3.3 Water audit:

Water is our most precious resource. Without it no plant or animal can survive. India is predicted to become drier, because of rising population and urban demand so the need to save water and ensure sustainability will grow. We all have a role to play by reducing our usage of water. We can secure our water supply for generations to come. We have to find new ways of source and preserve our precious water and we need educational institute to help by saving as much water as they can. This will save the money and reduce the impact on the environment.

Now-a-day colleges have become more aware regarding usage of water .The water audit of educational institute provide a fun and educational way to investigate ways that water is used every day, determine which areas of the campus may be causing problems and to spread the message of water conservation. These investigations will help to minimize water loss by detecting leakages and faulty fixtures so they can be repaired as soon as possible. This guideline will help to understand where and how more water is being used in our institute. It is divided into three parts; Part 1: Assessment of Water requirement in institute campus, Part 2 :Water storages in campus and Part 3 : collect information about water losses in campus. We all have a role to play so we can reduce our water usage and we can secure our water supply for generations to come. The Water Corporation has been finding new ways to preserve our precious water, and we need educational institutes to help by saving as much water as they can.

3.3.1 Water and waste water audit: A water audit is an on-site survey and assessment of water using hardware, fixtures, equipment, landscaping, and management practices to determine the efficiency of water and to develop recommendations for improving water use efficiency. In simple words, a water audit is a systematic review of a site that identifies the quantities and characteristics of all water uses. The site may vary from a public water utility, facility (institutional or commercial properties like malls, office, schools etc.) or a household. The overall objective of conducting a water audit is to identify opportunities to preserve and save water more efficiently.

Since, water uses vary greatly from one type of business or institution to another and from site to site, water audit is crucial to determine quantity, nature and quality of water consumption. Water audit for water utility refers to tracking, assessing and validating all components of flow from the site of withdrawal or treatment through the water distribution system and into the consumer's properties. On the other hand, water audit of an office building would review direction and quantity of water used for domestic, cooling/heating, sanitary and landscaping processes. Whereas usage of water for domestic purpose , audit examines the major areas in which a facility uses water, including human consumption, personal hygiene and sanitation, washing, cleaning, laundry, gardening etc.

Water audit comprises of preparation of layout of water sources, distribution network, and service / delivery points to water users and return flow of waste or excess water. The layout should include locations and capacities of flow measurement devices installed at key points, dimensions of pipes and fittings in the water supply system, locations and particulars of flow control devices and history sheets of all measuring and control devices including pipes and fittings. A study of the availability of water sources and past consumption patterns for various sectors is necessary to understand the present water utilization and projecting future requirement. Data on development of sustainable source of water through rainwater harvesting and effluent recycling should also be taken into consideration.

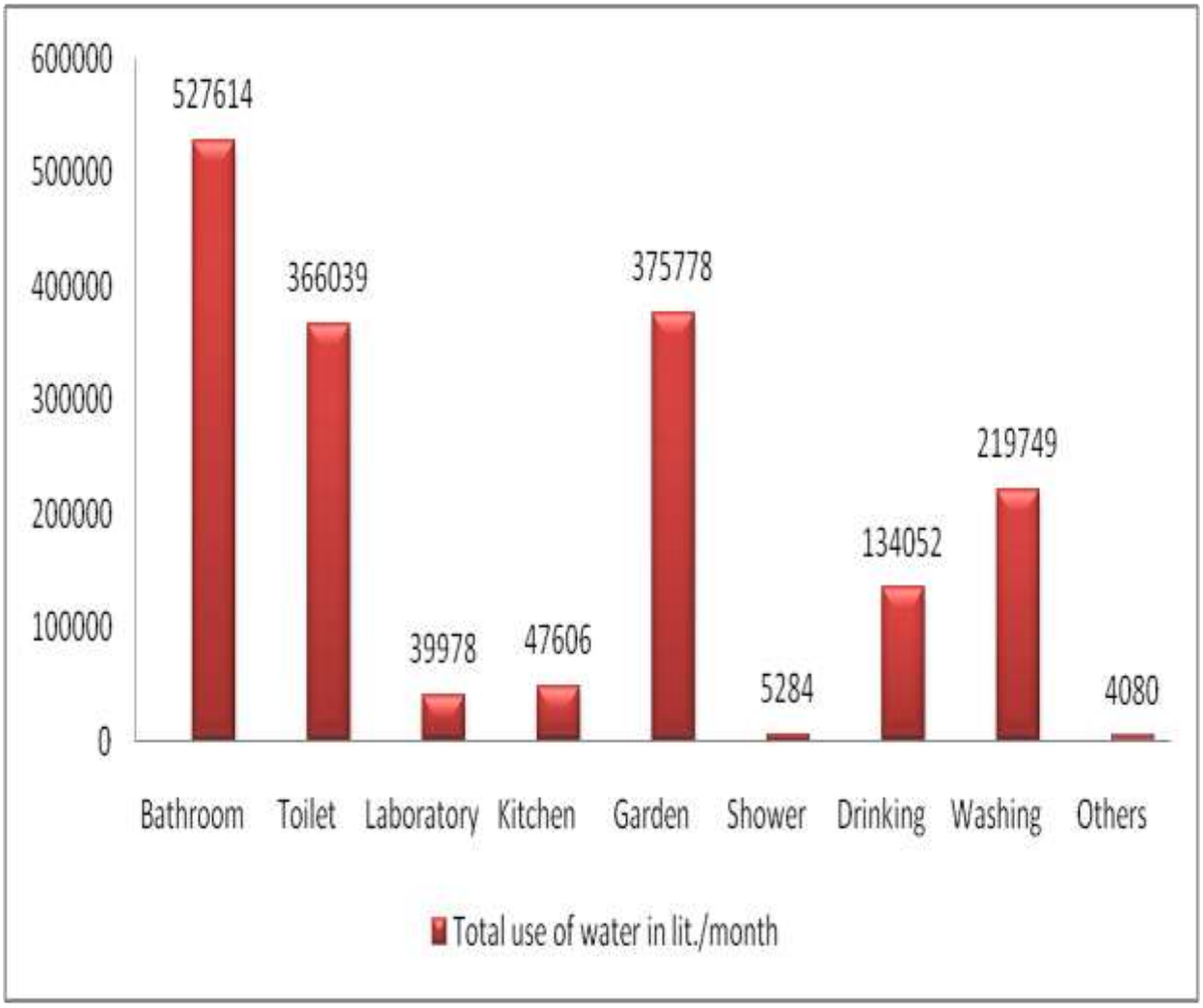
3.3.2 Water Audit of college: Data related the water audit is collected by circulating questionnaires **(Annexure–C)**, from water user profiles of it there are roughly 4000 students, 141 employers, 63 visitors on an average come each day in campus.

3.3.2.1 Assessment of water requirement at different sites in college: It includes Bathroom , Toilet, Laboratory, Kitchen, Garden , Shower , Drinking , Washing etc sites in college campus and water consumption on these sites were studied .

Table No.3.1 Monthly Average Water Consumption at different sites of collage

Site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Shower	Drinking	Washing	Others	Total
Total use of water in lit/month	527614	366039	39978	47606	375778	5284	134052	219749	4080	1720180
Percentage with total	30.67 %	21.27%	2.32%	2.76%	21.84%	0.31%	7.79%	12.77%	0.24%	100%

Graph No. 3.1 Monthly Average Water Consumption at different sites of collage

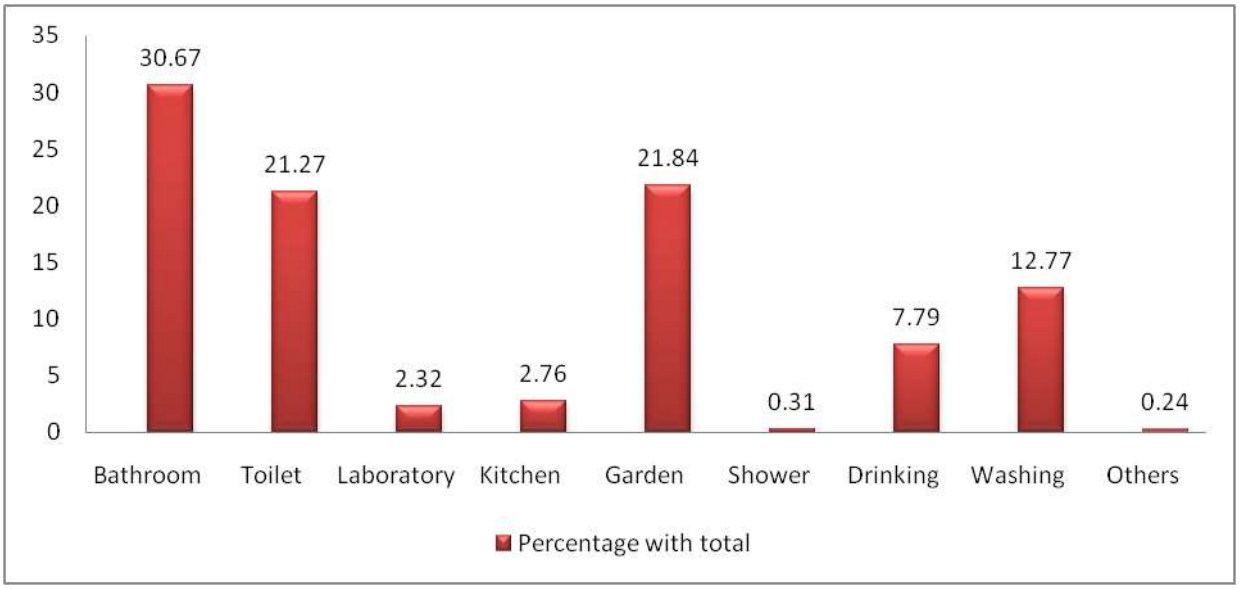


Monthly average water consumption at different sites of all departments at college premises is as below:

The total water consumption at different sites in college preemies is 1720180 liters/ Month. The maximum water used for bathroom is 527614 liters/ month (30.67%) followed by gardens on the premise are lush green throughout the year by using 375778 liters of water which is around(21.40%) and to keep the toilets clean 366039 liters/ month which is 21.27%. In the laboratories 39978 liters water is used every month. i.e. 2.32%. The use of water in kitchen is 47606 liters and it is 2.76%.The for the showers 5284 liters of water is used which is 0.31%. The use of water for drinking is 134052 liters which is 7.79% and 12.77% water i.e.219749 is used for washing purpose.

Water consumption at different site in percent is as shown below:

Graph No.3.2 Monthly Average Water Consumption at different site of collage



Collected and analyzed data in above graph clears that about the same (i.e.21 to 22 %) water consumption observed at Toilet and garden sites of college and very small water is used for Kitchen as well as shower purposes.

Table No.3.2 Department wise and site wise Total Assessment of water requirement in college in liters

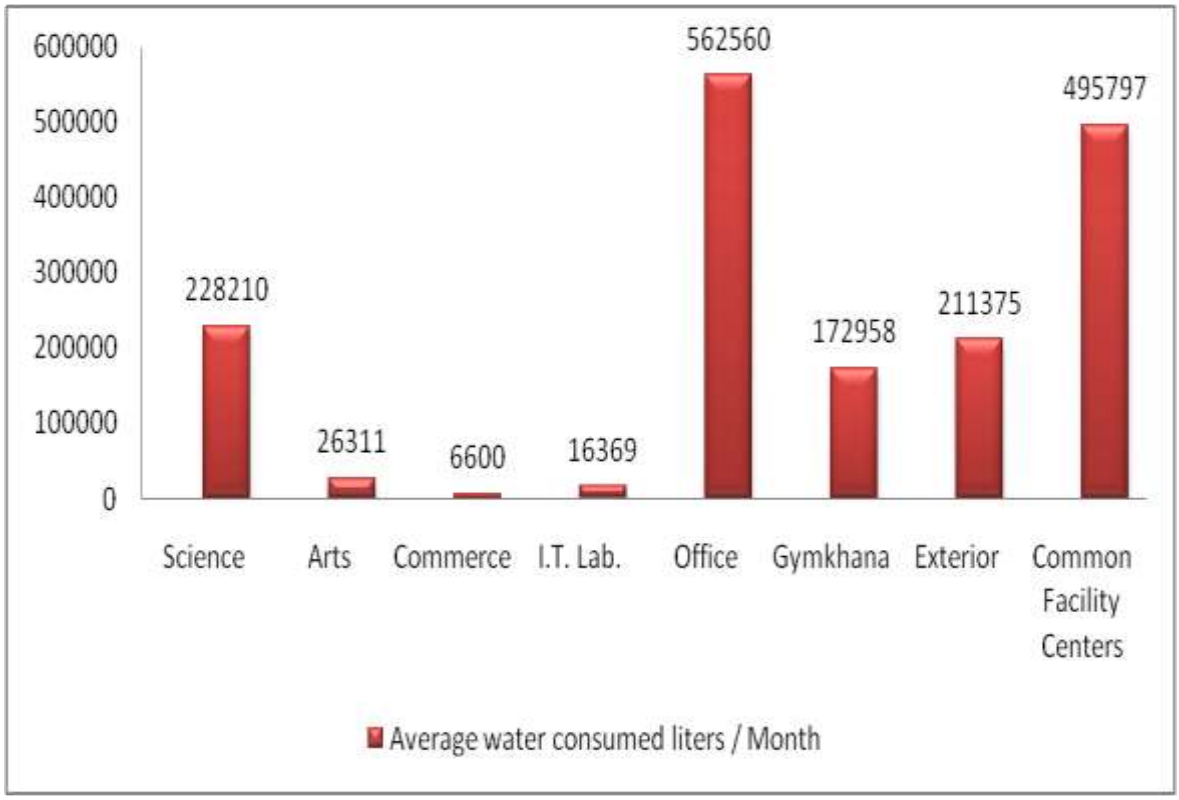
Sr. No.	Departments	Sites									Total per month	Total per Year
		Bathroom	Toilet	Laboratory	Kitchen	Garden	Shower	Drinking	Washing	Other		
1	Science	48000	141029	431728	000000	2063202	000000	45400	9160	0000	228210	2738519
2	Arts	48800	32000	48000	24000	000000	000000	67064	95864	0000	26311	315728
3	Commerce	000000	000000	000000	000000	000000	0000	79200	000000	0000	6600	79200
4	Computer Lab.	59440	46560	0000	0000	0000	00000	57840	32580	0000	16369	196420
5	Office	4032000	984960	000	000	0000	0000	748800	984960	000	562560	6750720
6	Gymkhana	112000	1722000	0000	0000	0000	0000	122500	119000	000	172958	2075500
7	Exterior	0000	0000	0000	0000	2446080	000	57840	32580	000	211375	2536500
8	Common Facility Centers	2031120	1465896	0000	547248	0000	63360	430136	1362840	48960	495797	5949560
Total		6331360	4392445	479728	571248	4509282	63360	1608780	2636984	48960	1720180	20642147

Above table reveals that the requirement of water for Toilet, Laboratory and Garden is maximum while water consumption at kitchen and shower site is very less.

