

**PATTERN OF URBANIZATION AND CREATION OF SOLID WASTES OF THE TWO –
MILLION CITY OF
PATNA, BIHAR**

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Urbanization can occur only when the rate of growth of the urban population is greater than the rate of growth of the non-urban population in a country. Due to the fast pace of urbanization urban environment has become progressively less livable and less attractive, Patna, being the Capital City of Bihar serves as magnetic attraction for the rural people for its developed infrastructure. The City record constant rapid growth since 1941, particularly faster growth from 1961. The growth of population in sixty years (1951-2011) was recorded 572.95 percent growth. The City produces huge quantity of Solid Wastes both by the permanent residents as well as by the various types of tourists visiting the City. In 2018 the total amount of Solid Wastes created in the city was 6,302.7 Quintals daily. Various ways are adopted to solve the problem of the disposal of Solid Wastes.

Key – words – Patna, the Capital City of Bihar – Urbanization – environment – population growth – fast pace – creation of Solid Wastes – residents – tourists – problems of waste disposal – its management.

Introduction: - Urbanization has been often used to denote the level of population concentration in an urban area. Hope Tisdale Eldridge treats urbanization as a process of urban concentration and identifies two elements in the process. (a) The multiplication of points of concentration and (b) the increase in the size of individual concentration. (Eldridge, 1956, 338-43). Urbanization can occur only when the rate of growth of the urban population is greater than the rate of growth of the non-urban population in a country (Sharma and Sharma, 1983, 213-14). Urbanization is a shift of people from village to City. One of the most impressive phenomena of the twentieth century has been the fast pace of urbanization and high pace of growth of the Cities. Now urbanization becomes an important infrastructure for socio Economic development of a region (Pandey, 1999, 6). A city is an engine of economic development. It is the focal point of culture, knowledge, industry and education. Equally it is a source of malaise – social, physiological and aesthetic (Nag., 1981, 288).

Environmental pollution is increasing at an alarming rate. The survival of man is explicitly dependent on environment. The quality of environment dwindles proportionately with the amount of stress. The environment cannot support the existing community. Air and water pollution problems are the results of industrialization and urbanization. It is the population explosion and consequent aggravation of poverty level that has turned the cities into nightmare (Sinha, 1991, 13). The urban environment has become progressively less livable and less attractive to the present urban residents and to possible future migrants to urban areas as well (Northen, 1979, 89).

Besides the natural increase of urban population, there is mass exodus of rural people to urban centers for economic reasons on the one hand and deteriorating law and order situations (extremisms) in countryside on the other. Towns serve as magnetic attraction for rural people due to

adequate electric and water – supply, educational institutions, hospitals, centre for recreation, communication and ways of life” (Baghel, 1995, 122). Economic capability is the most important factor in the human occupancy of an area. “The availability of employment opportunities in an area, determine the carrying capacity of the area, which exerts a direct influence upon the size and spacing of people in their spread” (Dyos, 1975, 190).

Purpose of the Study: - The aim of the study of present work is to assess the dynamics of population growth of Patna and its consequences as regards the creation of solid wastes. Its disposal and management has assumed as a great problem towards geographers and urban planners.

Methodology: -This work is based on primary and secondary data and information. Census report, Gazetteers forms the sources of secondary data. Literary work has been done from different libraries. On the basis of collected and processed data and information, maps have been drawn.

Study area: - Patna, the capital city of the State of Bihar, is an epitome of the history and culture, of the region. Sprawled on the bank of the Ganga, Patna, “the Eternal City of the East” is a lineal descendant of the ancient metropolis of Pataliputra and Azimabad. The City is also consecrated by the Sikh as it is the birthplace of Guru Govind Singh, the tenth and the last Guru of Sikhism. Geographically the city of Patna is located between latitudes 25° 35’ and 25° 38’ north and longitudes 85° 5’ and 85° 16 east. Patna is an ancient and the largest City of Bihar. The outstanding feature in Patna’s site is the natural dominance of the Ganga abandoned courses of Son (Sami, 1980, 37). Patna is an elongated ancient city of the State having an area of 57.83 sq. Kms. It is a second longest city in India headed by Calcutta (Kolkata) conurbation (Ahmad, 1965, 335).

