Safe, Resilient & Sustainable City – Reality & Challenges – Pune Urban Agglomeration

Under Subtheme Goal 11 – Sustainable Cities & Communities

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Abstract:

Pune is the 7th largest city in India and an important educational and Information Technology hub. Given the proximity to Mumbai and its national importance, the pleasant weather conditions & a cultural hub, the city acts as a magnet for the populace all over the country. The city has risen from a pensioner's paradise to a bustling metropolis over the last few decades. As per the Census of 2011 the city was home to about 3.5 million habitants, which in the last 12 years may have increased significantly. This is way beyond the ideal of 1 million habitants propagated by the United Nation for an ideal city.

The Sustainable Development Goal 11 & the recently held G20 summit perceive a safe, inclusive, resilient and a sustainable city. Given the economic pressures on one hand and the SDG on the other the paper tries to examine the preparedness of Pune Metropolitan area by 2030 and the challenges it faces.

The paper would examine crucial issues of transportation, safe shelters, inclusive communities, regional planning & development along with the disparity of unequal income & living conditions. The help of the Environmental Status Reports, the Regional Planning of Pune Metropolitan Regional Development Authority and literature studies and surveys would mark the SDG achievement. The challenges faced to complete the target and the interventions required would be marked. This study and conclusions would reset the global target to the local & national level. The paper would test the standardisation of the SDG 11 and the local level customisations required evolving a methodology to address the SDG11 with a regional understanding.

KEYWORDS*: Inclusive Communities, Safe Shelters, Unequal Incomes, Ideal City, Environmental Status Reports*

Aim:

To study the preparedness and achievements of Sustainable Development Goal 11 (SDG11) of Pune Urban Agglomeration with the recent backdrop of G20 summit.

Objectives:

1) To understand the target areas of SDG11 & its importance.
2) To evaluate the growth of Pune Urban Agglomeration.
3) To identify the sectors of the Pune Urban Agglomeration influencing the targets of SDG11.
4) To check the progress of achievement of SDG11.
5) To suggest a forward path for the Pune Urban Agglomeration to achieve the SDG 11 targets.

Limitations:

The study would encompass the areas of PMC, PCMC, Pune Cantonment, Khadi & Dehu Road Cantonment areas. The PMRDA (Pune Metropolitan Regional Development Authority) is excluded from this study.

Introduction:

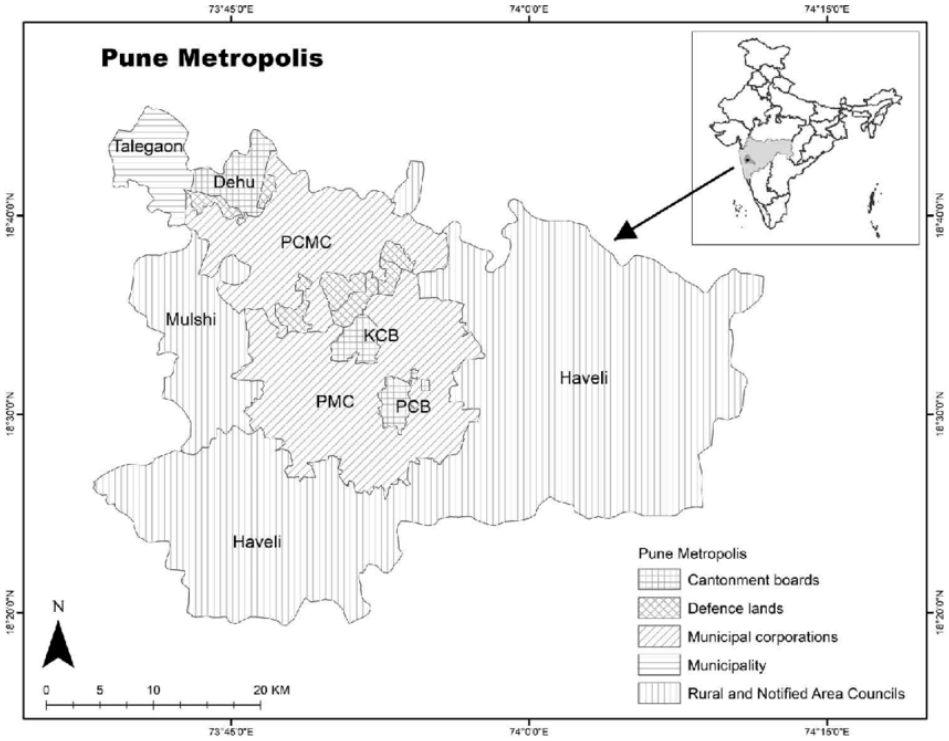
Pune city, known as the 'Oxford of the East', a pensioner's paradise is always looked upon as a younger sibling of the state and financial capital of Mumbai, due to its proximity. Though it has a long history of about a millennia, the most recent history is that of the 17th and 18th Century with the rise of the Maratha Empire. In 1818 it was taken over by the British East India Company till 1947. After independence the mid-sized city mostly consisting of peth areas slowly started turning into a metropolis with the advent of industries in the adjoining areas like Bhosari, Pimpri, Hadapsar, etc. and with the setting up of the MIDC (Maharashtra Industrial Development Corporation) in 1960 more industrial areas were earmarked. The status of Pune was elevated from town to city, when the Municipality was converted into Pune Mahanagar Palika or the Pune Municipal Corporation (PMC) in the year 1950.This period saw a huge influx of people to the city due to opportunities offered by the boom in the manufacturing industry. The influx has been from other areas of Maharashtra as well as from outside the state. The post-independence period has also seen further growth in the higher education sector in the city. This included the establishment of the University of Pune (now, Savitribai Phule Pune University) in 1949, the National Chemical Laboratory in 1950 and the National Defence Academy in 1955.

