

12. Land Use

12.1 INTRODUCTION

The physical characteristics are vital elements of the comprehensive land use plan as these characteristics often dictate how land is used. Topography, soil features and geology can create limitations to certain types of developments, while an inventory of surface water resources, vegetation types, environmentally significant areas, and historical features identifies those resources and areas which should be protected from development.

12.2 PHYSICAL PATTERN OF GROWTH

Due to rapid urbanisation and formation of newly state capital the physical growth of Ranchi city is tremendously change in different time period. Due to lack of planning interventions and haphazard spread, the growth can be examined in all directions of the city as well as the nearby settlements beyond the municipal limit. It can be analysed to see the increase of city limit area. In 1869 it was just 6.5 sq km, which increases to 39.86 sq km & 89.98 in 1961 and 1971 respectively; it grows up to 175.12 sq km in 1981, which is still same at present.

Table No. 12-1: Growth of Administrative Area of Ranchi Municipal Corporation

Year	1869	1961	1971	1981	1991	2001	2011
Area (Sq. km)	6.5	39.86	89.98	175.12	175.12	175.12	175.12

Source: Ranchi Municipal Corporation, 2012

A new Ring Road is under construction which may give impetus to development of Ranchi city in radial concentric pattern in coming future. Ranchi city is

considered as one of the most suitable capital of Jharkhand which provides educational and health facilities not only to population residing in it but also to nearby villages in its regional setting.



Figure No. 12-1: Physical Pattern of Growth during 1980, 1990 & 2010

12.3 EXISTING LAND USE DISTRIBUTION

The existing landuse study and analysis is necessary to understand and determine the forces responsible for shaping the urban morphology of a city and to get an insight into the future direction in which town has the potential to grow. Micro-level land use survey was conducted and landuse was broadly classified as Developed and Un-Developed landuses. The term 'Developed' indicates the land that is being used for the purposes, which are urban in character including open Spaces like parks and playgrounds, residential, commercial, industrial, public and semi-Public etc. The 'Undeveloped' land use has been defined as the land not specifically mentioned above under urban use even though it may have the potential for land is considered as undeveloped landuse. **Table No. 12.2** indicates the areas and percentage of different uses. The detailed analysis of the existing land use reveals that 20.68 % of the Planning Area is Developed Area while as 79.32 % of the total Planning Area constitutes Undeveloped Area.

Refer **Map No. 12.1** for Existing Land Use of Ranchi Planning Area

12.3.1 Residential Area

Residential use covers an area of 6,915.51 hectares in the Planning Area constituting 58.49 % and 10.60 % of the Developed Area and Planning Area respectively. The area has an average gross residential density of 129 PPH for the Developed Area, which indicates congested growth of the city including outgrowth. Ranchi (City + Rural) lacks planned residential colonies and the organic growth has resulted in urban sprawl and inefficient utilization of land. Physical thresholds have played dominant role for shaping the urban structure of city but the density has been primarily shaped by the infrastructural facilities. Although city has existed since long time, the urbanization has been taking place in haphazard manner.

