

Critical Assessment of Master Plan in Bilaspur City and Its Effectiveness(1976-2031)

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Abstract

The Master plan of any city plays an important role in the development of class I cities in India. The three master plans taken on Bilaspur city of Chhattisgarh from 1976 to 2016 have been discussed to show how it has become successful master plans. The study is based on a critical analysis of the proposed and existing Master plan of Bilaspur City. And it is followed the rate of implementation to suggest a viable scheme for future development. To know the actual causes of variation rate and its effectiveness in Master Plan. The master plan of Bilaspur city is compared with the master plan of Chandigarh City. The study has been conducted based on the secondary data collection from various Master plans has published by the Directorate of Town and Country Planning Organization, Bilaspur (1976, 2001, and 2016). In this research work, several statistical tools have been used like work participation ratio, land utilization rate, and rate of plan effectiveness to analyse the land use of Bilaspur city. It is verified whether the existing master plan is well recognized or not. The comparison of land use data for the years 1956 and 1976 was revealed that 124 Percent had extended the urban area during 20 years. The Land utilization rate per 1000 persons was 7.20 hectares and 6.5 hectares respectively for 1956 and 1976. The land utilization rate was 4.84 & 25.59 hectares per 1000 population in 2001 and 2011 Census. Population density of area were 20,645 and 5,380 per sq. km. in 2001 & 2011 Census. The rate of effectiveness in a master plan in 2001 was 53.08 and 120.99 percent in 2011. If policymakers planned for a short-term duration every 5 to 10 years, it will accelerate funding and adopt new technology for sustainable urban development. The unplanned areas of the city are newly added to the master plan, then the inequality of development will be eliminated and it will be fruitful for the development of the city. If the review committee has been formed for the field work, the committee will supervise and maintain land utilization.

Keywords: Master Plan, Rate of Effectiveness, 7Vs Plan, Compact and well recognized growth, Sustainable Urban Planning, Land Utilization Rate.

1. Introduction

Master planning is basically an exercise of resource planning, generation, development and management (Tiwari, D. P., 2002). Planning is the process of preparing a set of decisions for action in the future directed at achieving goal by preferable mean' (Dror, 1963). 'MASTER PLAN' is a blue print of several proposed ideas that are contemplated to improve a city's existing conditions and control its future growth in a coordinated manner (Mandal,

1998). Before Second World War, towns and cities were expanding in a haphazard way and hence after 1945 it has been realized that their development should be controlled through Master plans. (Mandal, 1998) Urban planning was started mainly in ancient Greek cities. Thus, conspicuous planning has been seen as Egyptian cities, Roman cities, and Modern cities. Earlier Mesopotamian cities were also cared for the common man revealing some kind of urban planning but the ruins were very old. So, it was complicated to draw a clear conclusion (Rao, 2016). In the early 20th century Master plan was first developed in Germany and such ideas were more effectively spread all over the world through the installation of “Layout Planning Concept by Town and Country Planning Act of UK in 1932 (Watson, 2009). Careful planning should be able to use well the advantages based on the location of a town. Particularly location in the context of the waterfront of sea, river and large lakes provides special resources, which can be effectively used for the town's development. Urban planning is based on several concepts and principles that lead to change depending upon the urban people's physical environment and socio-economic aspects. It also helps to define suitable zone for different functions like Residential, Industry, trade, administrative, educational, public offices, Institutional (Maurya, 2014). Master planning methods were widely adopted over the last few decades in India was not produced a satisfactory physical environment and have not been effective in the outputs as well as outcomes (Meshram, D. 2006). Master plan approaches to land management that may be appropriate in order to allocate land for different land uses in urban infrastructure etc. (URDPFI guideline, 2016). The master plan always controls the development of a city. In our country master plans have been prepared for all the cities with a population of more than one lakh (class I city 465 in 2011 Census) to improve their present structure (Bansal, 2016). Bilaspur is medium size and unplanned city but planning activity has been started under the 1973 Act. R. C. Tiwari gives commendable remarks in his book that urban planning can solve urban issues that can help make our cities liveable, clean, safe, and healthy for our present generation and our future generation (Tiwari, 2020).

1.1 National Level Planning Policy and Mission

Urban development is a state subject, but the Central Government performs an advisory and coordinating role of providing technical and financial support for promoting orderly urbanization. The constitutional amendment act, 1992 lays upon the states to develop the three-tier system of rural panchayats and municipalities in the urban area. Every state can develop adequate power, duties and economic upon these bodies so that they can prepare any implementation scheme for their financial development and social injustice. This act has given up on the basis of decentralizing power and authority to municipal bodies and ‘Panchayet raj’ in different state levels. It is expected that with the reference of this act of 73th and 74th, the states will be able to developed and establish a strong system of local self-government (Laxmikanth, M., 2017)). Therefore, the Government of India was formulated the **National Land acquisition, Re-habitation and Resettlement act, (1894, 2013)** that deals with proper guidelines to acquisition of private land for urbanization, industrialization and infrastructure development in the urban area. This policy described the government providing package for land owner family for their re-habitation, job assurance, actual price rate of land and better quality of life (Ministry of Law and Justice, 1894, 2013). Thus, Ministry of Urban Development was developed a **National Urban Planning Policy and Mission (1985-2016)** to formulate rational development in Urban Environment. The Ministry of Urban Development was collaborated with the Town and Country Planning Organization (TCPO) and focused on Regional Town Planning and Development law (1985) to provide instruction of all state Government so that state government can establish a regulatory board or authority is which known as State Regional Town Planning Department, which main work

is formulation and implementation of plan for regional and metropolitan area ([Ministry of Urban Development, 2014](#)). Thus, the Ministry of Urban Development launched the National Urban Transport Policy, 2006 to develop Bus Rapid Transport System (BRTS) to promote urban transit infrastructure or finance metro rail projects. Under the scheme for sustainable urban transport planning to encourage for better plan and manage their urban transport in cities. In this way, The Central Government was lunched a lot of guidance for the **Urban Development Plans Formulation and Implementation (UDPFI)** in 1996 ([Ministry of Urban affairs and Employment, 1996](#)) and again this guidelines has revised in 2016 ([Ministry of Urban Development, 2016](#)) Ministry of Urban Development and Poverty Alleviation has developed a **Model Municipal Law (2003)** to assist, Urban Local Bodies (ULBs) about Municipal revenue, Infrastructure development, health, Service and safety Management of urban dwellers. This way Government of India has launched **Jawaharlal Nehru National Urban Renewal Mission (JNNURM)** on 3rd December, 2005 for class I city, where a population more than 1 million as per 2001 Census. The aimed of the mission was to integrate the development of slum through projects for providing shelter, basic services, and other related civic amenities to provide utilities to the urban poor ([Ministry of Housing and Urban Affairs, 2005](#)). The Asian Development Bank (ADB) and Ministry of Urban Development (MoUD) was jointly launched the **North Eastern Region Urban Development Program (NERUDP)** on June, 2009. This scheme has been implemented in the 5 capital cities of north eastern state like Agartala (Tripura), Aizawl (Mizoram), Gangtok (Sikkim) and Kohima (Nagaland) to providing water supply, sewerage, sanitation, solid waste management ([Ministry of home and urban affairs, 2009](#)). Thus, the Ministry of urban affairs (Government of India) launched **Deendayal Antyodaya Yojana National Urban Livelihood Mission (NULM)** on 24th September 2013. This mission was focused on providing shelter and essential commodities to the urban homeless citizen in a step-by-step manner. Thus, the project can help slum dwellers for skill development on market-based employment and that influence to set up self-employment. According to the Ministry of Urban Affairs, the (**Swachh Bharat Mission-Urban**) was launched 2nd October 2014, with the mains of making urban free open defecation and achieving 100 percent scientific management of municipal solid waste in 4,041 stationary towns in the country. Ministry of Urban affairs has launched the **Heritage City Development and Augmentation Yojana (HRIDAY)** on 21st January, 2016, with the aim of planning, economic growth and heritage site conservation in an inclusive manner under the scheme 12th city has been selected for development. The ministry of urban affairs (Government of India) has launched the **Smart City Mission** to promote Sustainable and inclusive cities that provide core infrastructures like Digitalization, good E-governance, and robust connectivity for citizen service on 25 June, 2016. All over India 100 cities have been listed but two cities have been selected in Chhattisgarh State such as Bilaspur city and Raipur city. **Pradhan Mantri AwasYojana - Urban, (PMAY-U)** mission was launched on 25th June, 2016, which leads to provide pucca housing for all in urban areas by year 2022, when Nation completes 75 years of its Independence. This mission addresses urban housing shortage among the Economic Weaker Section (EWS), Low Income Groups (LIGs), and Middle-Income Groups (MIGs) categories including slum dwellers. The Ministry of Urban Affair (Government of India) has launched the **Atal Mission for Rejuvenation and Urban Transformation (AMRUT), June 2016**, with the purpose of providing basic amenities like water supply, sewerage, urban transport, park as to improve the quality of life for all specially the urban poor people.