Delimitation: - The study area is limited within Patna Municipal Corporation. On the basis of this work, study of other large city may also be done.

PATTERN OF URBANIZATION

Patna is a very old city. But no definite record of its population of the early period of its existence is available. Megasthenese, the Greek Scholar, who visited the city during Chandragupta Maurya reign (322 – 285 B.C.) has indicated in his Chronicles that the city had a population of 4 lakh persons. This figure seems quite exaggerated. Patliputra was fully destroyed by the Huns in 500 A.D. This was confirmed by a Chinese traveler Hiuen Tsang who visited the city in the Seventh Century, found it deserted and estimated its population to be about 5,000. The city remained in the dark for Sometime. In 1581 the population of the city is estimated to have been 30, 000. The population of the city continued to increase with its growth as trading centre. The prominence of the city was further enhanced in the seventeenth century when the Dutch established their control in some parts of Bankipur, which is known as Central Patna. In the middle of the eighteenth century the city came under the rule of the British. This was followed by territorial expansion of the city which led to the growth of its population. According to Buchanan (1811- 12), the population of the city was about 3, 12,000 persons. This figure is misleading because the population was taken for an area of 20 square miles around Patna, while the city actually spread over an area of only one and half square miles. The distribution pattern of the population of Patna was not uniform throughout the city. There were two main pockets of population concentration, first is the eastern Patna and second in Bankipur. Moreover, the stretch along the river bank was used for trade.

Authentic population figures:-Reliable figure for the population of Patna is available only from 1872 when the first census of India took place. In this census the population of Patna was 1, 58,900. However, the method used for counting people was very unscientific and crude. Hence the reliability of data was low. A complete and correct census took place on 1881, when scientific methods were adopted for enumeration. Since then the population is counted at regular intervals of ten years, which are known as census years. The population of the city commencing from the census of 1872 along with the decennial variation is shown in the following table no. 1.

Table no. 1

Patna: Decennial Growth of Population (1872 – 2011)

Census years	Total population	Variation	Percent decadal variation (+) Increase (-) Decrease
1872	1,58,900
1881	1,70,654	+ 11,754	+ 7.36
1891	1,65,191	- 5,463	- 3.20
1901	1,34,785	- 30,406	- 18.41
1911	1,36,153	+ 1,368	+ 1.01
1921	1,19,976	-16,177	- 11.88
1931	1,59,690	+ 39,714	+ 33.10
1941	1,96,415	+ 36,725	+ 23.00
1951	2,50,285	+ 53,870	+ 27.43
1961	3,63,700	+ 1,13,415	+ 45.31
1971	4,73,001	+ 1,09,301	+ 30.05
1981	7,76,371	+ 3,03,370	+ 64.14
1991	9,17,243	+ 1,40,872	+ 18.14
2001	13,66,444	+ 4,49,201	+ 48.97
2011	16,84,297	+ 3,17,853	+ 23.26
1872 – 1951	...	+ 91,385	+ 57.51
1951 – 2011	...	+ 14,34,012	+ 572.95
1872 – 2011	...	+ 15,25,397	+ 959.97

Sources: (I) Census of India, 1991, Series-5, Bihar, Part II-A,

General Population Tables, P.307.

(ii) Census of India, 2001, Series-11, Bihar, P.45.

(iii) Census of India, 2011, Bihar and

(iv) Self calculation.

