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The world’s urban population is growing at a phenomenal rate. At present 47.3 percent of the world’s population lives in urban areas. The uncontrolled population explosion coupled with increasing urbanization has posed innumerable problems to the planning authorities. Bangalore City, a fast growing Metropolitan City in south India, is experiencing a fast process of urbanization. Having a population more than 8.49 million (Census 2011), it is facing manifold problems related to physical, social, economic, environmental, health and administration. Some of the major problems being faced by the city include unplanned growth without proper infrastructure, traffic congestion and vehicular pollution, improper solid waste disposal and management, inadequate supply of drinking water etc. All these call for a proper understanding of the urban growth and development and it’s planning. They also necessitate effective monitoring of the urban growth, both in terms of the population and space.

The peri-urban (sometimes also called the urban fringe) may be the dominant urban form and spatial planning challenge of the twenty-first century. In older industrial or post-industrial countries the peri-urban is a zone of social and economic change and spatial restructuring, while in newer industrializing countries, and most of the developing world, the peri-urban is often a zone of chaotic urbanization leading to sprawl. In both cases the peri-urban can be seen as not just a fringe in-between city and countryside, a zone of transition, rather it is a new kind of multi-functional territory. While it resists simple definitions, there are common features wherever such areas are found, such as a relatively low population density by urban standards, scattered settlements, and high dependence on transport for commuting, fragmented communities and lack of spatial governance. Many global challenges arise from the ways that cities grow and change, especially the emerging mega-cities in developing countries where massive social and environmental problems can be found in their peri-urban hinterlands.

7.1 Results and Discussions

Bangalore had the geographical area of 567 sq km in 1990 and it is increased to 741 sq km in the year 2009. This is because of the increasing of the population, impact of industrialization and globalization. In the 20 years of time, Bangalore city population is doubled and growing rapidly. As per the 2011 census Bangalore city stands in the third place in India with the population of 8425970 persons. City grows like anything and transaction zone is created and further consider as the Peri-urban of the Bangalore Metropolitan Region. The present Bangalore city is administrated by the BBMP, and there are 198 wards in the BBMP.
Bangalore has many large scale, medium scale and small scale Industries. After the year 1995 many IT Industries were established, and finally Bangalore is considered as the Silicon Valley of India. In the year 2006 Bangalore had 111 villages surrounding the city, but today more than 27 villages are added to the Bangalore city. Growth being a good part of development, the residues caused by the growth is very serious. Shadow areas like slums, infrastructure, utilities, urban floods, public transportation, solid waste management, preservation of ecological spaces against urbanization, status of environmental services, and increasing demand for housing; all together stands as a big challenge for administrators and planners of Bangalore.

After comparing many models with the Bangalore Metropolitan Region, we came to know that The Multiple Nuclei Model created by the C D Harris and E L Ullman is the only model we can apply to the present scenario to the Bangalore city. Using the Multiple Nuclei Model and Conceptual Model, GIS Technology has been applied for the construction of the model in the study area.

The research makes many things clear which are related to the land-use and land-cover of the Bangalore Metropolitan Region. For the classification of the study area National Land-use and Land-cover classification scheme has been used. The study area has 1500 sq km; the area is constant because study area boundary has been demarcated in 2009. In the period of 15 years, built-up area of the Bangalore Metropolitan Region has increased between 163 sq km to 410 sq km. In the total geographical area 27.33 percent is covered by the built-up area. Study clearly shows that there is a gradual decrease in the Waterbody Areas, Greenery Areas and Other Areas. To understand the transformation happened in the study area, high resolution satellite imageries had been used.

