

Urbanization and Its Pressure on Resources

(A Case Study of Ranchi City)



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Abstract

After becoming capital of Jharkhand state, urbanization is in its peak in Ranchi city. It has witnessed a huge influx of people after the formation of Jharkhand State owing to the rising employment opportunities and establishment of new industries. Land acquisition is one of the major problem Ranchi city is facing, as land holders of the State are reticent to let go their land for setting up of industries due to which development pace is not picking up. This paucity of space in fact is a huge indicator of infrastructural bottlenecks the city is currently grappling. The State Government too has decided to develop a new capital township - Greater Ranchi - to meet the growing demand of rapid Urbanization. Water scarcity in some parts of the city is also a huge problem. Extensive deforestation, urbanization and industrialization have led to uneven spread of rainfall, on which the water supply from the dams to the city area depends. This is one area where lot of attention is required.

Keywords: Urbanization, Industrialization, Pressure, Resources, Agricultural Land, Infrastructural Development.

Introduction

Urbanization refers to the process of becoming urban. It is a spatial concomitant phenomenon involving the complex process of change involving population concentration, structural transformation and socio-psychological change affecting both people and places (Siddhartha, 2013, p.179). Here the matter of concern is Land Resource, Water Resource and Transport Sector. The growth of a city is ensuing of the process of urbanization. City is not an abstract thing; it is a social organism in which non-agricultural activities like production, consumption, and control are carried out. These activities give birth to institutions and social system, a system different from the rural society. The interrelations between the activities and the social systems are the theme of the urbanization process. Urbanization, thus, refers to the transformation of the society including some drastic geographic, economic and social changes (Smailes, 1975, p.1) characterized by non-agricultural occupations and land uses around a single nucleus or multiple nuclei (Rao and Tewari, 1986p.193). Industrialization is associated with a shift of workers from primary to secondary occupations accompanied by a rising standard of living (Smailes, 1975, p.2). However, in some parts of the world, industrialization has been very recent. In still other countries, urbanization and industrialization are both still very much in the process of developing, and one may eventually exceed the other (Breese, 1978, p.5). A history of social change, which can be interpreted either by materialistic or non materialistic approach (Sjoberg, 1967, p.159). The role of social and cultural values, attitudes and behavior are the indicators of the non-materialistic approach. In the materialistic approach, social change is interpreted by analyzing change in land use pattern, population structure, and so on. The process of urbanization brings a change in the overall land use of the region, which in turn, reflects the socioeconomic behavior of the concerned society. Therefore the social change can be analyzed on the basis of the changes occurred in spatial land use of the region. It is believed that the spatial change in a given region is the outcome of the processes of co-operation, competition, and conflict among the rival groups living in a society (Kuppuswamy 1977, p.3). Co-operation is the processes of working together for community accepted ends; conflicts arise when there is struggle between rivals for same goods and services for

recognition. The completion implies the process in which persons or groups strive to attain the same goods or services or recognition.