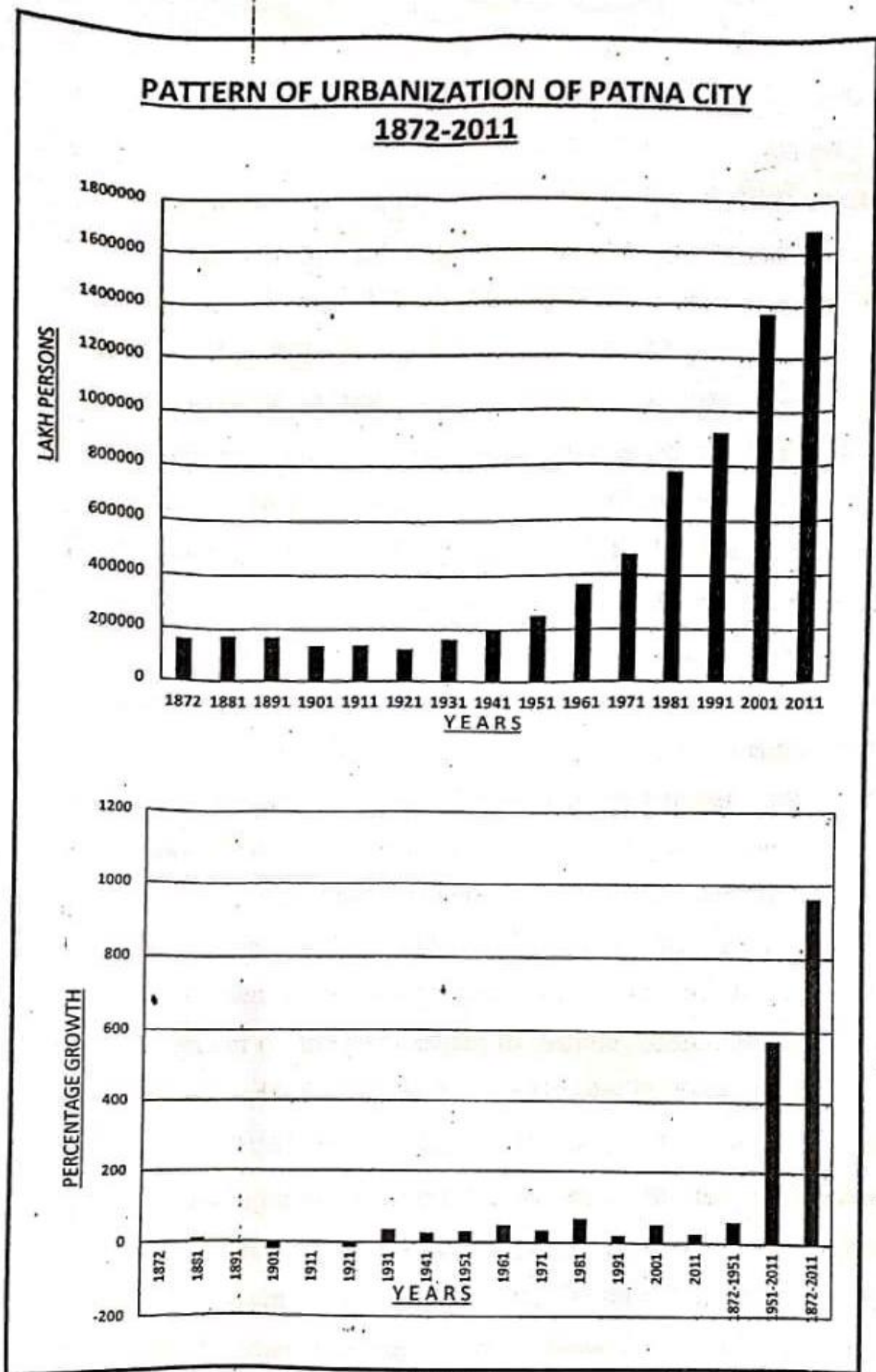


FIG NO.- 1

The above table reveals that the population of Patna increased from 1, 58, 90 in 1872 to 1, and 70,654 in 1881. thus there was an addition of 11,754 heads and the rate of growth was +7.36. But in 1891 the population of the city decreased to 1, 65,191. The total decrease belongs -5,463 and the percent of decrease was -3.2. In 1901 again the population decreased by -15.41 percent. In 1911 the city recorded 1, 36, 15 1 persons and there was nominal increase (fig.no.2).