1.2 State Lebel Planning Policy

Chhattisgarh Municipal corporation act, 1956 and **Chhattisgarh Municipalities Act, 1961** were relished to regulate the power of the municipality, Formulation of Municipalities

bodies, construction of building and announcement of private street as a public street for the development of Socio-economic and Cultural status of urban dwellers (Khetruple, 2010). Thus Bilaspur was upgraded to Municipal Corporation on dated 01/01/1981. At that time Municipal Corporation limit was 42 wards with covering an area of 26.5 sq. km (Directorate of Town and Country planning Organization, 2016). (Chhattisgarh Griha Nirman Mandal Adhiniyam) was launched to formulate Chhattisgarh Housing Board for the apartment and colonial development. Housing Board provided house for all communities (Khetruple, 2010). Thus, in 1973 Chhattisgarh Town and Country Planning act, was established to acquire land for the land use development and comprehensive planning of city with country side. The Chhattisgarh Gandhi Basti Kshetra Adhiniyam was launched in 1976 to formulate Chhattisgarh Slum Clearance Board (CBCS). This Board was providing healthy shelter and basic amenities. This act was revised in 1978 (Charate, 2010). In 1981 Madhya Pradesh (Including Chhattisgarh) government launched the policy (Chhattisgarh Housing Policy) to established the housing board to provide land housing accommodation for slum people, who belongs low-income groups, industrial worker, government servants and special reservation for Scheduled Caste (SC) and Scheduled Tribe (ST) in rural as well as urban area (Charate, 2010). Then the (Chhattisgarh Nagariya Kshetra Ke Bhoomih in Vayakti Niyam) was released in 1984 to ensure landless people's landholder (Patta) rights for housing in the urban area (Charate, 2010). Thus in 1984 Chhattisgarh Bhumi Vikas Rules were set up to guide the Chhattisgarh Town and Country planning organization, which was established in 1973. This rule was regulated as legal land development process in planning and un-planning area. In this Bhumi Vikas rules, the process of standard building height and floor area ratio (FAR) were mentioned. In 2012 Chhattisgarh state government launched Mukhyamantri Slum Swasthya Yojana to provide free health counselling, treatment, and medicine to the leaving people in slum areas. Under the scheme, mobile unit van with the doctor and medical staffs visit in slum area on particular day in a week. Urban administration and Development Department, under the Government of Chhattisgarh launched **Shahar-Sandhan Schme, 2016** to provide responsibility to the state Urban Development Agency (SUDA). SUDA has been involved in providing affordable house, safe drinking water, and sanitation, including solid waste management, storm water drainage, sewerage, roads, public transport, and the creation of better livelihood by accelerating the economic growth of the city (Urban Administration and Development Department, 2016). After deeply study, it is concluded that the state and central governmental laws and policies were launched to provide better quality of urban life. The present research has been done within broad framework of objective which is, to analyse the effectiveness rate of previous vs existing Master Plan and suggest a workable scheme for future development.

2. Materials and Methodology

2.1. Study Area

Bilaspur city is the third-largest city (after Raipur, Bhilai- Durg) in the state of Chhattisgarh and it is situated 113 km north side from the state capital, Raipur. The city's geographical area as per Master plan, 2031 is 345.80 sq. km. with a population of 3, 30, 106 (2011 Census). Bilaspur is situated on the banks of the rain-fed Arpa River, which originates from the high hills of the Maikal Range of Central India. It is located in between 22°3'5'' N to 22° 6' 30'' N latitudes and 82° 6' 45'' E to 82°12'5'' E longitudes (Fig 1). The present study is situated at an altitude of 285 meters above mean sea level. Bilaspur is the zonal headquarters of South East Central Railway, which comprises Bilaspur, Nagpur, and Raipur Divisions. It is the 3rd cleanest (2017) and 4th longest railway station in, India.

2.2. Data Set and Methodology

The study has been conducted based on the secondary data collection from various Master plan, which has been published by the Directorate of Town and Country Planning Organization, Bilaspur (1976, 2001, and 2016). Similarly, Census data is referred for ameliorate the understanding of the present trend of urban population growth and rate of effectiveness of master plan in the city. Basically, the land use parameters are statically computed for understanding the anatomy of the redevelopment of the process. However, the study concentrated on identifying the potentiality in the present Master Plan that may be sustainable for the future development of Bilaspur CG. After analysis field verification has been done by authors to validity the ground reality. In this study, work participation ratio, manipulation of land utilization rate, and rate of plan effectiveness were used as important parameters for predicting whether the existing master plan is well recognized or not in sustainable urban planning context.

