RESEARCH ARTICLE

WATER AUDIT IS A SUSTAINABLE TOOL TO SAVE AND CONSERVE WATER

J. N. Thakare*[1], Jagdish Thakur[2] and Lahu B. Pawar

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Author affiliation:
[1]Department of Science, K.B.P. Vidyalaya, Askheda, Tal. Baglan, Dist. Nashik
[2]State Project Coordinator, Environment Service Scheme (ESS), Maharashtra State
[3]Art, Commerce And Science Senior College, Pimpalner (Dhule)
***E-mail:** jaywantthakare7@gmail.com*

ABSTRACT:

Water audit is an effective management tool for minimizing losses, optimizing various uses and thus enabling considerable conservation of water not in domestic sector alone but in other sectors of water use such as, power and industrial as well. A water audit determines the amount of water lost from a water supply system and the cost of this loss to the utility. It will quantify Unaccounted for Water (UFW) and Non- Revenue Water (NRW). Water audits balance the amount produced with the amount billed and account for the remaining water (loss). Comprehensive audits can give the utility a detailed profile of the water supply system and water users, allowing easier management of resources and improved reliability. It is an important step towards water conservation and, if linked with a leak detection plan, can save the utility a significant amount of money and time.

KEYWORDS: *Water Audit, Unaccounted for Water (UFW); Conserve Water*

INTRODUCTION:

Growing population and rising standard of living of people, the demand of water for domestic use has increased in bathroom, toilet, kitchen etc. This should need to measure balance of input water to output water. This water proportion is low at the end of water distribution networks because of the leakages, overflow, and loss through valve. So, it is need to water audit of this entire water distribution system. This should save the money to unaccounted water flow and this conserve water used into lesser extent period. The study indicates that the unaccounted-for water and leaks are responsible for the wastage of water. Preventive measures

should be taken for reducing the total water flow. The distribution system should be checked for integrity and leaks from time to time to maintain efficiency of the system and to reduce water losses. Therefore, water audit is an effective management tool for minimizing losses, optimizing various uses and thus enabling considerable conservation of water Even if the taps in the kitchen, toilet and bathroom are leaking even minutely, we ignore it, but because of every single drop, we waste lakhs of liters of water in a year, resulting in water wastage and also cause huge financial loss in the society. It felt necessary to conduct a water audit to convince the importance of water

OBJECTIVES

1. To conserve the water
2. To manage the waste water
3. To ensure sustainable use of water resources 4) To find out loss of water due to leaks

METHODOLOGY

Before the water audit, initially 12 groups of five students each were formed in the school and they were trained on how to conduct a water audit In the training, they were asked to go to every house and check the taps in the bathroom, washroom, kitchen and water tank Measuring water for one minute by putting on a watch. The group was asked to estimate the amount of water wasted for one month and finally one year using the formula from the statistical information received. After that each group was given 20 forms and a measuring cylinder to survey 200 houses in the village. On the same day, two plumbers were sent with branded taps along with the students. After covering 200 houses in the village, almost 80 taps were found to be leaking. Immediately the plumber installed a new branded taps and stopped the leaking water

AT VILLAGE LEVEL (PRE SURVEY)

1. In month of October 2024 Secondary students were to do work in their Village
2. They have been done small experiment about 200 families
3. They measured the No of Taps.
4. They put up the measuring cylinder under the Leakage Tap
5. After one minute student measured leakage water with the help of measuring cylinder
6. Students took reading of leakage of water.
7. They calculate average of leakage water in 24 hrs. and then calculated monthly last yearly leakage of water.

Formula for leakage of water in lit. per year

- Leakage of water in one minute X 60 = leakage of water per hour
- Leakage of water per hour X 24 hours = leakage of water per day Leakage of water per day X 365 = leakage of water per year (in litre)
- Financial Loss = Leakage of water in lit. Per year X 20 Rs.

