



K. E. Society's

**Rajarambapu Institute of Technology, Urun Islampur,
Maharashtra**

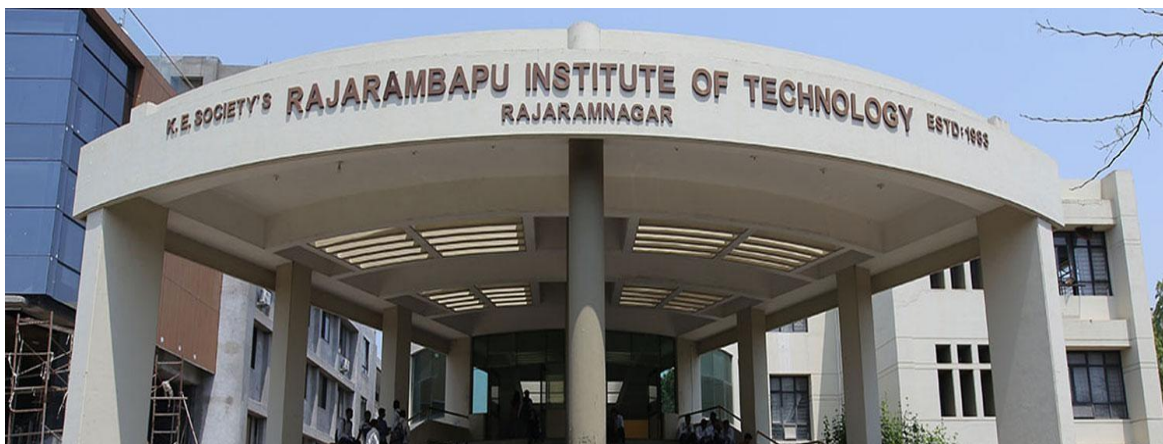
Green Audit Report

2018-19

Prepared by

**DEPARTMENT OF ENVIRONMENTAL SCIENCE,
SHIVAJI UNIVERSITY, KOLHAPUR- 416004**

ISBN: 978-93-85190-07-0



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Estd. 1962
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Ref. No. : SU/PG/ENV

Date: 1 MAR 2019

Certificate

This is to certify that the Department of Environmental Science, Shivaji University, Kolhapur has conducted detailed "Green Audit" of "Rajarambapu Institute of Technology, Urun Islampur, Maharashtra." during the academic year 2018-2019. The green audit was conducted in accordance with the applicable standards prescribed by Central Pollution Control Board, New Delhi and Ministry of Environment, Forest and Climate Change, New Delhi. The audit involves water, wastewater, energy, air, green inventory, solid waste etc. and gives an 'Environmental Management Plan', which the institute can follow to minimize impact on the institutional working framework. In an opinion and to the best of our information and according to the information given to us, said green audit gives a true and fair view in conformity with environmental auditing principles accepted in India.

Professor and Head
Department of Environmental Science,
Shivaji University, Kolhapur



Dr. P. D. Raut

Professor & Head

Department of Environmental Science

Shivaji University, Kolhapur.

RAJARAMBAPU INSTITUTE OF TECHNOLOGY

An Autonomous Institute, Affiliated to Shivaji University, Kolhapur,

Approved by AICTE New Delhi., D.T.E., Govt. of Maharashtra

NAAC Accredited "A" Grade



DTE Code : EN 6214, MB 6214

Ref: RIT/

Date:

Chairman's message

As a chairman it delights me and ethically motivates me, to learn that RIT has conducted green audit for the current academic year.

RIT has set various precedents of excelling in technological innovations; such innovations though extremely beneficial for the society may sometimes miss the edge of being eco-friendly. But this gap if any has been effectively bridged by Green Audit of this year.

We all are currently thriving in mixed economy whose GDP depends largely on economic activities conducted within the domain of primary sector. Raw material or in layman's language "input" for this sector is crude nature and it's by products Globalization, Industrialization and Urbanization have definitely ill-impacted the crude nature and this is the cause of concern for many. In this context the world has set "Sustainable Development" as its target, what policy makes various stakeholders contribute to achieve this target is something to be watched with vigilance. But at an institute level and as responsible citizen I feel that the best way to inch towards this goal is by maneuvering by using the 3 R principles: Reduce, Recycle, Reuse. On this note I extend my best wishes to all those who want to become eco-friendly and congratulate RIT to pioneer the cause of eco-friendliness.

Thank you.

Shri. Bhagatsinh R. Patil

Chairman BoG

K. E. Society's
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Director's Message



Any enterprise in its day to day functioning directly or indirectly consumes a plethora of natural resources, this consumption though enriches the enterprises may leave an incredible scar on the ecosystem if not reciprocated back in a timely manner.

Having sensed this, RIT annually conducts a green audit to assess its impact on environment. We at RIT believe that green audit is not merely a fault finding exercise but a self initiated healing process. The audit conducted not only gives insights of impact on environment but also directs on a path that scientifically leads to "Sustainable Development"

The audit of this year was conducted under the guidance of a team from Shivaji University. The insights provided by the team are enlighten and I am assured with a sense of satisfaction that we at RIT will ensure "Sustainable Development". On this note I bid adieu to the readers and appeal them to go green.

Thank you.

Dr. Mrs. S. S. Kulkarni

Director.

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Chapter - I

Introduction

1.1 Green Audit, a Tool for Environmental Protection :

The modernization and industrialization are the two important outputs of twentieth century which have made human life more luxurious and comfortable. On the other hand, they are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources and finally making our mother Earth ugly and inhospitable. Today, people are getting more familiar to the global issues like global warming, greenhouse effect, ozone depletion and climate change and so on. Now, it is considered that this is the final call by mother Earth. The time has come to wake up, unite and combat together for sustainable environment.

Green Audit is the most efficient ecological tool to solve such environmental problems. Such audit was invented in late 1970s with the motive for inspecting the work conducted within the organization. It is systematic identification, quantification, recording, reporting and analysis of components of ecological diversity and expressing the same in financial or social terms. Through green audit one gets a direction as how to improve the condition of environment.

1.2 Benefits of Green Audit:

There are many advantages of green audit if is implemented properly:

- It would help to protect the environment in and around the campus.
 - Recognize the cost saving methods through waste minimization and energy conservation.
 - Find out the prevailing and forthcoming complications.
 - Empower the organization to frame a better environmental performance.
 - It portrays good image of institution through its clean and green campus.
- Finally, it will help to built positive impression for the upcoming NAAC visit.

1.3 NAAC Criteria VII Environmental Consciousness :

Green Audit is assigned to the criterion VII of NAAC. National Assessment and Accreditation Council which is a self governing organization that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation of

the institution. The intention of green audit is to upgrade the environmental condition in and around the institution. It is performed by considering some environmental parameters like water and wastewater management, energy conservation, waste management, air monitoring, etc. for making the institution more ecofriendly.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring nature in students. Many environmental activities like plantation and nurturing saplings and trees, cleanliness drives, bird watching camp, no vehicle day, rain water harvesting visits to ecologically important places through green clubs will make the student a good citizen of country.

1.4 Profile of Kasegaon Education Society:

Kasegaon Education Society is one of the leading educational organisations in the Western Maharashtra. It was established in 1945 by Late Shri. Rajarambapu Patil, the leading statesman. Considering the need of time, the Society focused its attention on taking the education to the threshold of the rural masses. The Society started schools in the nearby villages and a hostel for backward class students at Kasegaon.

After the untimely and sad demise of Shri. Rajarambapu Patil in 1984, it was Shri. Jayant Patil, his son, who alike his father entered his public life through educational activities. He shouldered the responsibility of Kasegaon Education Society. Shri Jayant Patil took the society with time, diversifying its educational facilities. Today the society has 31 primary and secondary schools and 15 higher educational institutes under its roof. This includes mainly three arts, commerce and science colleges, two information technology institutes, an engineering college, a polytechnic, two management institutes, a nursing institute, a agricultural polytechnic, a pharmacy college and an international school.

The Society has been conferred with prestigious award like 'Dr. Babasaheb Ambedkar Dalitmitra Puraskar', 'State award for Educational Institutes'. Certificates of appreciation have been also awarded to the Society by C-DAC and MKCL for its exemplary contribution towards computer literacy.

1.5 College profile:

Formerly, Rajarambapu Institute of Technology (RIT) college was known as College of Engineering, Sakharale, established in 1983 has proved to be a landmark development of the society as well as an instrument for expanse of its horizon. It is located near Islampur, 7 kms. away from Peth Naka off Pune -Bengalore highway. RIT has a green

beautiful campus of 17 hectors and buildings on it measuring 49,021 Esq. RIT has emerged as a leading technological Institute in Western Maharashtra through its dedicated and disciplined approach to provide quality technical education over a period more than thirty years.

Rajarambapu Institute of Technology started in 1983 with an intake of 180 students with 03 UG programs and today after 34 years, we are an autonomous institute affiliated to Shivaji University, Kolhapur with 07 UG programs: Automobile Engineering, Civil Engineering, Computer Engineering, Electronics and Telecommunication Engineering, Electrical Engineering, Information Technology, Mechanical Engineering, 12 PG programs: Design Engineering, Electronics Engineering, Production Engineering, Structural Engineering, CAD / CAM Engineering, Automobile Engineering, Construction Management, Computer Science Engineering, Digital Systems, Power Systems, Heat Power Engineering and MBA, 03 Ph. D. centers and 04 Diploma programs in 2nd shift with a total of more than 3,500 students on campus.

VISION:

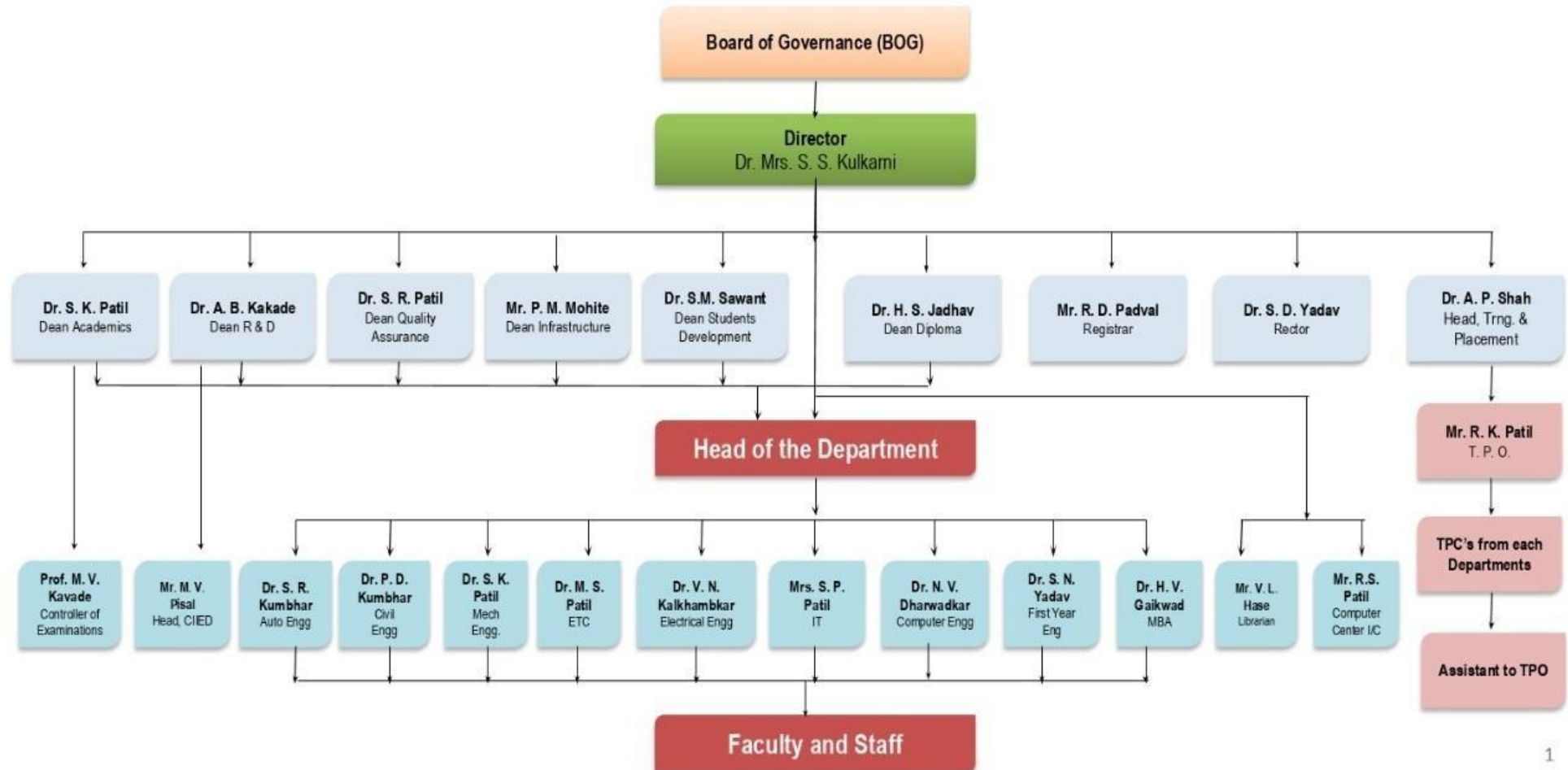
To be a globally recognized institute committed to excellence in academics, research, knowledge creation and delivery to develop socially-responsible professionals.

MISSION:

- To provide innovation and excellence in academic design, delivery and assessment to ensure holistic development of students for employability, entrepreneurship, and higher education
- To design and keep the curricula updated, based on changing needs of industry and society worldwide, and to provide experiential learning through industry connect
- To be at the forefront of emerging technological research, innovation and creation of intellectual property to attract talent
- To retain talent by building relationships based on professionalism, mutual respect, accountability, engagement and integrity
- To leverage alumni to inculcate leadership skills, social awareness and a passion for lifelong learning to make students socially-responsible global citizens

- To build and maintain world-class infrastructure, and adopt modern automation technologies for the purpose of organizational efficiency
- To identify alternate sources of revenue and augment inflows

1.6 Organization Structure of Rajarambapu Institute of Technology, Rajaramnagar :



1.7 Different Programmes offered by Rajarambapu Institute of Technology, Rajaramnagar

Sr. No.	Programmes	Sanctioned Strength
Under Graduate Programmes		
1	Automobile Engineering	60
2	Civil Engineering	60
3	Computer Science and Engineering	60
4	Electrical Engineering	60
5	Electronics & Telecommunication Engineering	60
6	Mechanical Engineering	120
7	Information Technology	60
	UG Total	480
Post Graduate Programmes		
1	Automobile Engineering	18
2	Civil Construction & Management	18
3	Civil – Structural	24
4	Mechanical - Design	24
5	Mechanical - Production	18
6	Mechanical Heat Power Engineering	18
7	Electrical - Power Systems	18
8	Computer Science & Engineering	18
9	CAD /CAM/CAE	18
10	Electronics Engineering	18
11	Electronics - Digital Systems	18
12	Master of Business Administration	120
	PG Total	330

1.8 Awards and Achievements of college:

- SEED has selected RIT for the award Sustainable Institute Industry Partnership (SII) 2014
- Institute received approval from AICTE for the **Diploma courses in second shift** for Civil Engineering and Mechanical Engineering & increase in intake for M.Tech Design Engineering and M. Tech. Civil – Structural Engineering (18 to 24).
- Successfully conducted conference of African Associations at institute from 8th June 2014 to 15th June, 2014.
- **First Graduation Ceremony** of M. Tech./MBA post graduates held on 10th November, 2013 at the auspicious hands of **Hon. Ratan Tata** in year 2013-14.
- DQ-CMR Top T-Schools Survey 2013 - Ranked 52nd as India's Top Engineering Colleges 2013-2014
- Institute has 23 provisionally registered patents.
- RIT has bagged Sri V.V.R. Seshadri Rao, Gudiavelleru Engineering College National Award for **“The Best Private Engineering College 2013”** by ISTE, New Delhi in year 2013-14.
- Best Practices Group of CSE dept. has won “Silver Medal” at QCFI, Pune Chapter - 28th Annual Convention on Quality Circle and allied concepts on 24th August, 2013 in year 2013-14.
- RIT has bagged The **ISTE Best Chapter** Award 2012-2013.
- **RIT** ranked 57th in **CSR-GHRDC- ENGINEERING COLLEGE SURVEY 2013** as top Private Engineering Colleges in India and ranked 6th as top Engineering College in State of Maharashtra, 2012-2013.
- RIT rated as 'AA+' Institute by careers 360 survey- 2013 in year 2012-2013.
- DQ-CMR Top T-Schools Survey 2012 - Ranked 56th as India's Top Engineering Colleges 2012-2013
- North East SUN magazine's Best Engineering Institutes Ranking - RIT is ranked on 30th in the Top 50 Private Engineering Institutes in India 2012-2013.

- RIT rated **30th in the Top 50 Private Engineering** Colleges in India by Dainik Bhaskar Lakshya, 2012-2013.
- Mechanical Engineering department's Quality Circle team has won "Gold Medal" in CCQC held at Quality Circle Forum of India, Pune Chapter on 25th August, 2012. Topic – In Efficiency of Turmeric Processing Plant in year 2012-2013.
- Civil Engineering department's Quality Circle team has won "Silver Medal" in CCQC held at Quality Circle Forum of India, Pune Chapter on 25th August, 2012. Topic – Kalpataru - Air Pollution Control Device for Small Scale Industries in year 2012-2013.
- Departments of Mechanical and Civil Engineering received Excellence award in Quality Circle competition at IIT, Kanpur year 2012-2013.
- The Institute is an Autonomous Institute from 2011-12.
- Institute has received Best Engineering College of Maharashtra Award by Engineering Education Foundation, Pune for the year 2011-2012.
- The Institute is an Autonomous Institute from 2011-12.
- RIT is ranked amongst first ten in the Survey of Industry-linked Engineering Institutes done by AICTE 2010-2011
- Successfully conducted Eye Donation and Eye Checking Camp in associated with Emerging Leaders of Information Technology (ELIT) on 15th September 2012.
- Quality Circle named 'Assured' from Automobile Engineering Department won international award at QC Convention (ICQCC) at Beijing, China in 2007-2008.