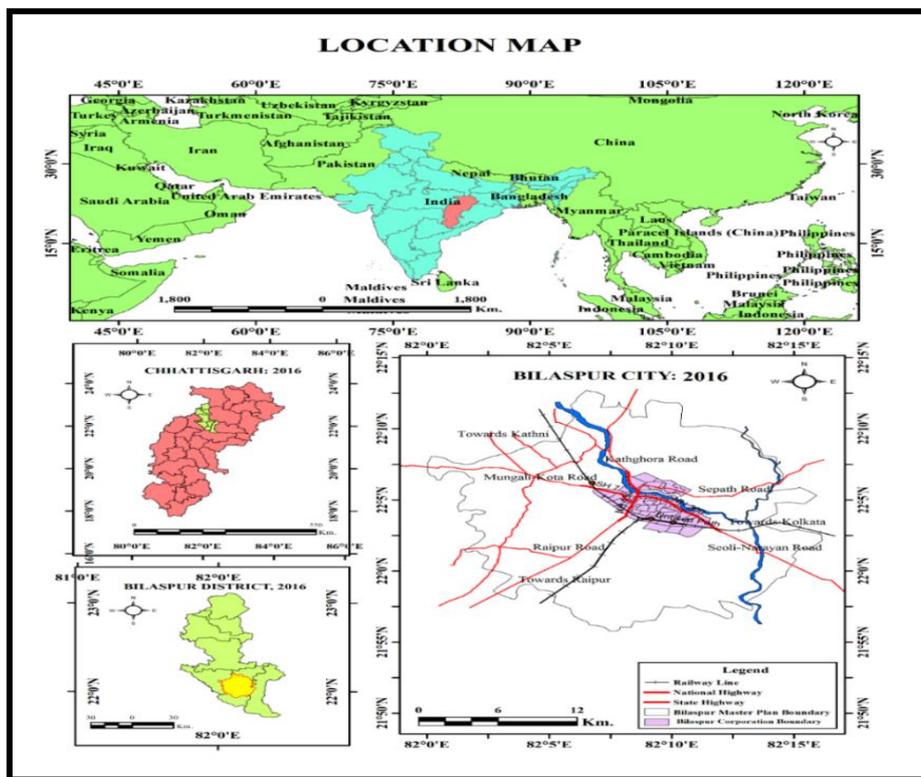


Fig 1: Location map of the study area Source: Prepared by authors

2.3. Parameters

2.3.1. Land Utilization Rate (LUR)

The amount of land per thousand populations is described as land utilization rate, which captures the variation of land utilization picture presented intensively or extensively in the city (Directorate of Town and Country Planning Organization, 1976). The Directorate of Town and Country Planning Organization has been used formula in Master Plan. Land Utilization Rate (LUR) is large value that denoted the intensive (explain the compact growth of city) land use in the city and when, Land Utilization Rate (LUR) is small value which

denoted the extensive (Sprawling development) land use in the city. According to Directorate of Town and Country Planning Organization, 1976 the average land utilization rate is 8 to 20 hectares per 1000 population required for sustainable urban form and size.

In the study LUR (Land utilization Rate) has been explained in all tables and formula is given below.

$$LUR = \frac{TL}{P} * 100 \dots \dots \dots (i)$$

Where, LUR = Land utilization Rate

TL = Total amount of land and P = population

$$Re = \frac{\text{Existing Development Area}}{\text{Proposed Development Area}} * 100 \dots \dots \dots (ii)$$

Where, Re = Rate of Effectiveness

2.3.2. Work Participation Rate (WPR)

WRP index is explained in the employment rate of Socio Economic and Human Resource Development (HRD) (Census of India, 2001) also it has been considered based on population density in sq.km.

$$WPR = \frac{Tw}{P} * 100 \dots \dots \dots (iii)$$

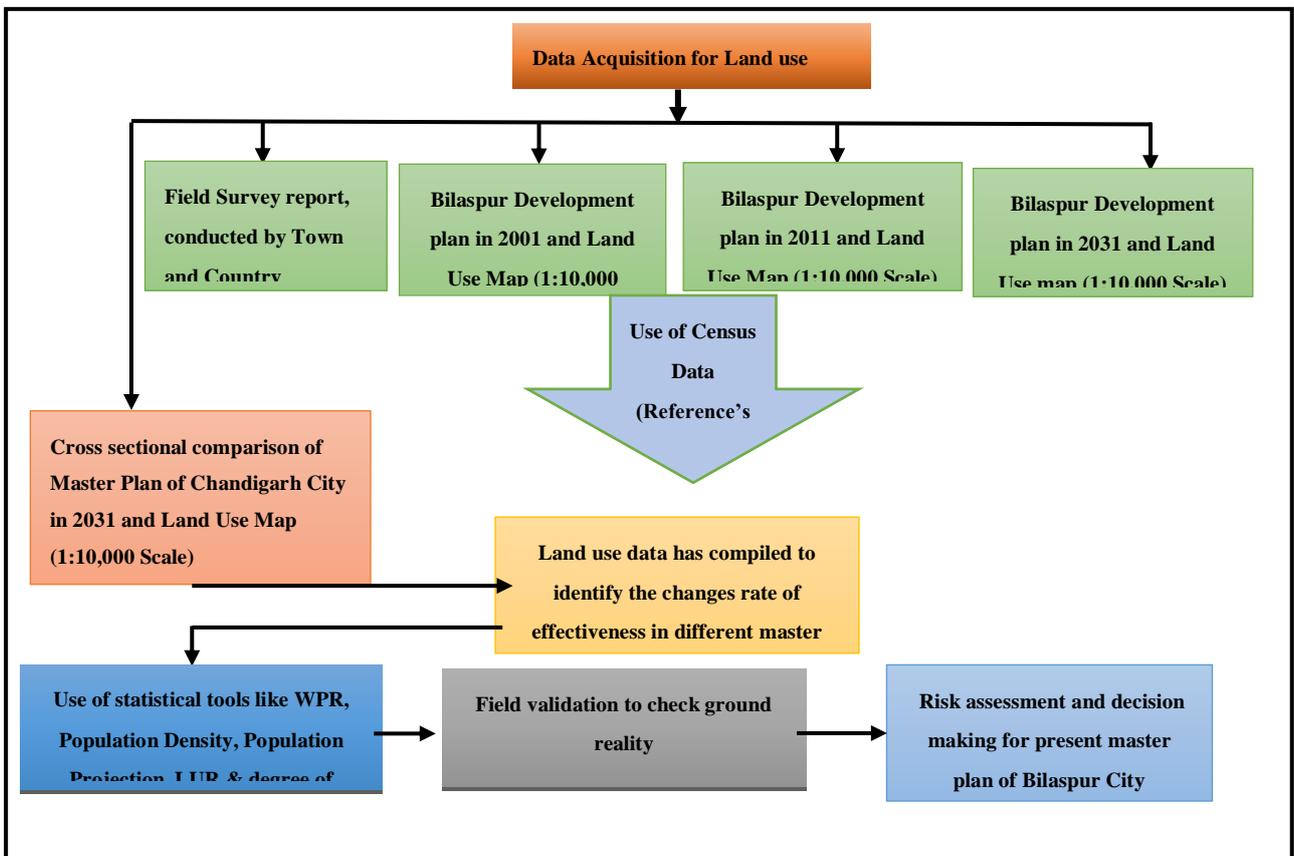


Fig 2: Schematic Methodology

Where, WPR is considered as work participation Rate, also Tw is the total worker and P is the total Population.

2.3.3. Geometrical Method

This method is based on decennial growth of proceeding decade. Population is assumed to increase at compound rate. This formula is the basis of Malthus’s population projection. This projection is widely used (Director of Town and Country planning Department, 1976). The formula is following

$$P_p = P_1 (1 + r)^n \dots \dots \dots (iv)$$

Where, P_p = Projected Population. P₁ = population size as per the recent Census, r = Mean growth rate, n= Number of years.

3. Result and Discussions

3.1 Land Use Survey 1956 and 1976

A town extension scheme was prepared by the Town planning Department Govt. of Madhya Pradesh during 1956. Some of its proposals for acquisition of land in Chanduabhata for development of Bus Stand and Market have been implemented. Land use problem is identified from the basis of the quantum of the land under various purposes and its correlation. The land-use survey was conducted by the Madhya Pradesh Tatha Gram Nivesh Adhiniyam (Town and Country Planning Department) in 1956 and 1976, provided data to study the variation in land use in the city during this period. The table given below shows the relative figures of land use for various purposes in 1956 and 1976.

