An Analysis of water Management and Consumption in Residential, Industrial and Commercial area of Katraj Sukhsagar Nagar, Pune, Maharashtra

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ABSTRACT

Water is one of the most precious natural resources and key elements in the Socio-economic development of a country. A person can live without food for days but cannot survive without water. Water is the basic and fundamental needs of any living being, but sadly this basic need is very soon nearing its end. Water is used for drinking, bathing, and cooking, washing, irrigation and in the industry etc. About 70% earth surface is covered with water but only little fraction of total water available on the earth, which is useful for human consumption it means only 3% water is available to us as fresh water out of this 2.99% is locked up in the mountain or glacier. Only 0.10% fresh water is easily available to us in the form of groundwater. Hence whatever water is available on the earth surface that water we have to conserve otherwise in future we will face water crises.

Similarly in this paper had tried to explain how water Management has been co-relates between residential, industrial and commercial point of view. For the present study Katraj Sukhsagar Nagar area has been identified, because in the year 1997, 37 villages have been attached into Pune Municipal Corporation due to this population of Katraj had increased and it's affected on distribution of water. Hence we should take care of using water to its proper utility and also take care of rain water harvesting method to overcome the scarcity of fresh water in all the sectors like domestic industrial and agriculture.

1. INTRODUCTION

Water is one of the most essential elements for every living being, it is the main source of every activity. This element is decreasing day by day so we should save water. In this study had tried that why the people are giving preference to stay in the Pune city, though they are facing water shortage problems. By studying the various aspects of water supply like how much water is consumed by per person, in the industry and in the commercial sector, how much water is utilized for daily household activities.

The water consumption in Pune city is vary in every ward due to various factors such as water supplied by different water pressure, different per head water consumption, continuity of water supply, excess use of water, water wastage and water management by different methods etc. among these all factors mainly highlight on water consumption by each activity and had tried to explain how water Management has been co-relates between residential, industrial and commercial point of view.

2. Study Area

Katraj Sukhsagar Nagar is located at distance of 12 km from GPO, Pune. It lies between 18° 27' North latitude and 74° 52'East longitude, it has covered an area 2133 hectors and population of this area is according to census 2011 is 31390.

Objectives:

The main objective of the present research paper is to study water Management and Consumption in residential, industrial and commercial area.