1.9 Awards received by Dr. Mrs. S. S. Kulkarni, Director of the Institute:

- Indian Society for Technical Education (ISTE) – Bharatiya Vidya Bhavan National Award for Best Engineering College Principal 2011-2012.
- 'Emerging HRD Thinkers Award' for the paper on Strategic Planning for Effective Implementation of Growth and Development Plan – A Case Study awarded by Indian Society for Training and Development (ISTD), New Delhi through Open Competition.

1.10 Awards received by Faculty & Staff:

- Prof. K. A. Parane and Prof. S. R. Poojara won 1st prize as Distinguished Facilitator at Infosys, Pune under Inspire Faculty contest on 27th June 2014.
- Prof. S. S. Patil, HOD - CSE dept. has won First Prize as Distinguished Facilitator at Infosys, Pune under Inspire Faculty contest on 14th August, 2013 in year 2013-2014.
- Institute Faculty Dr. S. M. Shiyekar has received Best Engineering College Teacher of Maharashtra by Engineering Education Foundation, Pune for the year 2011-2012.
- ISTE – ‘Best Engineering College Teacher Maharashtra State 2011’ award received by Prof. M. T. Telsang in recognition of outstanding contribution to Academic Community in year 2011-2012.
- Prof. M. V. Pisal, Associate Professor, has been awarded “Shikshak Bhushan Puraskar” by Avishkar Foundation, Kolhapur.
- Mr. Shankar Kulkarni has been awarded with the ‘Kala-Ratna Award 2011’ by Maharashtra Journalist Foundation Felicitated by Mr. Ramesh Dev.

1.11 Awards received by Students:

- Mr. Omkar Thorat from S.Y. B. Tech. Civil Engineering has won **Third prize** for his project titled **Measurement of Gas in a LPG Cylinder** on 1st March, 2014 at National Centre for Radio Astrophysics, Tata Institute of Fundamental Research, Pune and Giant Metrewave Radio Telescope, Tal: Junnar, Khodad, Dist: Pune in year 2013-2014.
- Mr. Abhijeet Shete from S. Y. M. Tech. Electrical Power System has received “**BEST PAPER AWARD**” in IEEE International Conference on Knowledge Collaboration in Engineering held at Kathir College of Engineering, Coimbatore, Tamilnadu on 24, 25th January 2014. He presented paper on “The case study of automatic power factor controller on distorted system with overview of harmonics reduction” in year 2013-2014..
- ASME Human Powered Vehicle Challenge India – 2014 hosted by IIT Delhi on 17-19th January, 2014 All Over India 2nd Rank.
- Automobile Engineering students secured 1st Rank in “Eco-Green Vehicle Challenge” organized by SAE at L.D.COE, Ahmadabad, Gujarat on 24-25th April 2014 All Over India 1st Rank
- Students grabbed 2nd position in **ASME-HPVC** hosted by IIT, Delhi in year 2013-14.

- **Students of Electronics department** won 1st prize in “**YUVA ANVESHAK**” competition conducted by IIT, Jodhpur and received funds of Rs. 10 Lakhs in 2012-2013.
- Miss. Kumbhoje Priyanka Ajit and Miss. Khade Ashwini Mahadev won **3rd prize** for the presentation during the 16th ISTE Students National Convention held at Periyar Maniammai University, Vallam, Thanjavur (Tamilnadu) in 2012-13
- Ms. Aditi Sutar & Mr. Prakash Vedpathak under the guidance of Prof. H. S. Jadhav won the **First prize** of International Fair ‘Constro 2012’ at Pune in “Memento Design Competition,” 2012-13.
- Mechanical Branch students grabbed **2nd prize** in Siemens “PLM-GTT” full throttle design competition.

Chapter II

Methodology

The college has conducted Green Audit in the year 2018-19, on a yearly basis. The audit was carried out in three phases.

2.1 Questionnaire survey:

It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to Water and Wastewater management, Energy conservation, Green belt, Carbon inventory, Solid waste management, Hazardous waste management, Air and noise quality status, activities of nature club, etc. should be gathered for the audit purpose. For collecting data related to these different areas, specific questionnaires were prepared.

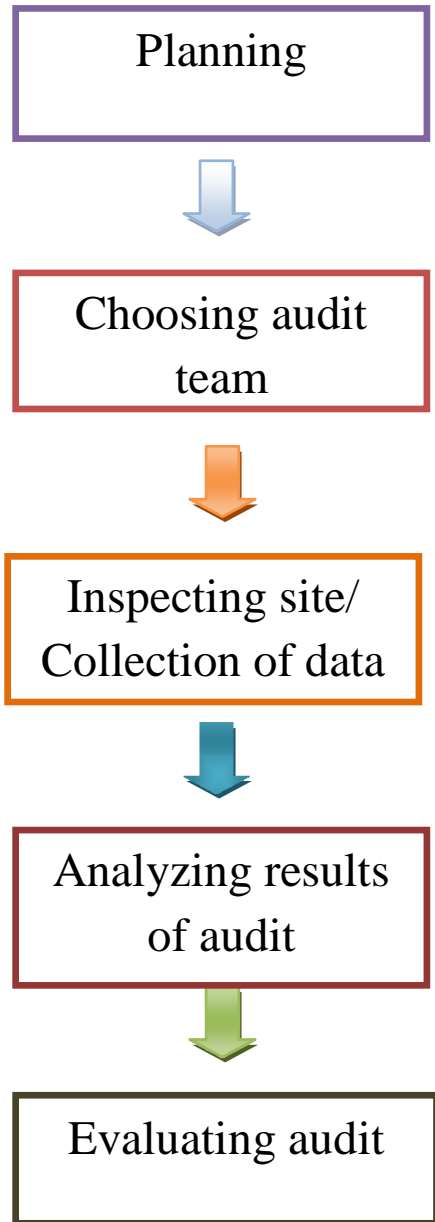
2. 2 Onsite visit and observations:

The data related to above mentioned areas was collected by visiting each and every facility of college campus. The questionnaires were filled up according to the present situation. Photographic documentation was also done with the help of sophisticated camera.

2.3 Data analysis:

After collection of secondary data, the reviews related to each environmental factor were taken by the green audit team. The data was tabulated, analyzed and graphs were prepared using computer. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. The Environmental Management Plan (EMP) was prepared for the next academic year in order to have better environmental sensitization. Finally, all the information was compiled in the form of Green Audit Report.

Environmental Auditing Process



Chapter III

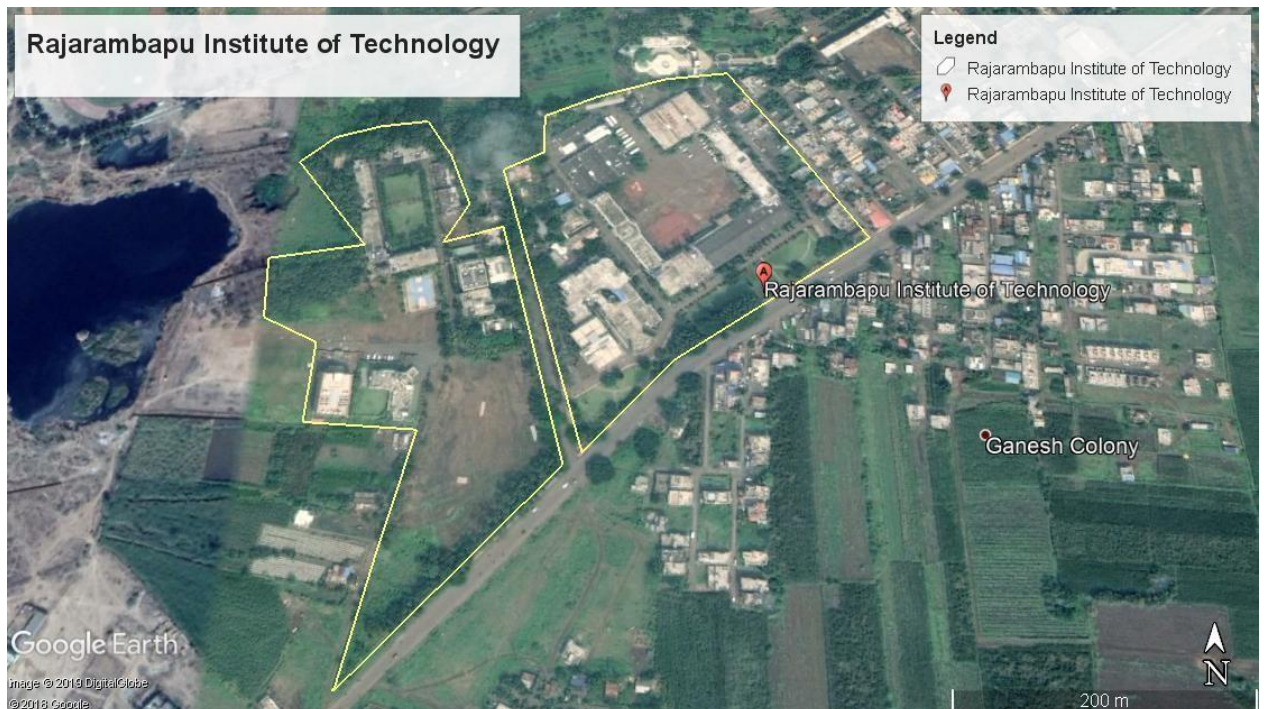
Overview of Green Audit

3.1 Rajarambapu Institute of Technology, Urun Islampur a glance:

Rajarambapu Institute of Technology, Urun Islampur is one of the leading technological institutes in Western Maharashtra. The institute caters seven Under Graduate Programmes and twelve Post Graduate Programmes of Engineering. The institute has huge campus with many classrooms, laboratories, workshops, girl's hostels, boy's hostels, mess, canteens, library building, etc. Enormous manpower including students, administrative faculty, teaching and nonteaching faculty, workers use this huge premises for various purposes.

Rajarambapu Institute of Technology, Urun Islampur is situated in Maharashtra at $17^{\circ}03'48.47''$ N and $74^{\circ}16'59.59''$ E, in the Sangli District. It covers an area of about 17.51 ha.

Satellite image of Campus Rajarambapu Institute of Technology, Urun Islampur



Source: Google Earth

COLLEGE PROFILE IN BRIEF

NAME OF THE COLLEGE:	Rajarambapu Institute of Technology, Urun Islampur, Maharashtra
ESTABLISHMENT:	June 1983
PIONEERS:	Late Shri. Rajarambapu Patil
No. OF STUDENTS:	2500
FACULTY:	175
FACILITIES:	A well-resourced campus with a good infrastructure, Gymkhana, A huge garden and qualified staff. The college is fulfilled with the following facilities like Library, Boys Hostel, ladies hostel and Canteen
RESEARCH AND EXTENSION ACTIVITY:	College conducts different courses for the excellence of PG, Degree and Diploma students of Engineering. The college has a good number of extension activities like plantation of trees, cleanliness drive, cleaning of public places and village, seminars, workshops, environmental awareness campaigns, etc.
AREA OF COLLEGE:	17.51 ha.

3.2 Water and Wastewater Audit:

Water which is precious natural national resource available with fixed quantum. The availability of water is decreasing due to increasing population of nation, as per capita availability of utilizable water is going down. Due to ever rising standard of living of people, industrialization, urbanization, demand of fresh water is increasing day by day. The unabated discharge of industrial effluent in the available water bodies is reducing the quality of these ample sources of water continuously. Hence, the national mission on water conservation was declared by the then Prime Minister Hon. Manmohan Singh in 2003 and appealed to all citizens to collectively address the problem of water shortage, by conserving every drop of water and suggested for conducting water audit for all sectors of water use.

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

Importance of Water Audit:

- Systematic process
- May yield some surprising results
- Easier to work on solutions when the problems are identified.
- A tracking mechanism can be put into place.

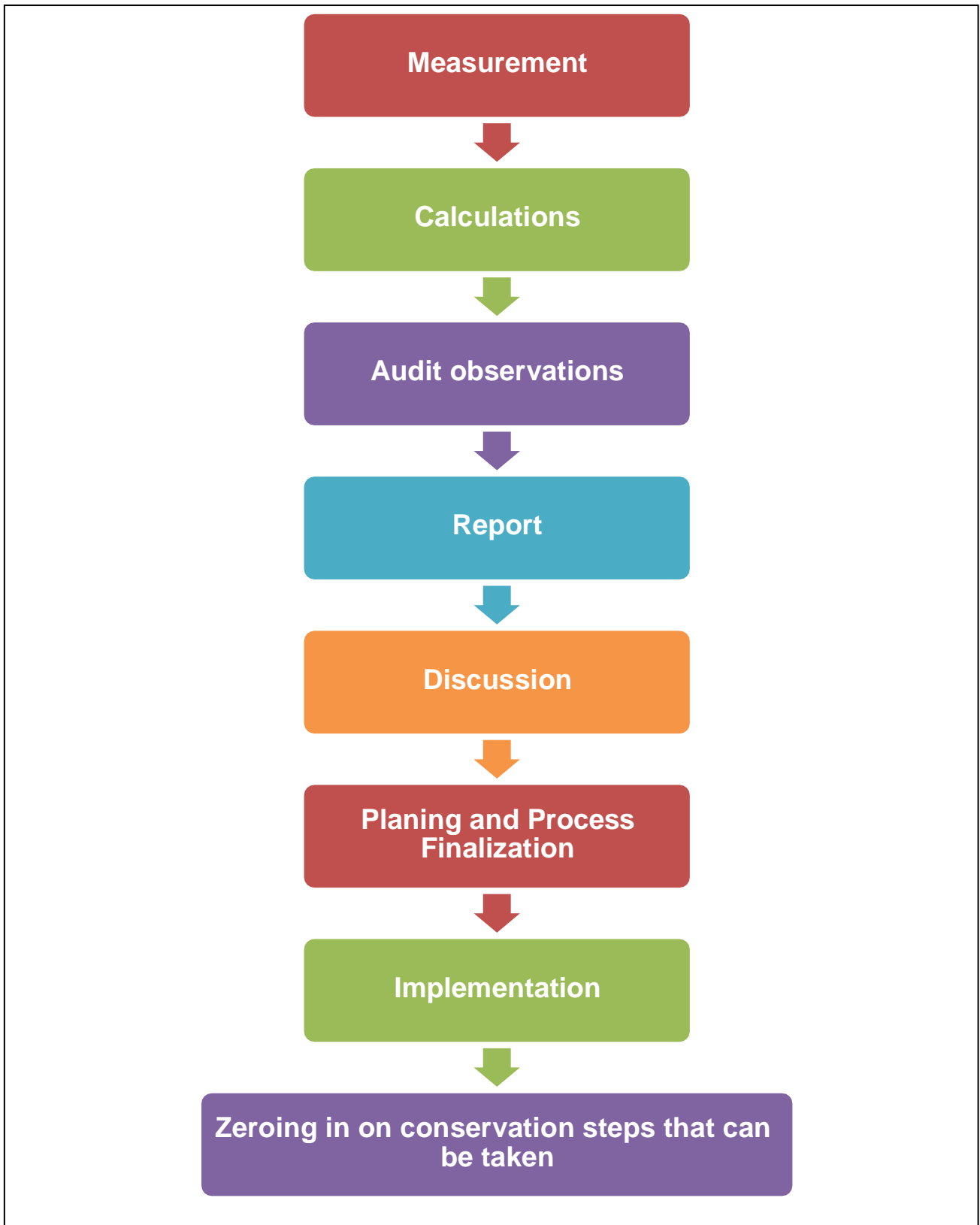
It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology determine the requirement of water. The community which has a population between 20,000 to 100,000 requires 100 to 150 liters per person (capita) per day. The communities with a population can consume over 100,000 - 150 to 200 liters person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools require 2 liters per student; 10-15 liters per student if water-flushed toilets, Administration requires (Staff

accommodation not included) 5150 liters per person per day, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

3.2.1 Water Audit:

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall waters used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system.