Table No.3.3 Department wise Total Assessment of water requirement in college in liters per month

Departments	Science	Arts	Commerce	I.T. Lab.	Office	Gymkhana	Exterior	Common Facility Centers	Total water consumed
Average water consumed liters/ Month	228210	26311	6600	16369	562560	172958	211375	495797	1720180
Average water consumed liters / Year	2738519	315728	79200	196420	6750720	2075500	2536500	5949560	20642147

Graph No.3.3 Department wise Total Assessment of water requirement in college in liters per month



Above Table No. 3.3 and Graph No. 3.3 shows Department wise Total Assessment of water requirement in college in liters per month from it water consumption in office and CFC department is 5 to 6 lakh liters /Month, while water consumption at Arts and I.T. laboratory is 16 to 26 thousands liters /Month, is minimum ,water is required for Commerce department is very minimum, it is only for drinking purpose.

Data of water leakages and loss of water due to leakages is collected from each department with help of questionnaires (Annexure C - Table -2), its analyzed form is shown in following table.

Table No.3.4 Department wise and Site wise Average Water Losses (Leakages) per month in college:

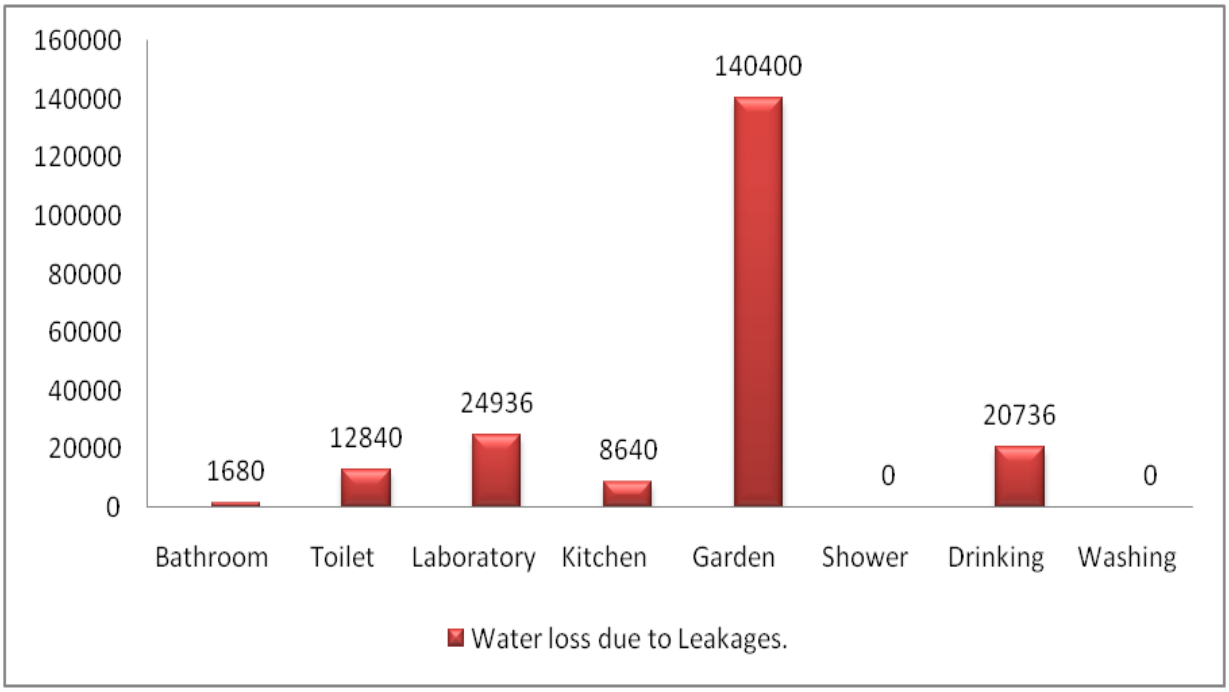
Sr. No.	Departments	Water loss site								Total water loss per Year in Lit.	Total water loss per Month in Lit.
		Bathroom	Toilet	Laboratory	Kitchen	Garden	Shower	Drinking	Washing		
1	Science	--	4320	24936	--	--	--	--	--	29256	2438
2	Gymkhana	--	00	--	--	--	--	--	--	00	00
3	Office	--	00	--	--	--	--	--	--	00	00
4	Common Facility Centers	--	00	--	--	--	--	--	--	00	00
5	Exterior	1680	8520	--	8640	140400	--	20736	--	179976	14998
Total		1680	12840	24936	8640	140400	00	20736	00	209232	17436

Data shows that water loss due to leakages seen in Science at Toilet and Laboratory site. In Exterior at drinking, Garden, Kitchen and toilet site water loss due to leakages is observed. Average water loss due to leakage is 17436liter/month or 209232 liter/month, is maximum at garden (140400 liter/year).

Table No.3.5 Site wise Average Water Losses (Leakages) per month in college

Water loss site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Shower	Drinking	Washing	Total water loss per Year in Liter	Total water loss per Month in Lit.
Total Water loss due to Leakages per Year in Liter	1680	12840	24936	8640	140400	--	20736	--	209232	17436
Total Water loss due to Leakages per Month in Liter	140	1070	2078	720	11700	00	1728	--	--	17436

Graph No.3.4. Site wise Average Water Losses (Leakages) per Year in college

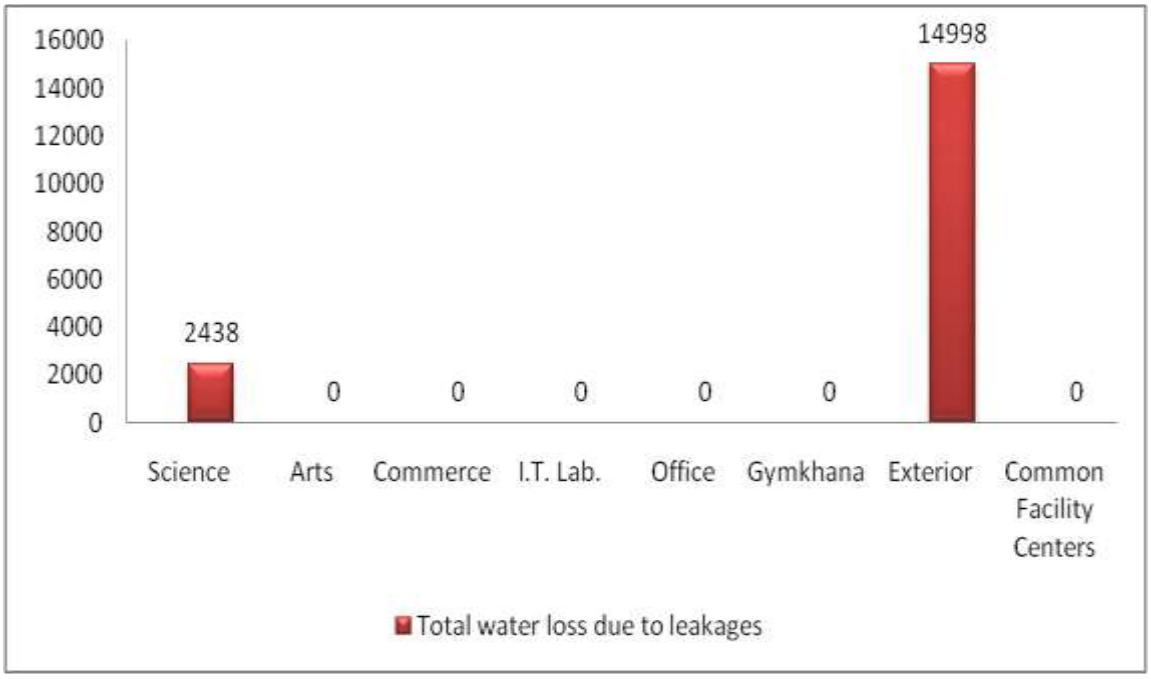


Water loss due to leakages is maximum (i.e.140400 liters/year) at garden site while water loss at bathroom site of college is negligible.

Table No.3.6. Department wise Average Water Losses (Leakages) per month in college

Departments	Science	Arts	Commerce	I.T. Lab.	Office	Gymkhana	Exterior	Common Facility Centers
Total water loss due to leakages	2438	00	00	00	00	00	14998	00

Graph No. 3.5. Department wise Average Water Losses (Leakages) per month in college



Graph No.3.5 shows that in science department water losses due to leakages is 2438 liters/month and in Exterior is 14998 liters/month.

Information/ data of water loss in campus due overflow at water storage is collected through questionnaires (Annexure -C- Table -3), again data is verified by Green Audit Committee Member with periodically visiting and monitoring the sites. To record water loss due to overflow Audit committee arranged number of drills and visits. Committee monitored, personally measure, kept the record of time (in minute) of water flowing, flow rates (liter/minute) and recorded water loss at each visit. Taking an average following water structure of over flow is shown.

Table No.3 .7.Deprtment wise Water Storage (Department wise details of water structures of overflow) (Data from Annexure-3 Table-2)

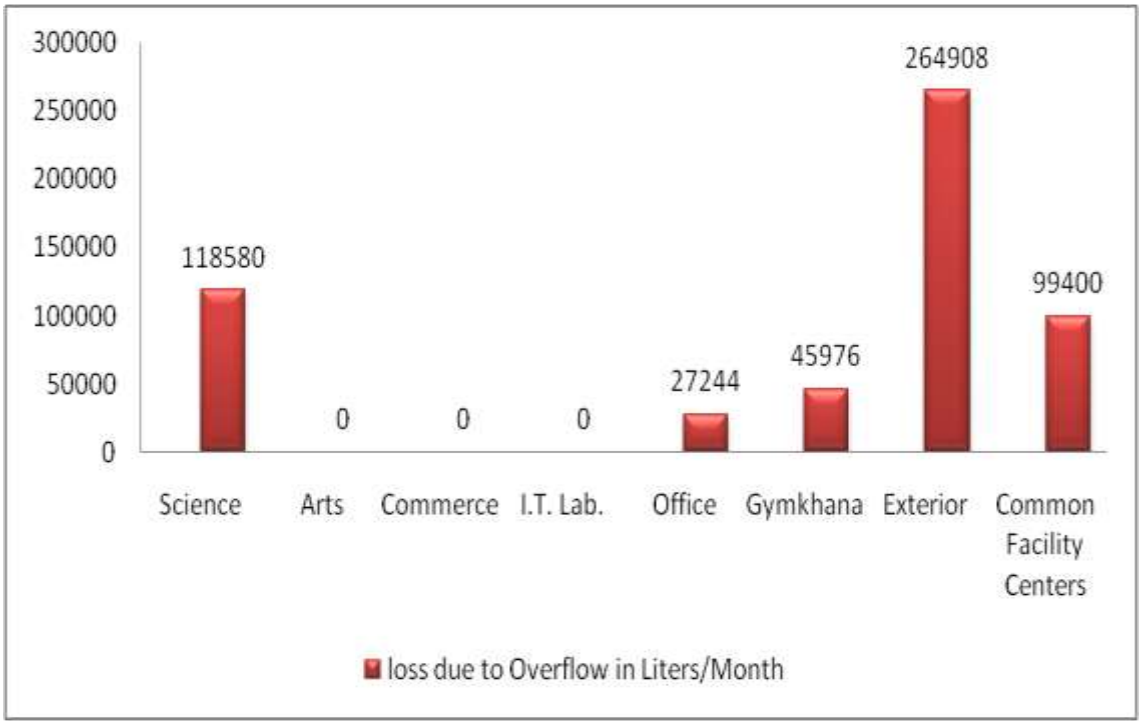
Sr. No.	Depart-ments	Storage Tank Site	Capacity in liters	Number of Tanks	Number of Times it is filled Daily	Daily Average time of water over flowing min	Flow Rate Liter / min (Average)	Daily Water losses due to overflow liter (Average)	Water loss in week liter (Average)	Water loss liter per month (Average)	Water loss liter in Year (Average)
1.	Science	a)Science building b)F.M.Filter house tank	20265 19477 9687	01 02	one	418	44.28	4235	29645	118580	1422960
				03							
2.	Gymkhana	a)Shivneri b)Gymkhana New-1 c)Gymkhana New-1	8950 5094 5094	01 01 01	one	34	154.42	1642	11494	45976	551772
				03							
3.	Office	Office-1	47250	01	one	15	64.85	973	6811	27244	326928
4.	CFC	a)YCWM Library-1 b)YCWM Library-2 c)Canteen -1 d)Canteen -2	1097 3119 5074 5074	01 01 01 01	one	56	251.28	3550	24850	99400	1192800
				04							
5.	Exterior	Quarters Total 6	6536 each	06	one	144	394	9461	66227	264908	3178896
	Total			17		667	908.83	19861	139027	556108	6673356

Table shows at Exteriors water loss by overflow is maximum 264908 lit./month and at office it is minimum 27244 lit./month .

Table No. 3.8. Department wise Loss of water due to overflow in lit./Month

Departments	Science	Arts	Commerce	I.T. Lab.	Office	Gymkhana	Exterior	Common Facility Centers	Total
loss due to Overflow in Liters/Month	118580	00	00	00	27244	45976	264908	99400	556108

Graph No. 3.6 Department wise Loss of water due to overflow in lit./Month



At exterior, Science and CFC departments of college water loss by overflow of tanks is maximum respectively it is 264908lit./month, 118580 lit./month,99400lit./month while at Arts, Commerce and I.T.lab. is zero.

Total water used from each storage tank is recorded by measuring the storage tank measurements and daily monitoring the height before filling the tank. With the help of questionnaire **(Annexure – C table -4)** we calculate total water used per month in liters. Data recorded of total used water from monitoring the water tanks and water consumed at each department in college is shown bellow.

