

# Planning Proposal for Pollution Control and Waste Management Of Channenahalli Village, Bengaluru:an Approach to Microlevel Planning

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**Abstract**—“Plan today for a better tomorrow” rightly said by someone and this is what is practiced in Planning Organizations. On a broader context, the Urban and Regional Development Plans Formulation & Implementation guidelines provides us with a typical planning process which takes into account the Regional Plan, Development Plan, Town Planning Schemes, Comprehensive Mobility Plans, Zonal Plans, etc. And for better implementation, there are various Town Planning Acts followed by the state governments to fasten and judicialize the process. The Maharashtra Regional & Town Planning Act provides sections and laws for the regional plan, development plan and town planning scheme whereas the Karnataka Town & Country Planning Act focuses on Master Plan and Town Planning Scheme only which is still a bigger scale to work on and eventually the problems on the minor scale are often neglected or not given much importance. Thus to bridge the gap between a Town Planning Scheme and a neighbourhood plan there must be a microlevel plan. Micro level Plan aims to consider various parameters such as water supply and storage, sanitation, power generation, infrastructure, basic and fundamental amenities, housing, recreation, waste management, etc. This paper focuses mainly on urban planning and urban design to reduce the generation of waste and pollution or look for its sustainable solutions on a microlevel scale for a village named Channenahalli in Bengaluru.

**Keywords**— *Town planning scheme, Microlevel plan, Neighbourhood plan, Waste management, Waste reduction, ICT, Smart Bin*

## I. INTRODUCTION

Development Plans are prepared by Planning Authorities with the accordance of State Government to structure the development within a region scaling from 1:10000 to 1:8000 (as per state provision) and to implement these development plans, several town planning scheme models are adopted. A Town Planning Scheme is majorly focused on Land Acquisition and Land Readjustment, the laying out or re-laying out of land either vacant or already built upon including areas of comprehensive development to carve out plots for housing, circulation, recreation, social infrastructure and sale by planning authority for commercial, residential or industrial purposes. Town Planning Scheme is however a typical plan on a paper which specifically tells about the location and nature of an attribute. But when the same plan comes on ground for implementation, it however takes a huge time span for its implementation and thus microlevel planning is needed to work in detail about this TP Scheme (Town Planning Scheme). For example the plan would show

a road by hatching it in typical grey colour or a canal in blue. Microlevel Plan works in detailing this grey coloured road with its street architecture, urban design, cross sections, etc. However planning and carving out plots alone can't develop a region, planning according to the human habitat is also required.

Microlevel planning is simply planning from the lowest level i.e., from the functional community upward to a clearly defined region to fulfil the need of the local areas and ensuring the process of integration of the different areas with an objective to attain balanced regional development. The concern of balanced spatial development social equity has come to the forefront. Micro-planning is suggested for the all-around socioeconomic and fundamental development. As the space in which people reside is real, we however cannot ignore it. Ignoring this space and its community is actually alike ignoring the basic reality of interface between human habitat its society and also its economy. Microlevel-planning takes into cognizance the evolution of the spatial pattern of human activities without which economic, social and environmental goals of planning cannot be achieved up to expectation. And thus this microlevel planning will take into consideration planning perspectives to the lowest levels, focusing on waste management and pollution control for a better promising tomorrow.

## II. PROBLEM STATEMENT

Anything which is not useful later turns out to be waste and this waste is actually the problem we face on a larger scale today. Also the human tendency and bad habits lead to more and more generation of waste and thus results into pollution which then leads to global issues such as climate change, global warming, etc. As a planner, if we look forward to alter some designs, or plan more precisely it may surely lead to a change for better social upliftment. Hence this paper focuses on methods to eliminate the problems related to waste management and pollution of a village in Bengaluru.