Water Audit Process



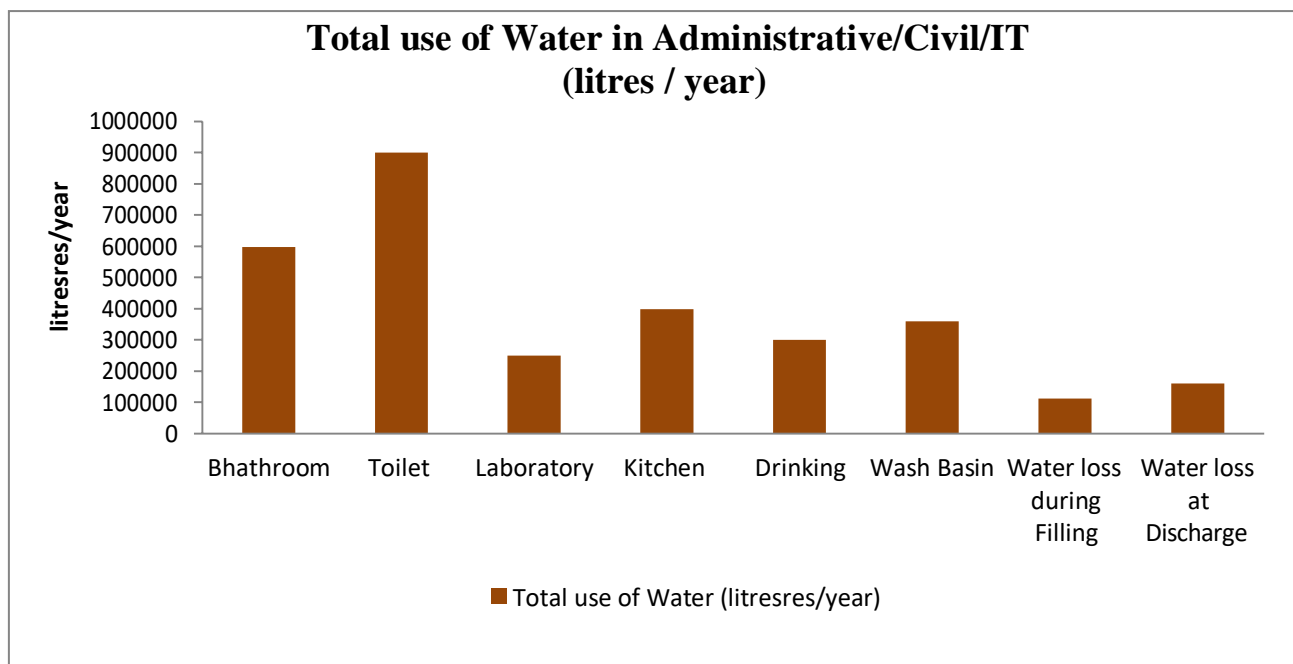
3.2.2 Water consumption in college:

From the data collected for water audit of Rajarambapu Institute of Technology, Urun Islampur, Maharashtra, the water distribution and water consumption pattern is noticed as follows. The college is divided in different sectors such as main building for administrative work and others are different department. For the water audit purpose categorized the college campus area into nine buildings namely as Administrative/Civil/IT, Mechanical/Automobile, Electrical (Instructional Building), CSE/Electronics/MBA (Main Building No. 2), Library (Central Library) Workshops, Hostels and Support services

3.2.2.a The water consumption by Administrative/Civil/IT:

Table No. 3.1: Sector wise calculated use of water in Administrative/Civil/IT

Sr. No.	Sector	Total daily use (liters)	Total yearly use (liters)	Percentage %
1	Bathroom	2,493	5,98,320	17.61
2	Toilet	3,753	9,00,720	26.51
3	Laboratory	2,502	2,50,200	17.66
4	Kitchen	1,660	3,98,400	11.73
6	Drinking	1,250	3,00,000	8.83
7	Wash Basin	1,500	3,60,000	10.6
8	Water loss during Filling	336	1,12,896	2.37
9	Water loss at Discharge	672	1,61,280	4.75
Total		14,166	33,99,840	100



Graph No. 3.1 Total water consumption by Administrative/Civil/IT building yearly

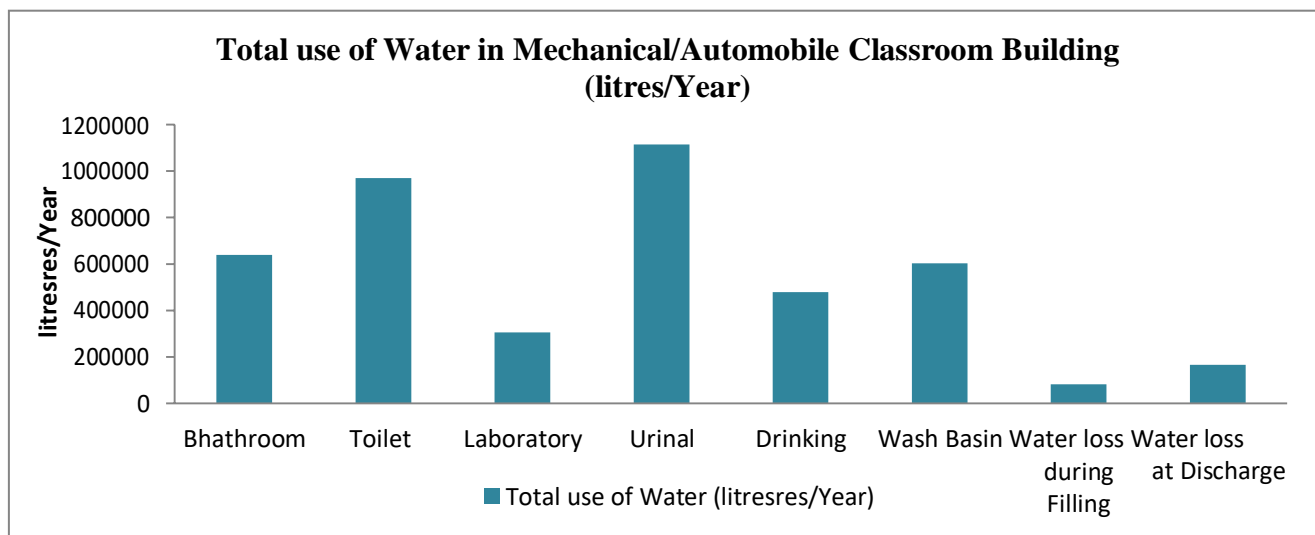
It is revealed from the data given in table no. 3.1 and Graph No. 3.1 shows that total 14,166 litres water is used daily and yearly 3,399,840 litres. In the Administrative/Civil/IT building use of water for bathrooms, toilet, drinking, washes basin, laboratory and kitchen, etc. purpose for daily and also calculated yearly. From above data it is observed that the maximum water consumption was for toilet purpose which is 3,753 litres / day i.e. 9,00,720 litres/year. Water loss during filling of water in tank was noted as 336 litres/day i.e. 1, 12,896 litres/year and water losses at discharge were found to be 672 litres. /day i.e. 1, 61,280 litres/year.

3.2.2.b. Water consumption by Mechanical / Automobile:

Table No. 3.2 Sector wise calculated use of water in Mechanical / Automobile building.

Sr. No.	Sector	Total daily use (liter)	Total yearly use (liter)	Percentage %
1	Bathroom	2,666	6,39,840	13.67
2	Toilet	4,042	9,70,080	20.73
3	Laboratory	3,060	3,06,000	15.69
4	Urinal	4,640	1,11,3600	23.80
6	Drinking	2,000	4,80,000	10.26
7	Wash Basin	2,115	5,07,600	10.85
8	Water loss during	348	83,520	1.78

	Filling			
9	Water loss at Discharge	626	1,50,240	3.21
Total		19,497	46,79,280	100



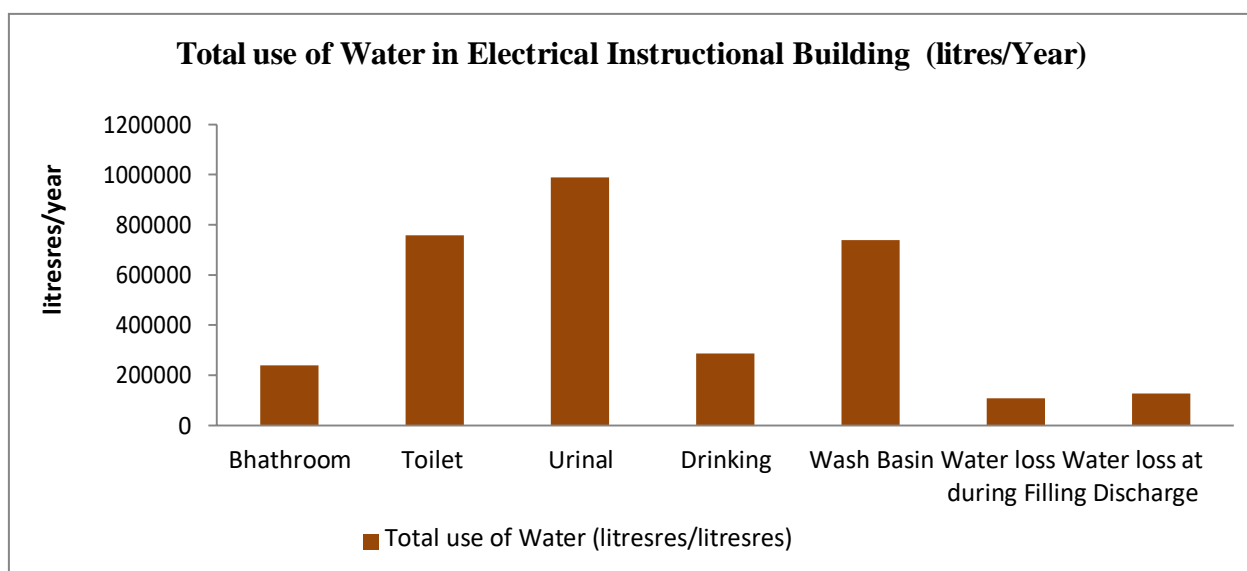
Graph No. 3.2 Total water consumption by Mechanical and Automobile Classroom Building yearly

It is shown from the data given in table no. 3.2 and Graph No. 3.2 that total 19497 litres water is used daily in Mechanical and Automobile building and yearly 46,79,280 litres. In this building use of water for bathroom, toilets, drinking, wash basin, laboratory and urinal etc. purpose for daily and calculated yearly. From above data it is observed that the maximum water consumption was for urinal purpose which is 4,640 litres/ day i.e. 11,13,600 litres/year. For toilet and bathroom purpose 4,042 litres and 2,666 of water required daily while yearly 9,70,080 and 6,39,840 litres respectively. In case of drinking purposes only 2,000 litres while yearly require 4, 80,000 litres. Water loss during filling of water in tank was also noted is 348 litres/day i.e. 83,520 litres/year and water losses at discharge were found to be 626 litres /day i.e. 1, 50,240 litres/ year.

3.2.2.c Water consumption by Electrical Instructional Building.

Table No. 3.3: Sector wise calculated use of water in Electrical Instructional Building

Sr. No.	Sector	Total daily use (liters)	Total yearly use (liters)	Percentage %
1	Bath room	1,000	2,40,000	7.39
2	Toilet	3,160	7,58,400	23.35
3	Urinal	4,120	9,88,800	30.44
4	Drinking	1,195	2,86,800	8.83
5	Wash Basin	3,080	7,39,200	22.76
6	Water loss during Filling	450	1,08,000	3.32
7	Water loss at Discharge	530	1,27,200	3.92
Total		13,535	32,48,400	100



Graph No. 3.3 Total water consumption (yearly) by Electrical instructional building yearly

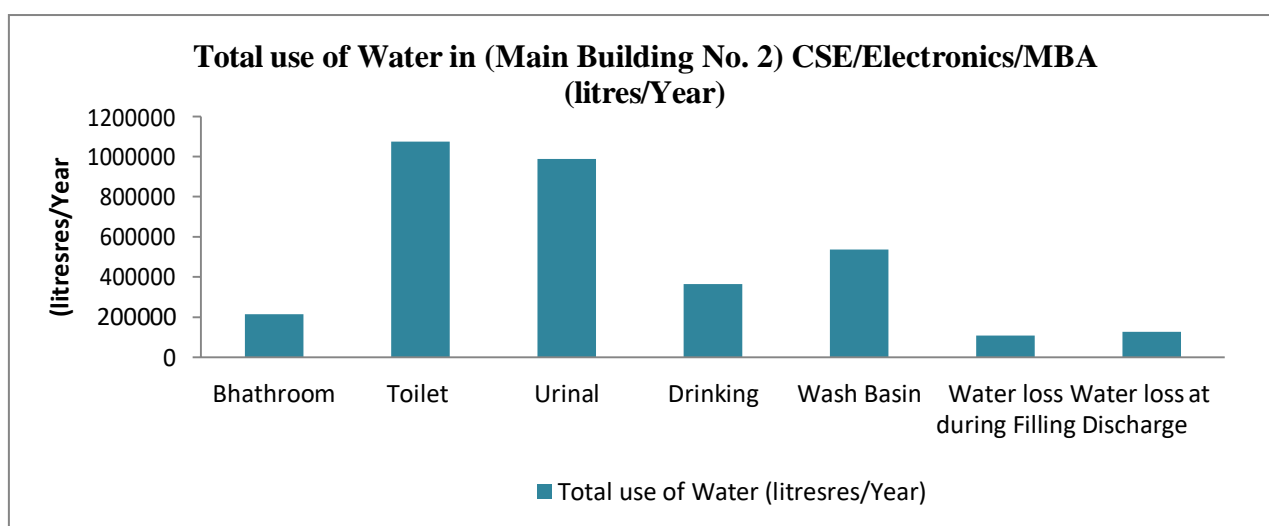
It is revealed from the data given in table no. 3.3 and Graph No. 3.3 shows that total 13,535 litres water is used daily and yearly it is used as 32,48,400 litres. In the Electrical Instructional building use of water for bathrooms, toilet, drinking, wash basin, urinal and wash basin etc. purpose for daily and yearly. From above data it is observed that the

maximum water consumption was for urinal purpose which is 4,120 litres. / day i.e. 98,8800 litres/year. Water loss during filling of water in tank was noted as 450 lit/day i.e. 1,08,000 litres/year and water losses at discharge were found to be 530 litres/day i.e . 1,27,200 litres/year.

3.2.2. d Water consumption by CSE/Electronics/MBA (Main Building No. 2):

Table No. 3.4 Sector wise use of water in CSE/Electronics/MBA (Main Building No. 2).

Sr. No.	Sector	Total daily use (litre)	Total yearly use (litre)	Percentage %
1	Bathroom	900	2,16,000	6.66
2	Toilet	4,480	10,75,200	33.13
3	Urinal	3,402	9,88,800	25.16
4	Drinking	1,520	3,64,800	11.24
5	Wash Basin	2,240	5,37,600	16.57
6	Water loss during Filling	450	1,08,000	3.33
7	Water loss at Discharge	530	1,27,200	3.92
Total		13,522	32,45,280	100



Graph No. 3.4 Total water consumption by CSE/Electronics/MBA (Main Building No. 2)

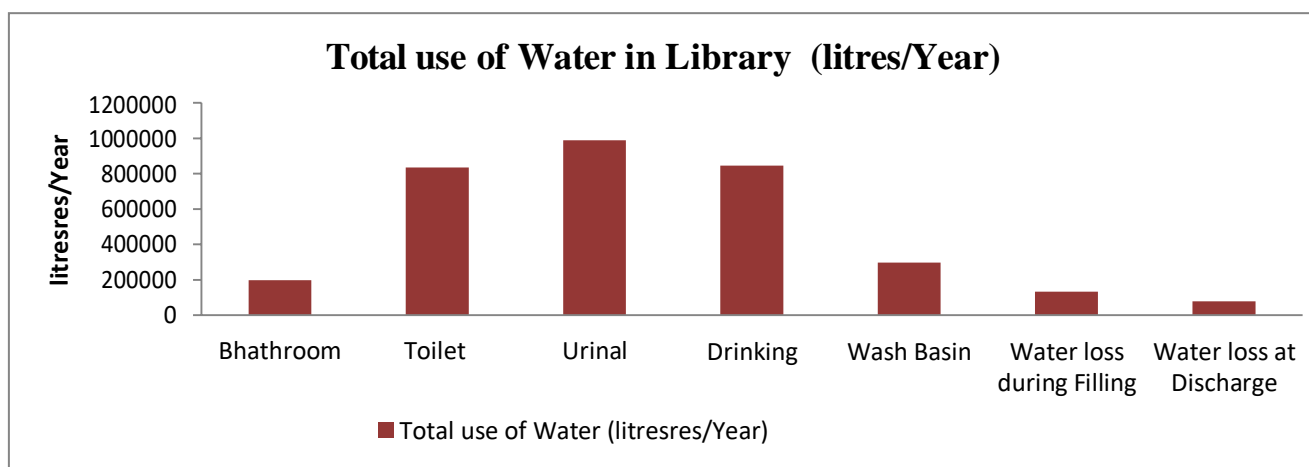
It is shown from the data given in table no. 3.4 and Graph No. 3.4 that total 13522 litres water is used daily in CSE/Electronics/MBA building i.e. Main Building No. 2 while

yearly use is used as 32,45,280 litres. Use of water for bathroom, toilets, drinking, wash basin, and urinal etc. purpose for daily and also calculated yearly. From above data it is observed that the maximum water consumption was for toilet purpose which is 4,480 litres/day i.e. 10, 75,200 litres/year. For urinal and washbasin purpose 3,402 litres and 2,240 litres of water is required daily 9, 88,800 and 5,37,600 litres yearly. Daily use for drinking purpose is only 1,520 litres while yearly 3,64,800 litre. Water loss during filling of water in tank was noted as 450 litres/day i.e. 10,8000 litres/year and water losses at discharge were found to be 530 litres /day i.e . 32,45,280 litres/ year.

3.2.2.e Water consumption by Library (Central Library):

Table No. 3.5: Sector wise calculated use of water in Library (Central Library)

Sr. No.	Sector	Total daily use (litres)	Total yearly use (litres)	Percentage %
1	Bath room	825	1,98,000	6.09
2	Toilet	3,480	8,35,200	25.69
3	Urinal	3,602	9,88,800	26.59
4	Drinking	3,520	8,44,800	25.98
5	Wash Basin	1,240	2,97,600	9.15
6	Water loss during Filling	550	1,32,000	4.06
7	Water loss at Discharge	330	79,200	2.44
Total		13,547	32,51,280	100



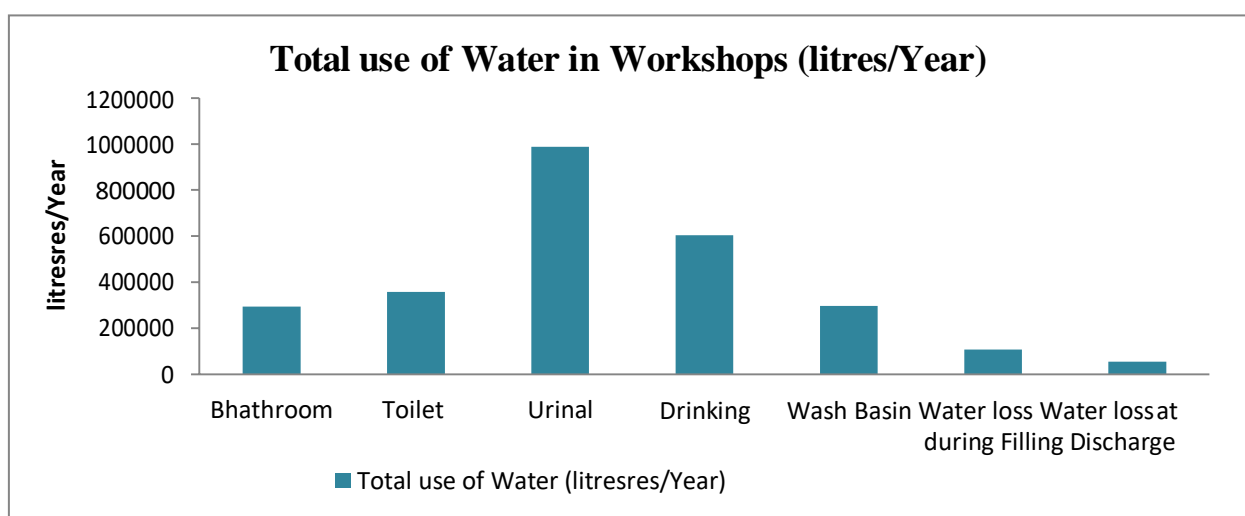
Graph No. 3.5 Total water consumption by Library (Central Library) yearly

It is shown from the data in table no. 3.5 and Graph No. 3.5 that total 13,547 litres water is used daily and 32,51,280 litres/yearly. In the Workshops use of water for bathrooms, toilet, drinking, urinal and wash basin etc. Purpose was calculated for daily and yearly. From the above data it is observed that the maximum water consumption was for urinal purpose which is 3602 litres/ day i.e. 83,5200 litres/year. Water loss during filling of water in tank was noted as 550 litres/day i.e. 1,32,000 litres/year and water losses at discharge were found to be 330 litres /day i.e . 79,200 litres/ year.