The decrease of population of Patna during 1881-1921 may be ascribed to outbreak of epidemics, droughts, floods, etc., as well as falling economic status of the city. In the beginning of the 19th century Patna was a river port and important centre of trade between upper India and Bengal. With the construction of the railway in the latter part of the 19th century the river borne traffic was badly affected. The traffic from up country which originally passed along the Ganga to Kolkata was now attracted towards the rail-roads and hence the commercial importance of the city which was largely dependent on the river began to decline. Moreover, abandonment of the opium trade added to setback. The population between 1881 and 1901 decreased by - 21.61 percent. During the period plague had spread out all over the city taking innumerable lives. Moreover the fear of its attack forced the people to move to countryside and at the same time it also prevented the people to move from the country side into the city. The position was slightly better in 1911, when the population increased by +1.01 percent. During 1911-21, the population of city again decreased to 1, 19,976. The period of 1911-21 was largely affected by floods, droughts and frequent outbreak of epidemics. In fine, the period between 1881-1921 may be termed as a “period of negative growth”.

After 1921, the population of Patna increased continuously and the trend is continuing till now. This trend is seen all over India. This is why, the year of 1921 is known as the “Grade Divide” of Indian census. During 1921-31 the city was fairly free from any large-scale natural calamity, the city’s population increased by +33.10 percent. The rate of increase during 1931-41 was somewhat less as compared to that of the previous decade, the total increase during the period being 23 percent only. It improves slightly in the decade 1941-51 which recorded +27.43 percent increase in the population of the city. The period between 1921 to 1951 may be referred to as the period of slow or marginal increase. The population figures after 1951 depict an accelerated rate of growth. It jumped from 27.43 percent during 1941-51 to 45.31 percent during 1951-61. In this period death due to launching of economic reconstruction programme after independence was less. During 1961-71 the rate of growth was +30.05 percent. It was less than in the previous decade. In fact, the emphasis laid after independence on the uplift of rural economy, decentralization of administrative machinery, encouragement to small scale and cottage industries and the reforms of agrarian and social orders, etc have to some extent minimized the migration of rural population to urban areas.

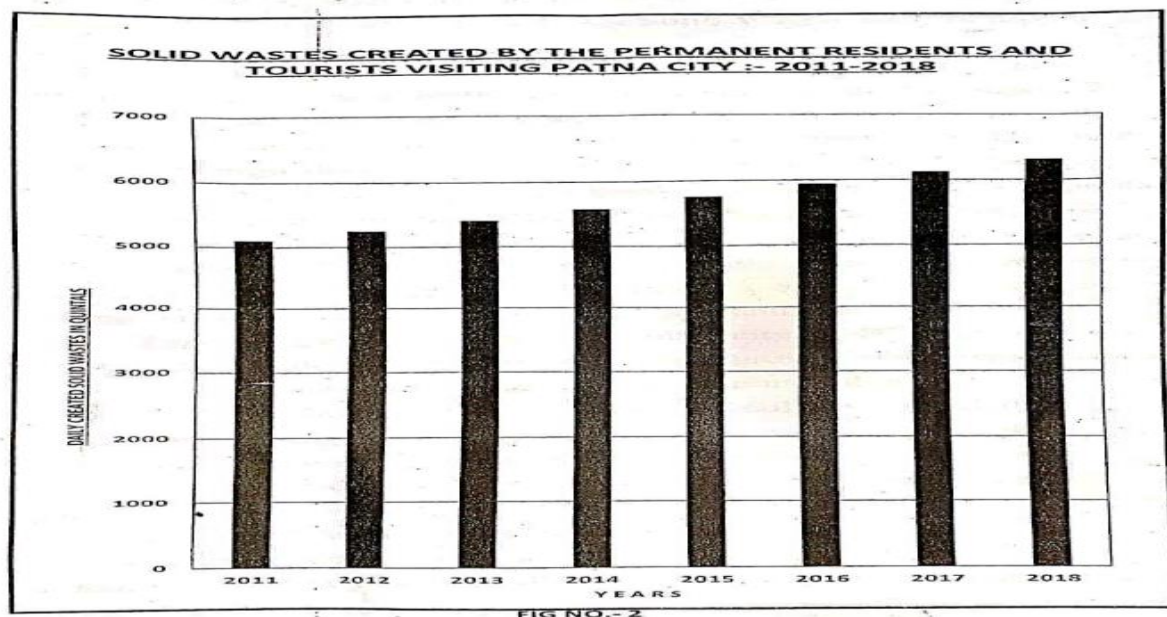
Patna experienced by far the highest rate of 64.14 percent growth in its population during 1971-81. This rate of growth is more than double that of the previous decade. It was mainly due to the large-scale rural-urban migration and development of a large number of residential colonies. Commercial, industrial, educational, medical and other functions of the city attracted rural people to

settle in Patna. Manifold increase in commercial activities and growth of small scale and cottage industries Attracted people from neighboring villages. There were job opportunities in Patna and unemployment and under-employment prevailed in the surrounding rural areas. It also attracted the people to Patna. However, rapid growth of population of Patna led to various problems such as shortage of house, lack of civic amenities etc.