No. of Families	Leakage water(ml) per minute	Leakage(ml) per hours	Leakage per day (lit)	Leakage per year (lit)	Economy loss in Rs.
1	3	180	4.32	1576.8	31536
2	1	60	1.44	525.6	10512
3	3	180	4.32	1576.8	31516
4	2	120	2.88	1051.2	21024
5	1	60	1.44	525.6	10512
6	6	360	8.64	3153.6	63072
7	1	60	1.44	525.6	10512
8	2	120	2.88	1051.2	21024
9	1	60	1.44	525.6	10512
10	1	60	1.44	525.6	10512
11	1	60	1.44	525.6	10512
12	1	60	1.44	525.6	10512
13	3	180	4.32	1576.8	31536
14	2	120	2.88	1051.2	21024
15	9	540	12.96	4730.4	94608
16	1	60	1.44	525.6	10512
17	1	60	1.44	525.6	10512
18	10	600	18	6570	131400

19	10	600	1.44	5184	103680
20	1	60	1.44	525.6	10512
21	1	60	1.44	525.6	10512
22	1	60	1.44	525.6	10512
23	1	60	1.44	525.6	10512
24	1	60	1.44	525.6	10512
25	1	60	1.44	525.6	10512
26	3	180	4.32	1576.8	31536
27	3	180	4.32	1576.8	31536
28	11	660	15.84	5781.6	115632
29	4	240	5.76	2102.4	42.48
30	11	660	15.84	5781.6	115632
31	1	60	1.44	252.6	10512
32	18	1080	25.92	9460.8	189216
33	2	120	2.88	1051.1	21024
34	20	1200	28.8	10512	210240
35	5	300	7.2	2628	52560
36	4	240	5.76	2102.4	42048
37	22	1320	31.68	11563.2	231264
38	5	300	7.2	2628	52560
39	2	120	2.88	1051.2	21024
40	2	120	2.88	1051.2	21024
41	10	600	14.4	5256	105120
42	5	300	7.2	2628	52560
43	12	720	17.28	6307.2	126144
44	6.5	390	9.36	3416.4	68328
45	5	300	7.2	2628	52560
46	15	900	21.6	7884	157680
47	1	60	1.44	525.6	10512
48	9	540	12.96	4830.4	94588
49	11.36	682	16.55	6044.32	120884
50	19	1140	27.36	9986.4	199728
51	2	120	2.88	1051.2	21024
52	7	420	10.08	3679.2	53611.2
53	10	600	31.68	11563.2	231264

54	4	240	576	2102.4	42048
55	3	180	4.32	1576.8	31536
56	3	180	4.32	1576.8	31536
57	5	300	7.2	2628	52560
58	16	960	23.04	8409.6	168192
59	38	2280	57.6	21024	420480
60	36	2160	51.84	18921.6	378432
61	3	180	4.32	1576.8	31536
62	4.5	270	6.48	2365.2	47304
63	8	480	11.52	4204.8	84096
64	14	840	20.16	7358.4	147168
65	2	120	2.88	1051.2	21024
66	15	900	21.6	7884	157680
67	14.7	882	21.17	7727.05	154541
68	5	300	7.2	2628	52560
69	6	360	8.64	3153.6	63072
70	2.25	135	3.24	1182.6	23652
71	11	660	15.84	5781.6	115632
72	5	300	7.2	2628	52560
TOTAL	**486.31**	**29179**	**1281.52**	**264106**	**5223563**

Average leakage water/hr = 3.78 lit Leakage water/day = 1281.5 lit.

Leakage water/year = 2,64,106 lit

Economy loss in Rs /year = 52,23,562 Rs.

AT VILLAGE LEVEL (POST SURVEY)

After a pre-survey of 200 households, it was found that around 75 households had leakages in taps. As per collecting the information in statistical form, it was found that 2,64,000 liters (two lakh sixty-four thousand lit.) of water were wasted for one year.

Along with the wastage of water, there would also be a loss of approximately Rs.52,23,562 (Fifty two lakh twenty three thousand five hundred sixty two Rs.) annually then we decided to install a new branded taps later as planned New branded taps were installed with the help of plumbers and the next day when we went to the same houses, the leakage was completely stopped and millions of liters of water were saved resulting in savings of lakhs of rupees.

RESULT:

1. People became alert and aware about loss of water
2. Students, youth, people participate themselves in this project
3. Millions of liters of water were saved resulting in savings of lakhs of rupees.
4. People realized that the water was wasted drop by drop, causing a huge loss of water every year

CONCLUSION:

1. Millions of liters of water were saved resulting in savings of lakhs of rupees.
2. It helps to save and conserved water
3. People started realizing the importance of water

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We have been selected the topic after full consideration and pondering over the same and realizing its need in the present day. This has been selected with a view that it might be of same use to my other fellow friends who are working in this field. This project has been completed with help of Environment Service Scheme (ESS) students by environment and climate change department Government of Maharashtra, Youth, villagers and household women. We are also thankful to Hon. Management of Rayat Shikshan Sanstha, Satara for providing the necessary facilities

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