Objective of the Study

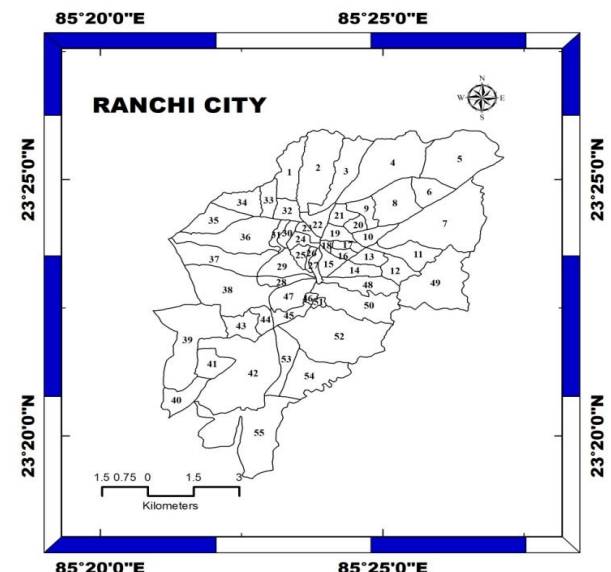
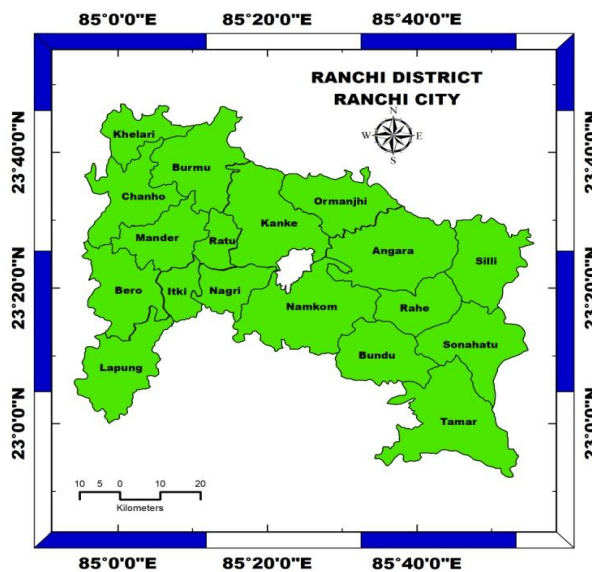
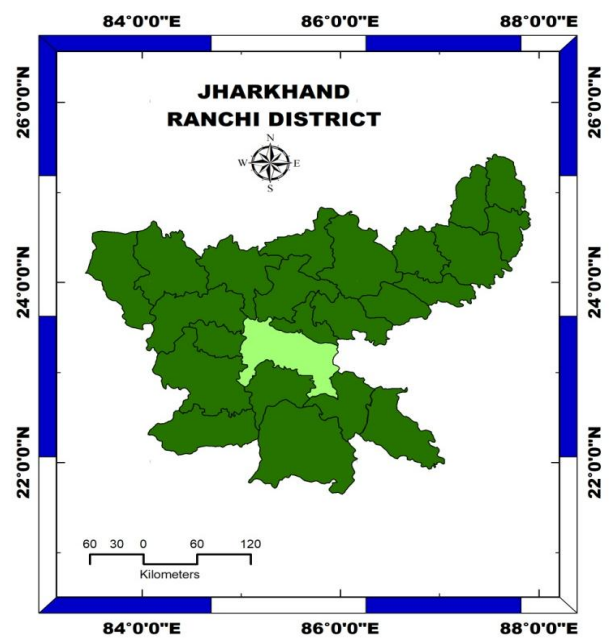
The objective of the present study is to understand the urbanization process since the formation of Jharkhand State and to analyze the pressure on resources due to urbanization.

Study Area

Study area Ranchi city lies at the intersection of 23° 22'N latitude and 85°20'E longitude on the north-west bank of Subarnarekha River within the Chhotanagpur plateau in India. This city is situated at an altitude of 2128 ft (618 m) above the mean sea

level. Due to fast development and urbanization, agriculture land is decreasing and simultaneously, residential area and urban population and industrial area are increasing. The agricultural area is decreasing continuously in Ranchi due to acquisition of land for various purposes. Ranchi city has heterogeneous type of landscape due to varied topological features, development processes, village forests, and natural resources. Use of land and steep slopes for cultivation, and heavy engineering works can easily activate ecological degradation. Since natural resources are important base for subsistence, some means should be devised for planned use of these resources.

STUDY AREA MAP



Methods & Methodology

The study is based on secondary data and personal observation. Secondary data are collected from RMC, DTO, Different Journals and Research Papers. Maps, Graphs, Tables are used in this Research Paper.

Result and Discussion

Land Resources

The pressure of commercialization has driven change in land use pattern over a period of time in Ranchi. It was observed that the waste

generated from industrial activities, encroachment and urbanization has adversely impacted the land use pattern in the city. A lot of commercial activities have come up in the form of industrial area, shopping complexes etc. Also, a more population means more transportation and traffic which has triggered change in the land use pattern. From the analysis it is found that due to fast development and urbanization, agriculture land is decreasing continuously in Ranchi due to acquisition of land for various purposes.