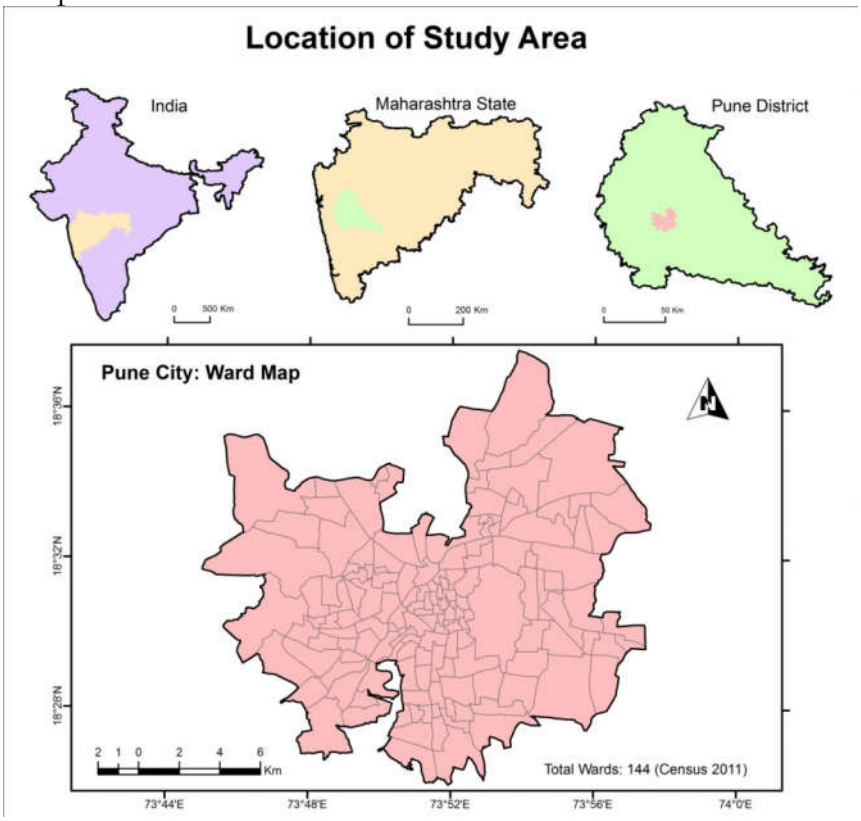
3. Data Base and Methodology

Present study is based on primary and secondary data. Primary data have been collected through questionnaire and field work. For sample survey ten percent persons are interviewed from apartments, societies, bungalows, industries and commercial sectors. Here an attempt is made to measure the water consumption by per person and per industry through survey, and also find out the total consumption. Secondary data have been collected from Pune Municipal Corporation, Daily News paper, Magazines and socio-economic abstract and census hand book etc.

To represent this data suitable statistical methods and cartographic techniques has used.

Importance of Katraj: Katraj is sub-urban area of Pune, it is famous for Katraj Lake this lake is manmade lake, built at the time of Peshawa in the year 1749 to fulfill the demand of water of the society. In 19th century the Katraj lake water used to supply, through an underground canal to the old city of Pune. Several fountains, tanks, wells and pipelines were constructed to supply of water from Katraj Lake to local residents for domestic use and drinking purpose. In 1879, the Pune Municipal Corporation have to look over the city's water supply system and from began a gradual decline the use of Katraj lake, today this water only using for boating and watering the plants because waste water, sewage, silt ect are entering to the lake from their external source. Hence all population of Katraj area is depends on

corporation water supply. If we clean the Katraj Lake and start use of this water burden on corporation will decrease.



Analysis of data: Katraj area gets water from Parvati Water Treatment Plant; installed capacity of this plant is 537 MLD. (Million Liter per Day) and discharge per day from Parwati water treatment plant is 259.14 MLD, and population of Katraj area is 31390. According to urban development plan per person water requirement is 210 LPCD (liter per capita per day) but in katraj area it is different it can see in the following explanation.

Major Findings:

The majority of people are depends on the municipal water supply for their daily needs. This water supply for Pune city received from rivers, dams, lakes and ground water. Basically pune city received water supply from four dams that is 29.26 TMC among these, 16 TMC used for drinking purpose bifurcation of this 2 TMC for industry 2TMC for commercial and 12 TMC for household purpose and 14 TMC for agriculture purpose.

Table No. 1Existing water storage capacity of dams

Dams	Storage capacity in TMC
Khadakwasala	1.97
Panshet	10.65

Warasgaon	12.82
Temghar	3.77

(Source: Pune City Sanitation Plan 2012)

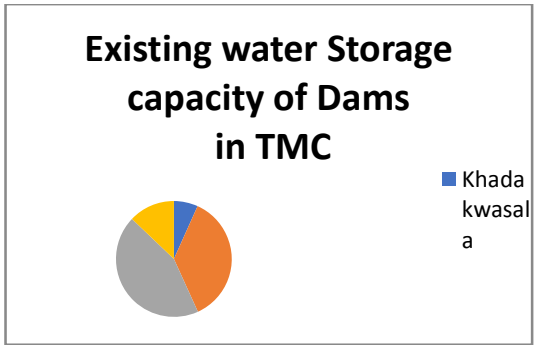


Fig No. 1

The following Table no. 2 shows that some people used water from multiple sources, the present study shows that about 93.5 percent of the households in Katraj use tap water.. It is noted that 38.3 percent depend upon bore wells, 18.5 percent people get water through public tap, 1.9 percent people get water from wells and 7.1 percent people' depend upon the tankers provided by municipal corporation.