After 1981, the rate of growth of population decreased considerably to +18.14 percent. The total population of the city was 9, 17,243 persons in 1991 and the net increase was 1, 40,872 during 1981-91. The slow rate of increase in population of the city during this period may be attributed to the effectiveness of family welfare measures and the change of attitude of the people towards small size of family. This decreasing rate of growth has been witnessed in all parts of the country. In 2001, Patna had a population of 13, 66,444 persons, the total increase being 4, 49,201 and the rate of increase was 48.97%.

As per the final population figure provided by the census of India, a total of 16,84,297 persons were enumerated in 2011.this population was distributed in 72 wards of Patna municipal corporation and excluded five out-growth viz. Patliputra colony, Digha Manipura, Badalpura, Sabazpura and Khalipura in 2011. In this way, there was an absolute increase of 3, 17,853 persons and percent increase was of 23.26. This is attributed mainly to the fast development of satellite towns of the city and building construction activity taking place in Bihta, Maner, Fatuha, Hajipur and Sonepur.

Further, the period between 1961-2011 was the period when the process of deceleration in the mortality rate continued further with no marked fall in birth rate. Again, in the total growth of population, the higher



Rate of urban growth of population as compared to that of rural is a universal phenomenon (pandey, 1985, 159-60).

Creation of solid wastes

“Solid waste substances are those materials which become useless and hence waste after short period of their use “.

---Savindra singh, 2007.

“The term solid wastes encompasses the highly heterogeneous mass of discovered materials or throwaways the urban community”.

----Suresh k Dhameka 2011-12

Solid wastes incorporate newspapers newspapers, different type of cans, bottles, broken glass wares, plastic containers, polythene bags, ashes and domestic garbage's. These discarded solid substances after their uses are variously called as REFUSE, GARBAGE, RUBBISH, SOLID WASTES etc .(Singh,2007,454).The types and sources of solid wastes are municipal wastes, packing wastes, human wastes, mining wastes, agriculture wastes, industrial wastes, animal wastes, radioactive wastes etc.

According to a report of NEERI (National Environment Research Institute) situated at Nagpur, urban wastes created per day per person is 0.5 kilogram at Kolkata and Mumbai, which in other cities this quantity ranges from 0.15 to 0.35 kilogram per capita per day.(Singh,Savindra,2019,78)

In the case of a tourist visiting a place creates on the average of one kilogram of solid wastes per capita per day.

On the basis of these facts, solid wastes created by the permanent residents as well as by the visiting tourists have been shown in the following table no. 2.

Table no. 2

Sl.No.	Year	Census population	Estimated population	Solid wastes created (in quintals dally)	Total tourists (domestic + foreign) daily	Solid wastes created in quintals daily	Total Solid wastes created quintals daily
1.	2011	16,84,297	...	5,053	4,110	41.0	5,094.0
2.	2012	...	17,34,826	5,204	4,560	45.6	5,249.6
3.	2013	...	17,86,871	5,361	5,130	51.3	5,412.3
4.	2014	...	18,40,477	5,521	6,225	62.25	5,583.25
5.	2015	...	18,95,691	5,687	6,870	68.70	5,755.70
6.	2016	...	19,52,561	5,858	7,580	75.80	5,933.80
7.	2017	...	20,11,137	6,033	8,110	81.10	6,114.10
8.	2018	...	20,17,471	6,214	8,870	88.70	6,302.70

Sources: (I) Census of India, 2011.