Current day Pune Urban Agglomeration consists of the PMC, the Pune Cantonment, Pimpri Chinchwad Municipal Corporation, and the Khadki and Dehu cantonment areas. The jurisdiction of Pune Metropolitan Regional Development Authority is not considered for this study as it encompasses land from the entire Pune District. The following table gives the land area and the population data (2011 census).

S. No	Jurisdiction	Area (Sq. Km.)	Population (2011 census)
01	Pune Municipal Corporation	340.45	31,32, 143
02	Pimpri Chinchwad Municipal Corporation	181	17,29,692
03	Pune Cantonment Board	11.90	71,781
04	Khadki Cantonment Board	13.25	78,684
05	Dehu Road Cantonment Board	37.73	48,961
	TOTAL	**584.33**	**50,61,261**

As the census for 2021 is not yet conducted the unofficial figure for population of 2023 is about 69,75,000 (an increase of about 37.81% over 2011 census). This works to a density of about 11936 persons per sq. km. The average as per United Nations standards is 1000 - persons per sq.km. and in Pune Urban Agglomeration the figure is already 1193.6 % exceeding.

Table 1 – Showing the jurisdiction, Area in Sq. Km. & Population (2011 census) (Source Internet).



Pune Urban Agglomeration, PMC: Pune Municipal corporation, PCMC: Pimpri Chinchwad Municipal Corporation, PCB: Pune Cantonment Board, KCB: Kirkee (Khadki) Cantonment Board, Dehu: Dehu Rd Cantonment Board.

Figure 1 – Exhibiting the Pune Metropolis and its statutory bodies. (Source – Internet)