Table No. 2 Distribution of water sources

Sr. No.	Water resources	In percentage
1	Tap water	93.5
2	Bore wells	38.3
3	Public tap	18.5
4	Water tanker	7.1
5	Well	1.9

(Source: Compiled by the author)

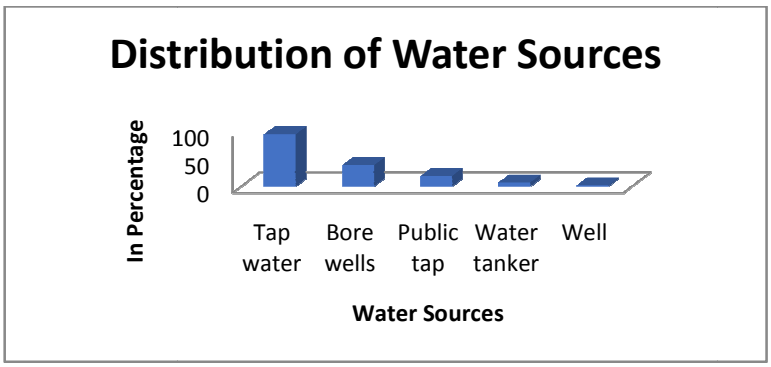


Fig. No.2

The second largest source of water for a majority of people and industrialist in Pune city is groundwater (Bore wells) because of the rapid growth of population of the cities is making people more dependent on ground water to fulfill their needs.

Per Capita Water Consumptions:

In this study has try to measure the water consumption by per person through house hold survey in residential, commercial and industrial area. It is observed that in residential and commercial areas having more water consumptions compare to industrial area. Following table shows water consumption at different areas.

Table No.3 Water Consumptions

Area	Percentage
Residential	93
Commercial	6
Industrial	1

(Source: Compiled by the author)

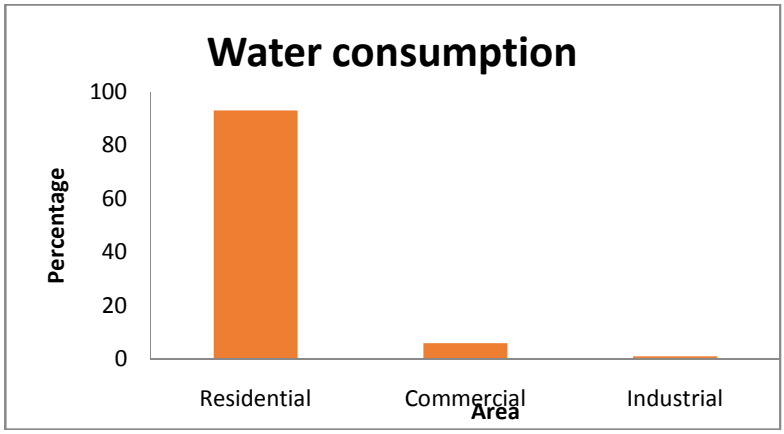


Fig. No.3

Activity-wise water consumption in Residential Area:

How much water is used by each member of family, for this data is collected through discussion with the family members. Most of the members are used running tap water for daily activities like washing, bathing, cleaning vessels, personal hygiene etc. and for watering the plants they are using buckets. So how much water are being used for daily activities has tried to calculate the duration of tap remained open and the quantity of water is used from tap. Actually it is very difficult task to calculate exact amount of water used for domestic purpose.

Table No. 4 Activity-wise water consumption in Residential Area

Types	No. of Respondents	Use of water personal hygie	Use of water for cooking &	Use of water for Toil	Use of water for gardening	Use of water for cleaning	Use of water for	Total

		ne	Drinking	et			other use	
Apartments	**200**	**40**	**12**	**20**	**03**	**50**	**15**	**140**
Bungalows	**40**	**50**	**15**	**40**	**05**	**60**	**25**	**195**
Flats	**100**	**45**	**15**	**40**	**03**	**40**	**20**	**163**
Societies	**60**	**45**	**15**	**36**	**05**	**40**	**20**	**161**

(Source: Compiled by the author)

If we observed that among the Apartments, Bungalows, Flats and Societies bungalows consumed more water daily that is 195 liter per person per day and the people of Apartments consumed less water daily that is 140 liters.

It is observed that maximum water utilization is for cleaning purpose (Cleaning Utensils, clothes and floor). The people consume more than 30% water at household level, for personal hygiene use of water is twenty five percent.

