



**K. E. Society's
Rajarambapu Institute of Technology, Urun Islampur,
Maharashtra**

Green Audit Report

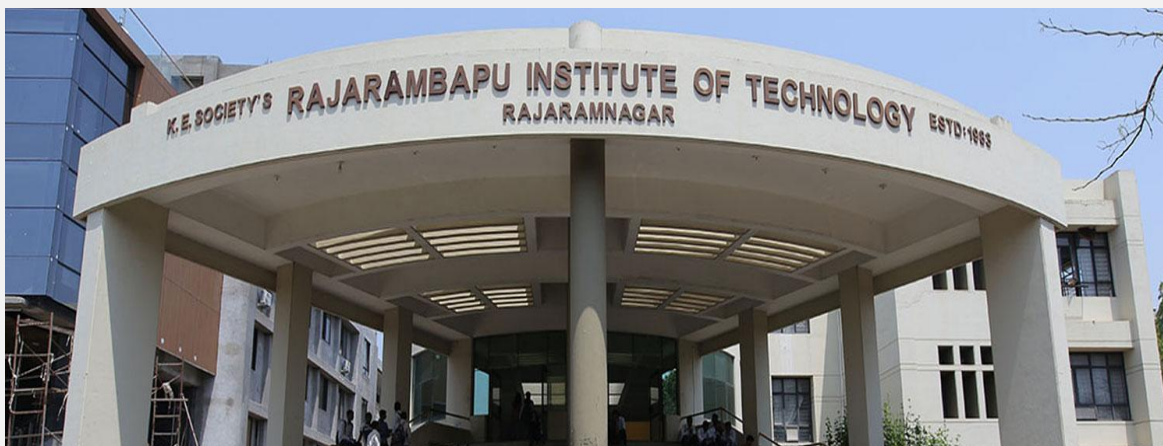


Prepared by

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

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5 FEB 2021

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 2019-2020. 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. The performance of Institute was found to have good quality with respect to sustainable Green Practices. 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.



Head

Department of Environmental Science,
Shivaji University, Kolhapur



RAJARAMBAPU INSTITUTE OF TECHNOLOGY

An Autonomous Institute, Affiliated to Shivaji University, Kolhapur,
Birth Centenary of Founder Late Rajarambapu Patil

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

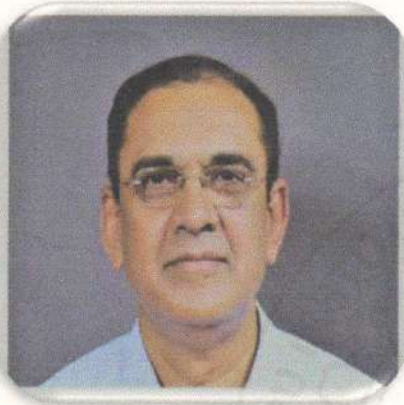
NAAC Accredited "A" Grade



Ref: RIT/

Date:

Chairman's Message



The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises.

On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development.

RIT Rajaramnagar is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends.

Green audit is a useful tool for a college to determine how and where they are using the most energy or water resources; the college can then consider how to implement change and make savings in the identified areas.

The intention of organizing green audit is to upgrade the environmental condition in and around the institute. It is carried out with the aid of performing tasks like waste management, energy saving, water conservation through rainwater harvesting, use of Biogas by student's mess, canteen, developing Miyawaki (a dense forest in small land) etc. It makes RIT an environmental friendly Institute with green landscape.

Thank you

Shri. Bhagatsinh R. Patil
Chairman BOG



K. E. Society's

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Director's Message



The Green Audit of an institution is becoming of paramount importance these days for self-assessment of the institution, which reflects the role of the institution in mitigating the present environmental problems.

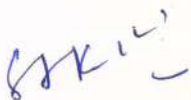
The institute has been putting efforts to keep the environment clean and green since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the

applicable regulations, policies and standards.

As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. To find out the environmental performance of the educational institution. and to analyze the possible solutions for converting the educational campus as eco-campus the conduction of Green Audit of institution is essential.

The green audit of RIT Rajaramnagar enables to assess the life style, action and its impact on the environment.

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:

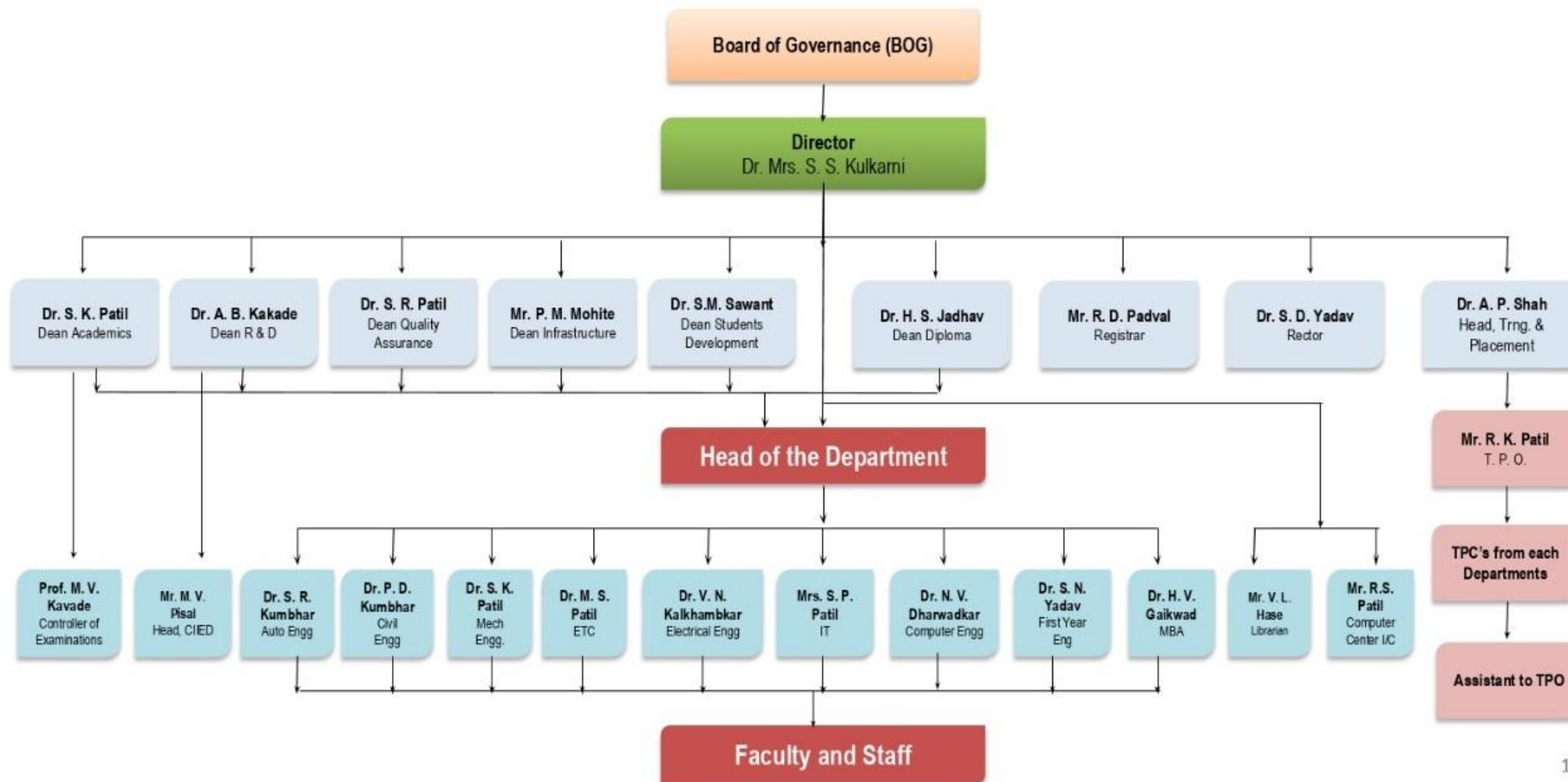
To be a globally recognized institute committed to excellence in academics, research, knowledge creation and delivery to develop socially-responsible professionals.

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.

1.12 Awards received by Students in the year 2019-2020:

Sr.No.	Name of Student/Team	Event/Tournament & Venue	Date	Position
01	Salunkhe Suraj Sanjay, F.Y.	State level Athletics (Discus Throw 45.90mtr.) Championship Balewadi, Pune	24 th August 2019	First Place
		Federation West Zone National Athletics (Discus Throw 47.79mtr.) Alwar, Rajsthan	10 th to 12 th Sept. 2019	Second Place
02	Miss. Kodolikor Kalyani Umesh	Shivaji University Sangli Zonal Swimming Competition held at N.D.Patil Night College, Sangli	27 th August 2019	Gold Medal
03	Rajput Prathamesh Sopan	Shivaji University Sangli Zonal Chess (Individual) held at PVPIT, Budhagaon	30 th & 31 st August 2019	3rd Rank
04	Dangare Shrirang Shivaji		30 th & 31 st August 2019	5th Place
05	RIT Chess Team (Men)	Shivaji University Sangli Zonal Chess Competition held at PVPIT, Budhagaon	30 th & 31 st August 2019	Runner up
06	RIT Badminton Team (Men)	Shivaji University Sangli Zonal Badminton Competition Held at RIT, Rajaramnagar	06 th & 07 th September 19	Winner
07	RIT Basketball Team (Men)	Shivaji University Sangli Zonal Basketball Competition held at Miraj Mahavidyalaya, Miraj	02 nd & 03 rd October 2019	Runner up
08	RIT Volleyball Team	Shivaji University Sangli Zonal	7 th & 8 th Oct.	3rd Rank