Table 1: Bilaspur: Variation of Land Use Survey Report (1956-1976)

Field Survey	Total no. of Wards / part of Villages merged within planning Area		City area within city limit and Outgrowth (in Sq.km)	Projected Population (in lakhs)	Density person/Sq.km
	Municipality Ward No.	Outgrowth			
1956-1976	1956	14	4.322	60,000	13,882
	1976	9	9.685	1,55,000	16,004

Source: Field survey conducted by Town & Country Planning Dept., M.P., 1956, 1976

N. B. Out growth towns are also included like Kududand, Juna Bilaspur, Mangla, Tifra, Deorikhurd, Ameri, Koni, Railway Colony, Sirgitti Town.

Table 2: Bilaspur: Land Use Survey Report Variation. (1956-1976)

Sl. No.	Land Use Categories	1956			1976		
		Area in Hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)	Area in Hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)
1	Residential	253.8	58.7	4.23	515.7	53.2	3.33
2	Commercial	9.7	2.2	0.16	28.8	3.0	0.19
3	Industrial	1.2	0.3	0.02	37.7	3.9	0.24
4	Public, Semi-Public	25.5	5.9	0.43	158.4	16.4	1.02
5	Public Utilities and Facilities	4.4	1.0	0.07	21.5	2.2	0.14
6	Recreational	8.1	1.9	0.13	13.2	1.4	0.09
7	Transport and Communication	129.5	30.0	2.16	193.2	19.9	1.25

	Total	432.2	100.0	7.20	968.5	100.0	6.25
8	Vacant land	NA	NA	NA	315.8	12.6	2.04
9	Agricultural land	NA	NA	NA	912.8	36.4	5.88
10	Water bodies	NA	NA	NA	309.6	12.4	2.00

Source: Field survey conducted by Town & Country Planning Dept., M.P., 1956, 1976

The comparison of land use data for the year 1956 and 1976 was revealed that the urban spread was increased by 124 percent during 19 years. In year of 1976 population of Bilaspur city was estimated to be 1, 55,000 (based on 1971 Census). The corresponding Population for the year 1956 is estimated to be 60,000 (on the basis of 1951 Census). Thus, the Land utilization per 1000 persons, as calculated assuming the above Population, works out to be 7.20 hectares and 6.5 hectares respectively for the years 1956 and 1976. This land utilization rate indicates a trend towards intensive use of land. The distribution of land in various categories has shown poor percentage of land under the recreational purposes. The land under residential has been used 53.2 of total developed area within the planning area. This proportion indicates that the residential area has been partially utilized. The total developed area was 968.5 hectares (including outgrowth), given a city density of 16,004 persons per sq. km (Table 1).

3.2 Bilaspur City Development Plan, 1976-2031

The master plan of Bilaspur city, which is started since 1976 and still continue three master plans has been launched but each of them have several lacunae like lack of accurate and compact dataset, gap of conceptual and technical mistake with modern application of technology, uncontrolled over urban growth and negligence of national and state level urban planning policies and law (Table 3). This type of scenario is common for master plan all Indians city.

Table 3: Review of Bilaspur city Development plan, 1976-2031

Master Plan		Total no. of Wards /Villages merged with in planning Area		City area (in sq.km)	projected Population (in lakhs)	Density of person/sq.km	@Work Participation rate
		Municipality Ward No.	Villages				
1976-2001	1976	31	24	9.685*	1,55,000	16,004	5.0 (1971)
	2001			29.20**	4,00,000	41,300	28.00 (2001)
2001-2011	2001	48	31	15.50*	3,20,000	20,645	28.00 (2001)
	2011			81.88**	6,00,000	7,327	34.26 (2011)
2016-2031	2016	66	93	99.06*	5,33,000	5,380	34.26 (2011)
	2031			261.32**	17,00,000	6,505	--

Source: Directorate of Town and Country Planning Organization, 1976, 2001, 2016; @ PCA of Urban Directory, Census of India, 1971-2011.

N.B. *star denoted for actual/present Population and ** star denoted for projected /proposed Population.

Hence, 1976- 2001 master plan data was collected by the Survey of Planning department on 29th October 1976. Survey of Planning Department in 1998 has collected 2001-2011 master plan data. Survey of Planning Department has collected 2016-2031 master plan data in 19th November 2014 to 2016. 1976, 1998, 2001, 2011, 2016, 2031 years has been used for projected Population based on previous Census year data.

Thus, in the table 3 explained that, every master plan calls for rapid inclusion of villages within the planning area such as 24 villages were merged into planning area in 1976-2001 master plan and 7 villages were included in 2001-2011 master plan (total 31=24+7) whereas

62 villages were included in 2016-2031 master plan (total 93=31+62) that indicates faster rate of urbanization. Similarly, villages in municipal corporation boundary were also included during several developments of the Bilaspur city (Table 3). Finally, the area of this development plan is increased into three times of the pre-development area (454.66 Sq.km). Hence the average density of city is gradually decreased due to rapid inclusion of village areas within developed area. Newly villages were merged with in municipal corporation boundary which were under developed or in developing process. In the development proposal land acquisition process was faster than the rate of effectiveness. Thus, in the master plan of 1976-2001 was proposed 29.30 sq. km land for 25 years but when plan reviewed in 1998 for master plan of 2001-20011 it is found that only 15.50 sq. km land has been developed in 22 years (1976-1998). Similarly, in the master plan of 2001-2011 was proposed 48.30 sq. km land for 10 years but review shows in 2016 for 2016-2031 master plan it was noted that only 97.46 sq. km land was developed in 17 years (2016-1998). Population density is gradually decreased due to including villages within planning area and work participation rate were low (Indicator of economic independency) of urban dwellers.

3.2.1 Bilaspur City Development Plan, 2001

The land distribution which was proposed in 1976 to 2001 (Table 4) was not followed UDPFI guideline, 1996. when the existing land use development was reviewed in 1998 to make draft master plan of 2001-2011, the rate of effectiveness of master plan of 1976-2001 in land development process was 53.08 percent in which residential (56.03 percent), industrial (79.58 percent), commercial (45.50 percent) and transportation (62.71 percent), semi-public (60.0 percent) was higher than recreational development 6.18 Percent (Table 4).

Table 4: Bilaspur City Development Plan, 2001

Sl. No.	Land Use Categories	1976 (Existing)			2001 (Proposed)		
		Area in hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)	Area in hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)
1	Residential	515.7	53.2	3.33	1260	42.9	3.15
2	Commercial	28.8	3.0	0.19	200	7.1	0.50
3	Industrial	37.7	3.9	0.24	240	8.6	0.60
4	Public, Semi-Public and Public Utilities	179.9	18.6	1.16	400	12.9	1.00
5	Recreational	13.2	1.4	0.08	340	12.1	0.85
6	Transport and Communication	193.2	19.9	1.25	380	16.4	1.20
	Total	968.5	100	6.25	2920	100	7.30

Source: Directorate of Town and Country Planning Organization, 1976.

A comparison of percentages for various land uses reveals that the land allotment for residential use has been reduced from 53.2Percent to 42.9Percent so as to achieve optimum utilization of the scarce urban land. The land allocation has been increased for commercial activities in view of the existing defects of efficiency areas coupled with the growing demand for commercial activities, similarly land allocations for industrial and recreational activities have been adequately provided in view of the anticipated requirements. The land allocation for transportation has been reduced for optimum utilization of the existing transport links. In the same way, the land allocations for public and semi-public uses have been reduced to intensify the existing area coverage.