Table No.3.9 Total Average Water Used per Month in the college (by monitoring the tanks)

Sr.No.	Storage Tank Site	Total Average Water Used Per Year(Lit.)	Total Average Water Used Per Month(Lit.)
1	Science	3333930	277827
2	Arts	--	--
3	Commerce	--	--
4	Computer Lab/I.T.	--	--
5	Office	10126513	843876
6	Gymkhana	1943664	161972
7	Exterior	2217327	1847777
8	Common Facility Centers	18804463	1567038

Table No.3.10 Total water consumed at each department from assessment of water requirement (From above Table No. 3.3)

Sr.No.	Storage Tank Site	Total Average Water Used Per Year(Lit.)	Total Average Water Used Per Month(Lit.)
1	Science	2738519	228210
2	Arts	315728	26311
3	Commerce	79200	6600
4	Computer Lab/I.T.	196420	16369
5	Office	6750720	562560
6	Gymkhana	2075500	172958
7	Exterior	2536500	211375
8	Common Facility Centers	5949560	495797

Actually Arts, Commerce and I.T departments water user, use water from Office tank, if we add the water requirement of these three departments in office consumption and compared above two tables we see in following.

Table No.3.11 Comparison of Table No.3.9 and Table No.3.10

Sr. No	Storage Tank Site	Total Average Water Used (by monitoring the tanks) Table No.3.9		Total water consumed at each department from assessment of water Table No.3.10	
		Total Average Water Used Per Year(Lit.)	Total Average Water Used Per Month(Lit.)	Total Average Water Used Per Year(Lit.)	Total Average Water Used Per Month(Lit.)
1	Science	3333930	277827	2738520	228210
2	Arts	--	--	--	--
3	Commerce	--	--	--	--
4	Computer Lab/I.T.	--	--	--	--
5	Office	10126513	843876	7342080	611840
6	Gymkhana	1943664	161972	2075496	172958
7	Exterior	2217327	1847777	2536500	211375
8	Common Facility Centers	18804463	1567038	5949564	495797

Thus from above table the figures for all the departments (Science, Office, Gymkhana and Exterior) are nearly matched except CFC because in CFC (canteen, Boys and girls hostel etc) data of water requirement collected by questionnaire and data from actually tank monitoring are mismatched.

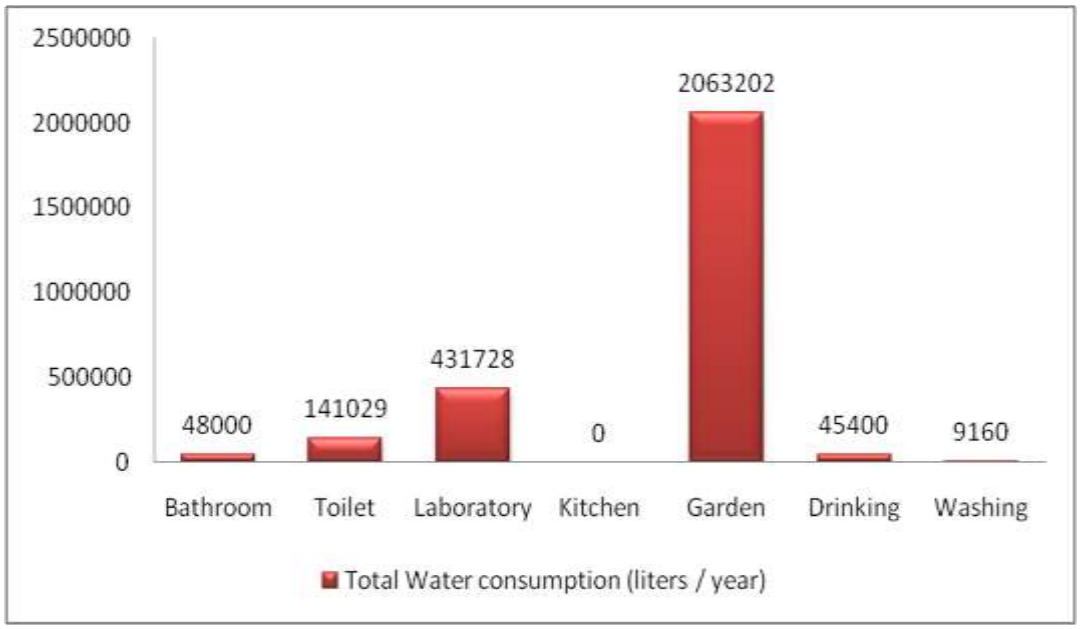
3.3.2.2 Science Department

Total number of water user in the science department is roughly 1800 (students, employers, visitors etc) their water consumption is as fallows.

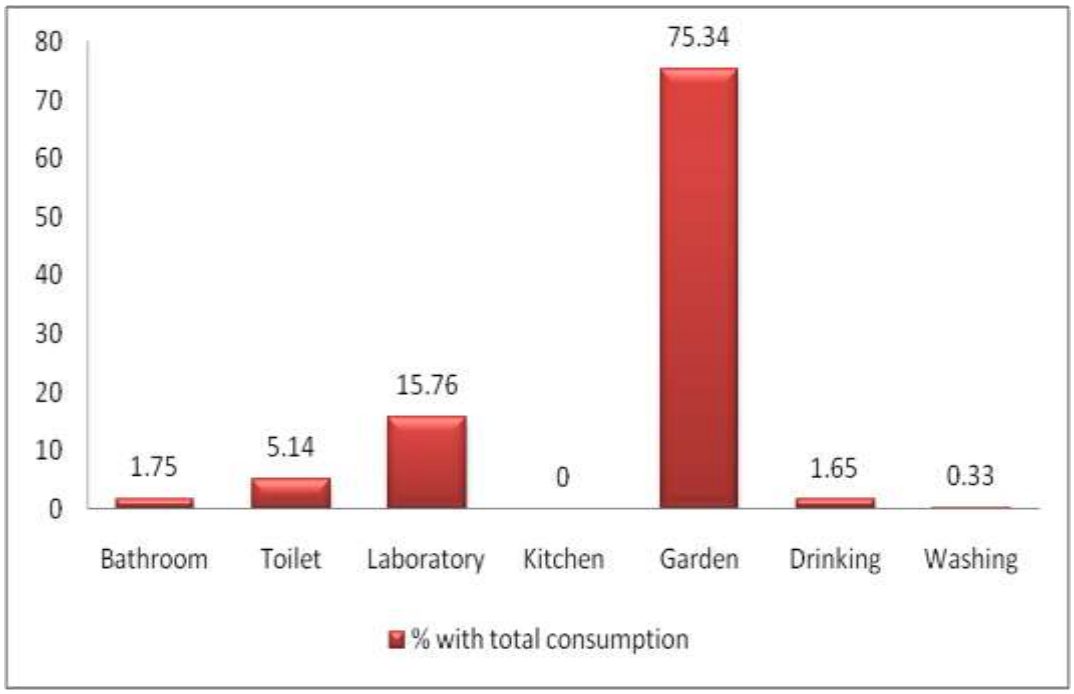
Table.No.3.12 Yearly Water Consumption at different sites of Science Department

Sites	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total
Total Water consumption (liters / year)	48000	141029	431728	000	2063202	45400	9160	2738519
% with total consumption	1.75	5.14	15.76	0.0	75.34	1.65	0.33	100.00

Graph no. 3.7 Yearly Water Consumption at different sites of Science Department



Graph no. 3.8 Percentage of Yearly Water Consumption at different sites of Science Department



Yearly water consumption by Science department is about 2738519 liters , water is consumed by the garden use is major source utilization comprising 75.34 % (2063202 liters/year). While 15.76 % (431728 lit./year) and 5.14% (141029Lit./year) consumed for Laboratory and toilet purpose. Only 1.65% water is consumed for drinking and 1.75% for bathroom purpose.

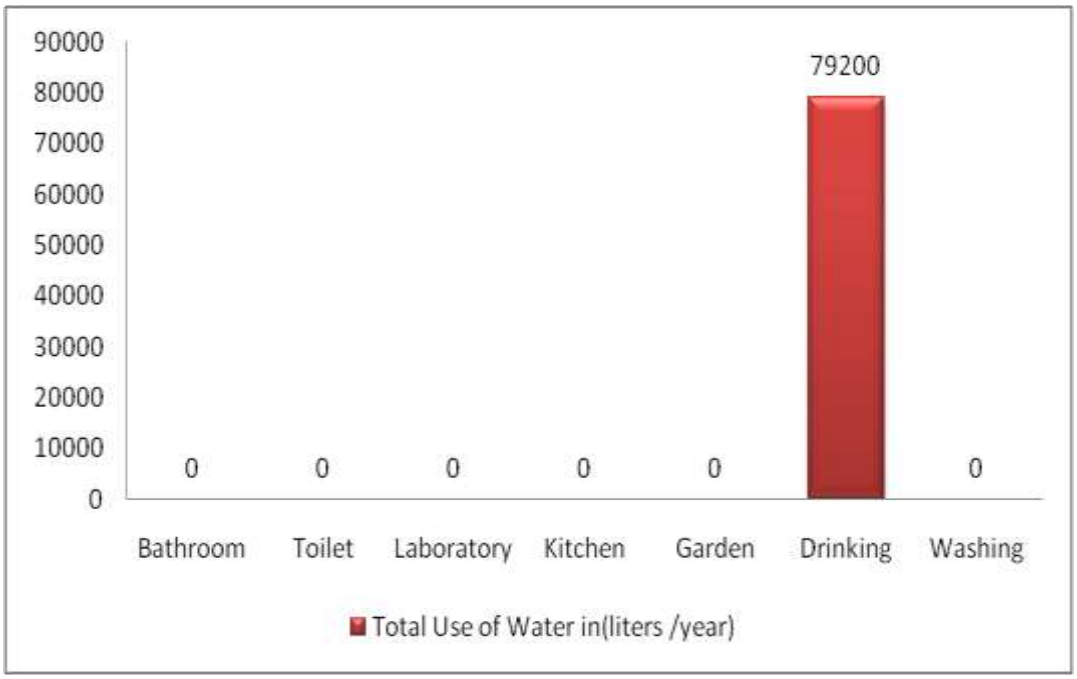
3.3.2.3Commerce Department

Total number of water user in the Commerce department is roughly 730 (students, employers, visitors etc), their water consumption is as fallows.

Table.No.3.13 Yearly Water Consumption at different sites Commerce Department

Sites	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total
Total Use of Water in(liters /year)	0	0	0	0	0	79200	0	79200
Percentage with total water consumption	0	0	0	0	0	100	0	100

Graph No.3.9 Yearly Water Consumption at different sites Commerce Department



About 79200 liters of water consume by commerce department , it is used for drinking (79200 liters /Year) purpose, while water consumed for Bathroom, Toilet, laboratory, Kitchen, Garden, washing is minimum.

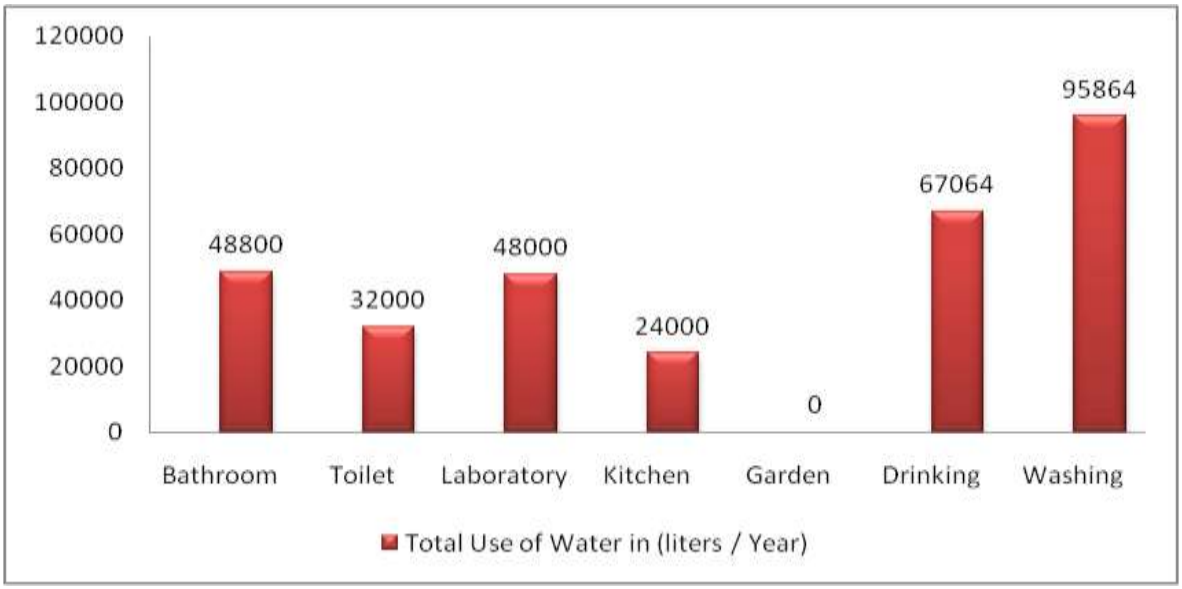
3.3.2.4Arts Department

Total number of water user in the Arts department is roughly 1900(students, employers, visitors etc), their water consumption is as fallows.