	(Men)	Volleyball Competition held at Dr.Bapuji Salunkhe College, Miraj	2019	
09	RIT Cricket Team (Men)	Shivaji University Sangli Zonal Cricket Competition held Chintamanrao College of Commerce, Sangli	16 th to 20 th Nov. 2019	Runner up
10	RIT Kabaddi Team (Girls)	Invited National level Kabaddi Tournament organized by College of Engineering, Pune	23 rd to 26 th Jan. 2020	Second Prize
11	Salunkhe Suraj Sanjay, F.Y. Civil,	Shivaji University Sangli Zonal Athletics Competition (Shot-put 13.50 mtr) Competition organized by Arts, Commerce & Science Mahila Mahavidyalaya, Tasgaon, Venue – District Sports Complex, Miraj	9 th to 11 th Oct. 2019	1st Rank
		Shivaji University Sangli Zonal Athletics Competition (Discus Throw 41.00 mtr) Competition organized by Arts, Commerce & Science Mahila Mahavidyalaya, Tasgaon, Venue – District Sports Complex, Miraj	9 th to 11 th Oct. 2019	1st Rank
12	Hajare Nikita Ananda, T.Y. IT	Sangli Zonal High Jump Competition organized by Arts, Commerce & Science Mahila Mahavidyalaya, Tasgaon, Venue – District Sports Complex, Miraj	9 th to 11 th Oct. 2019	3rd Rank
		Inter- Zonal High Jump Competition organized by S.K.Patil College, Kurundwad. Venue – Shivaji University, Kolhapur	2 nd to 4 th Dec. 2019	Silver Medal
13	Salunkhe Suraj Sanjay, F.Y. Civil,	Inter-Zonal Athletics Competition (Discus Throw) 42.47 mtr S.K.Patil College, Kurundwad. Venue – Shivaji University, Kolhapur	2 nd to 4 th Dec. 2019	Gold Medal
		23 rd Maharashtra State Inter-University Athletics Meet (Discus Throw) Punyashlok Ahilyadevi Holkar Solapur University, Solapur.	26 th to 30 th Dec. 2019	Silver Medal
14	Mane Akash Vasant, T.Y. Mechanical,	West Zone Inter-University Basketball Men Tournament held at	14 th to 18 th Dec. 2019	Bronze Medal

		Swami Ramanand Teerth Marathwada University, Nanded		
		All India Inter-University Basketball Men Tournament held at Swami Ramanand Teerth Marathwada University, Nanded	04 th to 7 th Jan. 2020	Participatio n & Qualified for Khelo India Youth Games
		Khelo India Youth Games Inter- University Basketball Men Tournament held at Kalinga Institute of Industrial Technology, Bhubaneswar, Odisha	21 st to 24 th feb. 2020	Participatio n
15	Mr. Rushikesh U Sawant, BBA IInd	WAKO India Open International Kick Boxing Competition held at New Delhi	9 th to 13 th Feb. 2020	Bronze Medal

Chapter II

Methodology

The college has conducted Green Audit in the year 2019-20, on a yearly basis. The audit was carried out in three phases.

2.1 Questionnaire survey:

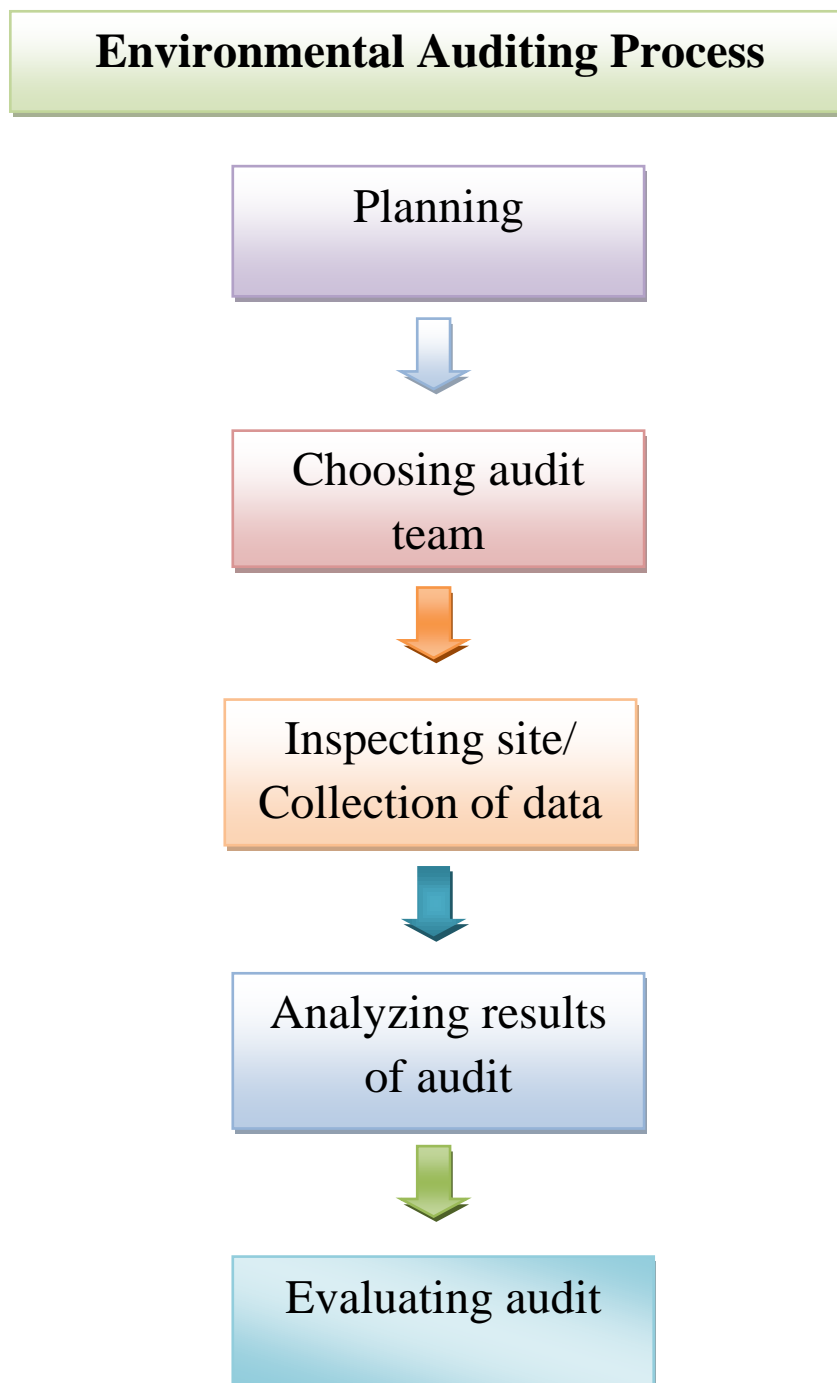
It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to 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.