3.2.2. f. Water consumption by Workshops:

Table No. 3.6 Sector wise calculated use of water in Workshops.

Sr. No.	Sector	Total daily use (litre)	Total yearly use (litre)	Percentage %
1	Bathroom	1,225	2,94,000	12.55
2	Toilet	1,492	3,58,080	15.29
3	Urinal	2,602	9,88,800	26.66
4	Drinking	2,520	6,04,800	25.82
5	Wash Basin	1,240	2,97,600	12.71
6	Water loss during Filling	450	1,08,000	4.61
7	Water loss at Discharge	230	55200	2.36
Total		9,759	23,42,160	100



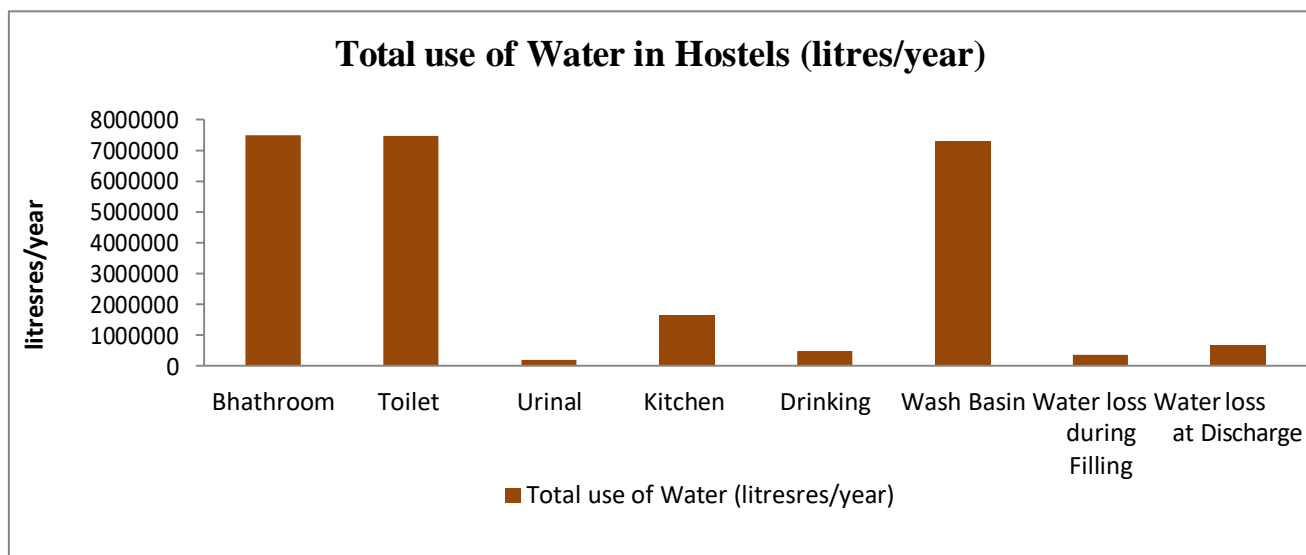
Graph No. 3.6 Total water consumption by Workshops yearly

It is shown from the data given in table No. 3.6 and Graph No. 3.6 that total 9,759 litres water is used daily in workshops. There are total six workshops on RIT campus. In the workshops water consumption is 23, 42,160 litres/yearly. In this building use of water for Bathroom, toilets, drinking, wash basin, and urinal etc. Purpose (is calculated) for daily and yearly. From the above data it is observed that the maximum water consumption was for urinal purpose which is 2,602 litres/ day i.e. 9,88,800 litres/year. For bathroom and toilet purpose 1,225 litres and 1,492 litres of water required daily while yearly it is 2,94,000 and 3,58,080 litres respectively. In case of drinking purposes 2,520 litres while yearly require 6,04,800 litres. Water loss during filling of water in tank was noted as 450 litres/day i.e. 1,08,000 litres/year and water losses at discharge were found to be 230 litres /day i.e . 55,200 litres/ year.

3.2.2. g. Water consumption by Hostels (Girls and Boys hostels):

Table No. 3.7 Sector wise calculated use of water in Hostels (Girls and Boys hostels).

Sr. No.	Sector	Total daily use (litres)	Total yearly use (litres)	Percentage %
1	Bath room	31,241	74,97,840	29.14
2	Toilet	31,128	74,70,720	29.03
3	Urinal	1,886	1,88,600	1.76
4	Kitchen	6,772	16,25,280	6.32
4	Drinking	1,994	4,78,560	1.86
5	Wash Basin	30,355	72,85,200	28.31
6	Water loss during Filling	1,075	3,61,200	1.00
7	Water loss at Discharge	2,768	6,64,320	2.58
Total		1,07,219	2,57,32,560	100



Graph No. 3.7 Yearly consumption of water by Hostels (Girls and Boys)

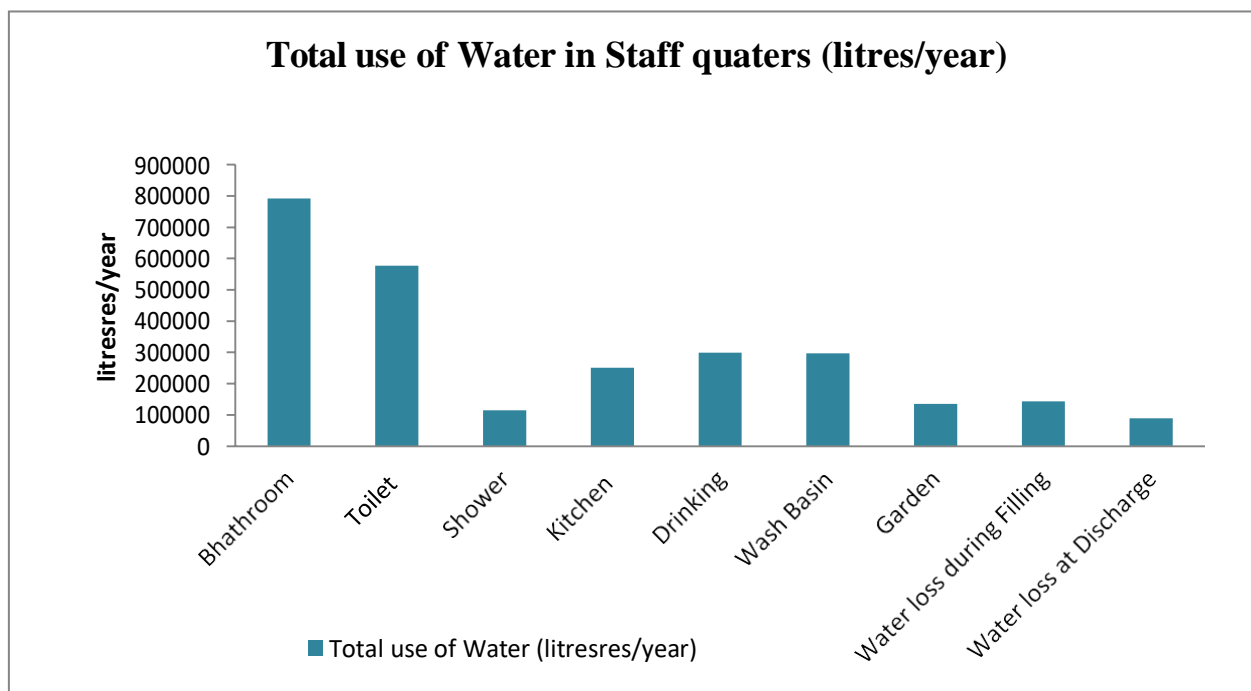
It is revealed from the data given in table No. 3.7 and Graph No. 3.7 shows that total 1,07,219 litres water is used daily and 2,57,32,560 litres. Yearly Both girls and boys hostels building use water for bathrooms, toilets, drinking, urinal and wash basin etc. purpose is calculated daily and yearly. From above data it is observed that the maximum water consumption was for bathroom purpose which is 31,241 litres/ day i.e. 74,97,840 litres/year. Water loss during filling of water in tank was noted as 1,075 litres/day i.e. 3,61,200 litres/year and water losses at discharge were found to be 2,768 litres /day i.e . 6,64,320 litres/ year.

3.2.2. h. Water consumption by Staff quarters:

Table No. 3.8 Sector wise use of water in Staff quarters

Sr. No.	Sector	Total daily use (litre)	Total yearly use (litre)	Percentage %
1	Bathroom	3,299	7,91,760	28.14
2	Toilet	2,403	5,76,720	20.50
3	Shower	1,146	1,14,600	9.77
4	Kitchen	1,042	2,50,080	8.89
5	Drinking	1,243	2,98,320	10.60
6	Wash Basin	1,235	2,96,400	10.53
7	Garden	561	1,34,640	4.79
8	Water loss during Filling	426	1,43,136	3.63

9	Water loss at Discharge	369	8,85,60	3.15
Total		11,724	28,13,760	100



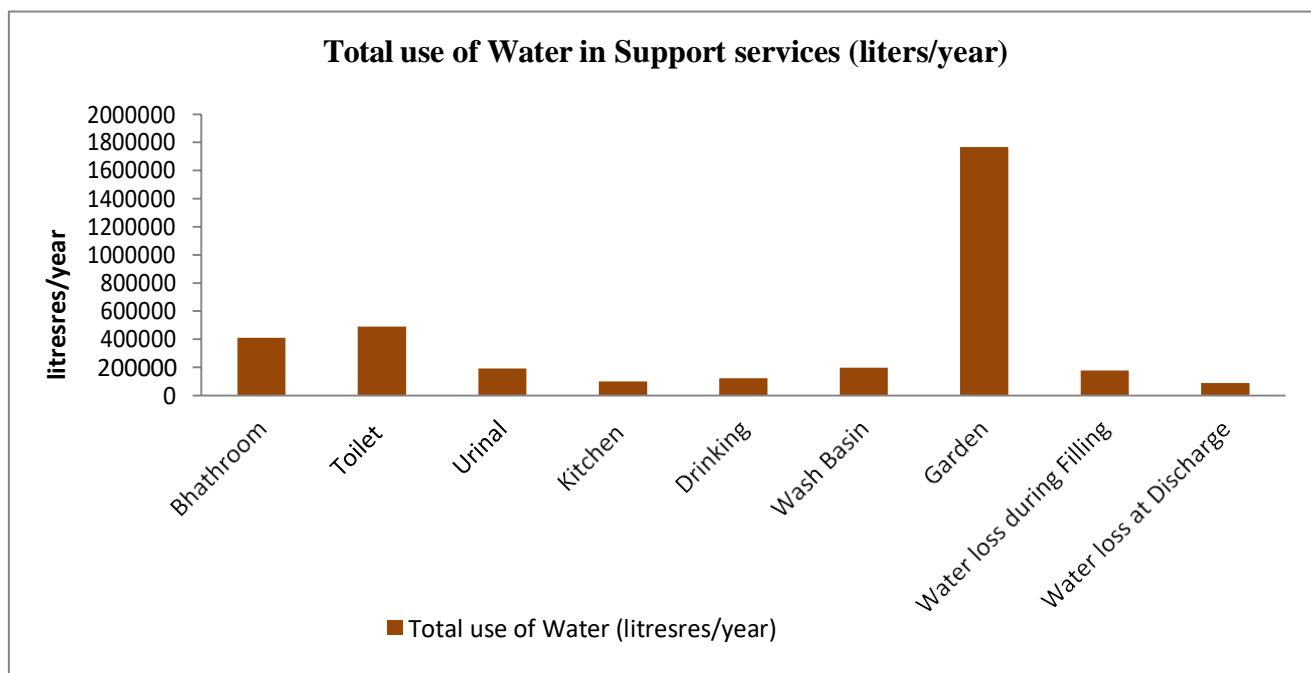
Graph No. 3.8 Yearly water consumption by Staff Quarters

The data given in table no. 3.8 and Graph No. 3.8 shows that total 11,724 litres of water is used daily and (28,13,760 litres/yearly) in Staff quarters. Use of water for bathroom, toilets, drinking, shower, kitchen and wash basin etc purpose for daily and also calculated yearly. From above data it is observed that the maximum water consumption was for Bathroom purpose which is 3,299 litres. / day i.e. 7,91,760 litres/year. For toilet and shower purpose 2,403 litres and 1,146 litres of water required daily while yearly 5,76,720 and 1,14,600 litres respectively. In case of drinking purpose 1,243 litres while yearly require 2,98,320. Water loss during filling of water in tank was noted as 426 litres/day i.e. 1,43,136 litres/year and water losses at discharge were found to be 369 litres /day i.e . 88,560 litres/year.

3.2.2. i. Water consumption by Support services (PG Structural Lab, Canteen, Gymnasium (Sports office) ,Guest House and Garden:

Table No. 3.9 Sector wise calculated use of water in Support services (PG Structural Lab, Canteen, Gym (Sports office) ,Guest House and Garden)

Sr. No.	Sector	Total daily use (liters)	Total yearly use (liters)	Percentage %
1	Bath room	1,710	4,10,400	10.91
2	Toilet	2,035	4,88,400	12.98
3	Urinal	1,920	1,92,000	12.25
4	Kitchen	420	1,00,800	2.68
5	Drinking	510	1,22,400	3.25
6	Wash Basin	826	1,98,240	5.27
7	Garden	7,361	17,66,640	46.96
8	Water loss during Filling	526	1,76,736	3.36
9	Water loss at Discharge	368	88,320	2.35
Total		15,676	37,62,240	100

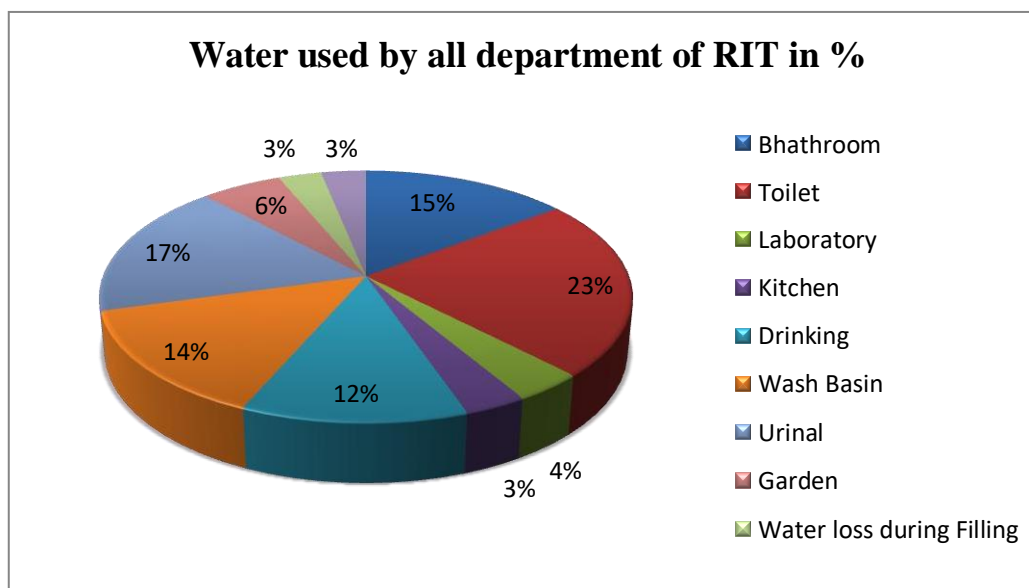


Graph No. 3.9 (Yearly) water consumption by Support services.

It is revealed from the data given in table no. 3.9 and Graph No. 3.9 shows that total 15676 liters water is used daily in Support services which include PG Structural Lab, Canteen, Gymnasium (Sports office) ,Guest House and Garden.

In the Support services water consumption is 37, 62,240 litres/yearly. In this Building use of water for bathroom, toilets, drinking, wash basin, kitchen and garden etc. purpose for daily and also calculated yearly. From above data it is observed that the maximum water consumption was for Garden purpose which is 7,361 litres/ day i.e. 17,66,640 litres/year. For Toilet and Urinal purpose 2,035 litres and 1,920 litres of water required daily while yearly 4,88,400 and 1,92,000 litres respectively. In case of drinking purposes 510 litres while yearly require 1,00,800. Water loss during filling of water in tank was noted as 526 litres/day i.e. 1,76,736 litres/year and water losses at discharge were found to be 368 litres /day i.e 88,320 litres/ year

3.2.2. j. Average daily water consumption by Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.



Graph No. 3.10 Average Daily Water consumption by Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

Graph No. 3.10 shows the total percent of water consumed by the Rajarambapu Institute of Technology . As per the graph toilets, urinal, bathrooms and wash basins are the major sources of utilization comprising 23%, 17 %, 15% and 14 % respectively. The other uses namely laboratory, kitchen, garden and drinking purpose consume relatively less water

with daily water requirement of 3.71 % (Laboratory), 3.9 % (Kitchen), 5.75% Garden and 11.85 Drinking respectively.

3.2.3 Wastewater management in the college:

The total wastewater generated in campus is approximately 50,000 lit/day. The whole water from academic campus is collected and is discharged to municipal drainage line at two different places. Wastewater of south half portion of residential area is collected at a point and then released to municipal drainage line and north half side wastewater is released to sugar factories agricultural land. All this water flows through open drainage lines.

To reuse grey water the institute installed grey water treatment plant of 4.5 m³/ day capacity. Waste grey water of hostel is stored in a tank and further goes for treatment. About 4,500 liters of water is treated in this treatment plant and remaining water goes to municipal drainage line. Treated water is then used for garden purpose.



Gray water treatment plant of 40 thousand liters per day capacity



Wastewater treatment in the phytoremediation tank

Key Observations:

- The calculation revealed that the highest water use sector is toilets which consumes average 23% water and remaining 77% water consumption further divided into other sectors in such bathrooms, washbasins, urinals, laboratory, kitchens and garden.
- College has Rain water harvesting plant which is in good condition. About 1000 m³/year rain water is harvested.
- The institute has waste water management practices such as grey water treatment plant for wastewater coming from hostels and phytoremediation plant. The water after treatment is used for irrigation purpose. Along with is college should include Landscape Areas, and Water Sub Metering etc. To save water.