## III. STUDY AREA PROFILE

Karnataka is the only state in India to have an exclusive Directorate of Urban Land Transport (DULT). The directorate has been set up in 2007 by the State Government close on the heels of the National Urban Transport policy coming into force, to coordinate planning and implementation of urban transport matters in the State. For the first time qualified personnel trained in urban transport planning were introduced into the government system. The Directorate is in general

responsible for overseeing all the urban land transport initiatives in Urban/ Local Planning Areas of Karnataka. And from 8<sup>th</sup> July 2019 to 31<sup>st</sup> August 2019 ie. for 8 weeks an internship program was conducted for Master Level Students and being a part of that internship program, I and my two colleagues Ms. Sushmita Paul and Ms. Ruchika Tater were allotted with the project of Microlevel Planning under the guidance of Urban Planner Ms. Ann Jacob.

The main focus on the project was to study the planning practices in various other states such as Gujarat & Maharashtra and implement them in Karnataka and specially Bengaluru. However, Bengaluru is a region which is not constrained by any water body as in the case of Mumbai in Maharashtra and thus the areal limit of the city went on increasing which gave rise to haphazard growth of the city. It is a fact that today in 2020 the overall development of Bengaluru is lacking by 10 years. Alike Gujarat & Maharashtra it does have provisions for Development Plan and according to Karnataka Town & Country Planning Act it is referred to as a Master Plan and in every 10 years it has been revised but however, these plans stay on the paper itself, their implementation is very hard as the typical TP Scheme mechanism takes almost 4 years to just develop a small piece of 100-200 hectares. And the time till the TP Scheme is commenced there is already half of land under construction or already built. Also the Section 17 of the act which says about subdivision of plots and layout of private roads let to major traffic problems, narrow streets, less or no proper percentage of recreation plots. To avoid the problems that would arise in future due to urbanization of the rural area, the village named channenahalli is being taken as the site for studying the topic of Microlevel Planning. This village is the farthest from the core of Bengaluru but However it lies within the jurisdiction of BDA ie. Bangalore Development Authority and thus the Master Plan of BDA and its planning proposals are applicable to this selected study area.

Sheegehalli- Yelachaguppe Planning District (PD. No.39) is located Western side in Bangalore Metropolitan Area with Magadi Road passing through its north western side and running north of the PD. It shares its boundary with Local Planning Authority (LPA) of BMICAPA on eastern side and LPA of Magadi on western side. BDA Scheme Layout, unorganised and scattered developments all along Magadi Road, & NICE corridor and reducing agriculture use defines the characteristics of PD. RMP2031 proposes to promote planned high density planned development, while retaining certain areas as agriculture.

After obtaining permissions from the Government of Karnataka, we visited the site to make a note of actual scenarios in that village. By personally interviewing the local villagers we came to know about various problems that existed present and also some of them that would create problems in the future. From the online website of Government of Karnataka portal we obtained this map of Channenahalli Village which contained the basic information about plot ownership, main road, water body, contour, etc which worked as a base for study. Further this image was converted to .tiff format and georectified on ArcGIS to digitize the map for our work



Fig. 1. Location of Planning District Sheegehalli- Yelachaguppe in Banagalore Metropolitan Area

Population (2011 Census): 17,013

Gross Density: 10 pph

Area of PD: 1733.21 ha

Villages in PD: 7 (Kannelli, Sheegehalli, Channenahalli, Ramapura, Yalachaguppe, Kodagihalli and Manganahalli.)

Gram Panchayats: Kodagihalli and Tavarakere

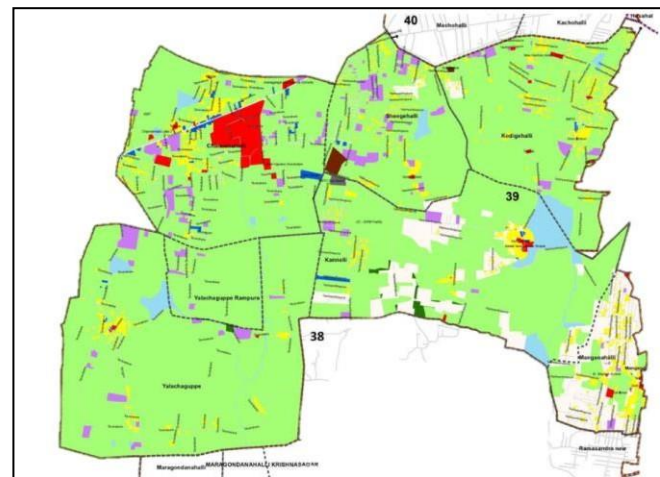


Fig. 2. Location of Channenahalli village in Planning District Sheegehalli- Yelachaguppe in Banagalore Metropolitan Area.