Chapter III

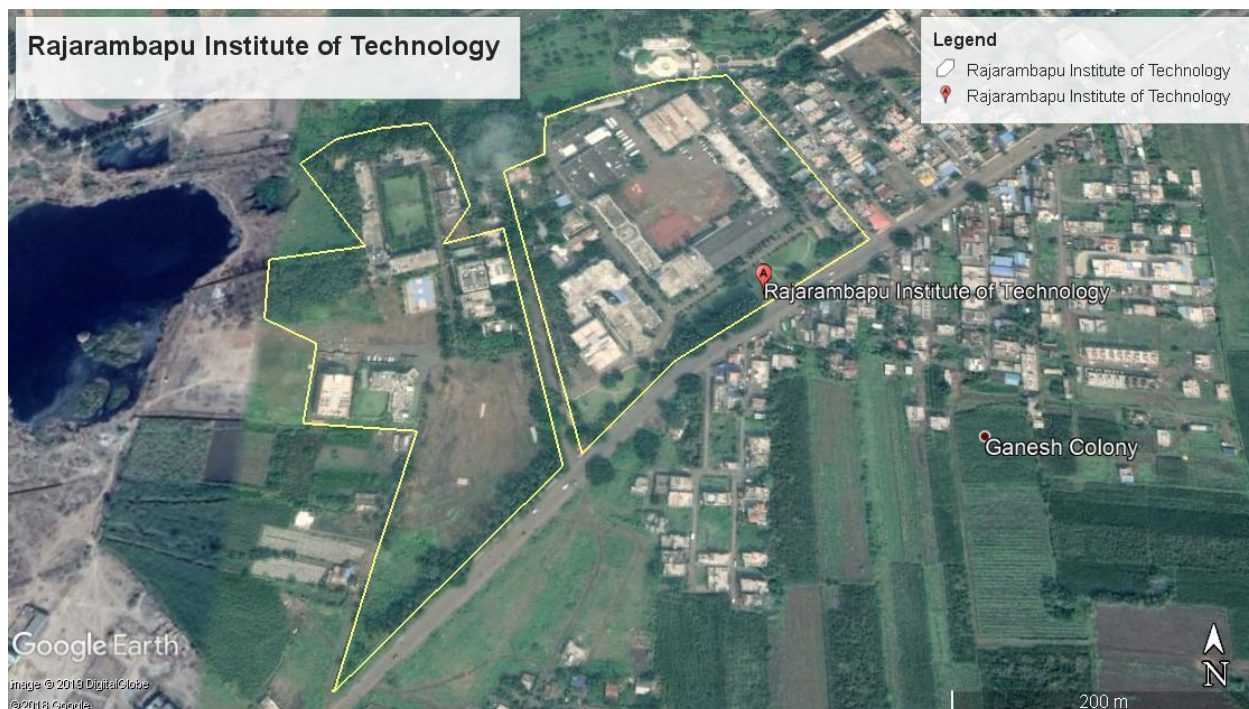
Overview of Green Audit

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: 3453

FACULTY: 213

NON TEACHING STAFF: 198

STRENGTH OF CAMPUS: 3864

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.

