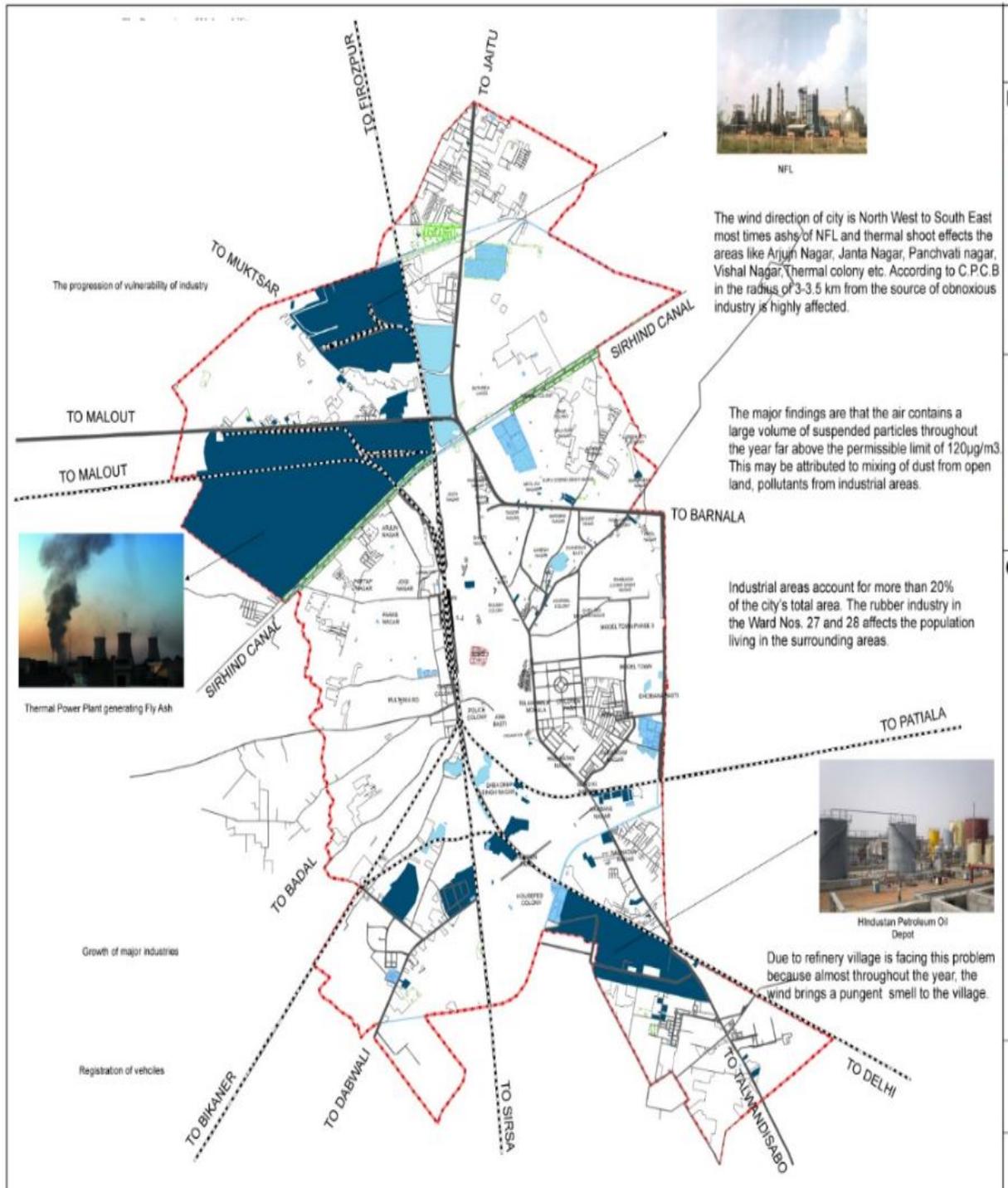


Fig. 8: Environmental Issues in Industrial Land use in Bathinda City.

4.1 Residential Land use

- In the main part of the city, where historically the development of the Fort Mubarak is changing, in an unplanned manner, where the use of high density and mixed land can be used as a worshipping hall, TaliaanMohalla, MohallaZuti Patti, MehnaMohalla is done. There is no

park or open space in SidhiyanMohalla, HarijanBasti, Birla Mill Colony, New Basti, Guru Nanak PraMohalla etc. Similarly, there is environmental degradation from Guru Nagar, Harbans Nagar, Mati Das Nagar, Balraj Nagar, Deep Singh Nagar, Sanjay Nagar, GV Nagar, HajuraKapura Nagar, which is an integral part of the plan and development of the city and effective implementation of the scheme. Must be controlled through enforcement process (1).

- The urban population of Bathinda is 2, 17,256, in which 41645 families are included. Slum population was 40602, in which 7723 families were included, which is 18.68% of the total urban population. The average size of homes in the slum was 5.13 compared to 5.26 in non-slum areas. The eight slums are referred to as master plan reports, which are reported that these slums are located on private land. Given the location of the slums, it is seen that almost all the slums are located in residential areas. The existence of most of the slums on private land helps in finding suitable solutions for the removal of slums with the participation of land owners based on providing high incentives and subsidies to make suitable shelter for such slums could. The slum-keeping slum can be considered as a partner in the entire process by asking for contributions to the share of the cost of the shelter. On their behalf, parasternal agencies can be asked to forgive all the fees and charges imposed for construction, building construction etc¹.
- The FAR of the buildings should be as according to the width of the roads, because the FAR of building and dwelling units are directly affect the traffic on the local street roads as well as on collector roads. It also has their impact on the reduction of on street parking and over congestion on the local street/collector roads. The height and basic coverage of building on the ground, building bye laws will be applicable for individual residential plots at city level for controlling the haphazard development and over crowd at street level¹.