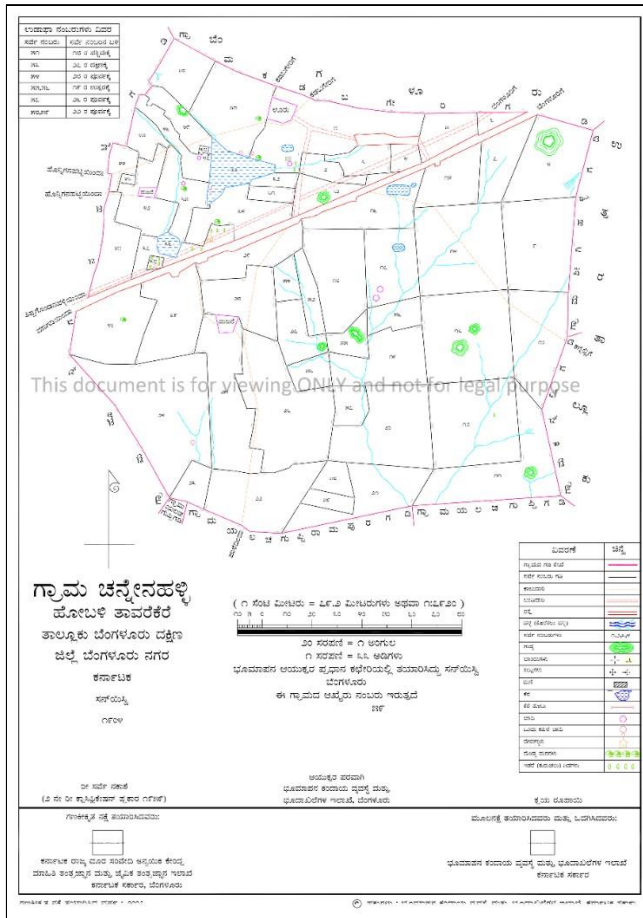


Fig. 3. Village map of Channenahalli

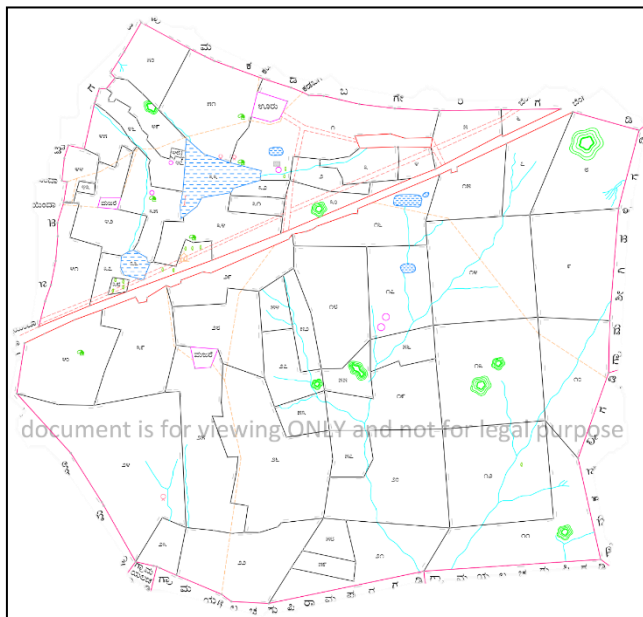


Fig. 4. Enlarged village map of Channenahalli

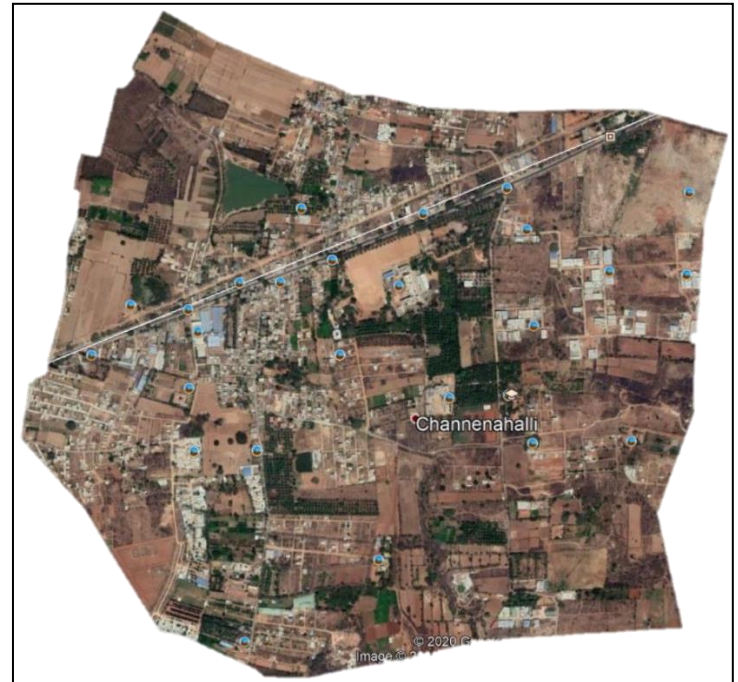


Fig. 5. Satellite Image of Channenahalli Village

#### IV. PLANNING PROPOSAL FOR STUDY AREA

### A. Lakefront Development



Fig. 6. Satellite Image of Lake in Channenahalli village



Fig. 7. Actual Image of Lake in Channenhalli village

Though Channenhalli lies in metropolitan area but still it is a village and we noticed that the villagers rely on this lake water for their daily purposes as a result this lake is on the verge of completely drying up and also this lake is getting polluted because the people wash their clothes in the same water and also this area has large industrial estate in its vicinity and thus the industries tend to pollute this water. To prevent this land and water pollution a buffer zone must be properly planned and designed in the lakefront area ensuring the water table is not polluted. By constructing a small scale screening unit and purification unit, the pollution can be controlled. Also a microlevel plan is needed to provide the connectivity between this lakefront and the adjoining industrial area, commercial area and main highway.