Table 5: Variation of Bilaspur city Development Plan, 2001

Sl. No.	Land Use Categories	Proposed area (in Hectares) in 2001 Master Plan	Existing area (in Hectares) 1998 Master Plan	Differences Area in (in Hectares)	Rate of effectiveness in Master plan
1	Residential	1260	706	-554	56.03
2	Commercial	200	91	-109	45.50
3	Industrial	240	191	-49	79.58
4	Public, Semi-Public and Public Utilities	400	240	-160	60.0
5	Recreational	340	21	-319	6.18
6	Transport and Communication	480	301	-179	62.71
	Total	2920	1550	-1,370	53.08

Source: Directorate of Town and Country Planning Organization, 1976, 2001.

The master plan was more influencing then residential, industrial, commercial, public and semipublic, transport and communication development but disgrace recreational development(Fig.3 and Fig. 4).

The first development plan of Bilaspur was prepared for the target year 2001, which was published in the year 1976.The preparation of this plan was done in view of the estimated Population of 4 lakhs and also proposed to develop an area of 2920 hectares under different land use for the purpose of providing facilities to the estimated Population of the city in the targeted year 2001. In 2001 development plan was implemented about 53.08 Percent in entire city(Table5).The maximum development has been taking place mainly residential, transport and industrial development. The total development land was used in amusement 2920 hectare and public and Semi-public facilities 12.9 Percent. The total Land Utilization Rate (LUR) only 7.30 Percent which shows intensive development with under developed area(Table 4).The main reason for the pitiable implementation of the development plan 2001 is the lack of proper institutional structure and lack of Financial support both in Public-Private partnership. There is a lack of maintaining of overlap of zone, review and understanding of Development plans. In order to overcome the arising problems of implementation of 2001 Development plan, a new development plan (2011) was prepared by the Directorate of Town and Country Planning for a period of 10 years i.e., till the year 2011 and it was published in the year September 2001.

3.2.2 Bilaspur City Development Plan, 2011

Proposed master plan of 2011 explain the distribution of land which did not follow URDPFI guideline, 2016 in comparison with previous master plan the land utilization rate is very low and unproportioned.

Table 6: Bilaspur City Development Plan, 2011

Sl. No.	Land Use Categories	1998 (Existing)			2011 (Proposed)		
		Area in hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)	Area in hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)
1	Residential	706	45.5	2.21	4073.12	49.74	6.79
2	Commercial	91	5.9	0.28	404.12	4.94	2.42
3	Industrial	191	12.3	0.60	686.37	8.38	1.14
4	Public, SemiPublic and Public Utilities	240	15.5	0.75	670.88	8.19	1.12
5	Recreational	21	1.4	0.06	1187.13	14.50	7.12

6	Transport and Communication	301	19.4	0.94	1166.48	14.25	7.00
Total		1550	100	4.84	8188.10	100	25.59

Source: Directorate of Town and Country Planning Organization, 2001, 2016.

In the year 1998 the land utilization rate of 4.84 hectares per 1000 population is compared to the land allocation for the year 2011 at 25.59 hectares per 1000 population seems to be relatively higher. Hence, high land utilization rate is 25.59 Percent that indicates excessive and haphazard development in the planning area. As against the estimated Population of 6 lakhs, the Population was only 5.33 lakh till the year 2011. The establishment of National Thermal Power Project (NTPC) and Railway Zone have been encouraged to reduce of density from some dense areas of the city and leads to higher land allocation rate in 2011. Plan has been influenced mainly the industrial development and recreational land use (Fig.5).

Table 7: Variation of Bilaspur City Development Plan, 2011

Sl. No.	Land Use Categories	Proposed area (units' hectares) in 2011 Master Plan	Existing area (units' hectares) in 2016	Differences Area in (in hectares)	Rate of effectiveness in Master plan
1	Residential	4073.12	5347.4	1,274.28	131.29
2	Commercial	404.12	322.28	-81.84	79.75
3	Industrial	686.37	859.01	172.64	125.15
4	Public, Semi-Public and Public Utilities	670.88	799.81	128.93	119.22
5	Recreational	1187.13	707.22	-479391	59.57
6	Transport and Communication	1166.48	1870.70	704.22	160.37
Total		8,188.10	9,906.41	1,718.31	120.99

Source: Directorate of Town and Country Planning Organization, 2001, 2016.

In Bilaspur Master plan 2011 (2001-2011) was prepared on the basis of estimated Population of 6 lakhs for the targeted year 2011. The development plan was proposed 8188 hectares' land under different land uses. The main conclusion come from the (Table7) that the overall land implementation rate of development plan has been 120.99 Percent. So that the region shows high urban growth during last 10 (2001-2011) years. Residential development (131.29 percent) and transport-communication (160.37 percent) was following by maximum growth in terms of Commercial growth (79.75 percent) & development of recreational area (59.57 percent) was low priority. It is explained that this master plan was promoted residential, industrial, transportation, public and semipublic development and discouraging commercial and recreational development.

3.2.2.1. Lack of Implementation of Development plan in 2011,

Most of the wholesale markets of the city are located in the old city area. The oldest wholesale market of the city is called Budhwari bazar from where some shops like cloth and leather shop have been shifted to Shri Ram Market. At present about 144 shops have been developed under her the new trend, some shops are also shifting from central area to Karbala area, which is a part of the old city. Therefore, it is necessary to displace these commercial activities outside the city. Telipara is located in the city, is also known as commercial area. But due to lack of basic infrastructure, only 120.99 Percent of this area has been developed. The lack of proper entry way for the heavy vehicles coming into trade hall is a big problem. Therefore, there is a need to make arrangements for entry way for heavy vehicles. So, that the developments of entry Vaypar Vihar can be encouraged completely. At present widening of routes has been possible and some roads have been partially widening due to lack of land.

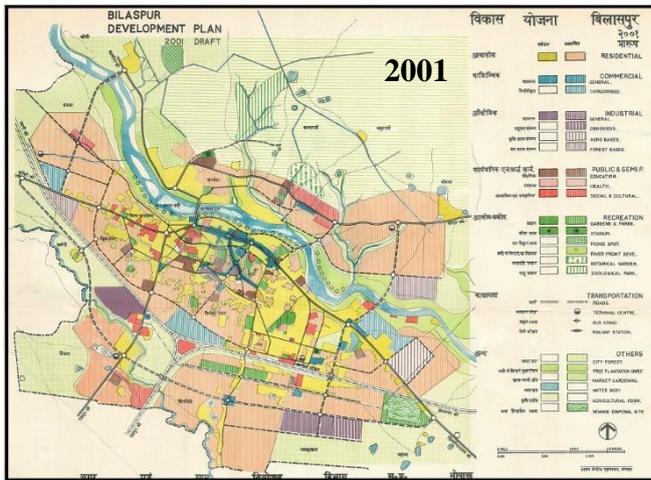


Fig 3: Bilaspur City Development plan, 1976-2001.

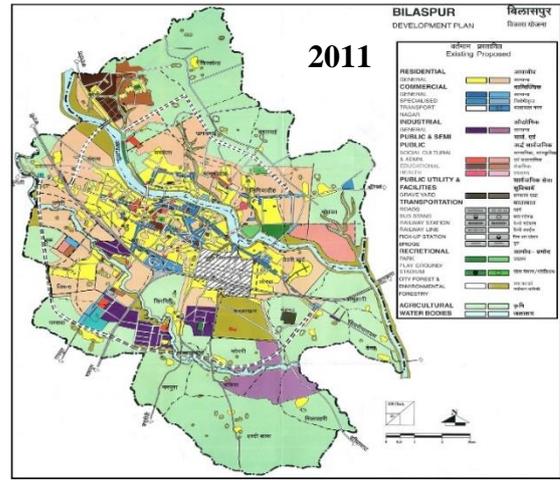


Fig 4: Bilaspur City Master Plan 2001-2011.