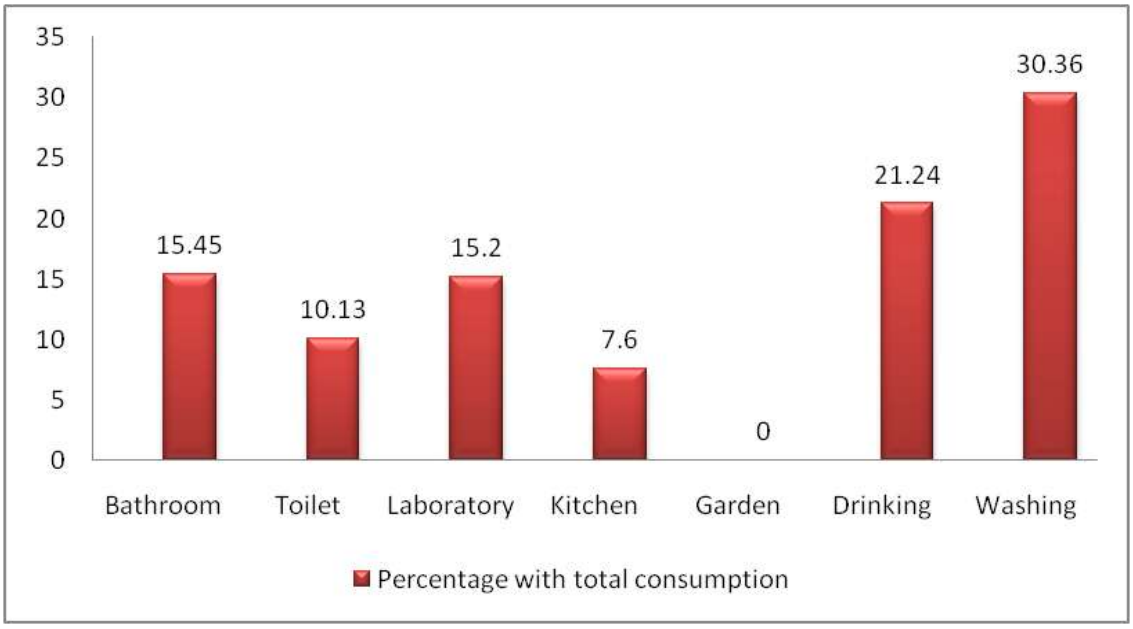
Table No.3.14 Yearly Water Consumption at different sites of Arts department

Water sites	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total water Consumption Lit. /Year
Total Use of Water in (liters / year)	48800	32000	48000	24000	0	67064	95864	315728
Percentage	15.45	10.13	15.20	7.60	0	21.24	30.36	100

Graph No. 3.10. Yearly Water Consumption at different sites of Arts department



Graph No.3.11. Percentage of Yearly Water Consumption at different sites of Arts department



Yearly water consumption at Arts department is about 315728 liters. Consumption of water for washing is 30.36% (95864liters/year), for drinking 21.24%(67064 liters/year), for bathroom and Laboratory water consumption is same (≈ 15%).

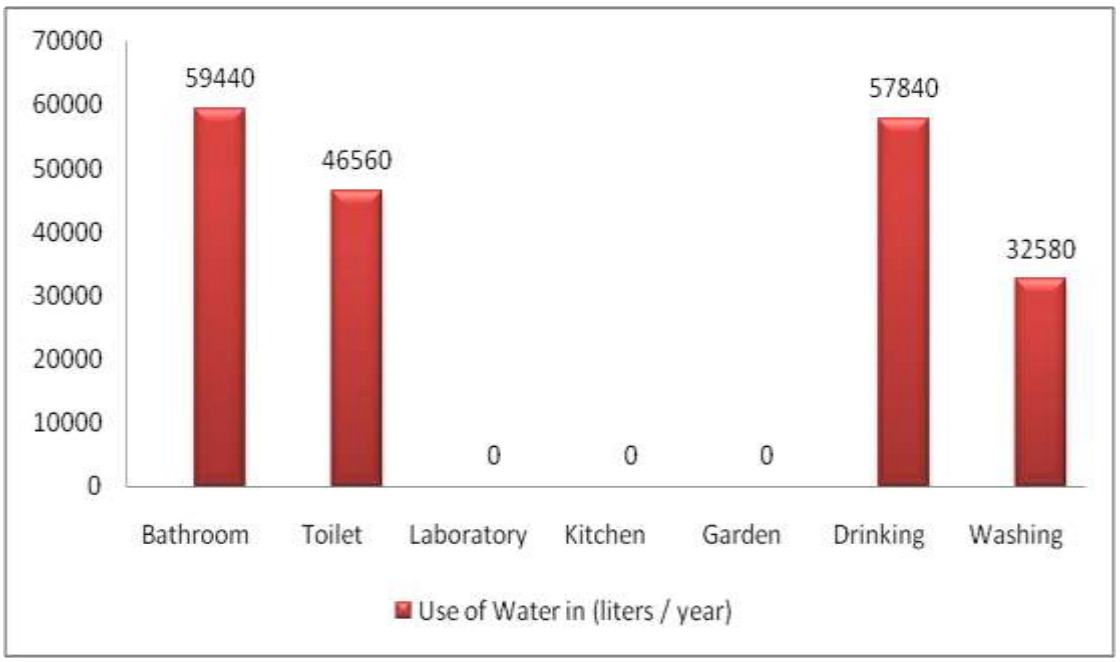
3.3.2.5 I.T Department

Total number of water user in the I.T department is roughly 526 (students, employers, visitors etc), their water consumption is as fallows.

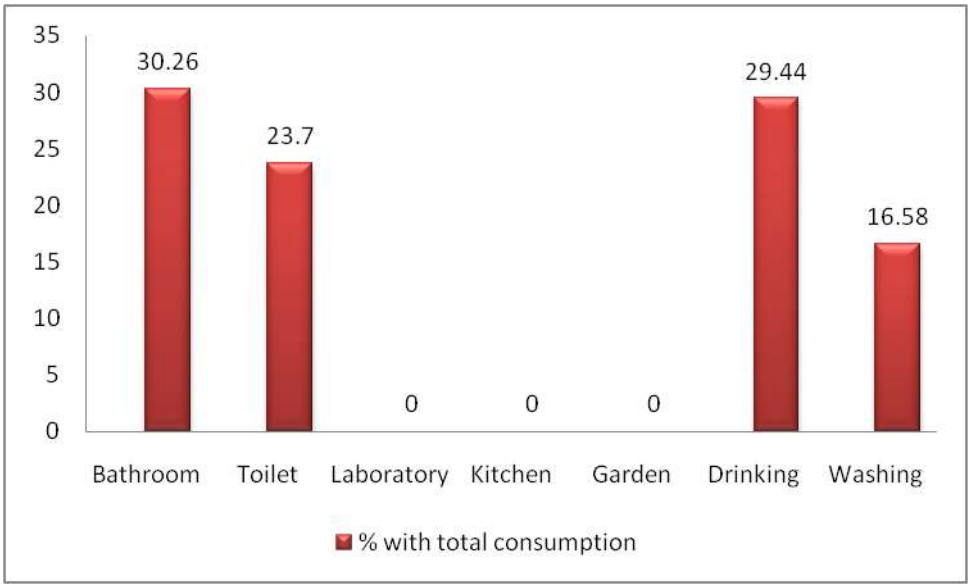
Table No.3.15 Yearly Water Consumption at different sites of I.T.lab

Water loss site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total water Consumption Lit. /Year
Use of Water in (liters / year)	59440	46560	0	0	0	57840	32580	196420
% with total consumption	30.26 %	23.70%	0%	0%	0%	29.44%	16.58%	100%

Graph No. 3.12. Yearly Water Consumption at different sites of I.T.Lab.



Graph No. 3.13. Percentage of Yearly Water Consumption at different sites of I.T.Lab.



About 196420 liters of water is consumed by computer lab (IT), of which the use of bathroom and toilet is major source of utilization comprising 59440 liters/year, i.e. 30.26 % and 57840 liters/year i.e. 29.44% respectively . While water consumed for Laboratory, Kitchen and garden purpose is negligible.

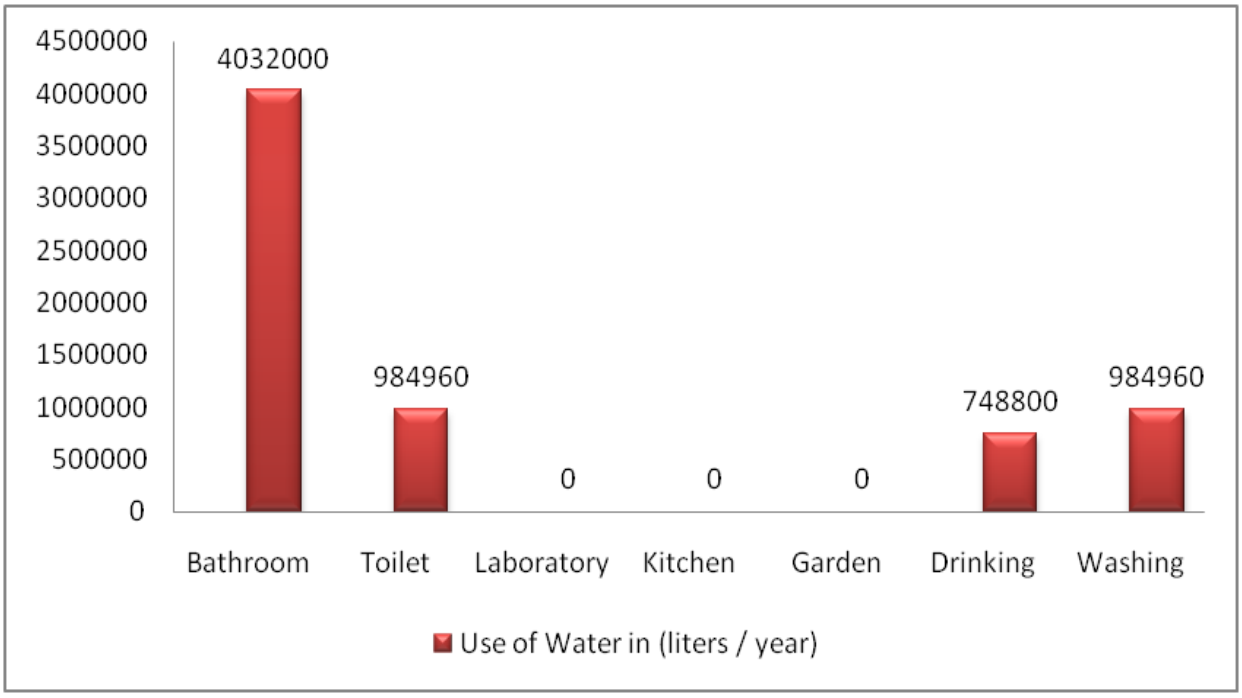
3.3.2.6 Office Department

Total number of water user in the office department is roughly 745(students, employers, visitors etc), their water consumption is as fallows.

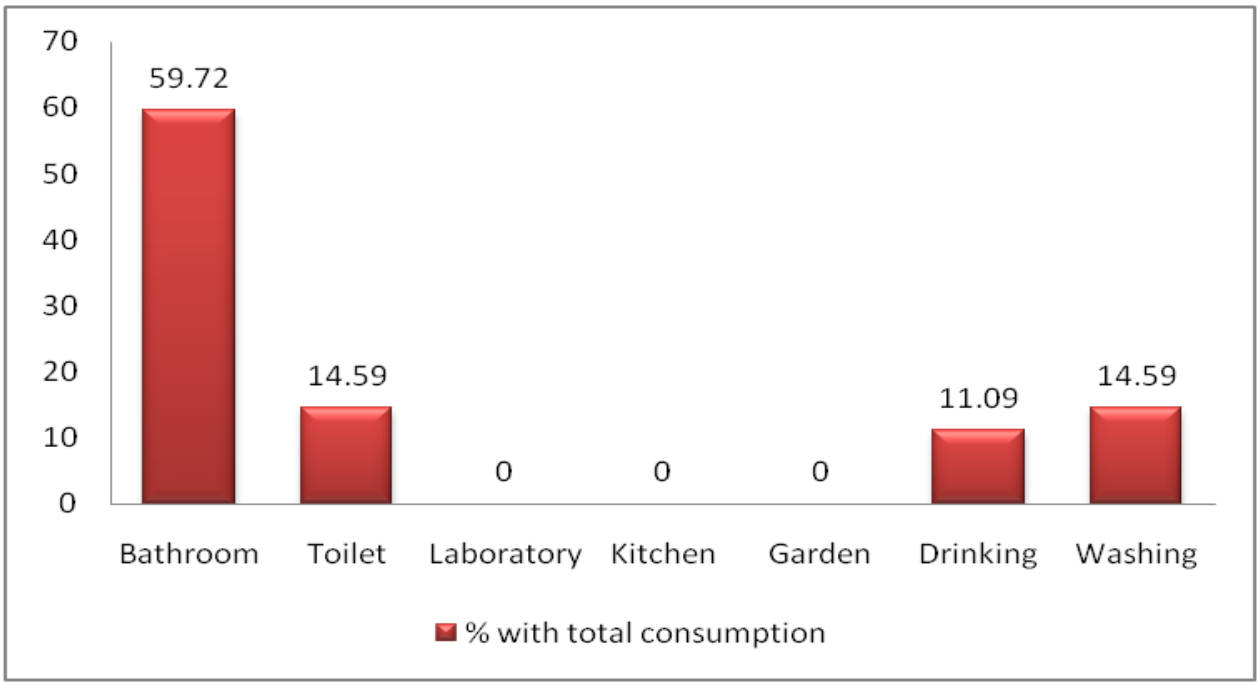
Table no. 3.16 Yearly Water Consumption at different sites of Office.

Water used site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total water Consumption Lit. /Year
Use of Water in (liters / year)	4032000	984960	0	0	0	748800	984960	6750720
% with total consumption	59.72	14.59	0	0	0	11.09	14.59	100

Graph No. 3.14 Yearly Water Consumption at different sites of Office



Graph No. 3.15. Percentage of Yearly Water Consumption at different sites of office



About 6750720 liters of water per year is consumed by office of which the bathroom and toilet use is major source of utilization comprising 4032000 liters/year, i.e. 59.72 % and 984960. liter/year i.e. 14.59% respectively . While for Washing and drinking purpose less water and it is consumed about 984960 liter/year (i.e.14,59%) and 748800 (i.e. 11.09%.) respectively.