3.3 Solid waste audit of the college:

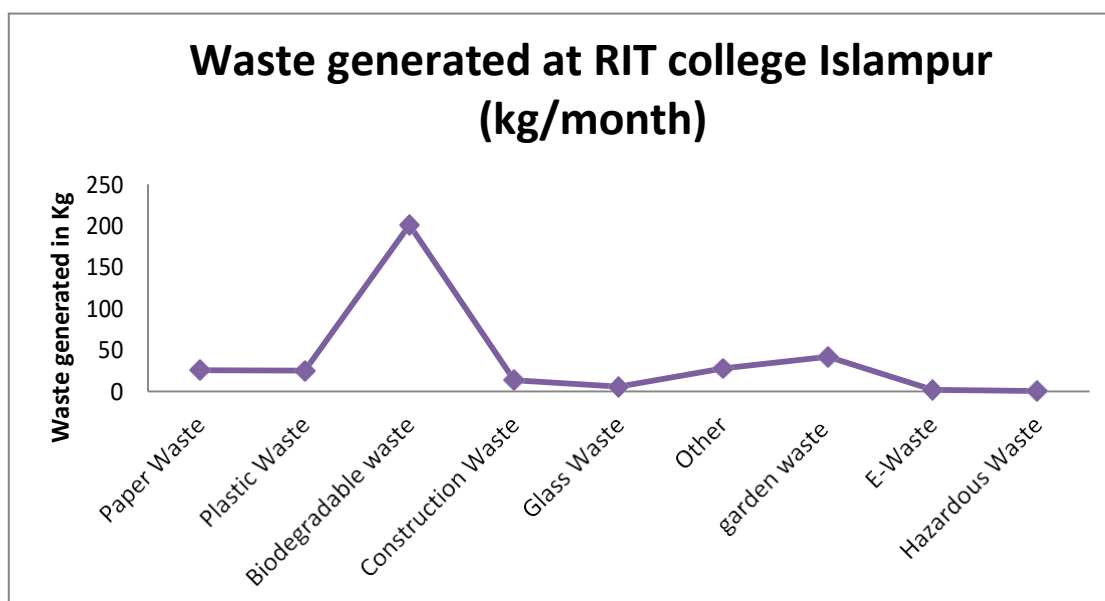
Solid waste management is becoming a major public health and environmental concern world over. Improper solid waste disposal leads to substantial negative environmental impacts e.g. pollution of air, soil, water and generation of greenhouse gases from landfills. Many insect borne diseases are spread through garbage. Therefore, it is necessary to manage the solid waste appropriately to reduce the load on waste management system. The intention of this inventory is to find out the quantity, volume, type and current management practice of solid waste generation at Rajarambapu Institute of Technology, Rajaramnagar.

RIT solid waste audit was conducted by dividing the college into Administrative, Civil and IT building, Mechanical, Electrical, MBA, Workshops, Library, Girls Hostel Boys hostel, Gymkhana, Canteen and Cafeteria, Guest House, Quarters and garden premises of RIT. Different types of waste are generated in the RIT campus. College has given yearly contract to private sanitary contractor to maintain cleanliness and hygiene conditions at indoor. The contractor use floor cleaning machine for two times in a day for indoor cleanliness of the college. Also, three different coloured dustbins are fixed in the administrative building which is used for segregation of plastic, dry waste and wet waste respectively. Considering its categorisation into biodegradable and non biodegradable waste, the further management is done.

3.3.1 Generation of solid waste in college:

Table No.3.10: Category wise solid waste generation in college (kg/month)

Departments	Paper waste	Plastic waste	Biodegradable waste	Construction waste	Glass waste	Other	Garden waste	E-waste	Hazardous waste
Quantity (kg/month)	25.73	25.1	201	13.8	5.9	27.96	41.9	2.05	0.5
Quantity (kg/year)	257	251	2010	138	59	279.6	419	20.5	5



Graph No. 3.11: Category wise solid waste generation in college (kg/month)

The average amount of solid waste generated per month in Rajarambapu Institute of Technology, Rajaramnagar is approximately 302 kg/month. On the basis of observations the highest quantity of solid waste generated is biodegradable waste which is about 201 kg/month. This waste is produced from hostel mess, Canteens, Cafeteria, Quarters, Gymkhana and Gardens. The leaf litter produced in the garden and premises is 41.9 kg/month. The total amount of biodegradable waste from gardens, hostel mess and canteens, it is 201 kg/ month, which is a very high quantity of biodegradable waste. The biodegradable kitchen waste from hostel mess is utilised for biogas production while the garden waste is utilised for composting.

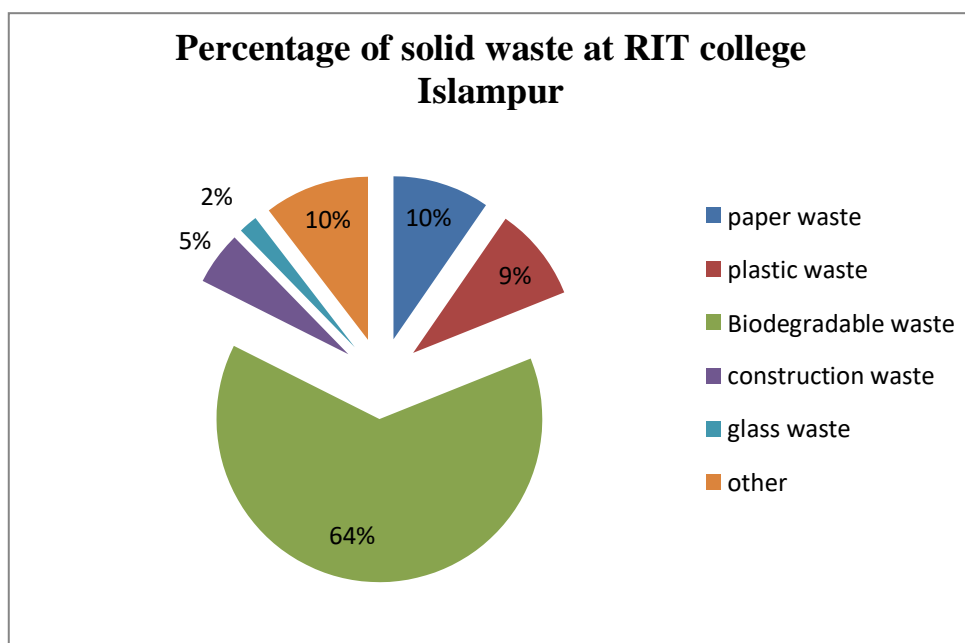
The other waste involves the metal pieces and wooden saw dust waste mostly generated in workshops .The activities in workshops generate approximately 30 kg of metal fragments with small pieces and 1.6 kg of wooden saw dust per month. Plastic waste in the form of packaged food wrappers, old broken chairs, old broken water tanks, etc and plastic water bottles is approximately 25kg/ month.

The institute is following paperless policy. The internal examinations of the students are conducted through online as well as the circulars are sent to the departments through emails. The answer books are disposed after use as per the University norms. The cardboards wrappers and boxes are sold to the scrap owners as per the decision made by the central committee meeting. Therefore, considering all the departments and manpower very less i.e. 25 kg/month waste is generated in the institution.

The glass waste is produced in minimum quantity i.e. 5.9 kg/month which is generally in the form of broken glassware, cups and glasses used in canteens and hostel mess. Besides, the above mentioned wastes, plastic waste is generated in the form of plastic wrappers of food items.

Table No. 3.11: Percentage of category wise solid waste in the college (kg/month)

Category	Paper waste	Plastic	Biodegradable-waste	Construction waste	Glass waste	Other	Total solid waste %
Percentage (%)	9.61	9.33	63.48	5.27	1.87	10.42	100



Graph No. 3.12: Percentage of solid waste generation in the college (kg/month)

Percentage wise distribution of different sources of solid waste is shown in the above graph. The maximum percentage of solid waste generated is of construction waste which is 64 % and minimum percentage of glass waste generated is about 2 %. The biodegradable waste is produced mostly through canteens, hostel mess and garden litter in the campus.

3.3.2 Status of solid waste generation in various departments and campus (kg /month):

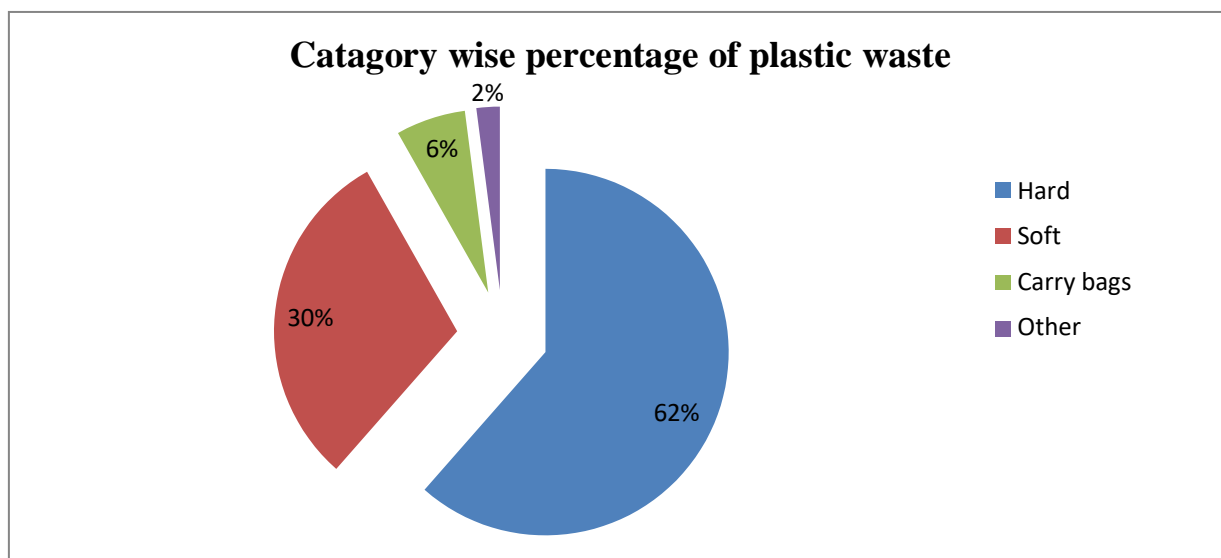
For solid waste audit, the college campus and buildings are divided into 13 different areas and the data was collected using questionnaire, actual site visit and discussion with the concern faculty members.

Table No. 3.12: Category wise solid waste generation in the college (kg /month)

Areas and Building	Paper waste	Plastic waste	Biodegradable waste	Construction waste	Glass waste	other	E-waste	Hazardous waste
Admin, Civil and IT	2.5	0.2	--	1.8	0.8	0.2	0.2	0.2
Mechanical	0.8	0.1	--	--	--	--	0.3	0.1
Electrical	0.6	0.1	--	--	--	--	0.5	--
MBA	0.7	0.1	--	--	--	--	0.2	--
Workshops	6.33	0.2	--	--	--	26.66	0.4	0.2
Library	0.9	1.5	--	--	--	--	-	--
Girls Hostel	2	0.8	50	7	0.2	0.2	0.1	--
Boys hostel	1.8	0.5	55	5	0.3	0.2	0.1	--
Gymkhana	0	0.6	8				0.05	--
Canteen and cafeteria	5	20	40	--	3.8		0.1	--
Guest House	1.5	0.3	7		0.2	0.1		--
Quarters	3	0.2	6	0.5	0.1	0.3	0.1	--
Garden and college premises	0.6	0.5	35	5	0.5	0.3	--	--
Total solid waste generated (kg/month)	25.73	25.1	201	13.8	5.9	27.96	2.05	0.5
Total solid waste generated (kg /year)	257.3	251	2010	138	59	279.6	2 0.5	5

Table No.3.13: Plastic waste generation and its distribution in the college

Category	Plastic kg/ month				Total
	Hard	Soft	Carry bags and water bottles	Other	
Quantity	14	8.4	2.1	0.6	25.1
Percentage	62	30	6	2	100



Graph No. 3.13: Categorization of plastic waste at (kg / month)

Graph No. 3.13 shows that the hard plastic in the form of broken chairs, tables and old scientific models of projects produce higher amount of hard plastic. The soft plastic accounts 30% of plastic while the carry bags, packaged food items in canteens are present about 30%.

3.4.1 Hazardous waste audit of the college:

The sources of hazardous waste in the institution are very less. The amount of hazardous waste generated in the institution is 0.5 kg/month. The major source of hazardous waste in campus is the sanitary napkin waste generated in girl's hostels. Improper disposal of such waste can cause serious health effects. But, the college has provided the facility of incinerator in each girl's hostel which has solved this major problem.

Very less quantity of hazardous waste and effluent are generated through chemical laboratories during the use of acids and chemicals, fumes in the practical's. Further, the hazardous effluent gets diluted with remaining grey water and sewage generated in the campus and therefore, the toxicity get decreased. The workshops generate less quantity of oils, tars and cotton swabs which are used in the internal road construction of the college.



Incinerator used for disposal of sanitary napkins in the girl's hostel.

3.4.2 E-waste generation in the college :

Generation of e-waste is found on every educational institute. It is observed that the e-waste generated at Rajarambapu Institute of Technology, Rajaramnagar is of Schedule II category. computers, printers, laptops, scanners, internet routers and xerox machines are used for administrative and laboratory work. The wire required for the connectivity also gets included in the e waste. The IT department of the college has its own computer laboratory of 200 computers. Besides this department, each department and administration use computers and laptops for their routine work.

The college has made its policy for e waste management. A committee examines the status of electronic equipments considering its working condition and decides its further disposal. If, some parts of computers are in good condition, then these are used in assembling new computers. Such computers are given to school laboratories in nearby villages. The remaining damaged computers are given for e waste recycling to an authorised dealer, Mahalaxmi e Recyclers. As per the data received by the Mahalaxmi e Recyclers. The college has handovered them about 5500 kg and 3540 kg of e waste on 24th January and 6th February 2019 respectively.



E waste recycling certificates given by Mahalaxmi e Recycler, Kolhapur.

3.4.3 Eco-friendly solid waste management practices:

The college follows following eco friendly solid waste management practices.

1. Composting: -

The collage has the 2 m³ of composting plant near library. The leafy waste is collected from the campus and dumped here for composting purpose.



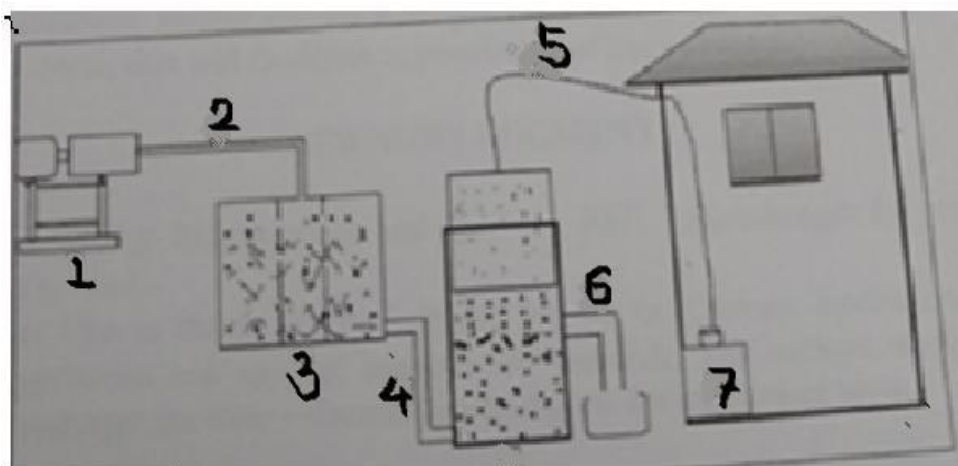
Garden waste generated in the campus



Composting pit near library

2. Biogas Plant:-

The food waste from boy's hostel is treated in the biogas plant having capacity of 10 m³. This anaerobic digester is designed by Appropriate Rural Technology Institute (ARTI), Pune. The digester is constructed using floating gas holder system while the cylindrical shape was adopted to enhance better mixing. It is designed with a crusher stand and pre digester unit, floating biogas digester and slurry outlet. The biogas generated from these plants is then used for cooking.



Schematic view of Biogas digester setup in the college

1. Crusher with stand 2. Feedstock inlet pipe 3. Pre digester unit 4. Hose from pre digester to digester 5. Biogas digester 6. Hose from digester gas cooker 7. Slurry outlet



Biogas digester near boy's hostel

3. Recycling of E- waste :

The remaining damaged computers are given for e waste recycling to an authorised dealer, Mahalaxmi e Recyclers. Electronic waste generated from the collage is repaired and used for demonstration for students or made available to students for the project Work.

4. Vermicomposting plant :

The waste generated from the campus such as landscaping waste, kitchen waste is used to run vermicomposting plant situated near boys hostel



Vermicomposting pit near boy's hostel

Key Observations:

- The average waste generated in the college is app. 302 kg /month
- Highest quantity of solid waste is of biodegradable waste around 201 kg/month.
- Biodegradable waste is utilized properly for composting and biogas generation.
- Plastic waste is generated 25.1 kg/month in the college campus.
- The E- waste generated from damaged computers is given to the dealer for recycling. Also, some part is repaired and used for demonstration for students or made available to students for the project work.
- Cleanliness and hygienic conditions were maintained in the campus.

3.5 Ambient air quality status:

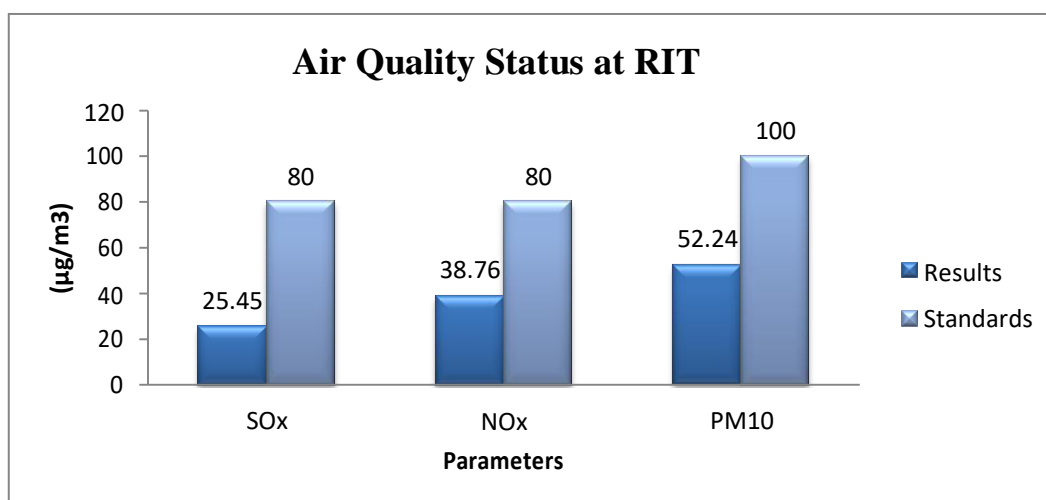
Ambient air sampling is important part of environmental monitoring. Particulate matter and trace gases sampling were carried out on the college campus. The sampling was carried out using calibrated Handy Dust Sampler APM 821 with flow rate 1 lit/min equipped with glass fibre filter paper (size 25 mm). The sampling period was 4 hrs.

Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO_x) in the air were estimated with West and Gaeke method and Jacob and Hochheiser modified method respectively. Particulate matter (PM₁₀) was measured gravimetrically. The samples were collected and analyzed in the laboratory of Department of Environmental Science, Shivaji University, Kolhapur. The details of air quality status in the college are given in the Table no. 3.14 and Graph No. 3.14.

Table no. 3.14 Ambient air quality status in Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

Sr. No.	Parameters	Results ($\mu\text{g}/\text{m}^3$)	CPCB Standards ($\mu\text{g}/\text{m}^3$)
1	SO _x	25.45	80
2	NO _x	38.76	80
3	PM ₁₀	52.24	100

RIT institute is adjoining to the village main road. It was observed that all the air quality parameters analyzed were within the Ambient Air Quality Standards of Central Pollution Control Board, (CPCB) India. The air quality is good in the college campus.



Graph No. 3.14 Ambient air quality status in college

3.6 Ambient noise monitoring status:

Ambient noise monitoring was carried out in different areas of college campus like at college campus entry, corridor, first floor and ladies hostel. The sampling was carried out using calibrated Sound Level Meter (AZ 8921) by logarithmic scale in Decibels (dB). The noise readings were collected in the college campus and calculated. The details of noise status in college campus are given below in the Table No. 3.8 and Graph No. 3.8

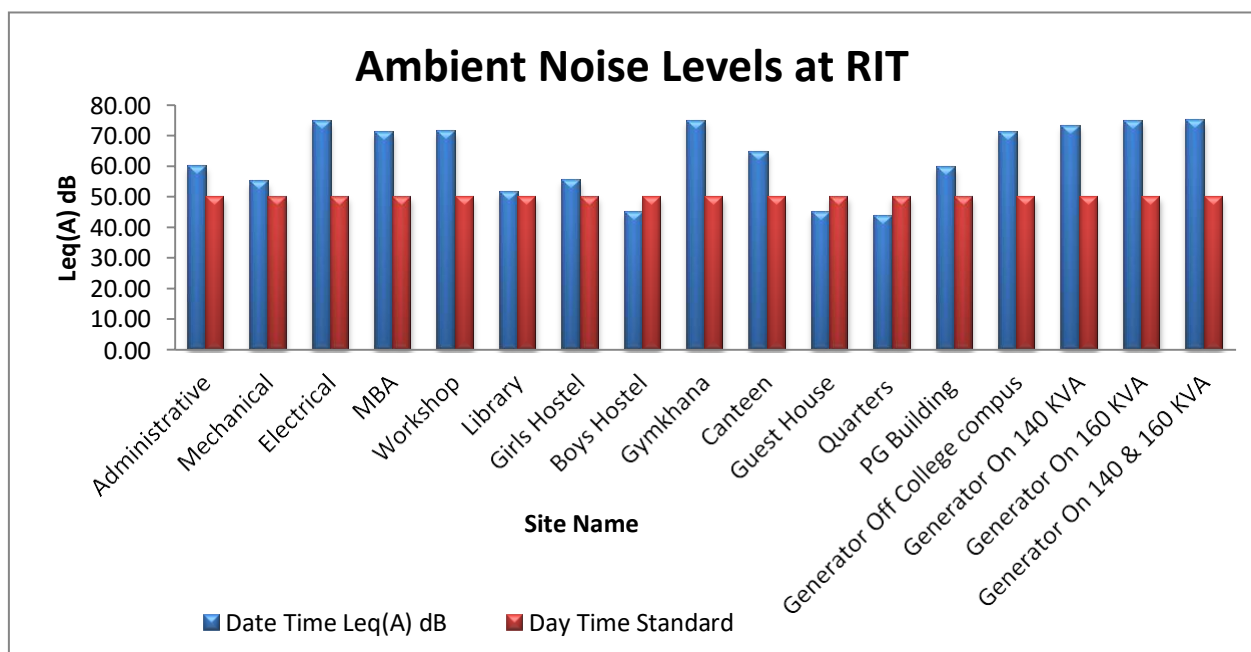
Table no. 3.15 Ambient Noise levels in Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

Sr. No.	Name	Date Time Leq(A) dB	Day Time Standard Leq(A) dB
1	Administrative	60.01	50
2	Mechanical	54.81	50
3	Electrical	74.62	50
4	MBA	70.99	50
6	Workshop	71.19	50
7	Library	51.50	50
8	Girls Hostel	55.23	50
9	Boys Hostel	44.92	50
10	Gymkhana	74.72	50
11	Canteen	64.80	50
12	Guest House	44.78	50
13	Quarters	43.61	50
14	PG Building	59.68	50
15	Generator Off College compus	70.86	50
16	Generator On 140 KVA	73.32	50
17	Generator On 160 KVA	74.85	50
18	Generator On 140 & 160 KVA	74.92	50

Note: - 1. All parameters expressed in dB (A) Leq.
 2. Monitoring is carried during day time.
 3. Day time is from 6.00 a.m. to 10.00 p.m.

It is observed from the table that the Ambient Noise levels in college is on higher side except Boy’s hostel, quarters and Guest house as compared to the standards of Central Pollution Control Board for the day time.

Since, the college is located adjacent of main road and therefore, the major source of noise is automobile noise and machineries. The human communication, engineering lab work and transportation are also contributing to high level sound.



Graph No. 3.15 Ambient Noise levels in Rajarambapu Institute of Technology, Urun, Islampur, Maharashtra.

3.7 Details of green inventory on college campus:

The beginning of the 21st century brought growing concern about global warming, climate change, food security, poverty, and population growth. CO₂ is a principle component causing global warming. Atmospheric carbon dioxide levels have increased to 40% from preindustrial levels to more than 390 parts per million CO₂. On this background it is a need of time to cover the educational campuses with green cover interrelated with climate change.

The current is a present status of tree cover, vegetation and carbon storage assessment of area under Rajarambapu Institute of Technology, Urun Islampur. In an era of global warming and climate change; carbon emission, carbon sequestration, mitigation, adaptation are the keywords in academia. Carbon sequestration is a phenomenon of converting atmospheric carbon i.e. CO₂ in to other pools of carbon such as vegetation, soil, ocean etc. in various forms to mitigate global warming. It is one of the important clauses of Kyoto

Protocol. Current tree census methodology has been adopted from the guidelines set by Indian Institute of Remote Sensing, Deharadoon, Govt. of India.

3.7.1 Total number of trees enumerated on Rajarambapu Institute of Technology, Urun Islampur campus:

All the collected data is tabulated and analyzed with the help of MS- Excel spreadsheets and objected findings were extracted by using various factors given by Inter governmental Panel on Climate Change (IPCC).

3.7.2. Total number of trees enumerated on Rajarambapu Institute of Technology, Urun Islampur campus: 709

Total 709 numbers of trees with more than 10 cm girth and height more than 4 feet have been enumerated. Girth and height of every tree has been measured.

3.7.3 Total No. of species identified in Rajarambapu Institute of Technology, Urun Islampur campus: 34

34 species have been identified during the census. It shows a comparatively good diversity of tree species on the campus.

3.7.4 Species with highest population

Table No-3.9 Species with Highest population

Sr. No.	Botanical Name	Common Name	Number
1	<i>Tectona grandis</i>	Sagvan or Teak	341
2	<i>Cocos nucifera L.</i>	Naral or Coconut	116
3	<i>Polyalthia longifolia</i>	Ashok	33
4	<i>Mangifera indica</i>	Mango	24
5	<i>Delonix regia</i>	Gulmohar	22

The species with highest population *Tectona grandis* is followed by *Cocos nucifera* and *Polyalthia longifolia*.

3.7.5 Total biomass :

Biomass, in ecology, is the mass of living biological organisms in a given area or ecosystem at a given time. Biomass can refer to species biomass, which is the mass of one or more species, or to community biomass, which is the mass of all species in the community. It can include microorganisms, plants or animals. The mass can be expressed as the average mass per unit area, or as the total mass in the community. 23.18 tones of total biomass of

woody vegetation have been recorded in Rajarambapu Institute of Technology, Urun Islampur campus during the current tree census.

Tectona grandis shows the highest biomass as it is highest volume in the campus. Followed by *Cocos nucifera* and *Polyalthia longifolia* are ranked at second and third place.

Table No-3.16 Total biomass of trees in tons on the RIT campus

Sr.No.	Botanical Name	Common Name	Total Biomass (Tones)
1	<i>Tectona grandis</i>	Sagvan or Teak	7.52
2	<i>Cocos nucifera L.</i>	Naral or Coconut	4.73
3	<i>Roystonea regia</i>	Royal palm	1.75
4	<i>Peltophorum pterocarpum</i>	Peltrophorum	1.23
5	<i>Polyalthia longifolia</i>	Ashok	1.00

3.7.6 Carbon stock:

Forests and trees act as natural carbon stores, but this carbon is released when the trees are felled and the area deforested. The amount of carbon stored within an area of land varies according to the type of vegetation cover. 10.658 tones of total carbon stock are present on the campus.

Table No- 3.17 Carbon stock of trees in tones on the RIT Campus

Sr.No.	Botanical Name	Common Name	Carbon stock (Tones)
1	<i>Tectona grandis</i>	Sagvan or Teak	3.762
2	<i>Cocos nucifera L.</i>	Naral or Coconut	2.363
3	<i>Roystonea regia</i>	Royal palm	0.873
4	<i>Peltophorum pterocarpum</i>	Peltrophorum	0.615
5	<i>Polyalthia longifolia</i>	Ashok	0.499

3.7.7 Carbon Sequestration:

Carbon sequestration describes long-term storage of carbon dioxide or other forms of carbon to either mitigate or defer global warming and avoid dangerous climate change. It has been proposed as a way to slow the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels. Vegetation carbon pool having the potential of 560 Pg (Pg: Petagram= billion ton) of carbon storage globally. In the current study the focus is given on the assessment of existing carbon stock stored Rajarambapu Institute of Technology, Urun, Islampur campus in the form of woody vegetation by enumerating every tree species. Overall 39.050 tones of CO₂ has captured and stored by the woody plants present in the college campus. A single tree consumes 0.0218 tons of CO₂ approximately annually consequently, as the campus possess 709 mature woody plants 15.4562 tonnes of CO₂ is consumed yearly by all woody vegetation on the college campus.

3.7.8 Oxygen released :

Woody vegetation of Rajarambapu Institute of Technology, Urun Islampur campus has released 15.4562 tonnes of oxygen in their lifetime till date. Released oxygen is directly proportional to CO₂ sequestrate in the ratio of 32/12. Thus, it is supposed to release of oxygen annually. It is assumed that a single tree supports oxygen demand of two people for their life. Thus, 709 woody vegetation in college campus are supporting 1,418 people around the campus.

Key Observation:

- As there is highest count of Teak species on the campus contains highest biomass as well as carbon stock on the campus, but it could tends to monoculture in the vegetation.
- The mixed culture of trees will give support to bird species and enhance biodiversity of the RIT campus.

3.8 Electricity and energy audit:

Energy sources utilized by all the departments, support services of Rajarambapu Institute of Technology campus include electricity and liquid petroleum. Major use of the energy is at office, canteen, hostel and laboratories, for lighting, transportation, cooking and workshop instruments. Electricity is supplied to the college campus by Maharashtra State Electricity Board also. College had installed solar power plant having capacity 300 KW.

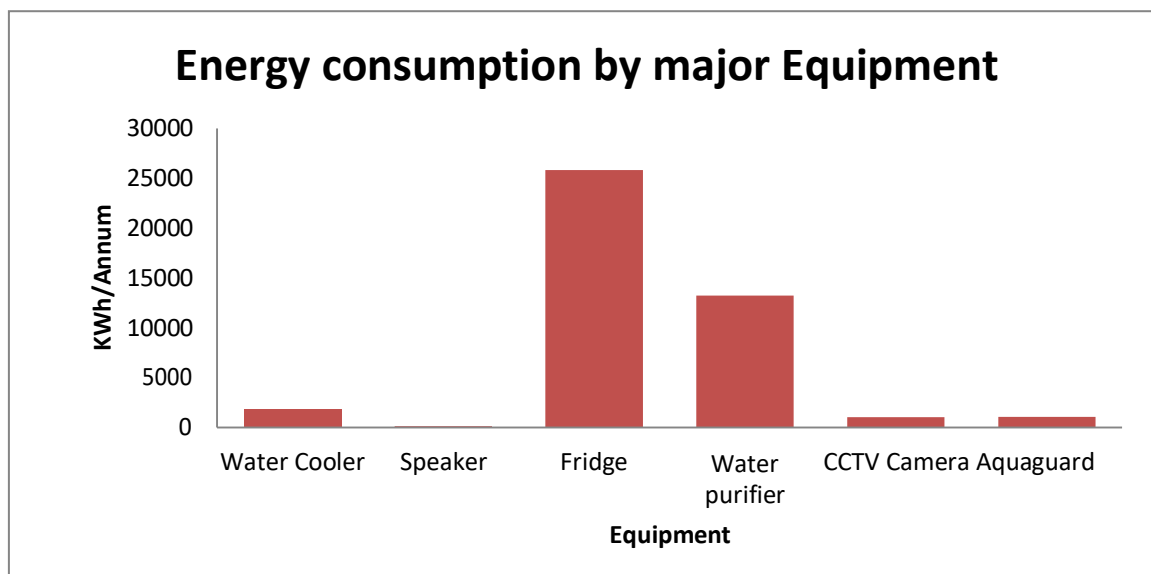
Fuel consumption by vehicles on campus is also an important criterion for energy audit. Count of two wheelers is 430 and of four wheelers are 55. But vehicles are not running on college campus but only parked on the campus.

3.8.1 Energy consumption:

It includes all Departments which includes Civil, IT, Automobile, Mechanical, Electrical and Administrative. The calculations are based on the data provided by the college and actual observations taken at the site. The collected data shows all departments in the college has maximum number of major energy consuming equipments and energy consumption is 43,102.72 KWh/ Annum.

Table No.3.18: Energy consumed per annum by major instruments in all the departments in the college

Sr. No.	Equipment	Number	KWh/Annum
1	Water Cooler	5	1840
2	Speaker	10	124.8
3	Fridge	8	25804.8
4	Water purifier	15	13248
5	CCTV Camera	20	1029.12
6	Aqua guard	22	1056
	Total	80	43,102.72



Graph No.3.16: Energy consumed per annum by major instruments at all departments in the college

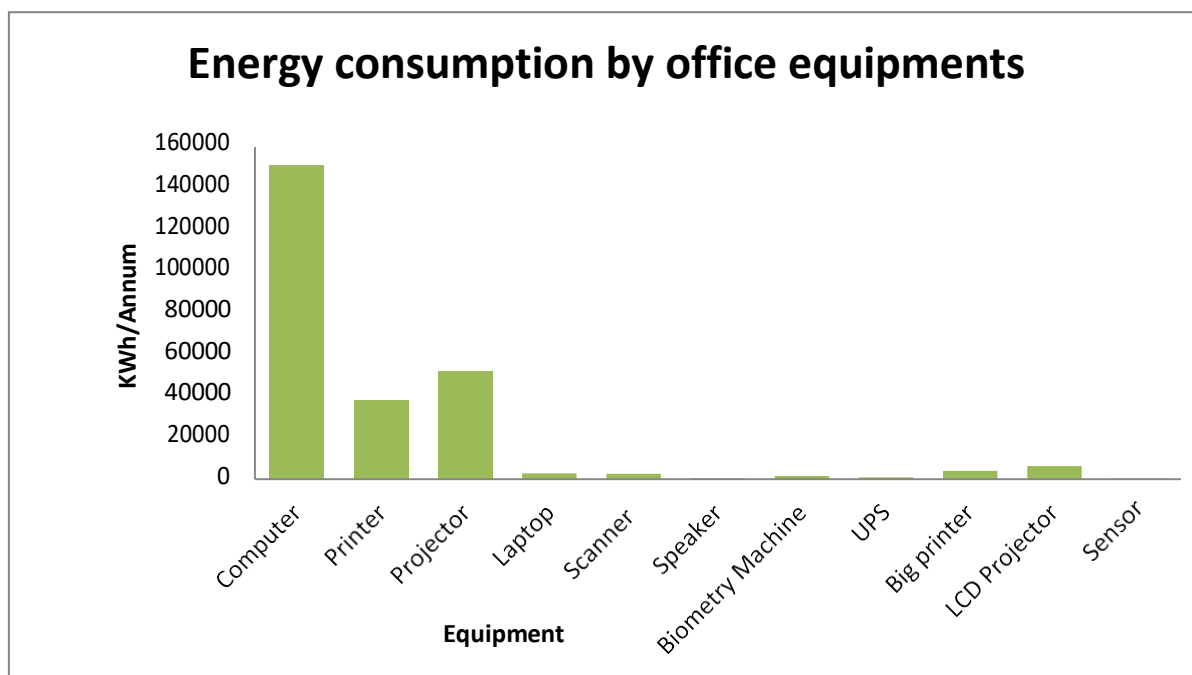
Total number of major energy consuming equipments at all departments energy consumption is 43,102.72 KWh/Annum. As major energy consuming equipments, number of CCTV Camera is (20) than other equipments and hence, also the energy consumed by major energy consuming equipments is also maximum i.e. 43,102.72 KWh/ Annum. Number of fridge is 8 at all departments but the energy consumption is highest i.e. 25804.8 KWh/ Annum. Followed by water purifier 13248 KWh/Annum, and Water Cooler 1840 KWh/Annum, Aqua guard 1,056 KWh/Annum, CCTV Camera 1,029.12 KWh/Annum respectively.