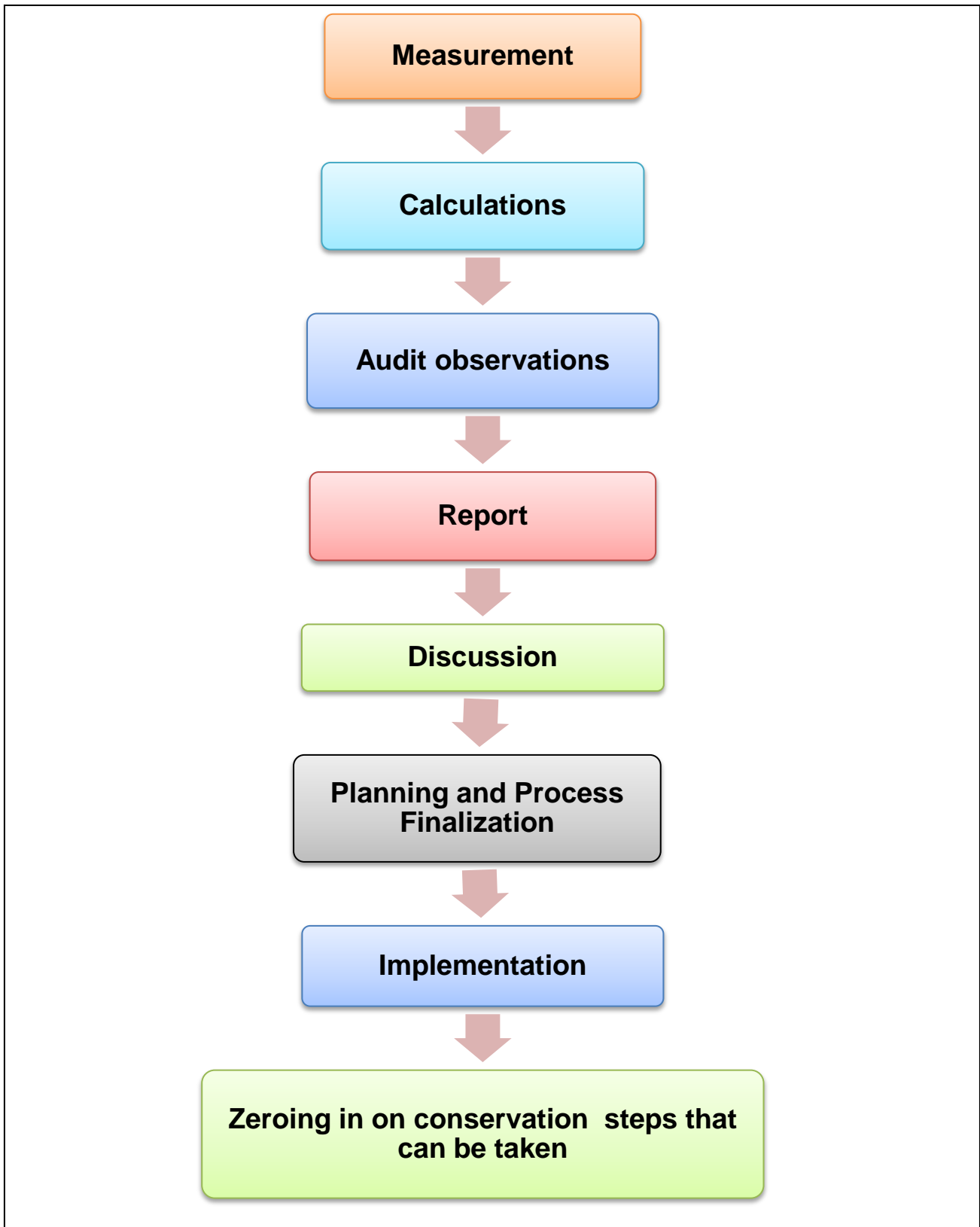
Importance of Water Audit:

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. As per the standards provided by WHO Regional office for South East Asia Schools require 2 liters per student for drinking; 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