Source: Directorate of Town and Country planning Organization, 1976, 2001. Source

Table8: Land use structure for developable Area in Urban Center

Sl. No.	Land Use Categories	Medium City Percent of Development Area in percent
1	Residential	43-48
2	Commercial	4-6
3	Industrial	7-9
4	Pub-Semipublic	6-8
5	Recreational	12-14
6	Transport and Communication	10-12
7	Agriculture, Water Bodies	Balance

Source: Revised based on UDPFI guideline, 1996.

3.2.3 Bilaspur City Development Plan-2031

The land distribution pattern in 2031 master plan is not strongly maintained the UDPFI guideline, (Ministry of Urban Development) 2016.

Table 9: Bilaspur city Development Plan-2031

Sl. No.	Land Use Categories	2016 (Existing)			2031 (Proposed)		
		Area in Hectares	Percent of Developme nt land	Land Utilization rate (per 1,000 persons)	Area in Hectares	Percent of Development land	Land Utilization rate (per 1,000 persons)
1	Residential	5347.4	53.98	8.91	14971.55	57.29	8.18
2	Commercial	322.28	3.25	0.6	904.05	3.60	0.55
3	Industrial	859.01	8.67	1.61	1274.08	4.31	1.91
4	Public, Semi-Public and Public Utilities	799.81	8.07	1.51	3657.43	4.88	0.75
5	Recreational	707.22	7.14	1.33	3094.04	14.00	2.15
6	Transport and	1870.70	18.88	3.51	1070.53	11.84	1.82

Communication							
	Total	9906.41	100	18.59	26132.95	100	15.37
7	Mixed land Use	0.00	0.00	0	1070.53	4.10	0.71
8	Forest	12.39	0.03	0.02	12.39	0.03	0.02
9	Meaning	416.83	-	-	416.83	-	-
10	Water bodies	1921.93	-	-	1921.93	-	-
11	Catchment Area	416.83	-	-	416.83	-	-
12	Pond/Green area	291.58	-	-	1921.96	-	-
13	Agricultural land	33076.22	-	-	33208.53	-	-

Source: Directorate of Town and Country Planning Organization, 2016. N.B. Sl. No. 8 to 13 categories in the table has been balanced.

Bilaspur city master plan (2016-2031) indicates that old dataset, old map and its processing and analysis were oldest (Table 9). The formulation of master plans was having lots of lacuna. Almost master plan influencing uncontrolled urban growth but always promoted industrial growth and breakdown the laws and policy of sustainable urban development. Master plan is unable to maintain proportional recreational land development in last three plans. Last of all master plans have exhilarated the residential development (Slums and Colonies) very rapidly. All development plans were neglected garden city or green belt concept, which are the core of sustainable urban planning. Last of all master plan of Bilaspur city is not following UDPFI (Urban and regional Development plans formulation and implementation) guideline 1996 and 2016. The urban land use plan is indeed an expression of the human behaviour in a city. An ideal city must have an average of 4.0-hectareland per 1000 population under residential land use for the construction of dwellings. In addition, there must be at least 0.40 hectars land per 1000 population under business and commerce 0.40 hectare under private institutions and public buildings 0.40 ha. Under industries 0.8 hectare. Under parks and play grounds 3.24 hectars. Under streets and 2.84 hectars vacant land, thus, making a total of 12.13 hectars of urban land for one thousand populations (William, 1966). In the present environment business, commercial and public activities located in the central area of the city encourage excessive traffic in the central region, causing problems like pollution and congestion there are. In order to decongest the central area, Commercial and public activities that promote traffic in the city have been proposed outside the city (Table 10). These mainly include wholesale marker Telipara, Raja Raghurajsingh stadium, Imalipara veterinary Hospital, Proposed industrial area Tifra, etc.

Table 10: Relocation of land use and development of vacant land.

Sl. No.	Relocation of land use	Present Location	Proposed Location	Use of vacant land
1	Wholesale Market	Telipara	Wholesales Marker, Near Trans port Nagar	Resident cam recreation park.
2	Veterinary Hospital	Near Shyam Talkies	Gokul Nagar, Ghuru	Kotwali
3	Kotwali	In front of Lal Bahadur High School. (Central zone)	Vacant land of Veterinary Hospital	Multi-level parking zone
4	Retail Market	Central Area	Wholesales Marker, Near Trans port Nagar	Commercial and Recreational.
5	Diesel store center	Sirgitti Railway Crossing	Outer area of planning zone	Commercial
6	Timber and Wood Market	SchnichuriParab	Wholesales Marker, Near Trans port Nagar	Commercial/Residential
7	Scrap Market	Jabli Nala, Near Stadium	Wholesales Marker, Near Trans port Nagar	Residential

Source: Directorate of Town and Country planning Organization, 2016.

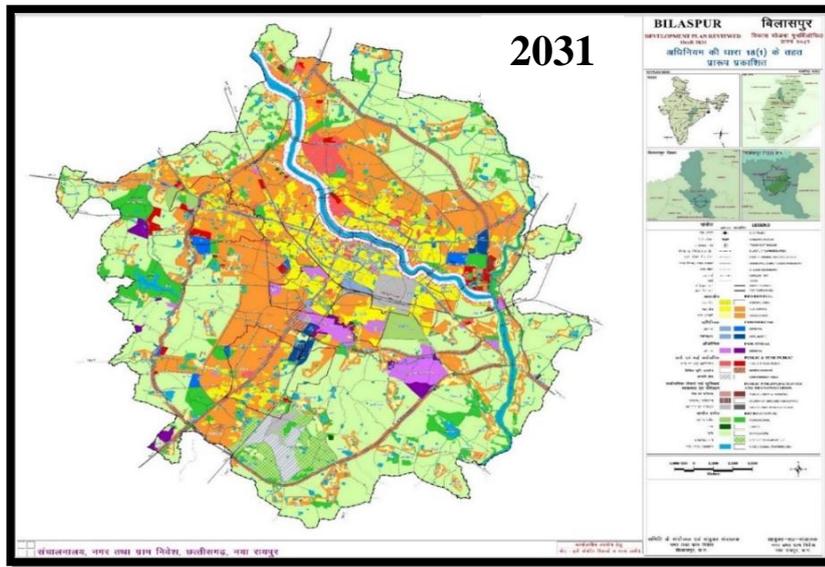


Fig 5: Bilaspur Master plan (Proposed for 2031)
 Source: Directorate of Town and Country planning Organization, 2016.

3.4. Selection of planning period

According to URDPFI guideline, 2014 (Ministry of Urban Development) There are three types of planning period like Short, Medium and Long-term plan. An urban plan which implemented for less than five years is called short term plan such as annual plan and which implemented for five to twenty years is called medium-term plan such as zonal plan and a plan which implemented for twenty to thirty years is call long-term plan such as master plan.