Similarly, to analyze the electricity consumption of office equipments computers, printers, laptops were also considered.

Table No. 3.19: Office equipments and their energy consumption (KWh/Annum) at all departments in the college

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	1351	1,51,312
2	Printer	105	37,800
3	Projector	76	51,680
4	Laptop	25	2,688
5	Scanner	10	2,560
6	Speaker	20	416
7	Biometry Machine	15	1,451.52

8	UPS	20	848.64
9	Big printer	10	4,000
10	LCD Projector	13	6,240
11	Sensor	24	7.68
	Total	1669	2,59,003.84



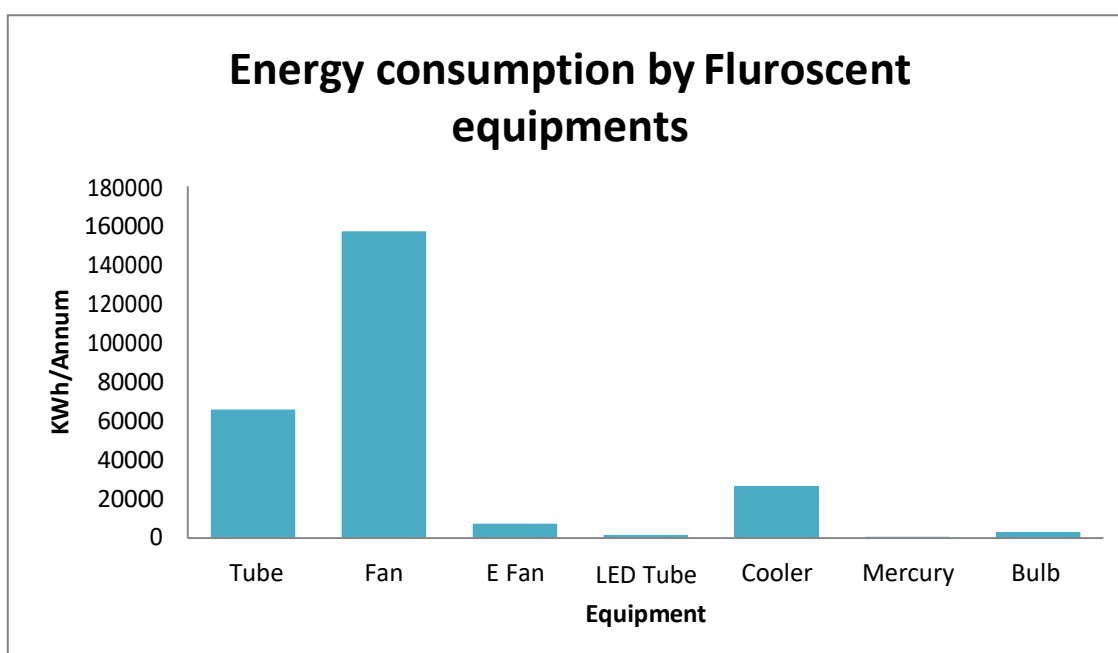
Graph No. 3.17: Office equipments and their energy consumption (KWh/ Annum) at all departments in the college

Total number of office equipments at all departments energy consumption is 2,59,003.84 KWh/Annum. As office equipment, number of computers is (1351) than Printers, Laptops, LCD projectors and Xerox machine hence also the energy consumed by computers is also maximum i.e. 1,51,312 KWh/Annum followed by projectors i.e. 51,680 KWh/Annum, Printers 37,800 KWh/ Annum, LCD Projectors 6240 KWh/Annum, Biometry machine 1451.52 KWh/Annum respectively

Similarly, to analyze the electricity consumption, lights and fans were also considered.

Table No. 3.20: Number of fluorescent tubes, bulbs and fans and their energy consumption (KWh/ Annum) at all departments in the college

Sr. No.	Equipments	Number	KWh/Annum
1	Tube	2,051	65,632
2	Fan	1,090	1,56,960
3	E Fan	50	7,398.4
4	LED Tube	60	1,689.6
5	Cooler	30	26,496
6	Mercury	5	691.2
7	Bulb	20	3,200
	Total	3306	2,62,067.2



Graph No.3.18: Number of fluorescent Tubes, bulbs and fans and their energy Consumption (KWh/ Annum) at all departments in the college

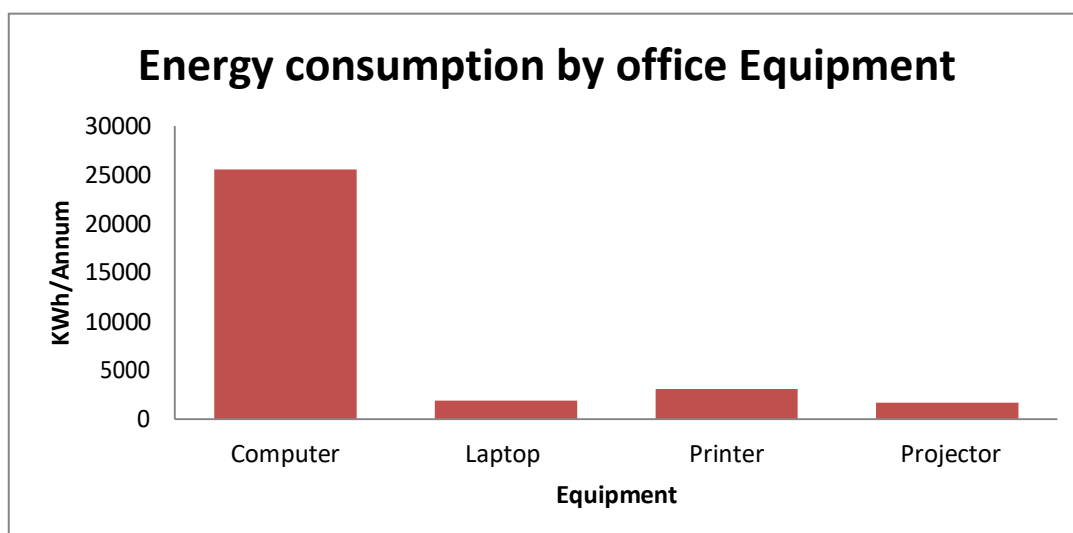
Maximum use of energy is for lightning and fans in all the buildings. The total number of fluorescent tubes is 2,051 and their electricity consumption is 65,632 KWh/Annum. In the building total number of ceiling fans and LED bulbs are 60 and their electricity consumption were respectively i.e. Fan 1,56,960 KWh/Annum and Exhaust Fan (E fan) 7,398.4 KWh/Annum, LED Tube 1,689.6 KWh/Annum, Cooler 26,496 KWh/Annum.

3.8.3 Energy Consumption at Workshops:

It has been observed that the Workshops has maximum number of major energy consuming equipments with energy consumption of 32,212 KWh/Annum.

Table No.3.21: Energy consumed per Annum by office equipment at Workshops

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	76	25,536
2	Laptop	17	1,904
3	Printer	8	3,072
4	Projector	5	1,700
	Total	106	32,212



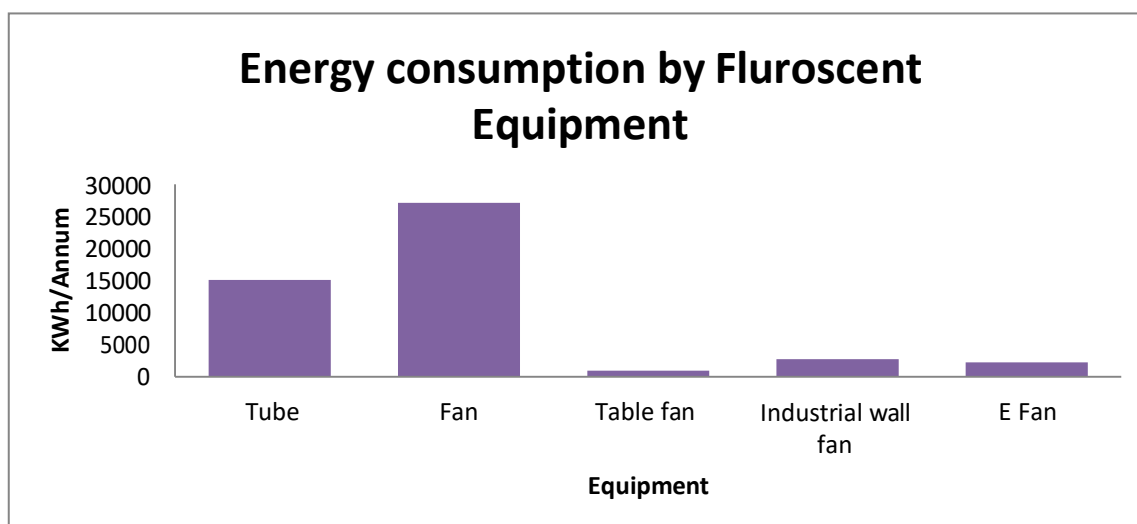
Graph No 3.19: Energy consumed per annum by office equipment at Workshops

Total number of major energy consuming equipments at Workshops energy consumption is 32,212 KWh/Annum. Number of Computer is 76 at all Workshops, but the energy consumption is highest i.e. 25,536 KWh/ Annum .As major energy consuming equipments, number of Laptop is 17 also the energy consumed by major energy consuming equipments is also maximum i.e. 32,212 KWh/Annum. Followed by Printer i.e. 3,072 KWh/Annum, Projector 1,700 KWh/Annum.

Similarly, to analyze the electricity consumption of office equipments computers, printers, laptops were also considered.

Table No. 3.22: Number of Fluorescent Tubes, Bulbs and Fans and Their Energy Consumption (KWh/Annum) at Workshops

Sr. No.	Equipments	Number	KWh/Annum
1	Tube	374	15,079.68
2	Fan	141	27,072
3	Table fan	10	921.6
4	Industrial wall fan	46	2,760
5	Exhaust Fan	15	2,219.52
	Total	586	48,052.8



Graph No.3.20: Number of fluorescent tubes, bulbs and fans and their energy Consumption (KWh/ Annum) at Workshops

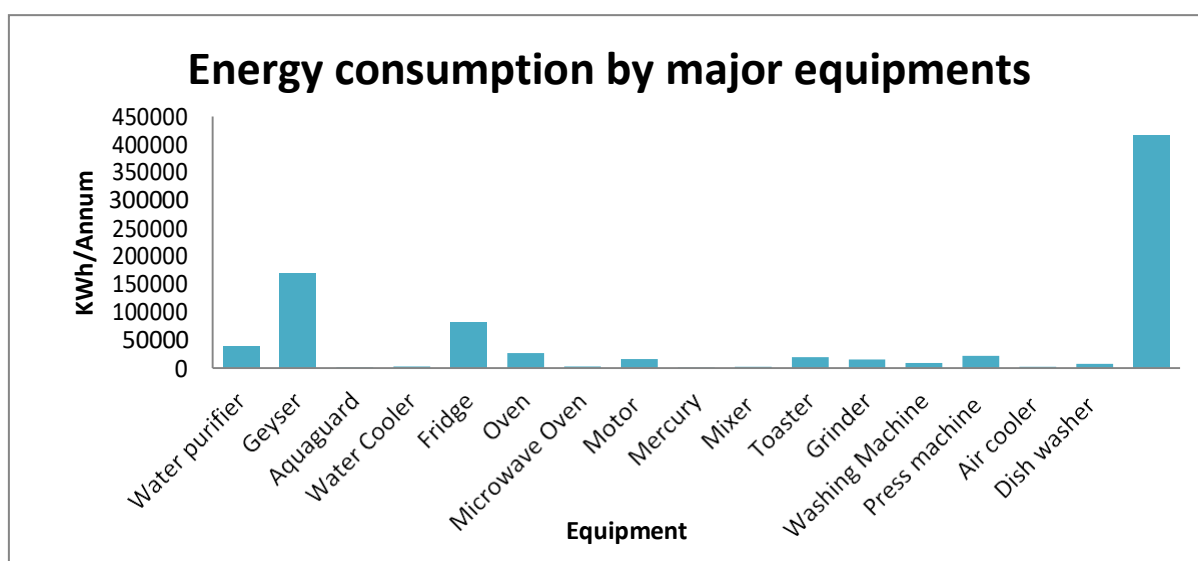
The total number of fluorescent tube is 374 and their electricity consumption is 15079.68 KWh/Annum. In the Workshops total number of fans and is 141 and their electricity consumption is maximum i.e. 27072 KWh/Annum, Industrial wall fan 46 and their electricity consumption 2,760 KWh/annum, bulb electric consumption is 652.8.

3.8.4 Energy consumption at Support services:

It includes Support services – Ladies hostel, Boy's hostel, Canteen, Gymkhana, Library, Quarters, guest house, campus the collected data shows the Support services has maximum number of major energy consuming equipments and energy consumption is 4,15,228 KWh/ Annum.

Table No.3.23: Energy consumed per Annum by major instruments at Support services

Sr. No.	Equipment	Number	KWh/Annum
1	Water purifier	18	38,272
2	Geyser	38	1,70,240
3	Aqua guard	20	960
4	Water Cooler	5	2,760
5	Fridge	25	80,640
6	Oven	8	26,880
7	Microwave Oven	5	2,500
8	Motor	15	16,128
9	Mercury	6	432
10	Mixer	15	2,304
11	Toaster	10	19,200
12	Grinder	20	15,360
13	Washing Machine	15	8,832
14	Press machine	20	21,504
15	Air cooler	10	1,920
16	Dish washer	5	7,296
	Total	235	4,15,228

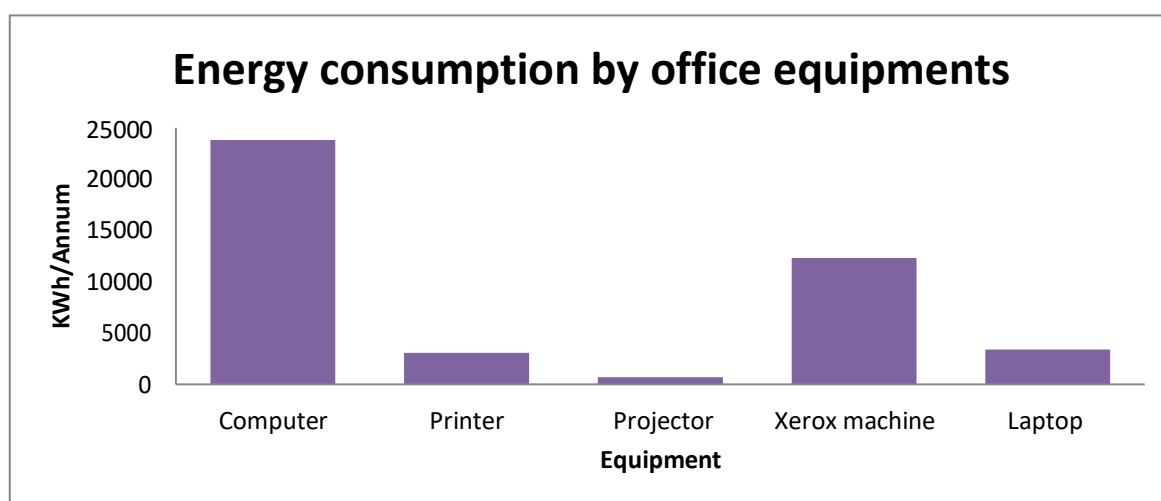
**Graph No.3.21: Energy consumed per Annum by major instruments at support Services**

Total number of major energy consuming equipments at Support services energy consumption is 4,15,228 KWh/Annum. As major energy consuming equipments, number of Geyser is (38) than other equipments and hence, also the energy consumed by major energy consuming equipments is also maximum i.e. 4,15,228 KWh/ Annum. Number of fridge is 25 at Workshops but the energy consumption is highest i.e. 80,640 KWh/ Annum. Followed by water purifier 38,272 KWh/Annum, Oven 26,880 KWh/Annum, Press machine 21,504 KWh/Annum, Toaster 19,200 KWh/Annum, Motor 16,128 KWh/Annum, Grinder 15,360 KWh/Annum, and Water Cooler 2,760 KWh/Annum, Aqua guard 960 KWh/Annum, Dish washer and Air cooler respectively.

Similarly, to analyze the electricity consumption of office equipments computers, printers, laptops were also considered.

Table No 3.13: Office equipments and their energy consumption (KWh/Annum) at support services

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	85	23,800
2	Printer	8	3,072
3	Projector	2	680
4	Xerox machine	5	12,288
5	Laptop	30	3,360
	Total	130	43,200



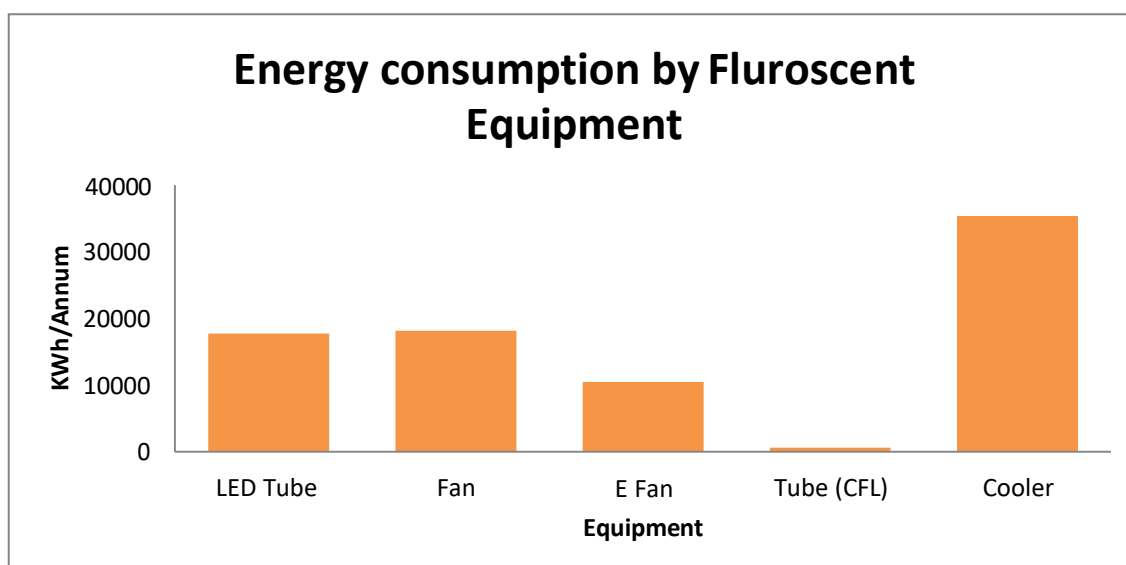
Graph No. 3.22: Office equipments and their energy consumption (KWh/ Annum) at Support services

Total number of office equipments at Workshops energy consumption is 43,200 KWh/Annum. As office equipment, number of computers is (85) than Printers, Laptops, LCD projectors and Xerox machine hence also the energy consumed by computers is also maximum i.e. 23,800 KWh/Annum, Xerox machine 12,288 KWh/Annum followed by projectors i.e. 680 KWh/Annum, Printers 3,072 KWh/ Annum, Laptop 3,360 KWh/Annum, Biometry machine 1,451.52 KWh/Annum respectively .