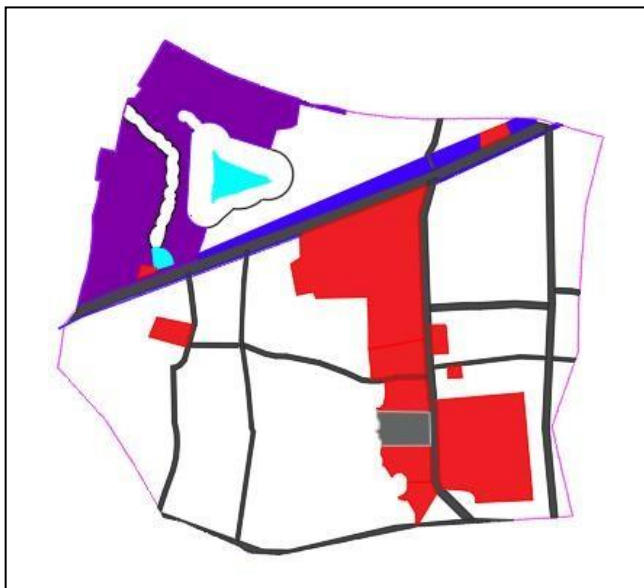


Fig. 8. Development Plan Reservations

### B. Domestic and Household Waste

Household waste which is generated on daily basis is also a major issue. Heaps of garbage gets collected in the landfills some being piled for years and some being incinerated causing pollution. Almost 70% of the household waste contains the kitchen waste which is completely decomposable. What if we carve plots besides plant nurseries or parks/ open spaces which would collect the everyday kitchen waste from houses and convert them into fertilizers for plants. Also a separate bin may be located at every 500m on the streets which would be Wifi enabled. As in the bins would send alert on the collection centre when they will be completely occupied. Depending upon how much the waste is collected the collection centre would optimize their collection routes and such a way even the fuel consumption of collector vehicles by running on all the routes everyday will be reduced. Such a way even the stress on the government agencies of waste collection and disposal would be reduced. Smart Bin Technology is one which works on the same principle which is surely need of the hour.