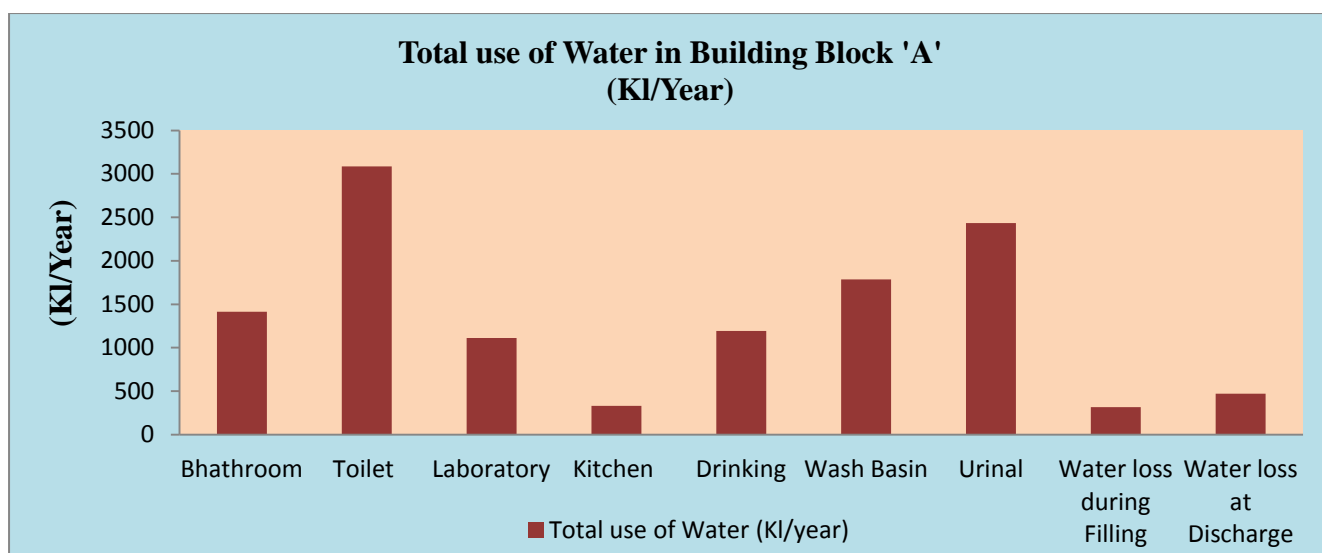
3.2.2 Water consumption in college:

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

3.2.2 .a The water consumption at Building Block 'A':

Table No. 3.1: Sector wise calculated use of water in Building Block A

Sr. No.	Sector	Total daily use (Kl/day)	Total yearly use (Kl/year)	Percentage %
1	Bathroom	7.059	1411.8	11.63
2	Toilet	15.435	3087	25.42
3	Laboratory	5.562	1112.4	9.16
4	Kitchen	1.66	332	2.73
6	Drinking	5.965	1193	9.82
7	Wash Basin	8.935	1787	14.72
8	Urinal	12.162	2432.4	20.03
9	Water loss during Filling	1.584	316.8	2.61
10	Water loss at Discharge	2.358	471.6	3.88
Total		60.72	12144	100



Graph No. 3.1 Total water consumption yearly by Building block 'A'

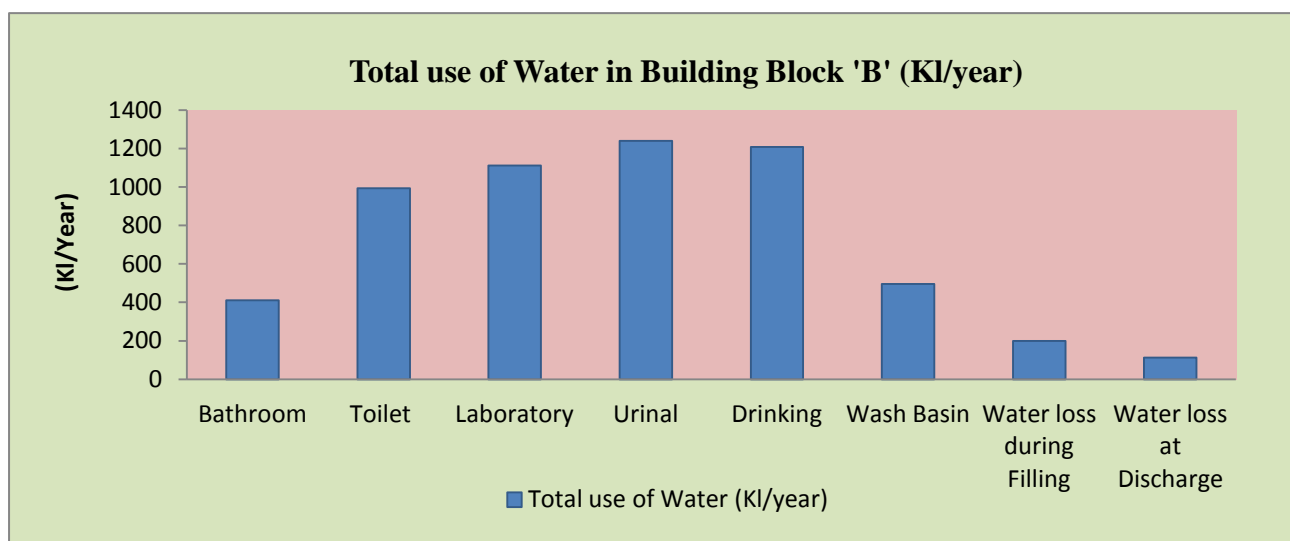
It is revealed from the data given in Table No. 3.1 and Graph No. 3.1 that total 60.72 Kiloliter daily and yearly 12144 Kiloliter water is used. In the Building block 'A' which includes Administrative/Civil/IT, Mechanical/Automobile, Electrical (Instructional Building), CSE/Electronics/MBA (Main Building No. 2) use of water is seen for bathrooms, toilet, drinking, wash basin, laboratory, kitchen and Urinal. purpose for daily and also calculated yearly. From above data, it is observed that the maximum water consumption was for toilet flushing purpose which is 15.435 Kilolitre/day i.e. 3087 Kilolitre/year. Water loss during filling of water in tank was noted as 1.584 Kilolitre/day i.e. 316.8 Kilolitre/year and water losses at discharge were found to be 2.358 Kilolitre/day i.e. 471.6 Kilolitre/year.