Similarly, to analyze the electricity consumption, lights and fans were also considered.

Table No. 3.24: Number of fluorescent tubes, bulbs and fans and their energy consumption (KWh/ Annum) at support services

Sr. No.	Equipments	Number	KWh/Annum
1	LED Tube	1237	17,733.632
2	Fan	126	18,144
3	Exhaust fan (E Fan)	80	10,444.8
4	Tube (CFL)	20	640
5	Cooler	40	35,328
	Total	1503	82,290.432

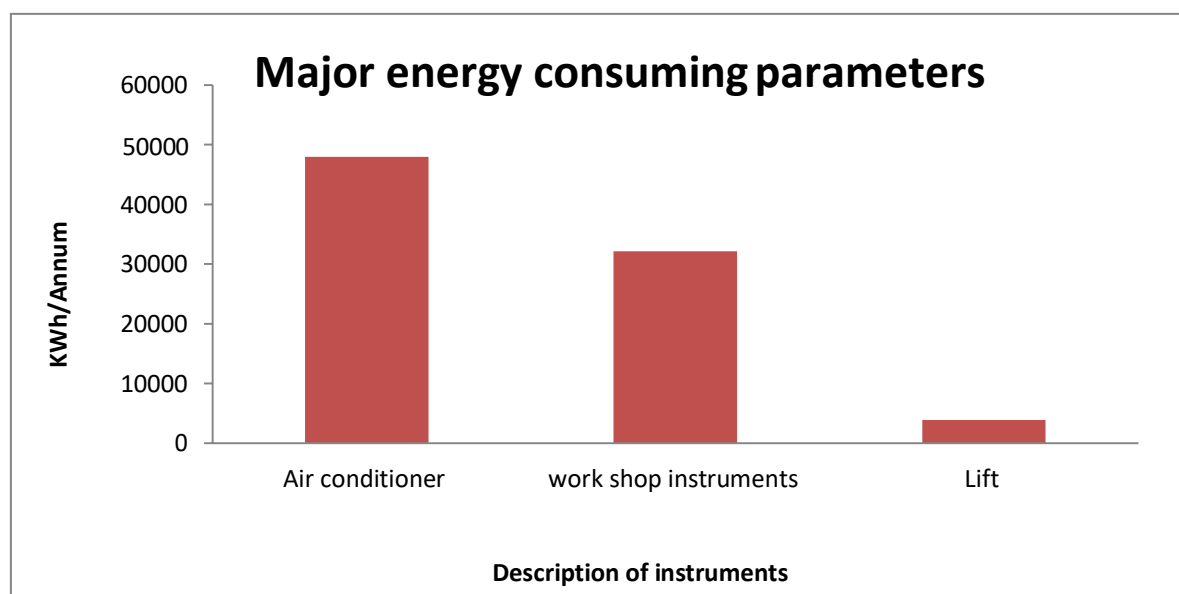


Graph No.3.23: Number of fluorescent Tubes, bulbs and fans and their energy consumption (KWh/ Annum) at support services

Maximum use of energy for lightning and fans is in the building support services . The total number of fluorescent Tubes is 1,237 and their electricity consumption is 17,733.632 KWh/Annum. In the support services, total number of ceiling fans and their electricity consumption were respectively i.e. Fan 18,144 KWh/Annum and E Fan 10,444.8 KWh/Annum, LED Tube 17,733.632 KWh/Annum, Cooler 35,328 KWh/Annum.

Table No. 3.25: Energy Consumed per annum by major energy consuming parameters

Sr. no	Description of instruments	Energy consumption KWh/ Annum
1	Air conditioner	48,000
2	work shop instruments	32,175
3	Lift	3,900
	Total	84,075

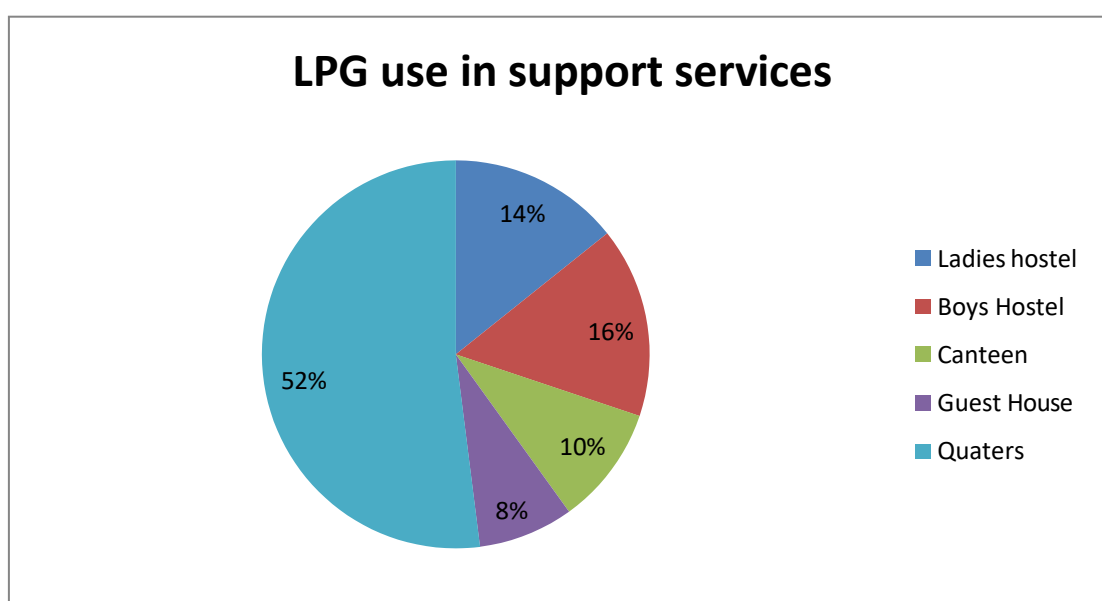


Graph No. 2.24: Energy Consumed Per Annum by major energy consuming parameters

Total 84,075 KWh/Annum of energy is consumed by all Air conditioner, workshop instruments and Lift on campus. Air conditioner has utilizes maximum energy of 48,000 KWh/Annum. College has 7 workshops and they contains many energy consuming instruments such as Welding machines, Drilling machine, Cutter, Arc machine etc. it has utilizes energy of 32,175 KWh /Annum. Rajarambapu institute of technology has some lift also and their energy consumption is 3,900 KWh /Annum.

Table No.3.26 LPG Use in Support Services

Sr. No.	Support Services	Kg/Annum
1	Ladies hostel	1,404
2	Boys Hostel	1,560
3	Canteen	975
4	Guest House	780
5	Quarters	5,112
	Total	9,831



Maximum LPG use is in Support services. LPG is used as a fuel for many residential, commercial purposes. The total number of LPG Cylinder is 602 and their consumption is 9,831 kg/Annum. In the Support services total number of LPG and their consumption were respectively i.e. in Quarters 5,112 kg/Annum (52%), Boys Hostel 1,560 kg/Annum (16%), Ladies hostel 1,404 kg/Annum (14%), Canteen 975 kg/Annum (10%), Guest House 780 kg/Annum (8%) respectively (Graph No. 3.10).

Key Observations:

- The total energy consumption of college is 10,59,666.56 KWh/Annum
- Highest consumption of energy is by equipments i.e. 4, 58,330.72 KWh/Annum.
- The energy consumption of equipments is more than office equipments and fluorescent lamps.

3.9 Environmental Protection through Activities and nature club

1. RIT Renewable Energy Club for energy conservation:

In order to create awareness about new and renewable sources of energy among students, in January 2006 RIT has opened Renewable Energy Club under the guidelines provided by Ministry of Non-Conventional Energy Sources. The club has been registered at Maharashtra Energy Development Agency. Following activities are taken under this club:

- Every year this club organizes events like seminars, workshops, expert lectures, poster and essay competition, and field visits to renewable energy projects in the vicinity. Also the club is celebrating Rajiv Gandhi Akshay Urja Diwas on August 20th every year.
- The staff and the students are also given instructions about to save energy by switching off the fans, tubes, computers, etc. when not in use.
- The air conditioners are used only in essential conditions in the institution and laboratories.
- Solar energy panels are used for heating water for bathrooms in hostels. Solar street lights are installed in front of college main building.

2. RIT Nature Club:

With the objective to uphold interest about wildlife and the environment among students the club has been started in 2005. The club works toward creating awareness among students about scientific and economic values of nature. Students get opportunities to serve the objective of protection and conservation of natural environment through various activities of the club like tree plantation, celebrating non-vehicle day in the institute, trekking and PUC testing programs.

The club is celebrating World Environment Day on 5th June every year.

3. Tobacco and Smoking free campus:

Concerning, the health issues of youth in the campus strict provision is made to ban Tobacco and Cigarette. Banners are displayed in the campus to divert the younger generation away from such addictions.

4. Plantation:

The college campus has planted many species of trees, herbs and shrubs making the campus more beautiful and cool. The Eucalyptus plantation is also made near the gray water treatment plant to utilise the wastewater and increase the green cover on the campus.

5 .Waste management:

Paper waste is regularly sold to outside agency through auction. The emphasis is given on online transfer of messages, circulars, internal exams, etc. to save on paper and to save the trees.

The waste generated in Boy's hostel mess is used as raw material for biogas generation which can be further used for cooking purpose. The campus is well equipped with attractive dustbins to avoid the littering of waste.

The E wastes generated through the damaged parts of computers are sent to proper licensed authority through auction for further treatment.

The biodegradable waste of dry leaf litter generated is used for making a good quality of vermicompost.

6. Wastewater Treatment:

The gray water generated in the campus is treated in the campus through a small phytoremediation treatment followed by sand filtration which is further used for gardening purpose.

7. Fire safety:

Chemical fire extinguishers and buckets filled with sand are placed at various important places in the college campus. The extinguishers are replaced as per their expiry dates.

8. Rain Water Harvesting:

The college has about 1500 sq. m roof top area under rain water harvesting. Total water collected from rain water harvesting is about 1000 m³/ yr. Rain Water Harvesting is mainly done above the classroom build-up area which is about 1000 sq. m. The water collected from roof is collected through pipelines and stored in a underground tank of about 80,000 lit. Capacity of Boy's hostel number 1 roof area 500 sq. m also contribute in rain water harvesting. The water collected from this building is used to recharge the bore well.

To increase the ground water percolation rate, the different layers using bricks, sand and stones below every grass lawn in garden. Hence, in rainy season the water percolates

easily into ground and there is no problem of water clogging due to heavy rainfall. Water level controller is used to reduce overflow runoff.

Chapter IV

CONCLUSION AND MANAGEMENT PLAN

The Department of Environmental Science, Shivaji University, Kolhapur has conducted a Green Audit of Rajarambapu Institute of Technology, Urun, Islampur in the academic year 2018-19. Green auditing is the process of identifying and determining whether institution practices are eco-friendly and sustainable. The main objective of college to carry out green audit is to check green practices followed by college and to conduct a well formulated audit to understand where we stand on a scale of environmental soundness.

Conclusions:

From the green audit conducted by college following are some of the conclusions:

1. The waste is segregated properly in coloured dustbins.
2. Highest quantity of solid waste is of biodegradable waste which is utilized properly for composting and some part for biogas generation. .
3. Confidential paper waste is disposed properly.
4. The E waste generated from damaged computers is given to the dealer for recycling.
5. Highest consumption of electricity is by equipments used in laboratories and workshops.
6. Use of CFL lamps in the college is minimum. Its use should be encouraged and now converted to LED lights.
7. Toilets and bathrooms are consuming more water. A care be taken to reduce water consumption.
8. College has good practices of rain water harvesting, biogas production from kitchen waste and gray water treatment in the campus.
9. Ambient noise levels overall in college is on higher side except Boys hostel, quarters and Guest house. A care be taken to reduce this noise.
10. Air quality on the campus is good.
11. The number of Teak species is more on the campus. More plantations can be encouraged.
12. Green practices like Nature club, Renewable energy club, plantation drive, rain water harvesting and tobacco free campus like programmes be encouraged to increase awareness amongst student.

Recommendations:

Following are some of the key recommendation for improving campus environment.

1. College should develop its own Environmental Policy by using guidelines given in Green Audit document.
2. The data related to all measured environmental parameters should be monitored and recorded regularly and information be made available to administration.
3. The college should develop internal procedures to ensure its compliances with environmental legislation and responsibility be fixed to carry out it in practice.
4. Wherever possible the waste should be reused or recycled.
5. All street lighting should be changed to LED lights to save electricity.
6. Rain water harvesting for all building and ground water recharging will be beneficial for self dependency of water.
7. Drip irrigation for gardens and vegetable cultivation can be initiated.
8. All the biodegradable waste should be utilized properly either for energy generation or for composting.
9. Lectures, environmental day's celebration and awareness activities should be enhanced.
10. The traffic noise pollution can be reduced by thickening the tree cover near the highway as well as the generator noise can be reduced by placing it in acoustic cover or room.

ENVIRONMENT MANAGEMENT PLAN:

By understanding the dynamics of present situation of resource utilization and current practices of waste disposal, an Environment Management Plan (EMP) for the Rajarambapu Institute of Technology, Urun Islampur is proposed. This plan not only will provide the strengths, weaknesses and remedies for the green and clean campus but also give priority of the sector where the college has to give more efforts to improve its environment.

Environment Management Plan 2018-19

For Rajarambapu Institute of Technology, Urun, Islampur

Sector	Strengths	Weakness	Suggestions	Priority
Solid Waste				
1. Paper	<ul style="list-style-type: none"> • Pulping of major portion of papers i.e. answer sheets, bills and other administrative papers. • Use of MOODLE software for submissions and exams 	<ul style="list-style-type: none"> • Multiple numbers of copies required for office work. 	<ul style="list-style-type: none"> • Use of software's can enhanced . 	Medium
2. Plastic	<ul style="list-style-type: none"> • Less use of plastic at departments 	<ul style="list-style-type: none"> • No segregation is done for plastic waste specially in hostels and quarters 	<ul style="list-style-type: none"> • Ban on Plastic carry bags in College premises 	Medium
3. Biodegradable waste	<ul style="list-style-type: none"> • One mess in the campus has biogas plant. • Vermicomposting is also done in the campus. 	<p>Considering the quantity of biodegradable waste generated, the amount undergoing for treatment is less.</p>	<ul style="list-style-type: none"> • More units of vermicomposting should be installed. 	Medium

<p>1. Electricity</p>	<p>College had installed solar power plant having capacity 300 KW.</p>	<p style="text-align: center;">Energy</p> <ul style="list-style-type: none"> • Unnecessary use of lights, fans and computers at some places when no one is using it. 	<ul style="list-style-type: none"> • Electrification of street lights by solar power. • Use of solar pumps for water tanks. • General awareness about electricity saving. 	<p style="text-align: center;">Medium</p>
<p>2. Fuel</p>	<ul style="list-style-type: none"> • Use of public Transport system is comparatively more by staff and students. 	<ul style="list-style-type: none"> • More awareness is required among students. 	<ul style="list-style-type: none"> • ‘Cycle on rent’ service for student • General awareness about efficient use of fuel. 	<p style="text-align: center;">Medium</p>
Water				
<p>1. Water utilization</p>	<ul style="list-style-type: none"> • College is following the practice of Rain water harvesting. • Installation of automatic water pumps to avoid overflowing losses 	<ul style="list-style-type: none"> • Overuse of water at bathrooms and toilets due to leakage 	<ul style="list-style-type: none"> • Proper and timely maintenance of plumbing at all departments • Rain water harvesting should be increased on more areas of campus 	<p style="text-align: center;">Medium</p>

<p>2. Waste water</p>	<p>Gray water treatment plant is functional on the campus by phytoremediation technology.</p> <ul style="list-style-type: none"> • Septic tanks present for sewage treatment 	<ul style="list-style-type: none"> • All the gray water in the campus should be treated and then discharged. 	<ul style="list-style-type: none"> • Installation of small scale STP to treat laboratory waste and toilet flushing. 	<p>High</p>
<p>Hazardous Waste</p>				
<p>2. E-waste</p>	<ul style="list-style-type: none"> • E waste is sent to E waste collection center at Kolhapur. 	<ul style="list-style-type: none"> • E waste related to computer and its parts are only collected. 	<ul style="list-style-type: none"> • E-waste in all forms not only computers, should be collected properly 	<p>Medium</p>
<p>Air and Noise</p>				
<p>1. Air and Noise</p>	<ul style="list-style-type: none"> • Air quality is still in good condition but at some places noise levels are increasingly. 	<ul style="list-style-type: none"> • Noise levels overall in college is on higher side 	<ul style="list-style-type: none"> • The plantation can be increased by vertical gardening. 	<p>Medium</p>
<p>Tree Census</p>				
<p>1.Tree Vegetation</p>	<p>Plantation cover is good in the campus.</p>	<p>Teak species is more dominating</p>	<ul style="list-style-type: none"> • Avoid monoculture, variety of species should be planted in the campus area 	<p>Medium</p>



Tree Plantation at RIT, Rajaramnagar



Tree Plantation at RIT, Rajaramnagar



Blood donation camp



Fire extinguishers with sand buckets



Rain water harvesting in RIT



Gray water treatment plant at RIT



Social Program organized by NSS



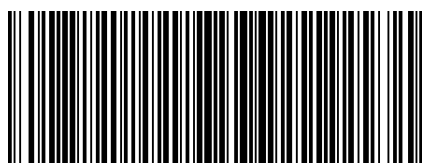
Run for unity organized by NSS



Visit of Green audit team of Shivaji University



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