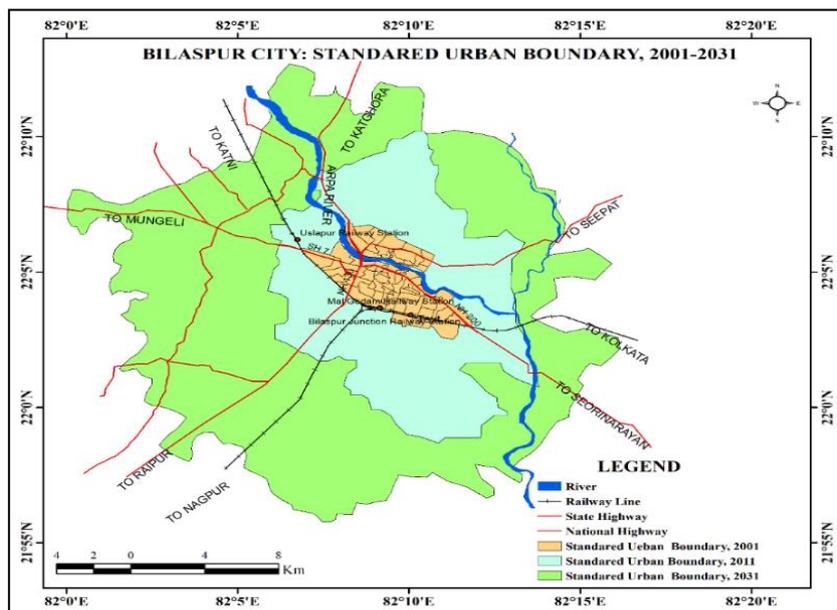


Fig 6: Planning area in different time period from 2001, 2011 and 2031

Table 11 Details of develop areas under different phases

Phases	Year of plans	Plan Periods	Proposed area –Actual area (hectares)	Percentage of area increase
I	1976-2001	25 years	2920-968.5	201.50Percent
II	2001-2011	10 years	8188.10-1550	428.26Percent
III	2016-2031	15 years	26132.95-9906.41	163.80Percent

Source: Calculated by authors using master plan data from Directorate of Town and Country Planning Organization, 1976, 2001, 2011, 2016, Bilaspur Master Plan.

But due to lacuna of arrangement of review committee Phase II master plan has been run to 2016. Plan evaluation after every five years must be built in as permanent process and be mandatorily done at the completion of the planning period (URDPFI guideline, 2014). Total developed area has increase 201.50 percent in first phase and phase II plan area has highly increased 428.26 percent all over the develop area (Table 12). In third phase percentage of development area is 163.80 percent.

3.5. Selection of planning Unit and Zoning Regulation

The chief tool of the master plan is its authority to formulate development codes and land use norms for different purposely uses (Dewal, S., 2006). In the late nineteenth century zoning concept has been adopted to controlled land use and enforcing legal status. ‘Zoning (Set of land use) is the legal regulation of the use of land’ (Gallion, et. al, 1969). Zoning has proven to be an effective tool for making any type of Urban planning effective and successful. Density zoning is referring to the population density of residential area which is regulated by appropriate laws. Sometimes problems that may arise in an area may not be completely eliminated by zonation in the old cities but in future urban life will be more sustainable and benefited. 1. Determine the pattern of building, side area and boundaries of the building. 2. Determine the maximum height of building. 3. The minimum and maximum amount of space that can be used for each home making. 4. Determine the maximum number of the houses per acre. Height Zoning refers to the zoning designed refers to the control of the height and width of the building and laying of roads and other adjoining open spaces which are considered to be conducive to ventilation so that lot of air and ventilation in each room, i.e., it should not disturb public health and safety in any way. Building should be constructed in such a way as to disrupt the communication system. The maximum amount of land that will be used is specified in the zoning designed. In generally there was six zones such as Residential, Commercial, Industrial, Recreational, Educational, Public and Semi-public (Fig.8). But in URDPFI guidelines, 2014 has described ten land use categories. According to nature of zones assisted various civic amenities like transport facilities, water supply, sewerage, electricity supply etc. in the whole planning area (Marufa, Q., 2016). An estimation of future Population, socio-economic conditions and their infrastructural needs and the preparation of land use and infrastructure plans for ensuring that the necessary facilities are in place when the development takes place. (Nallathiga, R., 2016; Nallathiga, R., 2009). Major workplace of state and central government offices, railways, trade, commercial services, transport and large-scale construction commercial service etc. are located in the central part of city. As a result, traffic congestion is daily increased during travel time. Therefore, zonation is needed to require for purposive land use for particular human activity. The central area from Deokinandan Chowk to Gandhi statue has commercial, industrial, educational, residential land uses situated adjoining each other which deteriorates the quality of environment essential for such uses. From the beginning of plan there is requirement to develop centrally-equipped building clusters with wide green area, around the govt. and semi-govt. office for

requirements of parking zone and easy access. To minimize this land use problems long scale proposal is required for this planning area.

3.5.1. Purpose of planning proposal, 2031

The quality of life in the settlement deteriorates only due to irrational use of land. The plan proposals have to satisfy the immediate as well as future needs. These proposals are of a large scale and have been more primarily from the point of population density, Settlement density, height of building, present land activity, ecological sensitivity of the city and neighboring sector. Along with the implementation of these proposals, small proposals will be necessary for proper planning at local level. It is necessary to divide the planning area into small units or zones (Table 12). But Grid zoning system like Chandigarh, Jaipur city is accelerating maximum utilization of land (Puri, A., 2012). Following the table presented details information about the planning units in whole planning area.

Table 12 Brief Information of proposed Planning Units

Sl. No.	Zones	Area in Sq.km	Nature
1	South-West area	111.03	This region is currently the predominate Population of the rural Population. This zone is proposed for mixed land use with moderate density.
2	South-East area	150.38	This region is presently identified in the industrial area, so this area is proposed for industrial and transport regulated development (Transport Nagar-Spatial development) with low density. (Plate.1)
3	North-East area	39.19	Rural Population is often seen. The proposed land use is also envisaged to maintain low density with little development like public and semi-public service.
4	North area	100.92	Residential and educational use is predominant. It has also been proposed with moderate density in the planning zone.
5	North-West area	38.01	Currently, the village is populated. Transport based development is envisaged in this unit with high density.
6	Town/Central area	15.13	This planning area is the central part and main city area is primarily developed. Redistribution of population density is necessary (Plate.2).
Total area		454.66	

Source: Data collection from Directorate of Town and Country planning Organization and author point of view.

3.5.2 Planning Units under the Master Plan, 2031

For the master plan 2031, the total proposed land was 454.66sq.km considered under 7 planning units as follows

Planning Unit 1-This planning unit is bounded by Raipur road and Mungali Road on west. This unit are included, high court, officer's colony.

Planning Unit 2-This unit is bounded by Raipur road and Deorikhurd road on south of Arpa river. This unit is bounded by railway line on north, ring road, part of Fadahakhar village and the area up to the boundary of Sirgitti on south. This unit covers loco shed, Sirgitti industrial area, and Wholesale vegetable market area at Tifra, Ganesh Nagar and Tarbaharroad (Fig.8)

Planning Unit 3-This unit is bounded by Mopka-Deorikhurd road. This unit is included Mopka, Lingiyadih, Chhatidih, and part of Sarkanda and Rajkishor Nagar.