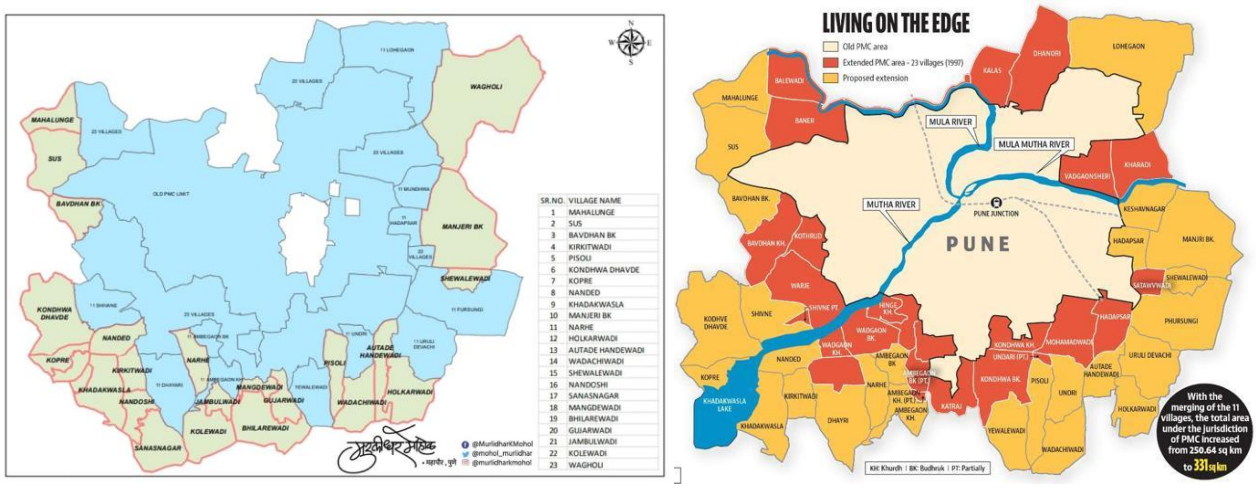


Figure 2 – Pune Municipal Corporation with extended villages' merger @ June 2021 (Source -Mayor's Office & Hindustan Times Newspaper)

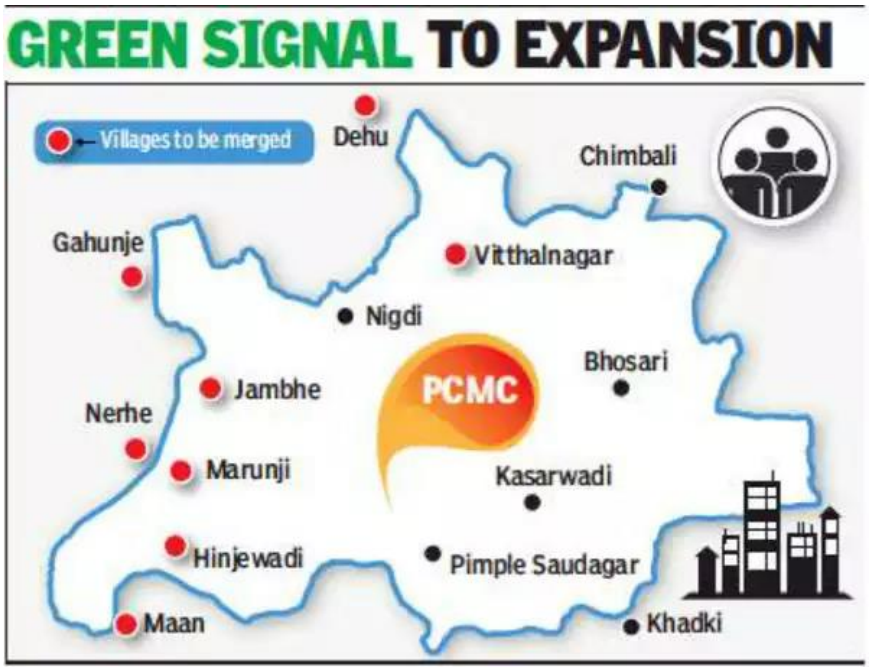


Figure 3 – Villages to be merged with PCMC @ February 2018 (Source -Times of India)

As evident from the Figures 1,2 & 3 the Pune Urban Agglomeration Area is set to increase far more than predicted in the chart above, getting the tag of Megapolis in the near future and also will have to

take into account the Pune Metropolitan Regional Development Authority which encompasses the entire District of Pune sans the Municipal, Cantonment and a few district(as per fig 4) areas.