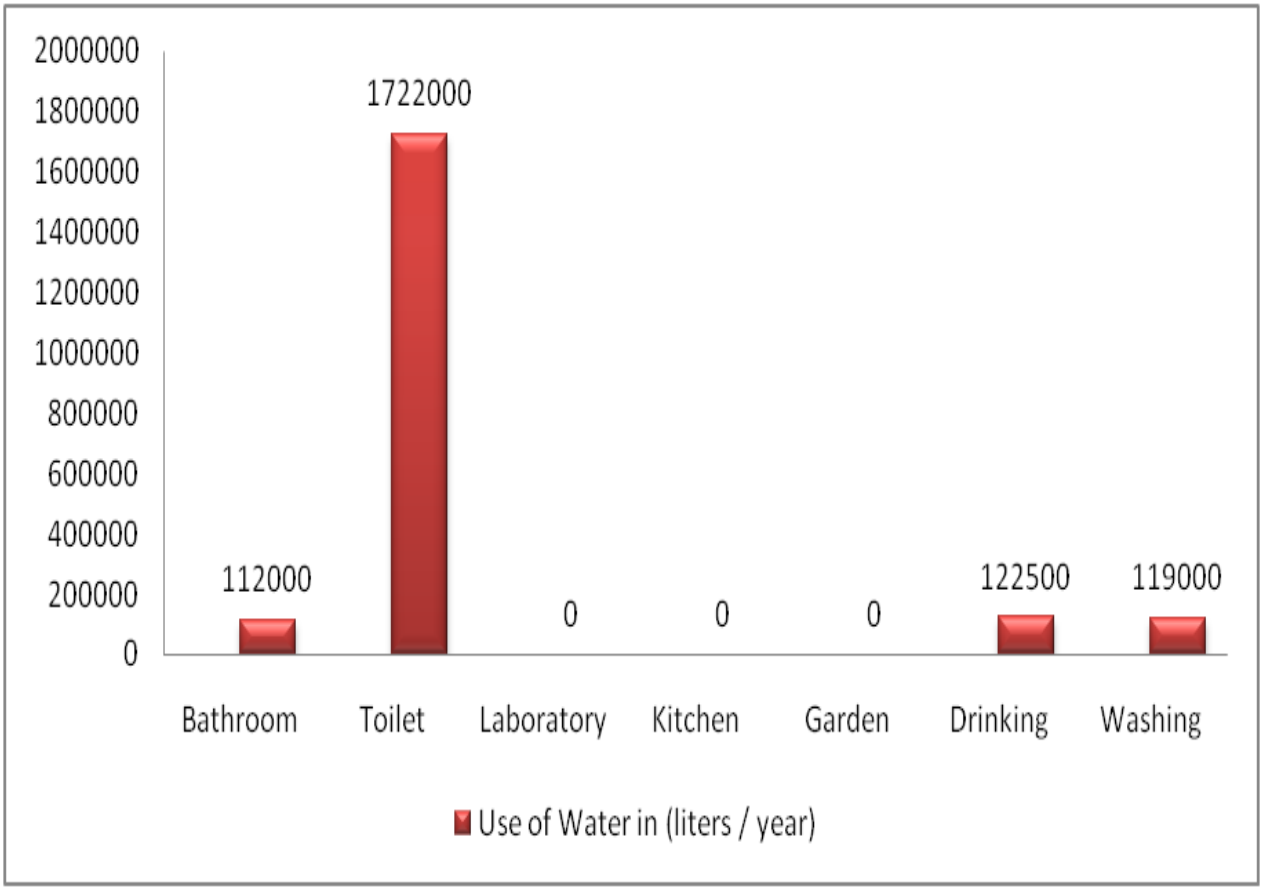
3.3.2.7 Gymkhana

Total number of water user in the Gymkhana department is roughly 185(students, employers etc), their water consumption is as fallows.

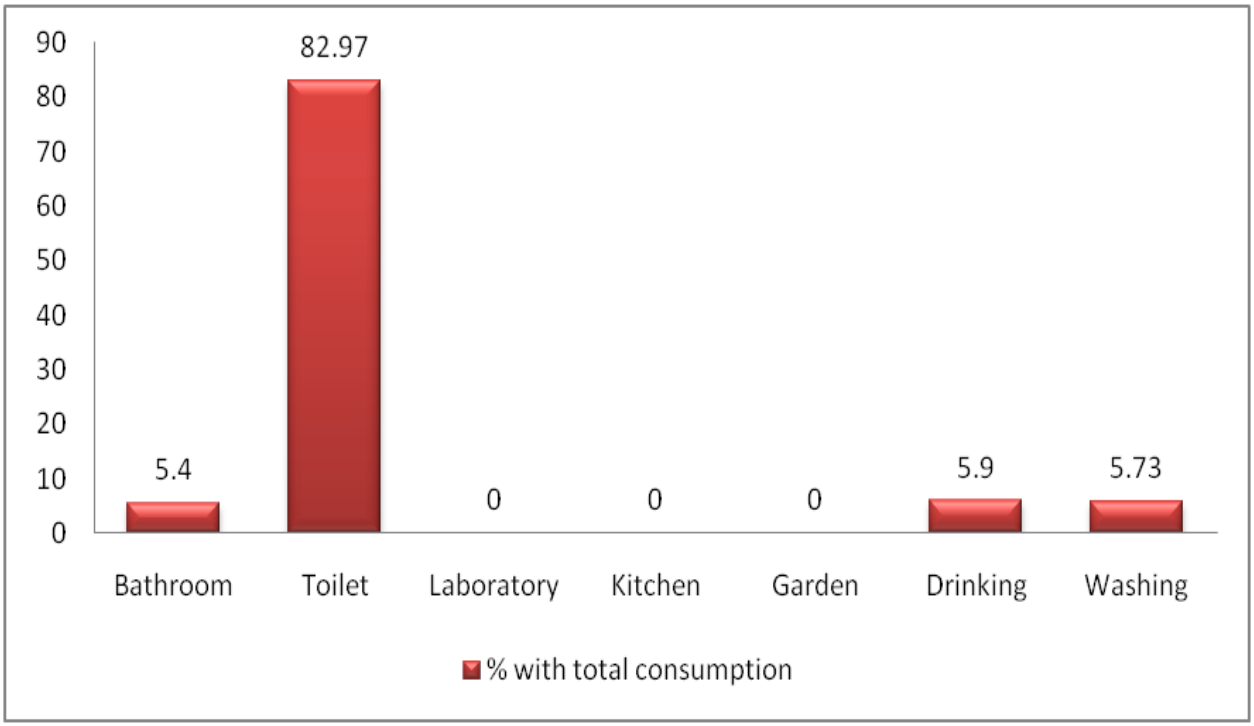
Table.No.3.17 Yearly Water Consumption at different sites of Gymkhana

Water used site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total water Consumption Lit. /Year
Use of Water in (liters / years)	112000	172000	0000	0000	0000	122500	119000	2075500
% with total consumption	5.40	82.97	0	0	0	5.90	5.73	100

Graph No.3.16. Yearly Water Consumption at different sites of Gymkhana



Graph No. 3.17. Percentage of Yearly Water Consumption at different sites of Gymkhana.



About 2075500 liter of water is consumed per year by Gymkhana. Bathroom and Toilet use is major source of utilization i.e. 112000 i.e. 5.4% while for toilet 1722000 i.e. 82.97% while drinking purpose 122500 liters/year, 5.90% while for washing purpose 119000 liters/year i.e. 5.73% water is used. The average figures are shown but maximum consumption of water at time of sports camp (like taluka, university, state and national level competitions).

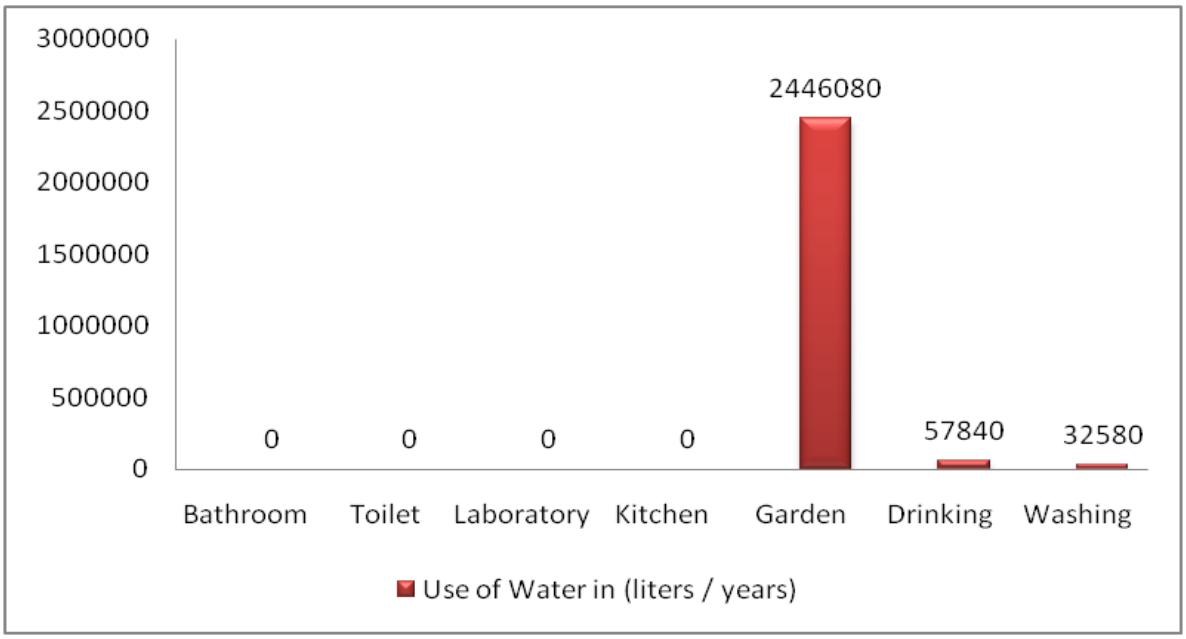
3.3.2.7 Exterior

Total number of water user in the Exterior is roughly 546 (students, employers, visitors etc), their water consumption is as fallows.

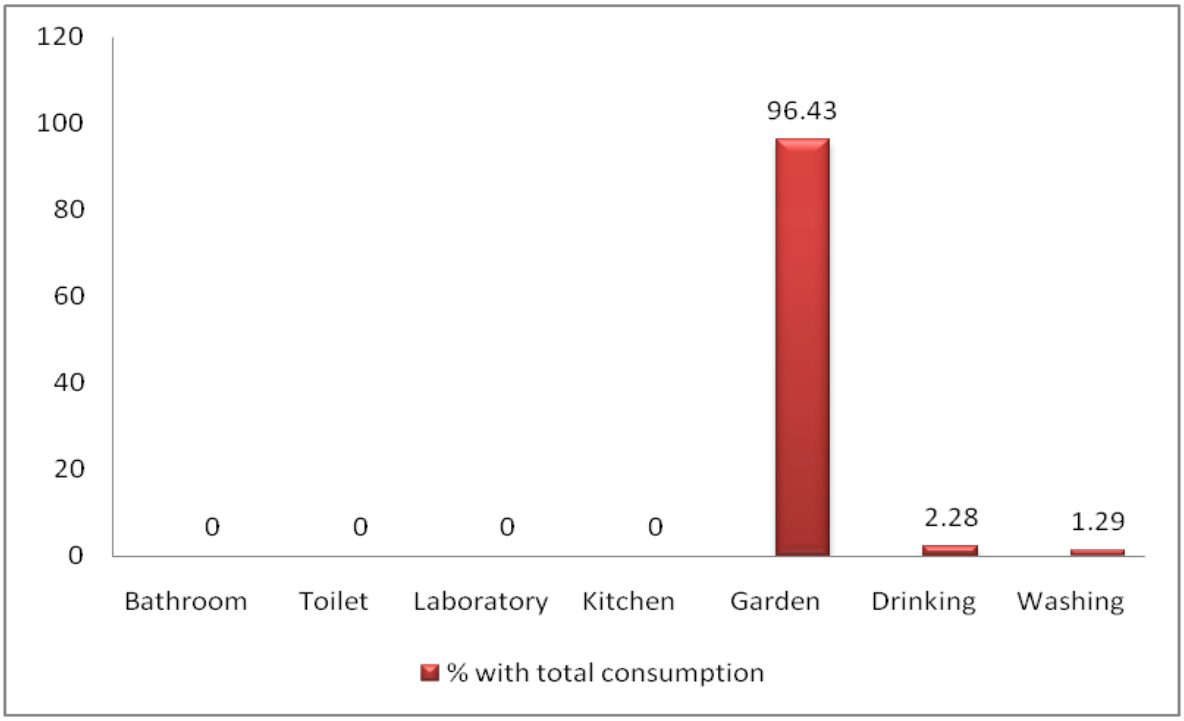
Table.No.3.18 Yearly Water Consumption at different sites of Exterior

Water used site	Bathroom	Toilet	Laboratory	Kitchen	Garden	Drinking	Washing	Total water Consumption Lit. /Year
Use of Water in (liters / years)	00	00	00	00	2446080	57840	32580	2536500
% with total consumption	00	00	00	00	96.43	2.28	1.29	100

Graph No.3.18. Yearly Water Consumption at different sites of Exteriors



Graph No. 3.19. Percentage of Yearly Water Consumption at different sites of Exteriors



About 2536500 liters of water consumed by exteriors per year of which garden use is maximum 2446080 liter/year(i.e. 96.43% of total) while drinking purpose is minimum i.e. 57840 liter per year (i.e. 2.2% of total use).

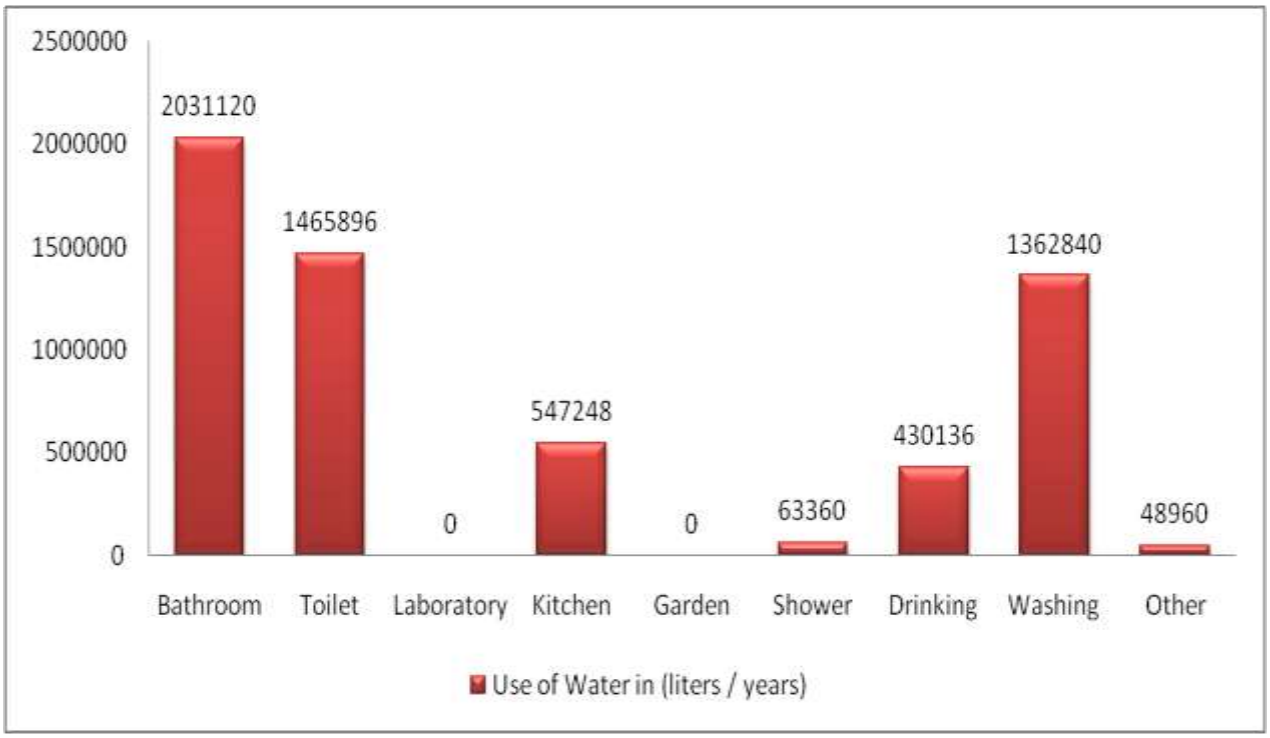
3.3.2.8 Common Facility Centers (CFC)

