Potential of Water Conservation by Efficient Use of Water

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Abstract- Water is necessary requirement for the all living beings. It is even impossible to imagine existence of living being without water. So water is one of the most valuable resources of the nature. But on the earth at major locations this resource is easily and cheaply available. So compare to other resources we are using water resource very carelessly. At present condition water is sufficiently available to satisfy the consumption of water. But with respect to time the population of humans is going to be increase and per capita requirement is also being increase but the source of potable water is being decrease. This situation will cause the scarcity of water. Many defence experts believe that the reason behind third world war will be water. This shows the level of scarcity of water in future. To avoid this level of scarcity it is necessary to decrease consumption of the water. We cannot reduce the genuine consumption of water. But there is large quantity of water which we are consuming unnecessarily. This unnecessary consumption of water can be eliminate and large quantity of can be saved in future. So it is necessary to identify this unnecessary consumption of water. The major quantity of water is unnecessarily utilized in urban areas. And to identify this unnecessary consumption in urban areas the total consumption of urban area is divided into three sectors which are 1) domestic sector 2) industrial sector and 3) commercial sector. So in this research unnecessary consumption of water in all three sectors is identified in Ahmedabad city. And total quantity of water wasted by this unnecessary consumption is calculated.

Introduction

Water is necessary requirement for human life. The total volume of water estimated on earth is 1.386 billion Km³ out of which.

- 97% is ocean water
- 2% is in glaciers
- 0.75% is as ground water
- 0.25 % water is in rivers, lake, streams etc.

So there is only 1.0% water of the total earth’s water which can be utilized by the humans, animals, birds, and ecosystem on the land.

In present condition sufficient water is available. But with development in human life style demand of the water is also increasing. So as the time will passes the per capita demand of the human will also increase and population of human will also increase. So in future there is possibility of arising shortage of water.

According to many defense specialists the third world war will be for the water which shows the importance of water in future.

So, it is necessary to conserve the water for future. In this project my focus is on the unnecessary water demand by the human. By knowing this we can reduce the water demand which will help to conserve the water for future.

Basically the water demand of the humans can be divided into the three sectors:-

1) Domestic water demand
2) Industrial water demand
3) Commercial & institutional water demand

In all three sectors we utilize the water approximately 30% more than the requirement. Because of following reasons:

- We do not consider importance and scarcity of water. Because it is easily available natural resource and water is available at very low cost.

So, it is necessary to identify this unnecessary utilization of water and eliminate it to conserve the water.
Potential of water conservation by efficient use of water.

To determine that how many percentage of population is selecting wasteful option for water consumption the household interview was carried out. The survey is carried out at the Ahmedabad city. Ahmedabad is a Mega city of Gujarat. It has large demographic dividend. So large verity of data can be get from this city For the survey 86 middle class and upper middle class houses was selected. The reason behind selecting the middle class and upper middle class group is because major population within full flushing system lies within this group.

Graphical representation of report:-

1) For drinking purpose:-

![Fig.1 Graphical representation of treatment pattern](image1)

2) For washing clothes:-

![Fig.2 Graphical representation of washing clothes](image2)

3) use of flush in W/C system:-

4) Bathing system:-

![Fig.4 Graphical representation of bathing pattern](image4)

5) Utilization for aesthetics:-

![Fig.5 Graphical representation of aesthetic utilization](image5)

6) Sewage disposal system:-
Quantity of waste water produced in Ahmedabad by R.O treatment in daily basis

Per capita required quantity of drinking water is = 5 lit.
Per capita water wasted in R.O Treatment is = 5 lit.

Total quantity of water wasted in Ahmedabad by R.O treatment \( (A) = \text{No. of population in Ahmedabad using R.O to treat water which is } = 3765109 \times 5 \)

\[ = 18825545 \text{ lit.} \]

Quantity of waste water produced by using washing machine in compare to manual washing

Washing machine uses 95 lit to 215 lit of water. On an average it uses 155 lit of the water during each wash. And in each wash it washes average 15 clothes. Means for one cloth it uses 10lit water.

Where by manual one cloth can be washed approximately by 6 lit water. So manually per cloth approximately 4 lit water can be saved. And daily per head there are four cloth required to be washed. So per capita approximately washing machine waste 16 lit more water than manual wash.

So total additional wastage of water by using washing machine in Ahmedabad:

Addition water wastage \( (A) = \text{No. of population using washing machine } \times \text{per capita additional wastage} \)

1) No. of population using washing machine:

\[ \text{Population above the poverty line } = 5020146 \]

40% of this population uses washing machine which is = 2008058

\[ \text{No of population using washing machine } = 2008058 \times 16 \]

\[ = 32128928 \text{ lit} \]

Quantity of waste water produced by using flushing system in W/C in compare to using tap

During each flush the amount of water discharged is about 4.5 lit. And each day the toilet is flushed approximately four times by one person. So per capita water discharged by flushing is 18 lit.

Whereas in absence of flushing system the water discharged per capita is 12 to 15 lit. On an average discharge is 13.5 lit per day.

So in flushing system per capita discharge is 4.5 lit more than normal tap fixtures.

Total additional discharge in Ahmedabad \( (A) = \text{No. of population using flushing system } \times \text{per capita additional discharge} \)

1) No. of population using flushing system:

92% of this population uses flushing system which is = 4518131

\[ \text{No of population using flushing system } = 4518131 \times 4.5 \]

\[ = 20331589 \text{ lit} \]

Quantity of waste water produced by using showers for bathing in compare to using tap
A standard showerhead discharges about 15 to 25 lit of water per minute. On an average 20 lit. A typical tap discharges 15 to 18 lit of water on an average 17 lit. So the discharge of shower is 3 lit more than tap per minute. And during the bathing process the individual runs the shower or tap approximately 3 mins. So per capita discharge of water by shower is 9 lit more than the tap each day.

Total additional discharge \((A) = \text{NO of population using showers (B)} \times \text{per capita additional discharge (C)}\).

1) No of population using shower:-
Population above the poverty line = 5020146
31% of this population uses the shower for bathing system which is = 1556245
2) Per capita additional discharge = 9 lit
\((A) = 1556245 \times 9\) = 14006205 lit

Quantity of water wasted in watering the lawns each day

Every 10 ft X 10ft lawn area requires 230 lit of water each day. And from the household survey of the Ahmedabad it is concluded that approximately 15060 houses has the lawn in their houses. So total quantity water used each day for watering lawn in Ahmedabad is 3463800 lit. So from above calculation it is evaluated that by using the water efficiently in domestic sector the total quantity of water that can be saved is 8,87,56,067 lit each day.

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