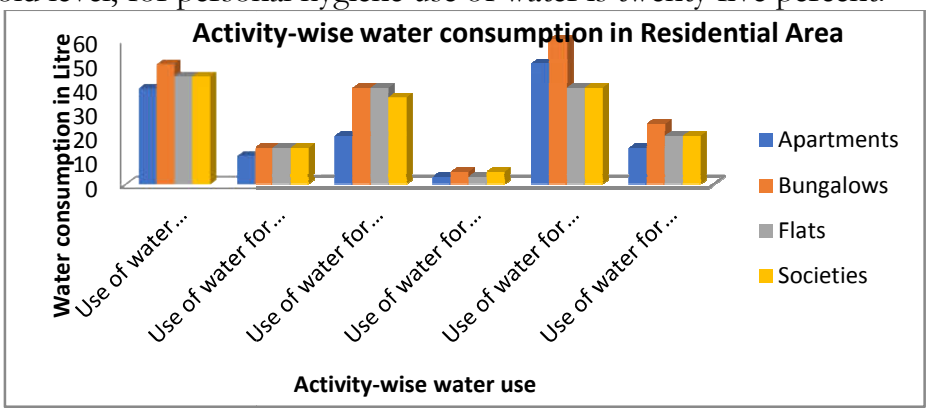


Fig. No. 4

Water Consumption in Industrial Area: In the study area there are 47 different industries are located, these all are small scale industries.

Table No.5 Name of the Industries

Sr. No.	Name of Industry	Total No. of industry
1	Mechanical works	02
2	Steel Buckets	08
3	Steel Drums	12
4	Steel Pots (Handa)	09
5	Steel Cupboard	10
6	Chakali Maker	01

(Source: Compiled by the author)

In these all industries water requirement is different it is as below it shows in following table No. 6. There is no need of water in Mechanical works industry and chakali maker industry because whatever raw materials they have they are melting

that and using to make finish production. To make steel cupboard they required 150 liter water per day for denting, coloring, cooling and painting. In all industries they need water for labor for drinking and cleaning.

Table No. 6 Water Consumption per day per labor and per Industry

Sr. No.	Name of Industry	Use of water for industry	Use of water for cleaning(labour) In litre	Use of water for drinking (labour)
1	Mechanical works	----------	80	20
2	Steel Buckets	100	100	20
3	Steel Drums	100	125	20
4	Steel Pots (Handa)	80	120	15
5	Steel Cupboard	150	180	20
6	Sorya	----------	40	10

(Source: Compiled by the author)

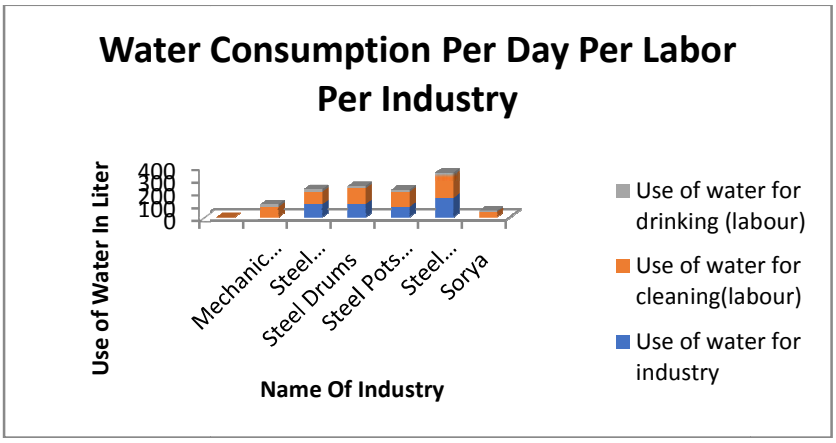


Fig. No. 5

Commercial Area: For the data collection these shops has been selected i.e. 5 Beauty Parlor, 10 Snack centers,4 Medicals, 5 Vegetables stall, 3 Cloths Store and 3 General Stores has selected. Requirement of these people is less it is recoded in table no 7.