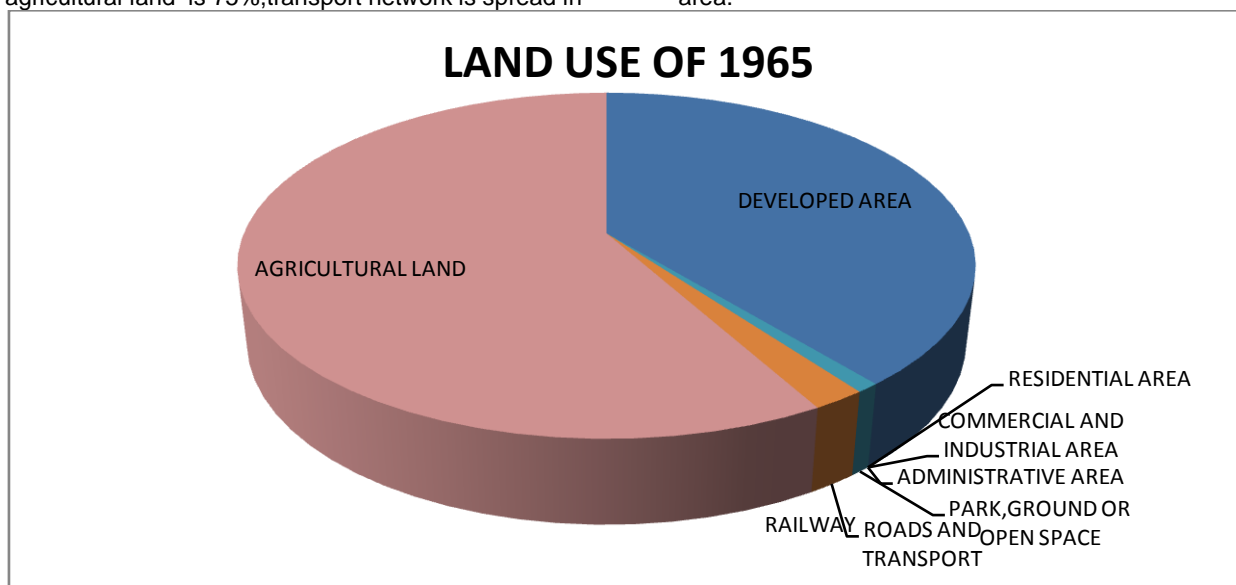
**Table-1
Land Use of Ranchi (1965)**

Land Use Categories	Area (Sq.Km)	Area (%)
Developed Area	20.53	20.79%
Residential Area	10.16	5.73%
Commercial And Industrial Area	2.05	1.15%
Administrative Area	4.1	2.31%
Park,Ground Or Open Space	2	1.13%
Roads And Transport	3.6	2.60%
Railway	1	0.56%
Agricultural Land	133.75	75.48%
Total Area	177.19	100.00%

Source: Ranchi Municipal Corporation

Land use of Ranchi in 1965 shows that Ranchi is spread over in 177.19 sq.km area and agricultural land is 75%,transport network is spread in

3% area of total land,1% land is used for parks, ground or open space and 21% land is in developed area.



**Table-2
Land Use of Ranchi (1985)**

Land Use Categories	Area (Sq.Km)	Area (%)
Agricultural Land	132.90	21.4%
Built Up Area	37.00	
Airports	187	
River	2.25	3.06%
Water Tanks And Ponds	1.97	
Plantation Land	1.20	
Total Area	177.19	100.00%

Source: Ranchi Municipal Corporation

After 1965 agricultural land is used for development of residential complexes and other on agricultural activities. During this period population

was increased 4 lacs and rate of development was increased 90% that is why northern part and southern part shows the development of Ranchi city.