4.2 Traffic and Transportation:-

- Given the need to integrate the strategy for many basic infrastructures, many fronts have been taken into account, on which Bathinda city can develop environmentally friendly urban transport system. Increasing awareness of the threats from climate change has focused on emitting greenhouse gas (GHG) and the need to reduce those people (Stern, 2006) and recent increases in petrol prices have raised the debate over the availability of petroleum-based fuels and the need for improvement in dependent transport sectors (Farr, 2007; see also AGO, 2006) in Bathinda City to make sustainable development in the city.
- Improve safety, mobility and efficiency of traffic within and outside the city¹.

- Separate and rationalize inter and intra city traffic.
- To improve the road geometry and road capacity of the existing network
- Reduce the pollution caused by traffic and transport and improve the environment.
- To create new road network to improve operational efficiency of traffic and improve existing network¹.
- Providing adequate parking space to overcome traffic constraints.
- Planning and providing effective public transport services
- There must be adequate provisions for the management tools needed to control the vehicle's population and road accidents¹.

4.3 Parks and Open Spaces:-

- The parks should be provided for the eastern part of the railway lines so that it also works for the entire Nagar and Mohalla and the western part of railway lines ¹.
- The ponds which are causing problems for residential areas such as deodorant and solid waste should be turned into parks to dump those ponds so that residents can get relief from the problems of diseases¹.
- Entrants should be removed with strict action in the main markets, so that open space is available to the passengers ¹.

4.4 Commercial Land Use:-

- Proposal of NMT in the Narrow Street and main markets with multilevel parking for the motorised vehicles near the market. Rehabilitation of the hawkers (Informal sector) from the main market and restrict the over path encroachment by the shopkeepers in the market, which give proper path to the pedestrian for their movement.
- Multilevel Parking should be proposed in commercial areas along with Guru Kashi Marg, BB road, Bhatti road, Ajit road and Bhagu road ¹ and restricted timings should be applied on the movement of heavy vehicles in these areas.

4.5 Industrial Land Use:-

- According to the guidelines of the Ministry of Environment, all the red / green categories of industries will be allowed to be set up in designated industrial areas only in the city and the orange category of industries will be treated with red category industries as far as farming sites Criteria / Transfer Non-specified area in designated industrial areas¹.

- According to the National Environment Policy, 2004, it must be mandatory for all unpleasant industries to provide green buffer. Therefore, buffer should be provided with buffer industrial areas in Bathinda, which are rubber industry in Ward no 27 and affect the population living in the surrounding areas¹.
- For the treatment of toxic waste of unpleasant industries, a common waste treatment plant should be provided under the Municipal Solid Waste Rules, 2000¹.
- Setup of the green belt with round wall of tall leafy trees around the industry near the industries even on the periphery areas to reduce the bad effect of the toxic gases and harmful smoke released from these industries.
- The poultry farms and dairy cattle's should not be allowed to be practising in the city level area and instruct the poultry farmers and cattle farmers about use the proper dumping boxes for collect their solid waste and teach them about proper use of their solid waste with new technology example set up of Gobar gas plant for their own.

4.6 Solid Waste Management & Water:-

- Proposal of theme based markets should be proposed for the informal sectors in Bathinda city, where the dumping boxes should be placed near the temporary structure of every vendor or hawker carts for proper dumping of the waste material, which also should followed by the MC solid waste collection vehicle.

- The Use of Groundwater:-

As the world's second largest source of freshwater after glacial waters, groundwater is an important component of the water cycle. The distribution of the urban groundwater is carried out according to three main destinations ¹⁴:

- _ The urban distribution network, which is the main network that generally carries most of the drinking water resources;
- _ Alternative networks, which develop when water resources are limited; and
- _ Spot captures for individual users (industry, households, etc.).

Groundwater management, in support of sustainable urban development, has improved with a basic understanding of the urban groundwater system and continuous monitoring of groundwater levels ¹⁵. The follow-up is a cyclical process, in which the types of information needed determine the monitoring strategy and design, which allows the data to be collected, analysed, and translated into useful information. The design of the network supervision is determined by, on the one hand, the urban planning needs and, on the other hand, by the complexity and spatial and temporal variability.

- The separation of solid waste should start at the point of production of the waste and recycling should be given priority compared to disposing waste in sanitary landfill site to reduce land and ground water pollution¹.

5. CONCLUSION:-

After analyzing the data and theory of Bathinda city environment get the root causes that why the environment of Bathinda (city) is getting deteriorating and it is concluded that in study how the preventive measures could be taken. Currently, rapid urbanizing areas deal with the relationship between land for construction and ecological usage by referring to various urban plans. Some plans on the basis of abiotic suitability for land-use types are not adequate, because they focus primarily on vertical relationship in the landscape and ignore ecological sustainability (Opdam et al. 2006). A successful and practical urban landscape planning should reflect the history and real development trend; furthermore, it also considers the requirements of social, economical, and ecological sustainable development and optimizes the structure and function of the urban environment, rather than maximizing certain ecological aim.

Based on this literature survey, the following conclusions can be made: (1) In order to address the environmental issues more widely in urban planning, a multi-disciplinary, inter-disciplinary framework is required; (2) Tools for applying environmental issues and standards with urban planning vary in terms of methodology, and many of them require further research and development; (3) To integrate environmental issues with urban planning, the equipment should be more process-based and participating, because collective decision-making is widely accepted in urban planning and development; (4) Sometimes a more accessible approach to environmental standards is advocated and equitable, in which environmental issues are addressed as well as local social and economic conditions.

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