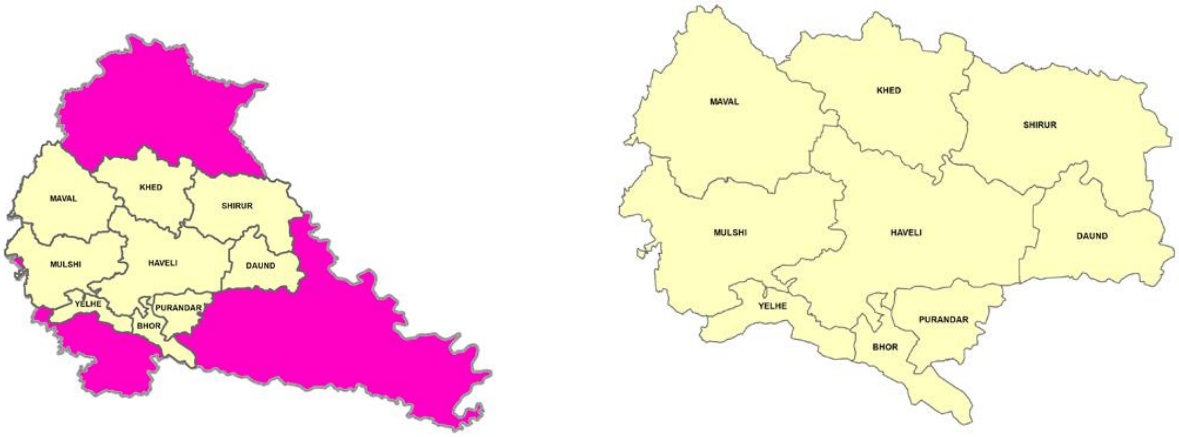


Figure 4 – Jurisdiction of PMRDA within Pune district (Source - PMRDA)

Literature Review

The Sustainable Development Goals were proposed at United Nations Rio Conference in 2012 and were adopted in 2015. They replaced the Millennium Development Goals started in 2000 to tackle the indignity of poverty. All the proposed 17 SDG are interconnected with targets for each (number almost 169) and carry forward the work started by the MDG's.

The SDG 11 focuses on to **Make Cities & Human Settlements inclusive, safe, reliant and sustainable.** It is further described with 10 different targets as mentioned below in Figure 5.

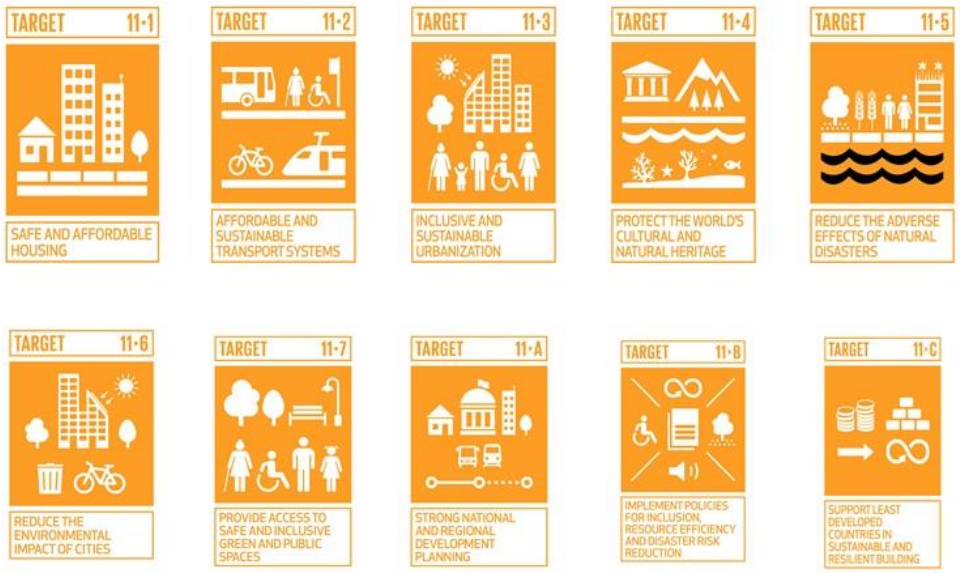


Figure 5 – Key targets for SDG 11 (Source – Dr. Saja Majeed)