Table No. 7 Water Consumption per day per Shop in Liter

Sr. No.	Name of Shops	Use of water for shops	Use of water for cleaning & washing in litre	Use of water for drinking

1	Beauty Parlor	800	200	50
2	Snack Centres	500	300	100
3	Medicals	50	10	20
4	Vegetable Stall	200	150	15
5	Cloths Store	80	50	20
6	General Store	50	20	10

(Source: Compiled by the author)

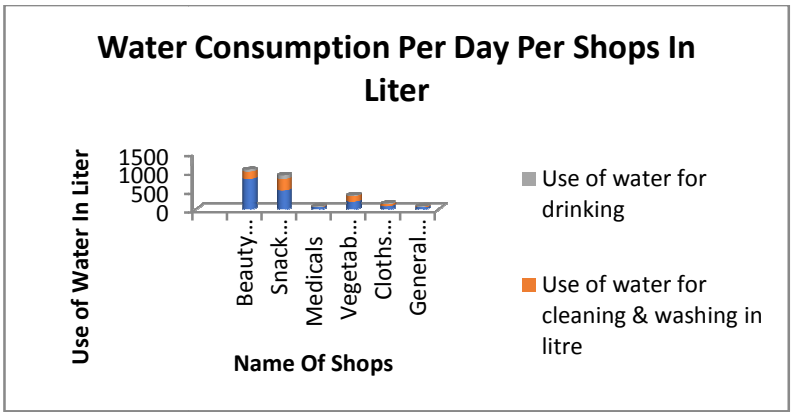


Fig. No. 6

Water Management: Water management is the activity of planning and managing the optimum use of water. Through Water management can reduce the scarcity of water. It aims at improving the efficiency of the use of water, and reduces losses and wastage. Water management refers to save water and use that for essential need and recycling of waste water for different purposes such as cleaning, manufacturing, and agricultural irrigation. It necessitates a step towards in order to secure it for future use. As per the discussion with the people, water management is essential, 73.5 percent residents state that it is very important. It is also discovered that two percent state that water management we don't know, twenty percent people revealed that water management is important because to reduce scarcity of water.

Table No. 8 : Views of people towards Importance of water Management

Importance of water Management	**No of respondents**	**In percentage**
Very important	294	73.5
Don't know	08	2.00
Less important	06	1.00
Moderate	12	3.00
Important	80	20.00
Total	**400**	**99.5**

(Source: Compiled by the Author)

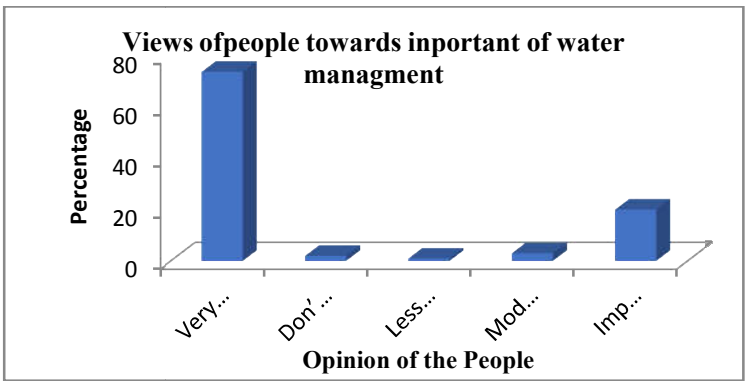


Fig. No. 7

Conclusion

In the present study, a comparison has been made in water consumption of Residential, Industrial and Commercial area, it revealed that in residential area requirement of water consumption is more than commercial and industrial area because they need water for cleaning, bathing, cooking, washing clothes etc. If corporation of Pune focused on katraj Lake water, burden will decreased on corporation, it is possible to get maximum utilization of Katraj Lakes as natural water supply source for nearby area so over burden from parawati water treatment plant will be minimum up to some extends.

Observations

1. Most of the residential and industries are depends on corporation water.
2. Each shops, house and industry having storage tank 500 and 1000 liters capacity.
3. They are not aware about water management
4. They don't have waste water re-use techniques and ideas.
5. Local people got the job in the industries as a labor no need of education.

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