Fig. 10. Smart bin Technology (<https://www.smartbin.com/>)

### C. Animal Droppings on roads

Animal Droppings on road which are often neglected but think in rainy seasons, this droppings flush into the storm water drains and then they find their way into reclamation centres. Even there are projects which recycle storm water and supply it back to us. Imagine you are consuming someone's excreta. Also these stray animals, who often reside on roads blocking the traffic, inviting diseases and sometimes also death. Even they have their right to exist in nature and our Town Planning Acts or Guidelines don't provide provisions for their living. The Town and Country Planning Organization Guidelines suggests that at least 5% of total TP Area must be reserved for Open Space and Recreation. For an area of 100 ha, 5% means 5 ha should consist of Open Spaces.

What if as an urban planner, we plan some areas within this 5% as animal shelters. Animal Shelters will ensure a roof for



this stray animals, and the advantages would be they won't defecate on public lands, won't create traffic jams and also their casualty and mortality rate would be reduced. And these animal shelters would also look after their vaccinations so that they don't spread diseases. Even today there are various NGO's working for these stray animals. One of them is Bhutdaya Foundation in Nashik, which is an NGO run by my student of Sandip Polytechnic Mr. Rushikesh Bhalerao and his team. And as the land for animal shelter would be within the land reserved for open spaces, it's ownership would lie with the government or planning agencies/ authorities and minimal funds can be raised by the government to look after their needs.



Fig. 11. Animal Shelter



Fig. 12. Bhutdaya Foundation

### Biogas from tree litter

Every other house in our country relies on LPG for cooking and day by day even the prices of LPG are increasing a sustainable solution for this could be Biogas. Biogas can be easily produced from plant residues such as dry leaf litter, branches, etc. Also the leaf litter on roads and parks is a waste which is eventually burnt causing air pollution. As an Urban Planner, a simple thing what we can do is revise the cross sections of the road. Instead of concreting the plant roots and paving them we can excavate a trench around it and elevate the non-motorized vehicle tracks and pedestrian paths so that these dried leaves gets accumulated in the trenches protecting the plant roots and after a particular time period, the road sweepers would easily collect these leaf litter to convert it into biogas. The trench would actually help in segregating other water such as papers, wrappers, etc. from

the tree litter and also ensuring that the waste is collected and stored at the place right where it is created. This would also create a source of income for the sweepers and garbage pickers and the Non-renewable LPG consumption can be reduced from waste.



Fig. 13. Biogas from tree litter

(<https://ahmedabadmirror.indiatimes.com/ahmedabad/cover-story/turning-dried-leaves-into-eco-friendly-fuel/articleshow/35639376.cms>)

### Optimization of NMV Tracks

NMV stands for Non Motorized Traffic. We all know the situation of Delhi few months ago. The smog was so harmful that it may cost a number of lives. To avoid this situation, the pollution must be reduced and the main reason for this pollution is the vehicles on road. Strategies like odd and even also didn't proved to be much fruitful so in order to provide a sustainable solution, as a planner we can search for alternatives such as electric vehicles which produce minimal pollution but the problem would be their charging stations so what if we plan sites specially as charging stations. Solar Energy is the best renewable energy source so making use of solar paving materials for the charging stations of electric vehicles. This will even reduce the import of fuel from other countries and help support our economy.



