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URBAN WATER SUPPLY AND SANITATION: A CASE STUDY OF KAVALI TOWN

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ABSTRACT

Physical infrastructure is one of the major assets of a city for economic and sustainable development. Globally Physical Infrastructure is facing threat due to the lack of Infrastructure resources within the city and its proximity. This paper envisages factors of land use implications, and the process of physical infrastructure development that would reflect the current contemporary challenges. The need and necessity of various types of infrastructure has been rapidly increasing beyond their core functions, which demands the involvement of stake holder participation to promote orderly decisions on infrastructure development policies. An empirical analysis is conducted on time series annual data from 1991 to 2011 for water supply and sanitation of kavali town. The availability of infrastructure facilities is inadequate and requires improvement for the future. The results suggest that public physical infrastructure provision certainly improves the socio-economic conditions by contributing towards growth in the ULB. This paper also suggests and proposes new innovative techniques for improvement of facilities by considering the norms and guidelines framed by the public authorities.

Key words: Land-use Analysis, Physical Infrastructure, urbanization, ULB and sanitation

INTRODUCTION

Great cities are born of and give rise to great infrastructure. Historically, city planning has been deeply rooted in infrastructure and physical planning. Currently, the links between infrastructure and city planning may be described as numerous but non-strategic and non-comprehensive, even as the bond between infrastructure and cities remains tight. It is the economic and social underpinnings of a society and the life wire of the urban system. An enormous growth in urban population has put a tremendous strain on Urban Infrastructure (UI) services resulting in a deterioration of the physical environment and the quality of life. It is estimated that over 20% of urban population live in squatter settlements, where access to basic services is extremely poor.

Service	Urban population coverage
Protected water supply	90%
Sanitation	49%
Sewerage system	32%
Low cost Sanitation facility	25%
Solid waste Collection-Metros	90%
Solid waste collection-Smaller towns	Less than 55%

Source: Economic Survey 2018-19.

Service	Salient statistics
Water supply	64% of urban population is covered individual connection & stand posts in India.91% in china, 86% in South Africa, & 80% in Brazil
	Duration of water supply in Indian cities ranges from 1 hour to 6 hours, compared with 24 hours in Brazil& china 22 hours in Vietnam
	Water utilities in India are typically able to recover only 30-35% of the O&M cost, in the Philippines and Cambodia, most water utilities recover the full O&M cost. Even in Bangladesh, water utilities recover about 64% of their O&M cost
Sewerage and sanitation	4861 out of the 5161 cities/Towns in India don't have even a partial sewerage network
	About 18% of urban households do not have access to any form of latrine facility and defecate in the open
	Only 21% of the waste water generated is treated, compared with 57% in South Africa

NEED FOR THE STUDY

Water supply and sanitation is a guide to orderly city development to promote health, safety, welfare and convenience of the people of a community. It organises and co-ordinates the complex relationship between urban land uses and many civic activities considering the resources and requirements. However, the basic infrastructure in the cities has not been able to match with this rapid urban growth and hence is overstressed. Such development poses serious health as well as economic risks to the entire community. With a restricted resource base, poor institutional capacities, the urban infrastructure development in India is a big challenge to planning.

The present paper encapsulates the demand side interference in the planning process with a critical analysis of the existing Indian planning approach to the urban infrastructure system and finally suggests an alternate planning philosophy to the ongoing chaos.

Case Study:

Kavali is a town in SPSR Nellore district in the state of Andhra Pradesh in India. It is one of the municipalities in Nellore district and is the second largest town in the district. Its position exactly between 2 district headquarters, viz. Nellore and Ongole on the National Highway 5 from Chennai to Kolkata, and on the arterial Chennai-Vijayawada railway line - helped its growth, more than the other towns in the Nellore district.

LAND USE (1991-2011)

SI NO	Landuse	1991		2001		2011	
		Area in hectare	% of total development area	Area in hectare	% of total development area	Area in hectare	% of total development area
1	Residential	236.84	41.28	252.25	39.38	256.93	38.37
2	Commercial	4.93	0.86	8.71	1.36	12.22	1.83
3	Industrial	4.30	0.75	6.92	1.08	9.06	1.35
4	Public and Semi Public	87.95	15.33	127.41	19.89	139.08	20.77
5	Parks and Open Spaces	54.22	9.45	67.96	10.61	80.81	12.05
6	Transportation and Communication	185.49	32.33	177.30	27.68	171.57	25.63
7	Agricultural,Forest and other uses	1446.45	-------	1655.32	--------	1771.57	-------
	Total	2020.19	100	2295.87	100	2441.24	100

Source: Directorate of town and country planning Andhra pradesh and Kavali Municipality

As per the above table in kavali municipality residential use predominate with 41.28% in 1991 and decreased to 39.38% and 38.37% in 2001 and 2011.