Total number of water user in the CFC is roughly 1423 (students, employers, visitors etc), their water consumption is as fallows

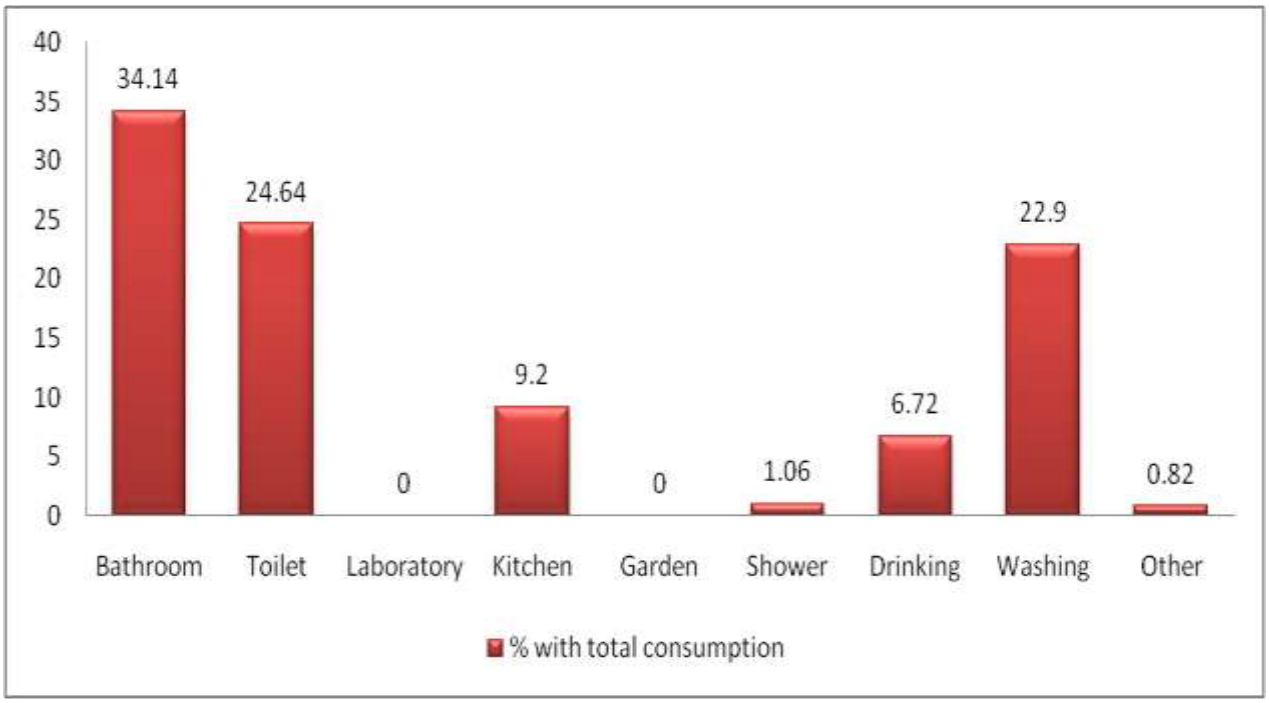
Table.No.3.19 Yearly Water Consumption at different sites of CFC

Water used site	Bathroom	Toilet	Labora-tory	Kitchen	Garden	Shower	Drinking	Washing	Other	Total water Consum-ption Lit. /Year
Use of Water in (liters / years)	2031120	1465896	00	547248	00	63360	430136	1362840	48960	5949560
% with total consump-tion	34.14	24.64	00	9.20	00	1.06	6.72	22.90	0.82	100

Graph No.3.20. Yearly Water Consumption at different sites of CFC



Graph No. 3.21. Percentage of Yearly Water Consumption at different sites of CFC



About 5949560 liter of water per month is consumed by Common facility center of which use of water in bathroom and toilet is maximum, 2031120 liter/year i.e. 34.13% for bathroom and 1465896 liter/year i.e. 24.63% for toilet purpose. While shower and other purpose use of water is minimum, 63360 liters/year i.e. 1.06% and 48960 liter/year i.e. 0.82 % respectively.

3.3.3Water Management Practices at college Campus.

Yashwantrao Chavan Warana Mahavidyalaya, Warananagar has become good runner in water conservation, water harvesting and management of water available on campus.

a)Rain Water recharge:

The wells in campus located at such natural geographical places where the peculation of rain is trapped in these. As the wells in the campus are located down, the rain water and peculated water from campus is easily collected in it.

The waste water from drinking and washing sites is directly send in the nearby garden and lawns.

b)Roof Top Rain water Harvesting –

The Roof Top Rain water from buildings of Arts , commerce, Science, Library, B.Ed / D.Ed, TKIET Library recharge the campus well which is backward of library helps the rain water harvesting .

The Roof Top Rain water from buildings of Boys hostels, Mess, Staff quarters , I.T.I recharge the well in hostel campus.

c)College well-

The water from recharged well is used for watering gardens, lawns, road side lawns which fulfills need of college campus. YCMM campus is partly self- sufficient in water ,because for drinking purpose water of Warana river is used.

d)College well behind boy's hostel.-

Water from boys hostels bathrooms are collected in it which is supplied to college campus gardens & lawns.

e)Water filtration plant-

The college campus has a small water filtration plant in side of botanical garden which fulfills drinking water need.

f)Plantation in campus-

College has green campus of 27 acres. Efforts have been made on to bring part of land under cultivation of medicinal plants as well as other productive plants through NSS , NCC students, Seniors students, teaching and nonteaching staff in college. In campus total 5021 trees of 152 varieties are present in which 3087 are trees, 1424 are shrubs, 473 are herbs and 37 are climbers.

g)Use of Sprinklers:

For irrigating the gardens and lawns drip/ sprinklers are installed in campus for water consumption and electricity.

3.4 Hazardous Waste Audit

3.4.1Chemical Waste:

Hazardous waste is waste that poses substantial or potential threats to public health or the environment. These wastes may be found in different physical states such as gaseous, liquids, or solids. A hazardous waste is a special type of waste because it cannot be disposed of by common means like other by-products of our everyday life. Depending on the physical state of the waste, treatment and solidification processes might be required. The four characteristics are Ignitability, Corrosivity, Reactivity, and Toxicity.

. For simplicity Y.C.Warana Mahavidyalaya Warananagar college campus divided into eight parts includes Science, Arts, Commerce, Gymkhana, Computer Lab., Office, Exterior and CFC. Out of these small quantity of Hazardous waste is observed only in Department of Chemistry, which is generated due to various chemicals handled in the department. It is in the form of solid as well as in liquid state. Data of Hazardous waste recorded is given below:

Table No.4.1: Hazardous Waste Generated at College

Sr. No.	Department	Type of Hazardous Waste	Hazardous Waste in (kg)	Hazardous Waste in (liters)
1	VKCA/ MPSC	Laboratory Chemicals and other	Nil	Nil
2	Botany	Laboratory Chemicals and other	Nil	Nil
3	Department of Garden	Laboratory Chemicals and other	Nil	Nil
4	HSVC	Laboratory Chemicals and other	Nil	Nil
5	Library	Laboratory Chemicals and other	Nil	Nil
6	Gymkhana	Laboratory Chemicals and other	Nil	Nil
7	Sociology	Laboratory Chemicals and other	Nil	Nil
8	Hindi	Laboratory Chemicals and other	Nil	Nil
9	Economics	Laboratory Chemicals and other	Nil	Nil
10	Histiry	Laboratory Chemicals and other	Nil	Nil

Sr. No.	Department	Type of Hazardous Waste	Hazardous Waste in (kg)	Hazardous Waste in (liters)
11	English	Laboratory Chemicals and other	Nil	Nil
12	Geography	Laboratory Chemicals and other	Nil	Nil
13	Marathi	Laboratory Chemicals and other	Nil	Nil
14	Commerce	Laboratory Chemicals and other	Nil	Nil
15	Computer (IT)	Laboratory Chemicals and other	Nil	Nil
16	Mathematics	Laboratory Chemicals and other	Nil	Nil
17	Zoology	Laboratory Chemicals and other	Nil	Nil
18	Chemistry	Laboratory Chemicals and other	4.320	11.500
19	Cap-Centre	Laboratory Chemicals and other	Nil	Nil
20	Physics	Laboratory Chemicals and other	Nil	Nil
Total			4.320	11.500

Above Table no. 4.1 shows that data is recorded from 20 different departments in college but hazardous Chemical Waste is generated only in Chemistry department. No other department (i.e. 19 departments) generate any type of Hazardous Waste. Here solid hazardous waste is 4.320 Kg and liquid hazardous waste is 11.5 liters.

3.5. E-Waste :-

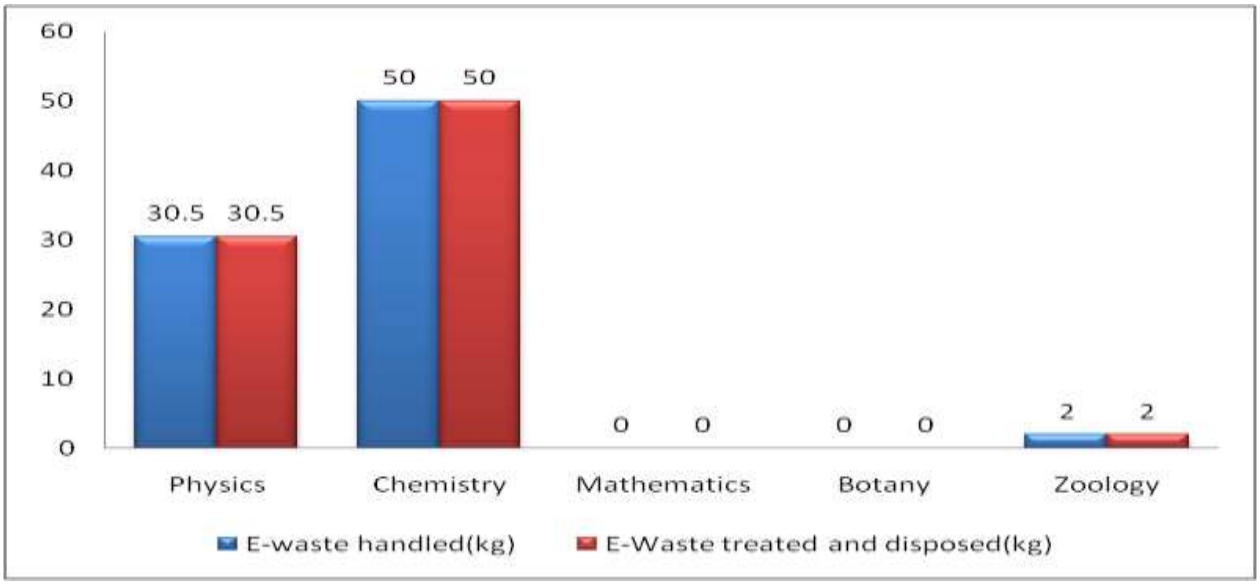
Generation of E-waste is apparent at every colleges. In academic colleges there are several equipments and instruments running in administrative as well as in various departments used for educational activities. Computers, Printers, Scanners, Xerox machines are mostly used for administrative work..At time of teaching, learning and evaluation in academic college we deal with electric material, electric equipments/ instruments ,measuring instruments, different electric circuits, wires, ICs, Microprocessors, PCBs, electronic components(like resistors, diodes, transistors, transformers, inductances, relays, etc),damages instruments, hardware's and peripherals of computer system, lighting equipments(like Bulbs, tube), fans all these include in E-wastes. The more use of such listed materials generates E- waste when these instrument/ equipments get worn out with time.

3.5.1 Science Departments:

Table No.5.1 E-waste handled, treated and disposed by science departments as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Physics	30.5	30.5
2	Chemistry	50	50
3	Mathematics	0	0
4	Botany	0	0
5	Zoology	02	02
Total		82.5	82.5

Graph 5.1 E-Waste handled, treated and disposed by Science departments



Data collected shown in above table reveals that, major source of e-waste are generated in Science department. Chemistry department generated highest amount of e-waste as compared to other departments .It is followed by Physics department which generated 30.500 kgs of e-waste which is treated and disposed in proper manner. other science departments generates negligible amount of e-waste.

3.5.2 Commerce Departments :

Table 5.2 E-waste handled, treated and disposed by Commerce departments as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Commerce	0	0

The Commerce department of our college has no any type of e-waste material.

3.5.3 Arts Departments:

3.5.3. 1 Language Department :

Table 5.3 E-waste handled, treated and disposed by Language departments as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Marathi	0	0
2	Hindi	0	0
3	English	0	0

The Language department of our college doesn't generate any E- waste.

3.5.3.2 Social Science and HSVC Department :-

Table 5.4 E-waste handled,treated and disposed by Social science and HSVC departments as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Economics	0	0
2	History	0	0
3	Geography	0	0
4	HSVC	0	0

In Social Science and HSVC Department, there is no e-waste material.

3.5.4 Computer Department/ I.T. Lab. :

Table 5.5 E-waste handled,treated and disposed by Computer departments as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Information Technology	51	51

In Department of Computer Science 51 kg e-waste is generated in last year, it is treated and disposed in proper manner.

3.5.5 Office department

Table 5.6 : E-waste handled,treated and disposed by Administrative Office as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Administrative Office	0	0
2	Principal Chamber	0	0
3	Enquiry room	0	0
4	Staff Room	0	0
5	Ladies Room	0	0
6	Meeting Room	0	0
7	NAAC Room	0	0
8	Store Room	0	0
9	Strong Room	0	0
10	Gents Room	0	0
11	Gents Lavatory	0	0
12	Cultural Hall	0	0

Administrative Office and other Sections has no e-waste material.