The reason for SDG 11 has been the inputs from the Asian Century Institute (A premier institute with a focus on research & analysis, and participation in policy dialogues to foster a better understanding of the opportunities and challenges of the Asian Century). As per ACI, in 1901, only about 10.8% of the Indian population lived in urban areas. By 1991, urbanization had increased to 26%, and by 2011 to 31%.Viewed globally, India's urbanization process will be both rapid and very significant. By 2030, nearly 70 Indian cities will have a population of more than one million, and five cities (Mumbai, Delhi, Kolkata, Chennai, Bangalore and Pune) will have population of more than 10 million. Mumbai and Delhi will become two of the five largest cities of the world. About 600 million people (40-42% of the population) would be living in cities (Urban Areas) in 2030 India, 50% for specific state of Maharashtra.

The dialogues and processes for implementation for the SDG 11 have already began in Pune and various forums and stakeholders are involved. A few important and significant have been studied. Samuchit Enviro Tech and LAYA which are a part of INECC (Indian Network on Ethics & Climate Change) and supported by MISEREOR, a German organization which is fighting poverty, in Asia, Africa & Latin America for the past 50 years, produced a 'Sustainable Smart Pune 2030' in December 2018 focusing on the aspects of SDG 11 and the 7 targets set by it.

In May 2019, the Pune Municipal Corporation under the umbrella of 100 Resilient Cities, sponsored by the Rockefeller Foundation, USA, held a workshop for Sustainable Urbanization Planning in Pune. This Resilience Pune concluded that the following aspects need to be prioritized for SDG 11 for Pune.

1) Digitisation and Localisation of SDG's annual monitoring of the same,
2) A comprehensive approach to mobility for the city,
3) Strengthening the environment resource base of the city,
4) Enhance pathways from skill training to employment,
5) Promoting MSME growth in the city,
6) Accurate and frequently updated city specific data of the city for decision making.

In another paper studied, written by Shrimoyee Bhattacharya, Sonali Patro and Sujaya Rathi, Creating Inclusive Cities: A Review of Indicators for Measuring Sustainability for Urban Infrastructure in India specifically measuring the progress for SDG 11 across the country lists the following priority aspects

1) Transportation,
2) Water supply,
3) Sanitation,
4) Solid waste Management &
5) Housing.

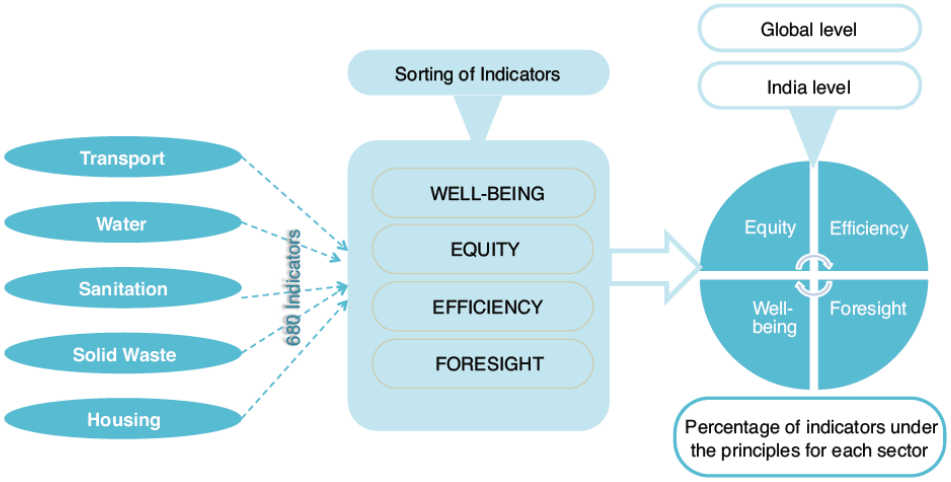


Figure 6 – Methodology for study of various target aspects for SDG 11 (Source - CSTEP)

Methodology

After the Literature Review and a study of SDG 11 with its targets, with specific Pune Urban Agglomeration for consideration the following priority sectors have been identified for research findings and study with specific PMC & PCMC areas in consideration. (Pune Urban Agglomeration)