Table No. 12-2: Existing Land Use Distribution in Ranchi Planning Area: 2011-12

Landuse	Planning Area			Ranchi Municipality			Rural Area		
	Area (HA)	% of Developed Area	% of Master Plan Area	Area (HA)	% of Developed Area	% of Master Plan Area	Area (HA)	% of Developed Area	% of Master Plan Area
Developed Area									
Residential	6,915.51	58.49	10.60	5,161.52	67.21	29.47	1,753.99	42.34	3.68
Commercial	277.47	2.35	0.43	218.55	2.85	1.25	58.92	1.42	0.12
Industrial & Manufacturing	694.02	5.87	1.06	518.00	6.74	2.96	176.02	4.25	0.37
Governmental	498.33	4.22	0.76	323.77	4.22	1.85	174.56	4.21	0.37
Public & Semi-Public	1,981.81	16.76	3.04	664.12	8.65	3.79	1,317.69	31.81	2.76
Recreational	289.27	2.45	0.44	252.32	3.29	1.44	36.95	0.89	0.08
Traffic & Transportation	1,166.14	9.86	1.79	541.59	7.05	3.09	624.55	15.08	1.31
Sub-Total Developed Area	11,822.55	100.00	18.13	7,679.87	100.00	43.85	4,142.68	100.00	8.68
Un-developed Area									
Agriculture	36,102.51	-	55.35	5,865.56	-	33.49	30,236.95	-	63.38
Water Bodies	2,341.81	-	3.59	436.66	-	2.49	1,905.15	-	3.99
Hillocks	839.93	-	1.29	201.58	-	1.15	638.35	-	1.34
Army / Defence Area	1,667.91	-	2.56	670.59	-	3.83	997.32	-	2.09
Forest & Plantation	6,632.11	-	10.17	60.50	-	0.35	6,571.61	-	13.77
Open Spaces / Vacant	5,813.38	-	8.91	2,597.24	-	14.83	3,216.14	-	6.74
Sub-Total Undeveloped Area	53,397.65	-	81.87	9,832.13	-	56.15	43,565.52	-	91.32
Grand Total (Developed +Undeveloped)	65,220.20	-	100.00	17,512.00	-	100.00	47,708.20	-	100.00

12.3.2 Commercial Area

Commercial land occupies about 2.85 % of the developed area of Ranchi Municipal Area and 1.25 % of the total Planning Area. Large portion of land in the city, which is under commercial land use, is because of the administrative nature of the city. Most of the commercial development is adjacent to the major streets or traffic corridors however, most of the commercial activities are concentrated in the Central Business District (CBD) of the city. The city generally lacks planned commercial areas and there is no hierarchy of commercial centers existing in it. In fact, all the existing commercial development has come up in linear fashion. Mixed Land Use characterizes most of the areas with commercial activities being carried out in the ground floor.