3.5.6 Gymkhana :

Table 5.7 : E-waste handled, treated and disposed by Gymkhana as

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Gymnasium Hall	0	0
2	Office	0	0
3	Ground	0	0
4	Doctor Room	0	0

Gymkhana and in other parts of Gymkhana has no e-waste material.

3.5.7 Exteriors :-

Table 5.8 : E-waste handled, treated and disposed by Exteriors as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Exteriors and Botanical garden	0	0

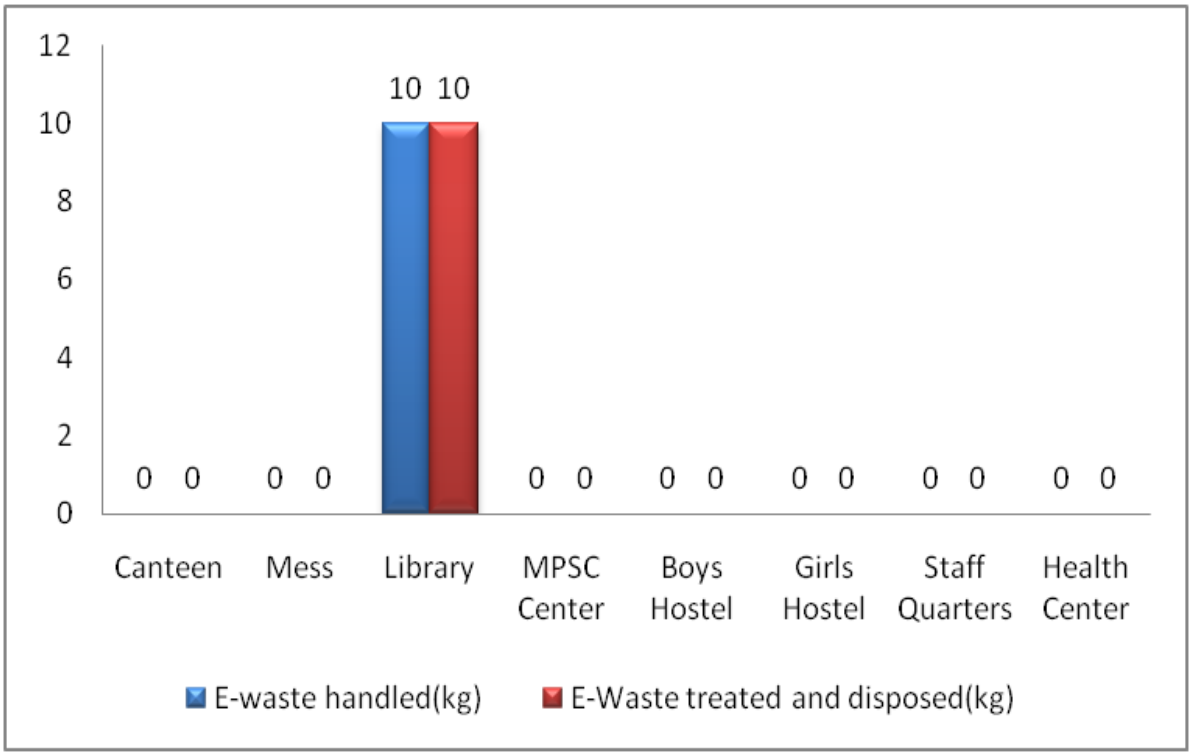
In Exteriors college there is no e-waste material.

3.5.8 Common Facility Center :

Table 5.9: E-waste handled, treated and disposed by Common Facility Center as,

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Canteen	0	0
2	Mess	0	0
3	Library	10	10
4	MPSC Center	0	0
5	Boys Hostel	0	0
6	Girls Hostel	0	0
7	Staff Quarters	0	0
8	Health Center	0	0

Graph 5.2 : E-Waste handled, treated and disposed by Common Facility Center

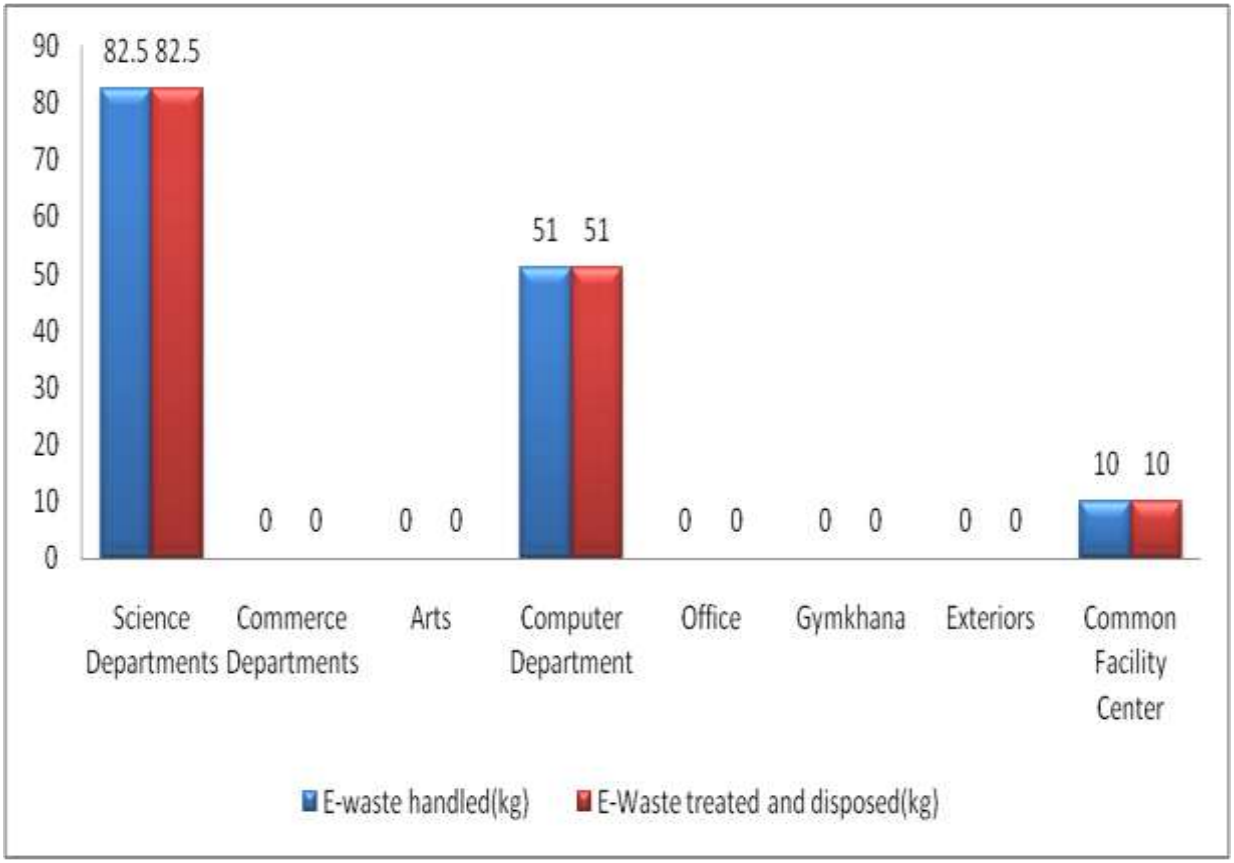


There are various common facility centers in our college campus like canteen, mess ,hostels, MPSC center, Library, Health Center and staff Quarters but only Library handled 10 kg e-waste material, which is disposed in last year.

Table 5,10. Department wise E-waste generation and its disposal in college:

Sr No.	Departments	E-waste handled(kg)	E-Waste treated and disposed(kg)
1	Science Departments	82.500	82.500
2	Commerce Departments	0	0
3	Arts a) Language Department b) Social Science and HSVC Department	 0 0	 0 0
4	Computer Department	51	51
5	Office	0	0
6	Gymkhana	0	0
7	Exteriors	0	0
8	Common Facility Center	10	10
Total		**143.500**	**143.500**

Graph No. 5.3 Department wise E-waste generation and its disposal in college:



The total amount of e-waste generated by various departments of college is about 143.5 kg per year. .Science department generates maximum of e-waste about 82.5 kg in year, followed by Computer department generates 51kg and Common facility centers generate 10 kg e-waste. All other departments generate 0 kg e-waste.

3.6. Air Environment

Air pollution has long term and short term impact on the biotic and abiotic component of the environment. The ambient air quality with respect to the core zone around the periphery of Yashwantrao Chavan Warana Mahavidyalaya, Warananagar, was monitored. The study area represents both rural and industrial environment. The chief sources of air pollution in the study area are mainly due to existing sugar factory unit of Tatyasaheb Kore Sugar Industry, other industrial units (like Wagpos, Manugraph, Biltube milk products etc) and vehicular activities and domestic firewood burning, fuel burning etc. The major pollutants released in the atmosphere will be PM_{10}, $PM_{2.5.}$ SO_2 NO_x and CO etc.

This section describes the selection of sampling locations, methodology adopted for sampling, analytical techniques and frequency of sampling.

3.6.1 Methodology

- Selection of sampling locations

Selection of ambient air quality monitoring stations is based on the Meteorological conditions of the area.

Ambient Air Quality Monitoring (AAQM) stations were establish at Six locations with due consideration to the Meteorological conditions of the area.

Table- 6.1 Ambient Air Quality Monitoring Locations

Sr. No.	Code No.	Station Name	Description
1.	AAQ1	Near Main Gate	Sensitive zone
2.	AAQ2	Near Sugar Factory	Industrial area
3.	AAQ3	Near main Building	Sensitive zone
4.	AAQ4	Near Library	Sensitive zone
5.	AAQ5	Near Gymnastic Hall	Sensitive zone
6.	AAQ6	Near Bus Stop	Rural area

The ambient air quality monitoring has been done twice in month for every location.

The air environment data is generated for the following parameters:

- PM2.5 : Respirable Particulate Matter (RPM);
- PM10 : Respirable Particulate Matter (RPM);
- Sulphur dioxide (SO_2); and
- Oxides of Nitrogen (NO_x)
- Carbon monoxide (CO);

3.6.2 Sampling Duration

- Twenty-four hourly samples, twice a month at all air-monitoring stations.

3.6.3 Instruments Used

Respirable Dust Samplers (APM-451) of "Envirotech" make are used for sampling PM2.5, PM10 and gaseous pollutants like SO_2, NO_x. The gases are collected in a sampling tray attached to the Respirable Dust Sampler.

3.6.4 Methodology for Analysis

The air samples are analyzed as per IS: 5182 "Method for Measurement of Air Pollution".

- PM2.5/ PM10: Gravimetric Method (IS: 5182, Part IV)
- SO_2: Modified West and Gaeke Method (IS: 5182, Part II)
- NO_x: Jacobs and Hochheiser Method (IS: 5182, Part VI)
- CO: NDIR spectroscopy method

3.6.5 Presentation of Results

The ambient Air quality monitoring data analyzed and tabulated in the **Table - 6.2 to Table-6.7** which is compared with National Ambient Air Quality Standards as tabulated in **Table – 6.8 (Annexure-Q)**

Table- 6.2 Ambient Air Quality Monitoring Results

Near Main Gate (A1)					
Date of sampling	**SO_2 (µg/m$^{3)}$**	**NOx (µg/m$^{3)}$**	**PM2.5 (µg/m$^{3)}$**	**PM10 (µg/m$^{3)}$**	**CO (ppm)**

06.01.2015	15.6	20.3	22.8	50.6	BDL
20.01.2015	14.6	18.8	21.3	48.3	BDL
03.02.2015	13.9	19.1	20.9	45.9	BDL
17.02.2015	15.1	18.9	19.7	44.8	BDL
10.03.2015	14.4	19.4	20.4	39.5	BDL
24.03.2015	11.3	19.0	21.7	40.7	BDL
14.04.2015	12.8	20.1	19.6	49.2	BDL
28.04.2015	13.6	18.7	18.4	46.8	BDL
13.05.2015	10.9	19.2	20.2	48.3	BDL
27.05.2015	14.2	18.0	20.7	47.2	BDL
09.10.2015	10.3	18.6	16.7	37.4	BDL
23.10.2015	13.1	18.9	16.9	42.4	BDL
06.11.2015	12.4	19.4	17.9	43.2	BDL
20.11.2015	11.8	18.7	18.4	44.8	BDL
08.12.2015	12.1	20.2	19.5	46.5	BDL
22.12.2015	13.6	19.3	20.4	41.3	BDL

Table- 6.3 Ambient Air Quality Monitoring Results

Near Sugar Factory (A2)					
Date of sampling	**SO_2 (µg/$m^{3)}$**	**NOx (µg/$m^{3)}$**	**PM2.5 (µg/$m^{3)}$**	**PM10 (µg/$m^{3)}$**	**CO (ppm)**
06.01.2015	22.4	28.3	26.8	58.9	BDL
20.01.2015	15.9	26.9	22.7	53.4	BDL
03.02.2015	16.8	24.8	24.6	56.2	BDL
17.02.2015	18.3	27.3	25.5	52.3	BDL
10.03.2015	17.9	26.2	23.9	54.7	BDL
24.03.2015	16.8	22.8	20.8	48.6	BDL
14.04.2015	20.4	24.1	24.7	51.7	BDL
28.04.2015	16.4	23.3	25.9	46.9	BDL

13.05.2015	19.8	24.9	24.8	53.1	BDL
27.05.2015	20.3	21.8	26.1	52.8	BDL
09.10.2015	11.2	19.8	18.7	40.1	BDL
23.10.2015	14.4	20.7	22.1	47.9	BDL
06.11.2015	13.8	22.3	23.9	49.9	BDL
20.11.2015	16.7	19.9	21.8	50.4	BDL
08.12.2015	19.3	23.6	24.2	52.6	BDL
22.12.2015	18.7	24.2	22.6	51.3	BDL

Table- 6.4 Ambient Air Quality Monitoring Results

Near Main Building (A3)					
Date of sampling	**SO_2 (µg/$m^{3)}$**	**NOx (µg/$m^{3)}$**	**PM2.5 (µg/$m^{3)}$**	**PM10 (µg/$m^{3)}$**	**CO (ppm)**
06.01.2015	10.8	19.7	16.3	46.7	BDL
20.01.2015	8.3	18.4	14.8	41.3	BDL
03.02.2015	8.6	19.1	15.2	38.2	BDL
17.02.2015	7.9	17.9	13.9	36.8	BDL
10.03.2015	9.3	16.8	15.8	37.6	BDL
24.03.2015	8.8	15.4	16.1	41.4	BDL
14.04.2015	8.4	16.2	14.5	44.2	BDL