Table-3
Land Use of Ranchi (2004)

Land Use Categories	Area (Sq.Km)	Area (%)
Agricultural Land	93.62	53.26%
Power Generation	0.56	32.95%
Built Up Area	47.61	
H.E.C Urbanization	4.76	
Airports	1.00	
Plantation Land	14.00	
River/Lakes/Ponds	6.15	13.79%
Hilly Area	2.14	
Parks/Open Space	1.36	
Stone Mines	0.77	
Total Area	177.19	

Source: Ranchi Municipal Corporation

Between 1965 to 2004 built up are increased from 21% to 34%. Population was also increased in this period and it shows the infrastructural development of Ranchi city. Demand for land was

increased rapidly that is why agricultural land is converted into built up area. Between 1965-2004 most changes are seen in agricultural land which declined from 75% to 53%.

Table-4
Land Use of Ranchi Decadal Study (1981-2011)

Land Use Categories	1981 (sqkm)	1991 (sqkm)	CHANGES	2001 (sqkm)	2011 (sqkm)	CHANGES
Industrial Area	1.32	1.39	+0.07	1.47	5.18	+3.71
Transportation Area	1.22	1.22	0.00	1.22	5.41	+4.19
Recreational Area	0.47	0.56	-0.09	0.56	2.52	+1.96
Commercial Area	1.25	1.82	+0.57	2.02	2.19	+0.17
Agriculture Area	108.55	102.44	-6.11	86.94	58.66	-28.28
Forest Area	16.36	14.29	-2.07	5.92	1.35	-4.57
Built-up Area	37.49	48.44	+10.95	73.86	51.62	-22.24
Water Bodies Area	3.36	3.27	-0.09	1.95	4.37	+2.50
Army/Defence Area	1.37	1.60	+0.23	1.87	6.71	+4.84
Others	3.23	2.86	-0.37	0.03	31.01	+30.98
Total	174.62	174.62		175.84	175.84	

Source: Ranchi Municipal Corporation

In Ranchi's economic activities industrial development plays a vital role. According to 2011 census data 5.18 sqkm land comes under industrial area. With its rich mineral resources and industrial base, Ranchi is also fast developing city into a major economic center. Techno-industrial facilities here are Heavy Engineering Corporation, MECON, SAIL's R&D Facility, High Tension CCL, CMPDI, IICM, Usha Martin, Usha Beltron Shipping Corporation of India, Jain Construction Insulator factory. Incidentally, Ranchi alone has six industrial areas. The hard facts about Jharkhand's capital city are no less impressive. Ranchi has been an important commercial, administrative and educational centre of the region. The city is mainly based on tertiary activities. About 22 per cent of the workforce in Ranchi is engaged in wholesale and retail trade, while 19 per cent in manufacturing and repairs. The district has over five hundred industrial units in and around close proximity of the city, contributing to the city economy.

Water Resources

Surface Water

Hatia dam, Rukka dam, and Kanke dam provides water to the city. Ranchi is dependent more on groundwater. More than 60% comes from

groundwater storage of the total consumption. The process of urbanization from last 18 years has caused changes in the water table as a result of decreased recharge and increased withdrawal. Small ponds (like-Line Talab) which were main source of water in the surrounding areas are now filled for different construction purposes affecting the water table. Deep boring is also one of the major causes that forced the water table to move down.

Ground Water

Ground water plays vital role in any region. But day by day increase in urbanization and industrialization has affected the ground water table and also the quality of water in Ranchi City. During summer season's people faces difficulties to fulfill their minimum day to day needs of water.

Polluted Surface Water

Ranchi city is surrounded by many small rivers like Swarnrekhariver, Harmu River, Jumar River, Potpoto River, etc. People throws domestic and household wastes in the river. They also wash their clothes in rivers. All these human activities create river water pollution. So, it's not only affecting the surface water but also affecting the ground water quality of the Ranchi city.

Liquid Waste

Lack of proper drainage system is also one of the major problems faced by the people. Liquid wastes penetrate in the ground and contaminate the quality of the ground water.

Transport

Ranchi has been selected as one of the Millennium cities, to be developed under the Jawaharlal Nehru National Urban Renewable Mission (JNNURM).