I) Transport Sector

A) Public Transport (Buses)

In the Pune Urban Agglomeration, as per studies conducted by Parisar, a NGO in 2018, around 11,00,000 to 12,00,000 (11 to 12 lac or 1.1 to 1.2 million) persons travel by public transport (PMPML). The number of buses PMPML has on route is about 1367 of the total 1428. The deficit number is in a state of either breakdown or accident. The Urban Mobility Plan standard is about 55 buses should be allotted for a passenger base of 100,000. The buses in PUA work out to be 28 per 100,000 passengers which is almost half of the standard. Also with informal interviews with the commuters it has been deduced that the buses do not ply on many of the routes forcing passengers to either use their private vehicle or spend an enormous time changing buses and modes of transport. Also about 400 of the 1428 buses (about 28%) the life span is over and need to be either scrapped or replaced. With the population increasing the problem is seemingly becoming acute over the years.

Parisar has studied the figures for 2016, 2017 and 2018 and come out with the following suggestions:

1) Increase the number of buses,
2) Regular maintenance and repairs,
3) Authority to check the reasons for breakdown and work on the same,
4) Attract new commuters and prepare a rationalisation of route framework,
5) Fix goals for short and long term for increasing productivity and quality.

B) Public Transport (Metro)

The Pune Metro is planned for 3 different routes and works are undergoing on all three lines. Partial opening of 2 lines is already done and an average ridership of about 55,000 commuters.

C) Private Transport (Auto rickshaws & Cabs)

There are 88,674 auto rickshaws and 36,946 cabs serving passengers in Pune as per a report from October 2022. Though there are no concrete figures for number of passengers served by the private transport sector, it is estimated to be around 300,000 (0.3 million or 3 lac) per day. As per informal talks it's an expensive mode of transport and used by the affluent class.

D) Private Transport (Self Driven Vehicle – Car & Two Wheeler)

The Environmental Status Report of 2016-17 mentions that the number of private vehicles (car & two wheelers) is almost equal to the population of Pune, may be even slightly greater too. This has resulted due to the following factors:

1) Inefficient Public transport service,
2) High rates of Rickshaws and Cabs,
3) The place of work, study etc. are located far off from the place of residence,
4) Odd working timings.

E) Public Transport (provided by the employer and institution like schools, hospitals etc.)

There are around 10,000 school buses and around 2000 private company buses in Pune area. Around 400,000 (0.4 million or 4 lac) persons travel by this mode of transport daily.

Given the sum of the above anywhere from 25,00,000 to 30,00,000 (2.5 to 3.0 million or 25 to 30 lac) persons are commuting daily for short and long trips for various works or activities in the Pune Urban Agglomeration.

II) Solid Waste Management Sector

The Pune Urban Agglomeration generates a waste of about 3400 tons per day. Of this are Household waste, Bio medical waste, Construction and demolition waste etc. Typically half the waste is dry and the remaining is wet waste. The disposal is managed by the Municipal Authorities and the private players like Swach. There are dump yards in Phursungi (Uruli Devachi), Moshi, Hadapsar, and proposed in Punawale. Recently a Garbage to electricity unit was unveiled in Moshi to convert 700 Tons of Garbage every day.

According to PMC it tries to treat most of its daily collected waste, however as per some reports about 70-80% of the total collected waste is treated and the rest goes untreated. It has mandated that the organic and inorganic waste be separated and source and the organic is converted to manure and used thereof.

III) Housing Sector

In the Housing sector it has to be seen how many people have shelter and what is the proportion of population that resides in unacceptable conditions like the slums without access to proper sanitation and water supply. MaSHAL, a NGO and a group of social architects, and likeminded experts have over the years mapped the areas of slums around the entire PMC area. They were also entrusted in preparation of the ESR (Environmental Status Reports) for PMC 2021-22.

Through their study it has been deduced that there are 390 slums with 140,846 tenaments and about 740,180 people living within them. These constitute about 27% of the entire population of the PMC.