IRS Series Satellite has been used for the classification purpose. After cross checking the result with the ground reality, 80 percent of the result is correct and 20 percent near to the ground survey reality. Many tanks and lakes have been encroached by the government projects, some lakes are leased to the private persons for the maintenance. Bangalore has been seen enormous growth and will tend to grow more. This growth has seen extreme effects on the land use and has made it undergo negative changes or transformation. Though a considerable ecology has been lost to the built up structures of the city, yet Bangalore is left with some lung space.
Urbanization, Globalization increases the Land Values and the house rent and commercial rent in the study area. The drastic growth happened in Bangalore after 1996 because of the new proposal of plans. To understand the land values for the different places, data’s have been collected through Department of Registration and Stamps, Karnataka State Gazetteer. And for the local real estate agencies, this shows the huge margin between the government value and the real estate value for 1 sq feet of land. Towards BIAL Airport, land value increased like anything. It was 1200000 in 1996 for 1 acre; now for the same area the value has increased more than 100 percent. The same thing happened in the Whitefield and surrounding areas because many IT Industries were opened and land value were increased.

In Bangalore like Metropolitan City, it is difficult to find houses, if the house is available the rent will be higher. There is a great margin between the residential and the commercial rents. Rent control fixes some amount of rent but owners take more than that amount. In 2001 rent for the small house is 800 Rupees but it is 2500 Rupees in 2011. Table 3.8 will be showing the details of increasing land-use values in temporal durations.

Cellular Automata model is created for the Bangalore Metropolitan Region using the GIS and Remote Sensing Technology. There are 5 criteria’s chosen to create C A Model. Those are Major Roads, Railways, Bus Stops, Lakes, and Dumping Yards. By conducting a survey among the localities, data have been collected regarding the criteria’s. There is a negative approach only for the dumping yards; other 4 criteria have got the positive approach. The peri-urban regions have been demarcated using the Cellular Automata Model created for the Bangalore Metropolitan Region. The result got from the study area is near to the actual scenario.

On the basis of the functional classification case study area have been chosen, Whitefield for IT Industries, Peenya for Industries, Kengeri for Residential Area and BIAL Road for Diversified Area.

7.2 Suggestion and Recommendations

By assimilating the results emerging from the present investigation, keeping in view some of the critical problems of Bangalore Metropolitan region and a few studies carried out by the researchers, certain measures have been suggested for the immediate attention of the planning authorities concerned with Bangalore urban development.
Bangalore is one of the fastest growing cities in India; it is becoming difficult to control the growth of the Bangalore city in terms of population, economics and culture. 1/3 of the Bangalore population is floating population just because; they are in seeking of the jobs. This leads to the growth of the city as well as peri-urban area of the city. To control this, nearby towns and cities has to take the burden of the Bangalore city, for this government has to pass some bills and provide the infrastructure facilities for the surrounding cities and towns.

The lack of infrastructure is one of the main drawbacks in the Bangalore Metropolitan city like road network, transportation facility, undeveloped lakes, and failure to identification of dumping yards, pollution and traffic congestion. To create the cellular automata model for the Bangalore city, only five criteria has been chosen. The result of the automata shines on the basis of those criteria’s. If we select the other favorable and non- favourable factors, the result will be different. So, concerned authorities have to take care of the other criteria’s also.

The master plan prepared by the BBMP, BDA and BMRDA is not up to the mark of current population. The master plan and the city development plan, planned for the year 2015 have already reached the destiny in 2010 itself. The authorities thus have attained the failure in this aspect. So the authorities have to plan henceforth, by keeping 10-15 years of future in mind.

Information technological industries have an enormous growth and it is found in a single stretch from Hebbal to Electronic city which includes Hennur, Banaswadi, Marathalli, Whitefield, Silkboard, and Koramangala region. We can nowhere else see such an IT hub. So the government should take up the initiative to build such an IT hub elsewhere.

One of the major projects, Namma metro is also a failure because it does not connect all the areas in the city. It does connect only the city not the peri urban regions. So it do not solve the transportation problem in the city.

Rural areas are converted into urban areas which is the evidence of Peri-urban. In the urban fringe, agricultural lands are converted into new layouts, industrial areas, and other class of built up areas. If the government is not taking proper measurements, then the demarcation of urban area will become difficult.
The Arterial roads, Ring roads, Grid routes used the traditional methods of construction. If they have adopted the GIS and GPS technology, they can still achieve a better result. Taking the help from the NGO’s and other organizations government can improve the infrastructure facilities and its maintenance.