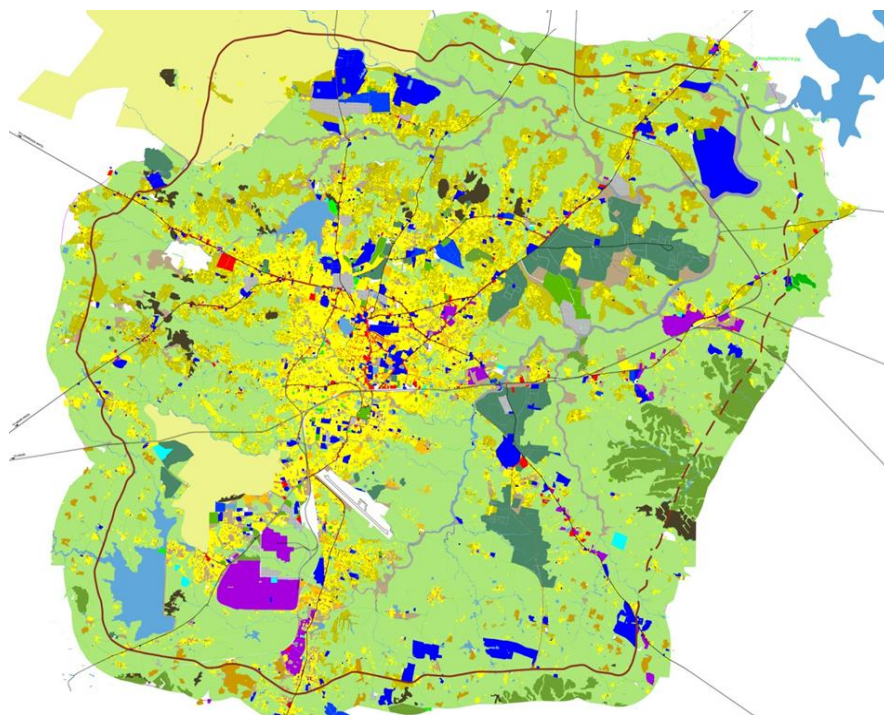


Figure No. 12-2: Existing Land Use Map of Ranchi

12.3.3 Industrial Area

Industrial development is playing an important role in the economic activity of the Ranchi area. Total area under industrial use is 694.02 hectare, which is 1.06 % of the total Planning Area. Major industrial areas include Namkum Industrial Estate, Tatisilwai Industrial area, Tupudana Industrial developed by RIADA. One of the largest industrial areas is HEC area.

12.3.4 Transport and Communication

Road network and related infrastructure is the most important sector for urban health. Roads act as arteries for the flow of goods and services and dissemination of urban influences. Efficient connectivity and improved linkages help in developing linkages between the market and the produce. Traffic and transportation infrastructure accounts for about 9.86 % of Developed Area and 1.79 % of the total Planning Area of Ranchi. The percentage area under traffic and transportation seems to be adequate though most of the roads including arterials are characterized by two lane undivided configuration only. The problem of inefficient road network is particularly more severe in the older and core parts of the urban area wherein the existing streets are highly narrow and winding wearing poor and dilapidated physical outlook. The pedestrian movement generally squats the carriageways resulting in further reduction of the effective road width as no pedestrian facilities exist in the entire city. The existing traffic characteristics reveal a chaotic picture predominantly because of lack of basic road infrastructure, pedestrian facilities, non-segregation of vehicular and non-vehicular traffic, inadequate parking areas etc.

12.3.5 Public and Semi-Public

Land under educational institutions, medical facilities, police stations and police lines, religious, graveyards and other community facilities which is grouped under public and semi-public use constitutes about 16.76 % of the Developed Area and 3.04 % of the total Planning Area. Out of the total 4148.05 hectares under public and semi-public land use, four major micro-level uses are defense (strategic), government, education and medical facilities.

12.3.6 Recreation

Parks, play fields, historical monuments have been grouped as recreational land use and constitute about 289.27 hectare, which is 2.45 % of the Developed Area and 0.44 % of the total Planning Area. Major recreational facilities include Krishna Park, Rock Garden, Cricket Stadium at Dhurwa, Khelgaon, Ranchi Museum, Aqua World etc. The land under recreational use is insignificant keeping in view the population and historical nature of the city. Uniformly distributed and well-planned parks and playfields are grossly lacking. Old city lacks both in active as well as passive recreational spaces. In absence of sufficient developed area for recreational purposes, the open spaces of schools and college and other unorganized open spaces are used as playfield, recreational areas by the local inhabitants.

12.3.7 Un-Developed Land Use

About 79.32 % (51729.74 hectares) of the total Planning Area constitutes the undeveloped landuse, which is under agriculture, plantation, water bodies, hillocks and vacant land. Majority of land in the undeveloped landuse category consists of land under cultivation, which is predominantly under paddy fields. Out of the total, water bodies constitute about 3.59 % of the total Planning Area. Large percentage of undeveloped land use in the Planning Area is primarily because of the inclusion of large areas of rural character in addition to the existing city area.

12.4 EXISTING LAND USE INCONSISTENCY

It is observed that there are certain activities in the city, which are not consistent with the existing land use. It is proposed to shift such activities out of the city within the planning area to protect environment and the inhabitants of the Ranchi city. In addition to this, there are some activities, which are not in sufficient numbers or over utilized due to shortage of land. The details of inconsistency and over-utilized activities distributed in the town are given in **Table No. 12.3** below.