Planning Unit 4-This unit is bounded by Arpa River on north between South-Eastern railway lines on south. This unit includes railway station and colony, office of the S. E. Railway, office of the district administration and local body. The locality covered by Jarhabhata, Kududand, Neharu Nagar, Civil line

Planning Unit 5-This unit is bounded by Ratanpur-Kathghora road on north Sarkanda and Seepath road to towards mopkanaka. This unit cover ITI. College, Central University, Agricultural College, Ramakrishna Ashram Birkoni with residential colony

Planning Unit 6-This unit is bounded by Mangla-Bhaisajar road on north, Bilaspur –Katni railway line and part of Tifra Nagar panchayat. Uslapur railway station is second railway station in municipal limit.

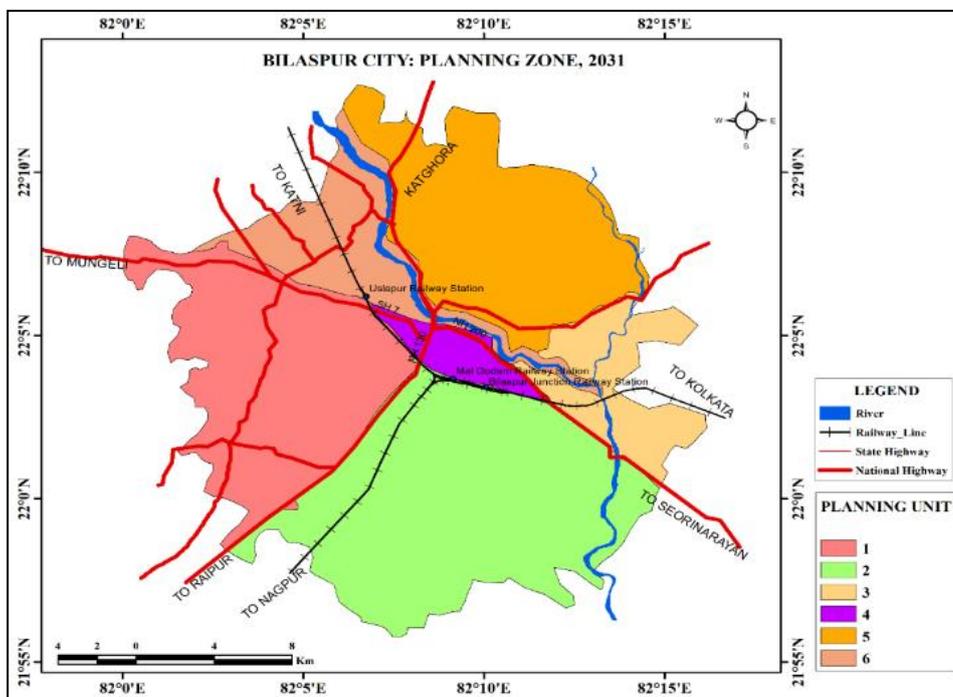


Fig 7: Planning Zone for master plan 2031

4. Conclusion and Suggestions

Policy making has been required for Unplanned Area and Planned Area. If master plan is compact and well recognized, then big volume of Population will be saturated. Participation of Urban dweller has crucial to decentralization of Govt. (State and Central) decision making process. Planning implementation is difficult task. Recent time Raipur city (Capital of Chhattisgarh) sky walk project is failure to implement this project. Urban planning must be realistic and practicable following the situation and data analysis of ground reality and must be influenced by the needs of the area. Also, planners need to create an atmosphere which allows people's participation (Mandal, 1998). Planning is also needed to protect land under environmentally sensitive zones and which provides ecosystem services. Farmer's livelihood options and food security issues make it imperative to protect land for agriculture. The open spaces have been provided at the rate of 1.4 to 1.6 hectare per 1000 person. The lower income area has been provided with more open spaces and the area under facilities like community hall that suit their social requirements (URDPFI Guidelines, 2014). After five years' review report will be published during plan period. Master Plan period will be short-term. Sometimes the supply of grunt has been stopped due to change of government. Long period Master Plans are too static in nature and they take very long time to prepare and are too

infrequently updated (Nallathiga, R., 2016; Nallathiga, R., 2009). Town and Country planning is not mentioned granary index. But due to flattening the road no of trees have been cut down. At present context 'Garden city' has been required for the living healthy urban development and creation a new town for the benefit of the community. Open space reservation is required for future development according to the future needs. In future new planed has been formulated in outside the municipal limits. Master plan is very crucial for Bilaspur city to segregate all kinds of the workplace into a particular zone and to remove bottleneck transport and traffic congestion. It also involves various situation such as widening of roads, control of traffic flow and moving vehicles, construction of over bridges, tunnels and sub way by pass road (Maurya, S. D., 2014). It is no doubt to prepare a master plan is a difficult task but its implementation is very difficult. In recent times Sky walk project in Raipur city (Capital of Chhattisgarh) wind mill at Nava Raipur has failure. As a result, all investment like public money and time has loss due to lacuna of proper planning. Absence of urban dwellers participation has not decentralized of the government decision-making process. Plan evaluation after every five years must be built in as permanent process and be mandatorily done at the completion of the planning period (URDPFI guideline, 2014) Tree plantation is necessary for city to make more beautiful and healthier. State government can take accorded the surplus open area to controlled slum and squatter settlement. Day to day land use problems can also be solved through extensive short-term planning. Parks and gardens are also being used in different age group. The plan implementation is a teamwork. More tragic fact is that the land allotted under park scheme is being accord by the residential buildings of influential leaders and officer. In a same way maximum tanks are encroached due to illegal residence. Such violation of planning policy must be restricted (Upadhyay, 1992). The haphazard development of some new residential colonies is also serious problem. New housing schemes for poor people of economically weaker sections should be prepared and the houses should be allotted to them on concessional prices in order to restrict further growth of slums (Upadhyay, 1992). In congested area one-way street is to be followed. Cattle shade is must be built in outer of city. Wholesale market generate heavy traffic flow because they involve heavy vehicles in carrying. So, wholesale market has been shifted in Tifra, outer of city. For improvement of the city land use certain hard decisions are desirable which include shifting the existing cantonments cattle shade, piggeries, burning/burial ground etc. Beyond the municipal limits of the city. One-way traffic system may be introduced in congested localities. (Tiwari, 2007) Also strict action should be taken against road encroachers and business establishment without parking spaces. To reduced city pollution and control the ground water level, encroachment of the river side's one-kilometer-wide green belt, dotted with beautiful parks and gardens should be developed along the bank of Arpa. Bilaspur Municipal Corporation should seek the co-operation of the institute like Bilaspur central university, engineering collage, NIT-Raipur, agricultural institute in the formulation and drafting of Master Plan government should set up monitoring committee for zoning reviewed in a month to maintained proper land use plan with the help of police protection. There were efforts to use the law as device to protect the property of future generation in city (Gallion et al. 1969). Facilities decentralization is required in planning and neighboring area.

According to the local people's opinion, 30 years ago, Bilaspur city was regarded as a dusty city because national and state highways were passing through in this city, as a result condition of the road was very deplorable. If Mungali to Kathghora road and NTPC road to Ratanpur road will be connected through ring road, this city will be protected from dust. 7Vs plan can be implemented in city vehicles circulation plan. Few selected vehicles like track, bus etc. will be regarded from V1 to V4 Categories Road. Slow speed vehicles like E-risks, Bi-cycle and another two-wheeler might be granted V5 to V7 categories road.

Flow in core is of city to cover over street blocked. So, a new commercial centre has been proposed in planning area to decongest the central area of the city. Greater involvement of public in planning processes is essential for preparation of a good master plan and its implementation on ground level (Mishra, A.K., 2012).

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