3.2.2.b. Water consumption by Building Block 'B':

Table No. 3.2: Sector wise calculated use of water in Building Block 'B'

Sr. No.	Sector	Total daily use (Kl/day)	Total yearly use (Kl/year)	Percentage %
1	Bath room	2.05	410	8.80
2	Toilet	4.972	994.4	21.33
3	Urinal	6.204	1240.8	26.62
4	Drinking	6.04	1208	25.92
5	Wash Basin	2.48	496	10.64
6	Water loss during Filling	1	200	4.29

7	Water loss at Discharge	0.56	112	2.40
		23.306	4661.2	100



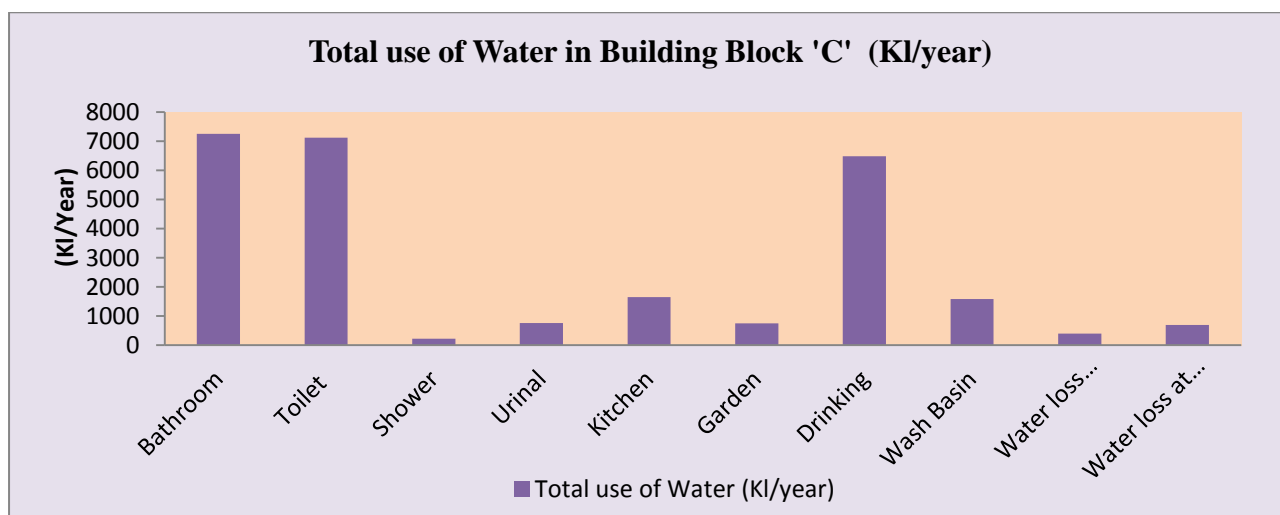
Graph No. 3.2 Total water consumption yearly by Building block 'B'

It is shown from the data in Table No. 3.2 and Graph No. 3.2 that total 4661.2 Kiloliter water is used daily in Building block 'B' i.e in Central library and Workshops together. There are total six workshops on RIT campus. In this building use of water occurs for Bathroom, toilets, drinking, wash basin and urinal 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 6.204 Kiloliter / day i.e. 1240.8 Kiloliter /year. For toilet purpose 4.972 Kiloliter / day of water required daily while yearly it is 994.4 Kiloliter /year respectively. In case of drinking purposes 6.04 Kiloliter / day while yearly require 1208 Kiloliter /year. Water loss during filling of water in tank was noted as 200 Kiloliter /year and water losses at discharge were found to be 112 Kiloliter /year.

3.2.2. c. Water consumption by Building Block 'C':

Table No. 3.3 Sector wise calculated use of water in Building Block 'C'.

Sr. No.	Sector	Total daily use (Kl/day)	Total yearly use (Kl/year)	Percentage %
1	Bath room	36.25	7250.0	26.93
2	Toilet	35.57	7113.2	26.42
3	Shower	1.15	229.2	0.85
4	Urinal	3.81	761.2	2.83
5	Kitchen	8.23	1646.8	6.12
6	Drinking	3.75	749.4	2.78
7	Wash Basin	32.42	6483.2	24.08
8	Garden	7.92	1584.4	5.88
9	Water loss during Filling	2.03	405.4	1.51
10	Water loss at Discharge	3.51	701.0	2.60
Total		134.62	26923.8	100