Table-5
Vehicle Registration Details

Mode	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Bus	120	150	110	210	220	190	220	220	130
MBS	10	10	10	10	70	20	63560	20	20
Maxi Cab	200	210	320	340	270	420	580	460	180
HGV	370	600	600	820	640	580	510	470	450
MGV	120	90	150	250	200	160	160	120	120
LGV	470	490	470	690	720	870	1170	1060	790
Car/Van	4160	4460	5130	6820	8040	7660	7530	7880	9450
Car Taxi	60	60	60	50	80	70	60	110	90
Jeep	1280	1230	1360	2180	2550	2190	2820	2460	1830
3 Wheeler	1880	1410	1950	2760	2660	3750	3570	2900	2750
Jeep Taxi	260	180	180	170	180	150	180	180	120
2 Wheeler	20390	20140	22090	28010	31980	31270	34530	37000	36210
Tractor	660	790	1060	1340	1430	1200	1300	1410	1110
Trailer	370	370	400	420	510	560	570	490	400
Others	1380	1870	2450	4210	7850	9700	10360	14430	14110
Total	31730	32060	36340	48280	57400	58790	127120	69210	67760

Source: DTO, Ranchi

According to this table we can see that how pressure of urbanization effects in transport sector. Vehicle registration is going throughout the year. In the year 2012-13 1, 27,120 vehicles are registered and it is the highest number till 2015.

According to this table, no. of two wheelers are highest registered in the year 2013-2014 in numbers that is 37000. Its shows that middle class population is more in Ranchi city. And after becoming capital the no. of two wheelers and four wheelers are also increased. In the year 2000 the vehicles are registered in very less numbers but now after 18 years we can see the drastic change in transport sector.

Transport Network

In terms of Urban Transport, Ranchi is well connected. Three national highways, NH-23, NH-33 and NH-75 pass through the city. Ranchi has developed along the major roads in a radial pattern. Ranchi has a total of 559 km road length of which 89 kilometers are major traffic carriers, and these roads are maintained by PWT. The rest 470 km roads constitute sub-arterial and colony roads, and these roads are maintained by RMC. Due to rapidly rising numbers of vehicles, the traffic congestion is increasing. "The present average speed is just about 10 km per hour during peak hours," says a Ranchi City Development Appraisal Report by the JNNURM. Average daily trip rate per person (PCTR) is about 2.25 which includes trip undertaken by walking. Significant proportions of the trips are undertaken by walking (30 per cent) and using bicycles (12 per cent). Motorized two wheelers carry 24 per cent of trips. Main modes of public transport within the city are cycle rickshaws and auto rickshaws.

Conclusion

As we know Ranchi is an unplanned city. The infrastructural development of Ranchi city is in unplanned manner, after the formation of Jharkhand state Ranchi became the capital of 28th state in 15th November 2000. From here the development of Ranchi is started. Ranchi has changed drastically in these 18 years. If we see the image of Ranchi in 2000 and now then we can see the changes very clearly. Due to rapid increase in urbanization agricultural land and forest area have been decreased. The Pressure of urbanization's effects not only water resources, Land resources, Forest resources and Transport, but also affects the climate of Ranchi. Due to rapid increase in urbanization process, population increases suddenly and agricultural lands and forest areas are turned as residential complexes, apartments, multiplexes and shopping malls that is why water level decreases and temperature increases. Efforts should be made to create ample employment, infrastructural and institutional amenities, restoration of peaceful political state in adjoining rural, urban and satellite towns, to curb down the expanding migration of people. Efforts should also be drawn to preserve and protect the present environment and accepting a sustainable way of development. Deforestation and infrastructural development effects adversely to the climate of the Ranchi City. In the last decade, the Ranchi city's population has urbanized quickly. As per the census 2001, Ranchi City area had population of 8, 47,093. But as per census 2011, Ranchi City area had population of 12,57,340, the proportion rose to 48.42% within a decade. Urbanization means the physical growth of urban areas as a result of rural migration and even suburban concentration into cities. As urbanization increases then the changes occurs in

land use or land cover pattern, which also have negative impacts on ecology of the Ranchi City.

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