Within the PCMC area the identified slums number 147, 810 people living in various slums, as per ESR dated 2022-23 of the total 30,00,000 population. This amounts to about 4.92 % of the total population and may be even slightly higher.

IV) Water Supply Sector

The PMC has about 3 different regions which supply water to its residents, viz Swargate, SNDT and Lashkar (Camp). The water supply to the city is drawn from the 4 dams – Khadakwasla, Panshet, Temghar and Warasgaon. The live storage of all these 4 dams is collectively 30 TMC. Water supply requirement for PMC area is about 14.5 TMC or 1250 MLD. 70% of this is supplied by closed pipes and the rest 30% is through open canals. As per data from PMC the supply is about 228 lpcd as against the norms of 135 lpcd. The loses are to the tune of 30% which the authorities are trying to get them below 15%, so also the water from the canals are being tendered to be through closed pipes to reduce evaporation loses. Equatibile supply to all and 24/7 water supply is being aimed at, however in the core area of the city old pipes and hydraulics present a pressure issue and scarcity of water to some people.

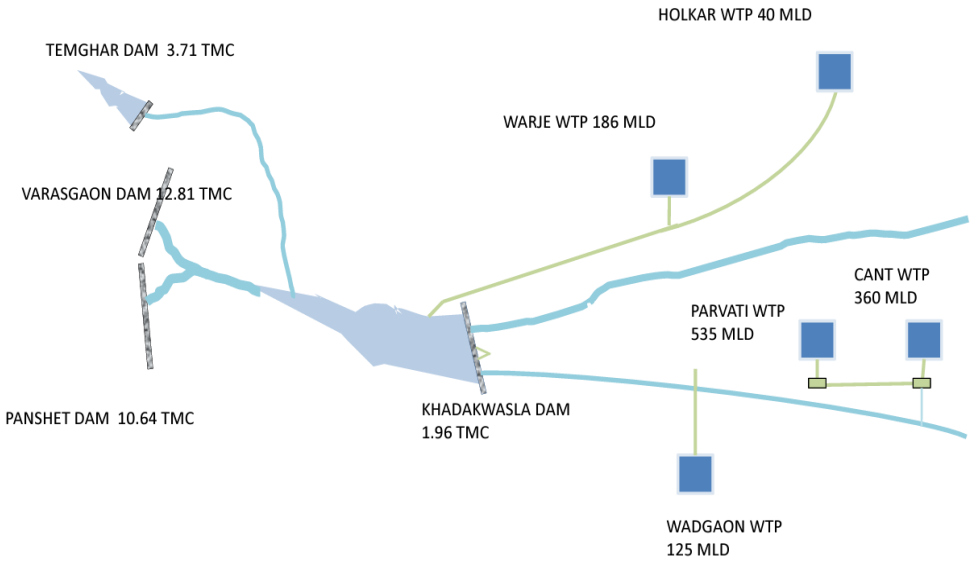


Figure 7 – Schematic showing water supply to PMC areas. (Source – PMC website)

The PCMC area requirements for water supply is about 546 MLD as per 2021-22 and the main source of water is Pawana Dam which is located about 40 kms in Maval Taluka. The per capita water supply is about 165 lpcd, however some areas there are specific timings for the water supply. The report of PCMC mentions that about 90% water is supplied whilst 10% is ground water used by the people. The authorities are trying to minimise the losses and optimise the hydraulics along with MDPE pipes at house hold levels to avoid leakages and wastage of water and provide 24/7 water supply.

V) Sanitation & Sewage Treatment Sector

In the PMC area the total Sewage generated is about 477 MLD every day which is treated at the various STPs built by the authorities. Another 396 MLD and 115 MLD capacity STP's for the merged village (21 & 11 villages respectively) are being constructed with funds from the Central Government. As of today about 33% of the sewage goes untreated and mixes with the river and ground water. This has an adverse effect on the ground water and the inhabitants.

The PCMC area generates 353 MLD of which 265 MLD is treated and the rest 88 MLD (25%) goes untreated into the Pawana and the Indrayani rivers. This has arisen due to the fact that the merged villages capacity STP's have been constructed but the lines connecting them are still under progress.