(ii) DHAMASHALAS, including lodges of Patna Saheb

(iii) Tourist Information Office, Patna and

(iv) Self Calculation

Note: Total tourists also incorporates the pilgrimage tourists of Har Mandir

Although tourists and visitors come in Patna round the year, but their maximum ingress is in the season of winter, the best period climatically.

Hare it may be noted that there is a direct positive relationship between the amount of Solid Wastes produced and the affluence/ richness. Rich person believe in “Throwaway culture” none of the used items are reused or recycled.

Tourists producing Solid wastes constitutes mainly of Plastic bags (Polythenes), Plastic plates, Bottle, Leave- plates, earthen pots, packing materials, residue of hotels e.g. remnants of food- stuff- vegetarian as well as non- vegetarian (bones of animals and birds) etc. The environmental pollution caused by these Solid Wastes is rapidly increasing in tune with rapid rate of industrial growth and urbanization. The problem of Disposal of ever-increasing quantities of solid substances has become a headache for urban authorities. These Solid Wastes require proper and ample space for their dumping and disposal.

Improper handling of Solid Wastes is a health hazard especially for the workers who directly come in contact with the wastes. Scavengers and stray animals invade the roadside dumps and litter

the wastes over large area causing much aesthetic damage to the environment. The organic solid wastes undergo decomposition and befoul the air with obnoxious odours. Burning of these wastes produce smoke and causes air pollution especially the noxious fumes given off by the burning of plastic contains (Dhameja, 2011-12, 251). Solid waste management includes manifold tasks viz. Collection of Solid Wastes, disposal of Solid Wastes and Waste utilized. Presently the wastes of Patna Municipal Corporation are utilized as land-filling on both sides of By-pass roads, lowlands, etc.

Conclusion: - Patna the capital city of Bihar record fast pace of urbanization, the dynamics of population growth is particular in the 2nd half of the 20th century. The total growth of population from 1901 to 2011 is 959.97 percent. Patna is the focal point of culture, knowledge, industry and education. Equally it is source of malaise – social wastes created both by the permanent residents of the city as well as tourists visiting the place. In 2018, total amount of solid wastes was created was 6,302.70 quintals daily. To solves the problems of Solid Wastes numerous ways should be adopted e.g. Salvage or Manual Component Separation, Compaction, Incineration, Open dumping, Sanitary Land filling, Biodegradation, Reuse, Reclamation, Recycling etc. Presently, green wastes may be utilized to produce organic manures also.

References:

1. Ahmad, Enayat, Bihar-A physical, Economic and regional Geography, Ranchi University, Ranchi.
2. Bagel, G.S., New York, Geography of Human Resources, Mohit Publications, New Delhi.
3. Chaudhary, B.D.Nag, The urban Environment in Bhargava, Gopal, 1981,
4. Urban Problems and policy Perspective, Abhinav Publications, New Delhi.
5. Dhameja, Suresh k, 2011-12, environmental Studies, S.K.Kataria and Sons, New Delhi.
6. Dyos, J.J. (ed.) The Study of Urban History, The Camelot press Ltd., Southampton.
7. Hope Tisdale Eldridge, The Process of Urbanization in j.j. Spendlert and O.D.duncan (eds.) 1956, Demographic Analysis, Illinois Free Press, Glencoe.
8. Northern, R.M, Urban Geography, New York.
9. Pandey, Mahima, Process of urbanization-Problems and solution: A case study of Lucknow District in Souvenir, National Conference on urbanization Problems and Prospects, Deptt. Of Geography, D.D.U. Gorakhpur university, Gorakhpur, Nov, 1999
10. Pandey, N., 1985, A Geographical Analysis of the population Dynamics of The cities of Magadh Plain, An unpublished Ph.D. Thesis, Magadh University, Bodh-Gaya.
11. Sami, a, 1980, Intra-Urban Market Geography: A Case Study of Patna, Concept Publishing Company, New Delhi.
12. Singh, Savindra, 2007, Environmental Geography, Prayag pustak Bhawan, Allahabad.
13. Sharma, Ram Nath and Sharma, Rajendra K., 1983, demography and population Problems, Rajhans Prakashan Mandir, Meerut.

17. Sinha r.c., Environmental Pollution in Bihar , An extract, The times of India, a daily newspaper, Patna edition,1991