Table No. 12-3: Inconsistence and over-utilized land Use of the City

S. No	Landuse	location	Problems/Remarks
(a) Inconsistence landuse			
1	Vendors activities on footpaths	Along road from Kutchery chowk - Saheed Chowk - Firayalal Chowk	Traffic Congestion
2	Vendors activities on Parking space	Along road from Firayalal Chowk to Sujata Chowk	Traffic Congestion and noise pollution
3	Vendors activities on footpaths	Along road from Firayalal Chowk to Lalpur chowk	Traffic Congestion
4	Parking Space	Along road from Firayalal Chowk to Sujata Chowk	Parking problem and traffic congestion
5	Parking Space	Uppar Bazaar area	Parking problem and traffic congestion
6	Traffic congestion at different road intersection	Kantatoli chowk, Sujata chowk, Patel chowk , Bahu Bazaar chowk and Ratu road area	Traffic Congestion, lack of parking area
(b) Over utilized landuse			
7	Khadgada Bus stand	On Kantatoli- bahu bazaar road in ward no. 13	Lack of Space and traffic congestion due to vending activities and lack of parking space
8	Govt. Bus stand	Near Station Road	Insufficient space for bus parking and visitor's vehicles and unorganized shops caused traffic congestion, parking problem and road jams during peak hours.
9	Over utilized open spaces	St. Xavier's college, Sadar Hospital, upper bazaar, Kutchery	Due to lack of open space these locations are used as parking, Daily market and unauthorized shops.

Source: Consultant's survey, 2011-2012

12.5 PROPOSED LAND USE - 2037

Land requirement of Ranchi City has been worked out from the studies related to sub-sectors like housing demand, community facilities, utilities and services, transportation, industries, besides the land requirement for government offices and commercial establishments. Total land requirement for horizon year 2037 has been worked out under different categories of landuses and is given in **Table No. 12.4**.

Table No. 12-4: Proposed Land Use Distribution of Planning Area-2037

S. No.	Landuse	Area (HA)	% of Developed Area	% of Planning Area
1	Residential	12486.50	44.18	19.14
2	Commercial (Retail)	145.00	0.51	0.22
3	Wholesale & Godown	214.00	0.76	0.33
4	Composite Use 1	1017.00	3.60	1.56
5	Composite Use 2	503.00	1.78	0.77
6	Industries	2490.00	8.81	3.82
7	Public and Semi-Public	2570.00	9.09	3.94
8	Governmental Office	735.00	2.60	1.13
9	Recreational	4327.00	15.31	6.63
10	Transportation and Communication	2940.00	10.40	4.51
11	Greater Ranchi Phase-1	832.00	2.94	1.28
Sub Total (Developed Area)		28259.50	100.00	43.33
12	Defense Area	1879.00	-	2.88
13	Agriculture	25514.70	-	39.12
14	Forest	5826.00	-	8.93
15	Hillock	798.00	-	1.22
16	Rural Settlements	1373.00	-	2.11
17	Water Body (River, Nallah, lake)	1570.00	-	2.41
Sub Total (Un-developed Area)		36960.70	-	56.67
Total Planning Area		65220.20	-	100.00

Refer **Map No. 12.2** for Proposed Land Use of Ranchi Planning Area

12.5.1 Residential Use

For the projected population of 31,57,636 persons, the total area required over the next 25-years for urban development is estimated to be 28,259.0 hectares, out of which 12,486.0 hectares (44.18%) are earmarked for residential development against 6,915.51 hectares available at present. The residential area constituting 44.18 % of the proposed developed area will have average gross residential density of 112-persons per hectare. The Master Plan envisages the development of residential areas (both existing and proposed) on the concept of self-sustained 114-neighbourhoods with a population size of about 12,000-15,000 each.

Proposed Residential Density

Population density as envisaged in the Ranchi Master Plan-2037 varies from low of 250 PPH, medium density 251–300 PPH, high medium density 301-350 PPH and high density of 350 PPH and above. Planning zones (PU-6, PU-8, PU-10 and PU-12) are proposed to be developed as high-density areas with provision of 'Group and Flatted Housing'. The Master Plan proposes that planning use zone (PU-10 and PU-7), the areas abutting river Subarnarekha be developed as low-density areas. Planning use zones (PU-13) has been proposed as eco-tourism areas. Old city and Central Business District (CBD) have been envisaged as special areas for purposes of the Master Plan.