DECDAL POULATION GROWTH RATE (1911-2011)

Year	Population	Growth rate in Persons	Growth rate %
1911	6,380	-	-
1921	8,800	2,420	37.93
1931	10,522	1,722	19.57
1941	11,969	1,447	13.75
1951	15,516	3,547	29.63
1961	20,544	5,028	32.41
1971	29,616	9,072	44.16
1981	48,119	18,503	62.48
1991	65,910	17,791	36.97
2001	79,682	13,772	20.90
2011	108,768	29,086	36.50

Source: Census of India

WATER SUPPLY

Drinking water supply and sanitation in India continue to be inadequate, despite longstanding efforts by the various levels of government and communities at improving coverage. In urban areas, Institutional arrangements for water supply and sanitation in Indian cities vary greatly. Typically, a state-level agency is in charge of planning and investment, while the local government (Urban Local Bodies) is in charge of operation and maintenance. Some of the largest cities have created municipal water and sanitation utilities that are legally and financially separated from the local government. However, these utilities remain weak in terms of financial capacity. In spite ofdecentralisation, ULBs remain dependent on capital subsidies from state governments. Tariffs are also set by state governments, which often even subsidize operating costs. Water supply is the provision of water by public utilities, commercial organisations, community endeavors or by individuals, usually via a system of pumps and pipes.In 2020, about 85% of the global population (6.74 billion people) had access to piped water supply through house connections or to an improved water source through other means than house, including standpipes, water kiosks, spring supplies and protected wells. However, about 14% (884 million people) did not have access to an improved water source and had to use unprotected wells or springs, canals, lakes or rivers for their water needs.

WATER SUPPLY FACILITY IN KAVALI TOWN

OLD :-

1. V.R.Nagar - 450 K.L, 500 K.L.
2. Municipal Office - 1000 K.L
3. Co-operative Colony - 500 K.L.
4. GLSR - 750 K.L
5. IDSMT - 250 K.L

NEW :-

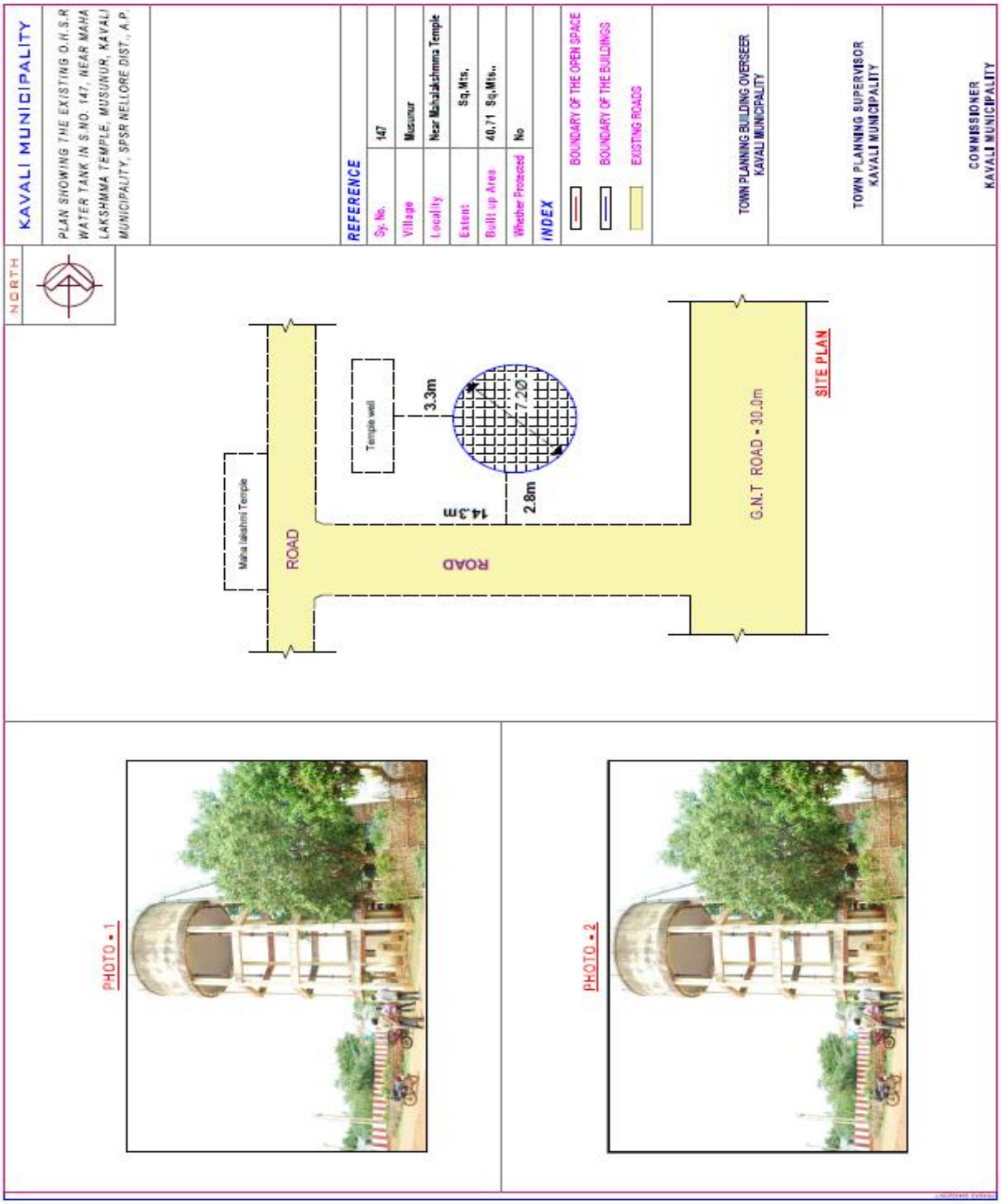
1. Pullareddy Nagar - 750 K.L.
2. Vivekananda Park. - 1000 K.L.
3 Slaughter House - 750 K.L.
4. Peddapavani Road - 750 K.L
5. No of Open Wells - Agraharam well, Ambedhkar well , Maddurupadu well, SubbulaBhavi