Summary of Assessment

At an aggregated level, it can be seen from the analysis that all the hard infrastructure sectors, that is, water, sanitation, solid waste and transport , behave in a similar way. In all the four sectors, efficiency emerges as the major theme. The major drawbacks in these sectors are equity and foresight. In the case of these four sectors, similar patterns are observed at both the global, India and city levels. However, the housing sector behaves in a very different way. At India level, the indicators have more emphasis on the overall well-being of the sector. Housing mainly lacks in the foresight aspect. Foresight, which includes emerging threats like climate change, emerges as the most deficient theme across all sectors. City Development Plans (CDPs) need to address the existing situation in a city against a set of indicators across a wide range of sectors within the sustainability framework. While being cognizant of potential opportunities, constraints and priorities, the cities' future goals should be set on the basis of these sustainability frameworks. This process will enable a holistic method for the determination of infrastructure projects and also for identification of potential areas for dovetailing different projects to have a larger impact on addressing the needs of a city and its citizens.

Conclusion

It is quite clear from the literature study and the assessment of the sectors that challenges faced by the city to achieve the SDG 11 goals and target are enormous. To make things happen or to boost the facility and infrastructure the monetary aspect plays an important role.

The conclusion of the SDG 11 compliance can be divided into 2 broad aspects

A) Administrative Aspect
   1) The 74th Constitutional Amendment and the recent changes to the Local Body Tax and Octroi into Goods & Services Tax collected has resulted in the Statutory bodies to be dependent on Central and State funding for projects. Hence the delay is seen in projects

like buying needed buses or transport infrastructure, the laying of pipes and Sewage Treatment Plants, allocation of land by buying them for garbage disposal or be it creating more road facilities with infrastructure.

2) Study of various statutory bodies suggest that apart from property tax, and issue of building permits majority of other services are not monetarily feasible. The Chennai Municipal Corporation has the mandate to collect the Professional Tax instead of the state government which is a major chunk of about 28% of the total collection. Such an initiative by the Pune Urban Agglomeration from the state can boost the monetary health of the statutory bodies.
3) Use of ICT and technologies like GIS and IOT to boost tax collection, taxation based on real time market values incremental at a specific interval can also help.
4) The Statutory body needs to function like a company rather than being a lethargic institution. They need to be able to attract funds and money in form of bonds and loans from banking institution by projecting a healthy financial future and stability.
5) The political elite are seen to be keen on adding to the already burgeoning area of the Urban Agglomeration for obvious political reasons. It would be wise to have smaller Municipal Corporations which are manageable, rather than a huge one.

B) Technical Aspect

1) The statutory body undertakes preparation of Development Plans every 20 years with the help of state authorities. This exercise needs to more detailed and in line with the SDGs to achieve the desired effects. Even now the modifications can be done to a logical conclusion. For eg. The DP's are just a description of the land type and the various uses it may be put to. Technology like GIS and GPS may be used to make the end product out of the land more in tune with the SDGs. More layers can be added and authoritatively they can be used to make the areas SDG compliant.
2) The processes as observed of many aspects like the transport or the waste management needs to be have a clear foresight with set goals to curb the leakages and wastages to make them more efficient. Eg. The STP's are designed for a certain capacity but they function at almost 2/3 of that capacity. These areas should be focused on for efficiency. The buses and the route planning need to be people centric. The connect with the masses seems to be missing and the end user group needs to be taken into decision making.
3) Awareness about the SDGs is not very high amongst the masses and is only limited to the elite and educated part of the populace. The common man should be made aware of these goals as it is high time from 2015 to 2023 and only 7 years are left to achieve these goals and action against climate change.
4) The surveys and studies by various institutes w.r.t. SDG11 are not widespread and are only sporadic. The educational institutes are barely aware of the SDGs. Given these conditions the educational institutes, the IT masses should be roped in to make the masses aware of the SDGs and more specific about the Pune Urban Agglomeration turning it into an event and a movement.

With these few considerations the currently seen compliance of the SDG 11 and its targets for Pune Urban Agglomeration **may** see a positive light of the day.

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