12.5.2 Commercial Use

Commercial retail use is proposed in compatible to residential areas in the proposed plan to establish efficient work-home relationship. The existing plan showed concentration of commercial areas on Main Road. 1.27 % of area in proposed landuse plan is rendered under commercial use zone, with city level commercial areas, integrating with existing commercial area. The hierarchical distribution of commercial area is established through facility centre at city level, neighbourhood level and housing area level, which includes appropriate percent of commercial areas as per development guidelines.

12.5.3 Composite Use

In Ranchi Master Plan-2037, two types of Composite use are proposed i.e. Composite use-I (Residential and retails uses) and Composite use –II (residential, Commercial retails and existing industrial use). The composite use –I constitutes 3.60 % of the total developed area and 503 hectare is proposed under composite use –II, which is about 1.78% of the developed area.

12.5.4 Industrial Zone

Ranchi City has four industrial estates/areas, HEC of 350 hectare having large scale activities and Tupudana measuring land area of 108.75 hectare with auxiliary industrial units, Tatisilway industrial area measuring 73.73 ha and Kokar Industrial area of measuring 447.82 hectare. It is proposed to shift Kokar and Tatisilway industrial areas to new proposed industrial area. The total lands of 1,119 hectares in two pockets are proposed for new industrial areas in planning unit-9 and PU-3. The industrial area of the planning area has increased from 5.14 % to 8.81 %. The two pockets of Information Technological Parks are also proposed in the Ranchi Master Plan constituting about 865 hectare (3.06 % of developed area).

12.5.5 Recreational Use

2.14 % land area under recreational use in the city, which is very low in comparison of standards of UDPFI. The proposed plan gives thrust to green cover and proposes an area of 4327.0 hectare (15.31 %) for recreational activities. The proposed green uses includes District Park, Exhibition Ground, Golf Course, Sport centres and neighbourhood and housing area level parks/ playgrounds duly included in neighborhood centres and housing area facility. To include flowing green concept, green strip along road network, along riverbanks and along peripheral of existing Ring Road and proposed inner circular road shall be developed.

12.5.6 Public and Semi-Public Zone

Public and Semi-public zone comprised of education, health, public utilities etc., considering the infrastructural requirement for the projected population and

hierarchical distribution of facilities, facility centre at city level; neighbourhood centre at neighbourhood level and housing area facility centre at housing cluster level is proposed. To make efficient and sustainable planning units, these facility centres includes education, health etc. facilities. There has been an increased an area under Public and Semi-Public Zone from existing 1981.81 hectare to 2570.0 hectare in horizon year 2037 within planning limit.

12.5.7 Governmental Use

Presently, 498.33 hectare of land is under governmental use. This area is proposed to increase 735.0 hectares in Ranchi Master Plan-2037, which is about 2.60 % of the developed area.

12.5.8 Transportation and Communication

To increase mobility and connectivity in the city, new roads network along with LRTS have been proposed to strengthen and improve the existing transport system of the planning area. The hierarchies of roads i.e. 60 m, 45 m, 36 m, 30 m, 24 m, 21 m, 18 m, 15 m and 12 m have been proposed. The total area under transportation landuse has increased from 1166.14 hectare to 2940.0 hectare.

12.5.9 Agriculture and Allied Use

To preserve the prime agricultural land to meet the agro-products requirement of future development, some cultivation land parcels have been consumed. In order to improve the quality of environment and to promote the percentage of green cover, it is proposed to plant trees along all major roads. The proposed peripheral expressway and the town semi-circular road will have thick tree plantation.

12.6 PLANNING UNIT WISE PROPOSED LAND USE BREAK-UP: 2037

Refer Annexure No. 12.1