EXISTING INSTALLED CAPACITIES OF WATER TREATMENT PLANTS

SI.No	Location	Install Capacity in KL
Zone-1	Pulla Reddy nagar	750
Zone-2	Kaccheermetta	750
Zone-3	Co-operative society	450
Zone-4	KMC	1000
Zone-5	Vivekananda Park	1000
Zone-6	Fish market	750
Zone-7	Peddapavani road	750
Zone-8	V.R.Nagar	500/400/250

Source: Public health department kavali

Water supply	2011	2018
Projected Water Supply Reservoirs	5	10
Total Installed Capacity of WS	4300 MLD	6600 MLD
No.of House Service Connections	2602	4000
No.of Public Stand Posts	480	528
Length of Distribution Pipeline(KM)	74.3	78.2
No.Of Hand Bores	457	550



SEWERAGE AND SANITATION

The town is not provided with any under ground drainage system at all. The absence of an efficient under ground system invariably leaves the choice of households to dispose the sewage water and sullage water directly into the open drains, which are provided for rainwater run-off. The sewage and sullage water reaches the primary drain which is passing through tanks which pose environmental hazards not only to the river but also to the environment.In general, the disposal of night soil is carried out mainly through septic tanks, and public convenience facilities. Nearly 67 % of the population is covered through septic tanks, 10 % of the population covered through Public toilets, 5 % of the population covered through Soak pits and remaining 18 % of the population is not covered by any of the systems of night soil disposal.

STORM WATER DRAINS

The total length of roads-165 kms,Length of drains 187kms,length of kutcha drains-3 km and no ugd connection. The general drainage pattern is dendritic to subdendritic. The drainage density varies from less than 1 to 3 km/km2.

The drain flow in the town is quite natural.There are 4 tanks surrounding the municipal area and two lakes which can able to accommodate the storm water in rainy season. since it is near by the sea, most of the times the flood will go into it.

WATER RESOURCES:

The town has four collective tanks which serves for storm water.The drinking water is away 30 kms from the town.The town is not suitable for much irrigation.

PROPOSALS

The vision is to provide adequate, reliable and affordable physical infrastructure facilities in the town by 2030.

- 100% coverage in water supply and improved service levels
- 100% coverage in sewage collection

Strategies for achieving vision:

Based on close consultations held with various action groups (identified in the visioning workshop), a list of strategies was carefully drawn up and prioritized based on expected outcomes and target group preferences. The strategies related to the areas of local economy, water supply system, sewerage and storm water drainage system .The strategies are summarized below.

Water supply system:

As per the suggested vision statement for water supply services is “Water for all at 135 lpcd and 24 x 7 supplies with focus on safety, equity, and reliability”. To achieve this target, additional schemes need to be designed for sourcing more surface water. Rainwater harvesting should be made compulsory for all new building projects to supplement the ground water. Upgradation of existing pipe lines to 400 mm for the effective service. In the interests of reducing transmission and distribution losses, ULB should refurbish the old distribution system, conduct leak detection studies, and identify illegal water connections. All households should be provided with

valve and metered connections to increase coverage to 100% and volumetric billing should be introduced to discourage wastage.

Sewerage and storm water drainage system:

As per the vision statement for the sewerage and storm water drainage system has been defined as "100% coverage of sewage collection and treatment, and strengthening and rejuvenation of the natural drainage system". ULB must extend the sewerage system to the entire city and provide individual connections to all households/constructed units. The proposed sewerage system must ensure that no sewage is disposed untreated into the water bodies in and outside the city. To provide universal access to clean and affordable sanitation facilities at public places, ULB should encourage the 'pay and use' category of public conveniences through public private partnership arrangements and community involvement in the maintenance of the same. All the roads must have storm water drains to prevent flooding during peak periods.

CONCLUSION:

The study concludes that the location of the town between the two capital head quarters Nellore and ongole helps its advantage. The town is an education centre, and having textile business with familiar to adjacent areas. The land availability for development is one of the major potential compare to other towns in the district. A time bound map for municipal reform has been suggested to improve quality of civic services provided by them. The map also suggests measures for strengthening the financial status and management capabilities of ULB. The availability of the infrastructure services will influence the future development. There is good potential for development of tourism due to nearest location to sea. It can generate three major objectives in development such as diversification of economy, generation of employment opportunities and raising gross district domestic product.

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BIOGRAPHY

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My areas of interests are Urban planning, Urban design, Sustainability, landscape design, art &interior design.