Fig. 14. Solar Pavement (<https://interestingengineering.com/6-examples-of-solar-powered-roads-that-could-be-a-glimpse-of-the-future>)

## V. CONCLUSION

According to me, the main motive of this study was to highlight the need of a microlevel plan. Because, the concept of neighbourhood planning is still a restricted or limited one which fragments the society in parts. Today we see large projects taking place in the form of Townships or small cities but somewhere this must be integrated with the planning of the Planning Authorities and the government. Not just a Town Planning Scheme but Microlevel planning is needed to efficiently develop a region or to implement the Development Plan. The various proposals suggested in this paper are a part of the internship program held at DULT Bangalore which were proposed by we student interns and we hope such sustainable solutions are considered by the government agencies for a better tomorrow.

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## REFERENCES

- [1] Karnataka Town & Country Planning Act
- [2] Maharashtra Regional & Town Planning Act
- [3] Urban and Regional Development Plans Formulation & Implementation guidelines
- [4] Town & Country Planning Organization guidelines
- [5] Directorate of Urban Land Transport, Urban Development Department, Government of Karnataka.  
<http://www.urbantransport.kar.gov.in/>
- [6] Bhutdaya Foundation, Nashik  
<https://www.facebook.com/pages/category/Non-Governmental-Organization--NGO-/%E0%A4%AD%E0%A5%82%E0%A4%A4%E0%A4%A6%E0%A4%AF%E0%A4%BE%E0%A4%AB%E0%A4%BE%E0%A4%8A%E0%A4%82%E0%A4%A1%E0%A5%87%E0%A4%B6%E0%A4%A8-439943293418293/>
- [7] Google Earth and GIS planning studio, School of Engineering and Technology, Sandip University Nashik.
- [8] Peter Jones, Stephen Marshall, Natalya Boujenko, Professor, Centre for Transport Studies University College London, London, UK, Senior Lecturer, Bartlett School of Planning University College London, London, UK, Independent Consultant London, UK, "Creating More People-friendly Urban Streets Through Link And Place", Street Planning And Design, February 19, 2008,  
<https://reader.elsevier.com/reader/sd/pii/S038611214601965?token=BB424AF5082D1DFD88EE1E6F09B682E924DE4487940D40C104AF9047D4221F6283C0564CD9E6100347FBC5AC94FA680E>
- [9] Shelly Shah, Micro-Planning: Needs, Aims and Objectives of Micro-Planning, Sociology Discussion,  
<http://www.sociologydiscussion.com/planning/micro-planning-needs-aim-and-objectives-of-micro-planning/1085>
- [10] OpenCity Urban Data Portal [www.opencity.in](http://www.opencity.in)
- [11] OpenStreetMap  
<https://www.openstreetmap.org/#map=15/12.9764/77.4329&layers=T>
- [12] Mrs. Rupali P Zope, Assistant Professor, Civil Engineering Department, Symbiosis Institute of Technology, Planning Strategies For Urban Land Use Pattern: A Case Study Of Pune City, India, , Pune July 2013, International Journal of Innovative Research in Science, Engineering and Technology Vol. 2, Issue 7 Micro-Planning: Needs, Aims and Objectives of Micro-Planning, Shelly Shah, Sociology Discussion
- [13] Micro Level Planning Approach for Ru-Urban Development – A Case Study of Palsana Town, Gujarat, June 2014, Civil Engineering Department, SCET Surat – Gujarat (India) IJRSI ISSN 2321 – 2705 Volume I, Issue I, June 2014
- [14] Creating Places, achieving quality in residential developments, incorporating guidance on layout and access, May 2000
- [15] Shirley Ballaney, The Town Planning Mechanism in Gujarat, India, , The International Bank for Reconstruction and Development /The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A. January 2015
- [16] Smart Bin Technology <https://www.smartbin.com>
- [17] Biogas from tree litter  
<https://ahmedabadmirror.indiatimes.com/ahmedabad/cover-story/turning-dried-leaves-into-eco-friendly-fuel/articleshow/35639376.cms>
- [18] Solar Pavement <https://interestingengineering.com/6-examples-of-solar-powered-roads-that-could-be-a-glimpse-of-the-future>