28.04.2015	9.3	18.7	14.3	40.8	BDL
13.05.2015	8.0	17.3	15.1	39.6	BDL
27.05.2015	8.2	18.2	14.9	41.8	BDL
09.10.2015	7.8	13.6	11.3	29.6	BDL
23.10.2015	8.3	15.9	14.4	32.2	BDL
06.11.2015	8.1	16.4	15.2	34.8	BDL
20.11.2015	8.8	17.5	13.1	38.4	BDL
08.12.2015	7.9	16.2	14.8	40.2	BDL
22.12.2015	8.0	18.1	16.0	42.8	BDL

Table- 6.5 Ambient Air Quality Monitoring Results

Near Library (A4)					
Date of sampling	**SO_2 (µg/$m^{3)}$**	**NOx (µg/$m^{3)}$**	**PM2.5 (µg/$m^{3)}$**	**PM10 (µg/$m^{3)}$**	**CO (ppm)**
06.01.2015	11.8	20.3	17.6	45.9	BDL
20.01.2015	9.9	18.4	14.3	39.8	BDL
03.02.2015	10.1	19.2	16.8	40.2	BDL
17.02.2015	9.6	17.7	15.2	41.6	BDL
10.03.2015	8.9	16.9	16.4	39.9	BDL
24.03.2015	8.7	19.4	15.9	42.8	BDL
14.04.2015	10.2	19.8	14.2	43.7	BDL

28.04.2015	9.3	18.4	13.8	41.4	BDL
13.05.2015	11.0	17.8	15.7	36.9	BDL
27.05.2015	9.6	16.9	14.4	38.6	BDL
09.10.2015	8.4	14.1	11.6	30.1	BDL
23.10.2015	9.3	15.4	13.9	40.5	BDL
06.11.2015	8.4	17.2	15.2	38.4	BDL
20.11.2015	8.7	18.1	14.3	39.4	BDL
08.12.2015	9.1	18.4	16.8	41.8	BDL
22.12.2015	9.3	19.2	17.1	42.7	BDL

Table- 6.6 Ambient Air Quality Monitoring Results

Near Gymnastic Hall (A5)					
Date of sampling	**SO_2 ($\mu g/m^{3)}$**	**NOx ($\mu g/m^{3)}$**	**PM2.5 ($\mu g/m^{3)}$**	**PM10 ($\mu g/m^{3)}$**	**CO (ppm)**
06.01.2015	9.7	18.3	15.4	47.2	BDL
20.01.2015	8.3	17.4	14.3	41.8	BDL
03.02.2015	8.7	16.9	13.8	44.9	BDL
17.02.2015	9.1	17.8	13.7	40.8	BDL
10.03.2015	8.5	18.3	14.1	42.6	BDL
24.03.2015	8.3	18.6	15.2	38.9	BDL
14.04.2015	9.4	17.2	13.4	36.8	BDL

28.04.2015	8.6	15.8	13.8	40.7	BDL
13.05.2015	8.2	16.2	12.9	41.9	BDL
27.05.2015	8.0	17.3	13.6	42.3	BDL
09.10.2015	8.1	14.9	12.3	32.8	BDL
23.10.2015	8.4	15.8	13.1	40.9	BDL
06.11.2015	9.1	15.9	14.8	39.5	BDL
20.11.2015	9.2	16.1	14.2	42.7	BDL
08.12.2015	8.7	17.4	13.7	40.2	BDL
22.12.2015	8.6	17.9	14.1	43.1	BDL

Table- 6.7 Ambient Air Quality Monitoring Results

Near Bus Stop (A6)					
Date of sampling	**SO_2 ($\mu g/m^{3)}$**	**NOx ($\mu g/m^{3)}$**	**PM2.5 ($\mu g/m^{3)}$**	**PM10 ($\mu g/m^{3)}$**	**CO (ppm)**
06.01.2015	21.2	27.4	28.3	60.4	BDL
20.01.2015	20.6	25.2	25.2	55.3	BDL
03.02.2015	19.9	24.8	26.8	51.6	BDL
17.02.2015	18.4	26.3	27.3	54.8	BDL
10.03.2015	20.7	25.7	28.1	53.2	BDL
24.03.2015	20.9	22.9	24.2	50.7	BDL
14.04.2015	19.8	24.7	21.6	52.9	BDL

28.04.2015	18.4	23.1	22.9	58.4	BDL
13.05.2015	20.3	25.8	20.5	53.6	BDL
27.05.2015	19.2	24.9	25.2	56.9	BDL
09.10.2015	14.9	20.8	17.4	44.8	BDL
23.10.2015	17.6	23.4	22.4	51.3	BDL
06.11.2015	18.4	26.5	26.2	53.4	BDL
20.11.2015	19.8	22.7	23.8	55.1	BDL
08.12.2015	20.1	23.6	21.4	50.8	BDL
22.12.2015	19.7	21.9	20.9	53.2	BDL

Ambient air quality analysis results for the six monitoring locations which were selected to represent condition of the region are given below.

3.2.6 Near Main Gate (A1)

The location comes under Sensitive zone. The concentration of PM2.5 ranged from 16.7-22.8 µg/m3 while that of PM10 was in the range of 37.4-50.6 µg/m3, SO2 and NOx were in the range of 10.3-15.6 µg/m3 and 18.6-20.3 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

3.2.7 Near Sugar Factory (A2)

The location comes under Industrial zone. The concentrations of PM2.5 and PM10 at this location were in the range of 18.7-26.8 µg/m3 and 40.1-58.9 µg/m3 respectively. While the values of SO2 and NOX were observed in the range of 11.2-22.4 µg/m3 and 19.8-28.3 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

3.2.8 Near Main Building (A3)

The location comes in the Sensitive zone. Here the PM2.5 and PM10 concentrations were in the range of 11.3-16.3 µg/m3 and 29.6-46.7 µg/m3 respectively. The concentrations of SO2 and NOx were observed in the range of 7.8-10.8 µg/m3 and 13.6-19.7 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

3.2.9 Near Library (A4)

This location comes within the Sensitive zone. The concentrations of PM2.5 and PM10 at this location were in the range of 11.6-17.6 µg/m3 and 30.1-45.9 µg/m3 respectively. While the values of SO2 and NOX were observed in the range of 8.4-11.8 µg/m3 and 14.1-20.3 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

3.2.10 Near Gymnastic Hall (A5)

The location comes under Sensitive Zone. The concentration of PM2.5 ranged from 12.3-15.4 µg/m3 while that of PM10 was in the range of 32.8-47.2 µg/m3. SO2 and NOx concentrations were in the range of 8.1-9.7 µg/m3 and 14.9-18.3 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

3.2.11 Near Bus Stop (A6)

The location comes under Rural Area Zone. The concentration of PM2.5 ranged from 17.4-28.3 µg/m3 while that of PM10 was in the range of 44.8-60.4 µg/m3. SO2 and NOx concentrations were in the range of 14.9-21.2 µg/m3 and 20.8-27.4 µg/m3 respectively. The CO values were observed in the Below Detectable Limit.

The summary of the monitoring results including minimum, maximum and average levels are presented in Table 1.2. The results obtained were compared for 24hrs average standards for residential areas prescribed by the National Ambient Air Quality Standards (NAAQS). The National Ambient Air Quality Standards are presented in **Table 6.8**

Table 6.8: National Ambient Air Quality Standards (NAAQS)

Sr. No.	**Pollutant**	**Time Weighted Average**	**Concentration in Ambient Air ($\mu g/m^3$ except indicated)**		
			Industrial Area	**Residential, Rural and Other Areas**	**Sensitive Area**
1	Sulphur Dioxide (SO_2)	Annual Average *	80	60	15
		24 Hours**	120	80	30
2	Oxides of Nitrogen (NO_x)	Annual Average *	80	60	15
		24 Hours**	120	80	30
3	Suspended	Annual Average *	360	140	70

	Particular Matter (SPM)	24 Hours**	500	200	100
4	Respirable Particular Matter (RPM)	Annual Average *	120	60	50
		24 Hours**	150	100	75
5	Carbon Monoxide (CO)	8 Hourly Average*	5.0 mg/m^3	2.0 mg/m^3	1.0 mg/m^3
		1 Hour Average**	10.0 mg/m^3	4.0 mg/m^3	2.0 mg/m^3

* Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval

** 24 hourly /8 hourly values should be met 98% of the time in a year. However, 2% of the time it may exceed but not on two consecutive days

The salient observations of the results and their compliance to the 24 hourly average NAAQ standards are as follows:

- The maximum concentration of PM2.5 observed was 28.3 µg/m^3 near Bus Stop site. The peak PM10 value of 60.4 µg/m^3 was also observed near Bus Stop site.
- The Sulphur Dioxide levels monitored at all the locations confirms to the standards of 80 µg/m^3, with highest value of 22.4 µg/m^3 observed Near sugar Factory.
- The Oxides of Nitrogen levels monitored at all the locations also complies with the stipulated standards of 80 µg/m^3.
- The Carbon Monoxide levels also complied with the stipulated standards of 2.0 mg/m^3, The CO levels at all the locations were within the stipulated limit.
- Sampling location which are in campus shows sensitive zone standards while Sampling location which are out campus shows industrial area , Rural area zone standards.

3.7 WATER ENVIRONMENT

The purpose of this study is to:

- Assess the waste water characteristics of the laboratory waste;

Waste water sample was examined for physico-chemical parameters in order to assess the characteristics of the laboratory waste. The sample was collected and analyzed as per the procedures specified in 'Standard Method for the Examination of Water and Wastewater' published by American Public Health Association (APHA).

Sample for chemical analysis was collected in polyethylene cans. Selected physico-chemical parameters have been analyzed to identify the laboratory waste water quality.

The results of sample are as given below **Table 7.1**.

Table 7.1: Laboratory waste analysis Results

Sr. No.	Parameters	Results	Unit
1	pH	7.2	---
2	Total Dissolved Solids (TDS)	264	mg/l
3	Bio-chemical Oxygen Demand (BOD)	80	mg/l
4	Chemical Oxygen Demand (COD)	840	mg/l
5	Oil and Grease	0.03	mg/l

From the analysis report of laboratory waste it is observed that Chemical Oxygen Demand (COD) is higher.

From above report the COD of laboratory waste water sample is observed to be high (840mg/L), hence it is not suitable for irrigation purpose. It can be decreased and make suitable for irrigating by adding coagulants like $Fecl_3$ and $Fe_{2(}So_4$) and then passing the sample through the filter made up of sands, charcoal, activated carbon.

3.8. NOISE ENVIRONMENT

The noise levels measurements were carried out using precision noise level meter. The noise level survey was carried out at six locations, located within the in campus and out campus of Yashwantrao Chavan Warana Mahavidyalaya, Warananagar. The major source of noise identified in the study area has been predominantly the vehicular movement, and the transportation activities.

3.8.1Selection of Locations for Monitoring

Noise monitoring has been undertaken for the duration of 24 hrs at each location to cover up all the periods of the day to establish the noise levels and assess the impact of the total noise generated at the study area. The environment setting of each noise monitoring location is given in **Table 8.1.**

Table 8.1: Details of Noise Monitoring Locations

Location Code	Monitoring Location	Criteria
N1	Near main gate	Sensitive zone
N2	Near sugar factory	Industrial area
N3	Near main building	Sensitive zone
N4	Near library	Sensitive zone
N5	Near gymnastic hall	Sensitive zone
N6	Near bus stop	Rural area

3.8.2 Instrument Used for Monitoring

Sound pressure level (SPL) measurements were automatically recorded with the help of an Integrated Sound Level Meter to give the equivalent noise level for every hour continuously for 24 hours in a day

3.8.3 Results

Equivalent noise levels viz., L_{day} and L_{night}, at the noise monitoring locations are provided in **Table 8.2** while noise standards are given in **Table 83.**

Table 8.2: Noise Monitoring Results in the Study area

Name of Station	Noise Levels (dBA)		Ambient Noise Standard (dBA)		
	Day	Night	Day	Night	Category of area

Near main gate	65.0	51.2	50	40	Silent zone
Near sugar factory	68.8	55.5	75	70	Industrial
Near main building	58.5	46.2	50	40	Silent zone
Near library	55.7	41.3	50	40	Silent zone
Near gymnastic hall	54.0	41.0	50	40	Silent zone
Near bus stop	71.5	61.5	65	55	Urban area

From the monitoring survey of noise levels it was observed that the day time noise levels were observed in the range of 54.0-71.5 dB(A). The higher noise levels are due to vehicular traffic in the area. The night time noise levels observed at all the 6 locations were found to be in the range of 41.0-61.5 dB(A), which are found to be higher due to the transportation.

Table 8.3: Ambient Noise Quality Standards

Category of Area/Zone	**Limits in dB(A) Leq***	
	Day Time	**Night Time**
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence Zone	50	40

Day time shall mean from 6.00 a.m. to 10.00 p.m.

Night time shall mean from 10.00 p.m. to 6.00 a.m.

- ✓ Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts. The silence zones are zones, which are declared as such by the competent authority.
- ✓ Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.

Chapter-IV

Aware of the suffering caused by the destruction of life, I undertake to cultivate compassion and learn ways to protect the lives of people, animals, plants, and minerals.

- Thich Nhat Hanh, Buddhist monk

Our task must be to free ourselves by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty.

- Albert Einstein

We share the earth not only with our fellow human beings, but with all the other creatures.

- Dalai Lama

OUR CAMPUS


College Well


Solar Water heater at Boys hostel

Vermicomposting Plant.


Botanical garden

‘Shivneri Ground’ 


Ramps for Disabled students

Green Lawn Behind Science Building

Lawn near Science Building Parking

Use of LED Lamps

Lawn in Front of Library

Roof top Rain Water Harvesting
(Back Side of Library Building)

Roof Top Water Harvesting
(New Building)


Green Lawn: Study Area


Lawn In Front of College


Lawns: Near Main Stage

Front Lawn : Sprinklers

'Smurti- Mandir': Late. Tatyasaheb Kore

Boys Hostel Campus

Boys Hostel Campus

Trees in Hostel Campus

Greenery on both sides of Road In Boys Hostel Campus

Medical facility center & Greenery around the road

Lawn :Nilkantheshaver Garden

View near Nilkantheshaver

Waste Collector

College Roads

Gymnasium Hall

Top View of Entrance

Solid Waste Collection

Collection of Chemical Waste from Laboratory

Arrangement of coloured bench for disabled students

College- Rose Garden

College farm