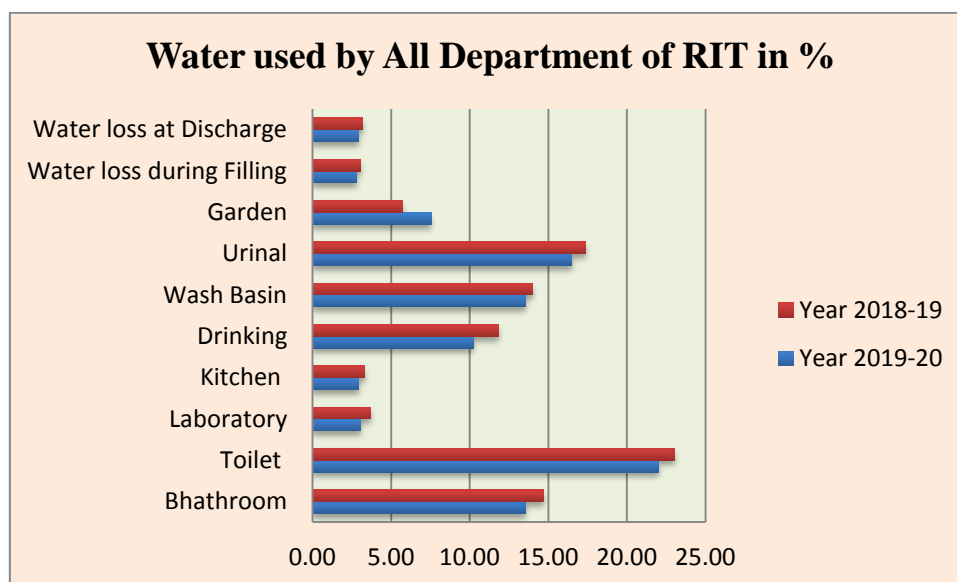


Graph No. 3.3 Yearly consumption of water Building Block 'C'

It is revealed from the data given in Table No. 3.3 and Graph No. 3. 3 that total 134.62 Kiloliter water is used daily and 26923.8 litres yearly. In Building Block 'C' water used for bathrooms, toilets, shower, drinking, urinal, wash basin and garden etc. is calculated daily and yearly. From above data, it is observed that the maximum water consumption was

for bathroom purpose which is 36.25 Kilolitre/ day i.e. 7250.0 Kilolitre /year. Water loss during filling of water in tank was noted as 2.03 Kilolitre/day i.e. 405.4 Kilolitres/year and water losses at discharge were found to be 3.51 Kilolitre/day i.e . 701.0 Kilolitre / year.

3.2.2. d. 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 difference between total percent of water consumed by the Rajarambapu Institute of Technology in the year 2018-19 and 2019-20. As per the graph toilets, urinal, bathrooms and wash basins are the major sources of utilization comprising 22.04%, 16.49 %, 13.56% and 13 % respectively. The other uses namely laboratory, kitchen, garden and drinking purpose consume relatively less water with daily water requirement of 3.02 % Laboratory, 2.95 % Kitchen, 7.55% Garden and 10.22 % Drinking respectively in the year 2019-20 while in the year 2018-19 the percentage of water consumption were more as compared to this year because of pandemic situation. Besides that the college has fulfil the suggestions given for water management by the Green Audit report 2018-19.

3.2.3 Sustainable Water Practices (SWP):

3.2.3.a 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. 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

3.2.3. b. Biogas Plant

RIT College has constructed Biogas Plant behind Canteen of Boys Hostel which has capacity of 10 m³ per day. The substrate used in Biogas plant is waste generated from canteen and Hostel. Biogas can be used in a specially designed burner for cooking purpose. A biogas plant of 2 cubic metres capacity is sufficient for providing cooking fuel needs of a family of about five persons. So the gas produce in biogas plant is used for making food in canteen and the slurry which form is utilized as manure for garden plant.



Solid waste utilization in Biogas Plant.

3.2.3. c. Farm pond

RIT College has constructed farm pond near Miyawaki project. The size of the pond from bottom is 43.50 x 13.30 meter and top size is 7.00 x4 16.80 meters while height 2.20 meter. The farm pond has capacity of 1500.00 m³. When it fills to about 50% of capacity, it helps in recharging of ground water. The water from it is supplied for garden purpose.



Creation of farm ponds near Miyawaki project

3.2.3. d. Rain water harvesting:

RIT College, Islampur, is equipped with the rain water harvesting system located in Boys hostel having area available for rain water collection is 1551m². On the basis of average rainfall per year the capacity of rain water harvesting project is implemented. Yearly in this area the water fall is on an average 819 mm. So the total area available for recharge is 1270000 litre. This collected water is stored in tanks, farm ponds and helps in recharging bore well.



Rain water harvesting at Boys hostel of RIT College.

3.2.3.e. Drip Irrigation in RIT college Garden

RIT College has huge green campus. Drip irrigation system have been installed at gardens which helps to save water and nutrients by allowing water to drip slowly to the roots of plants. The goal is to place water directly into the root zone and minimize evaporation to save water.



Drip irrigation in RIT College garden

Key Observations:

- The calculation revealed that highest water use sector is toilets which consumes average 22% water and remaining 78% water consumption further divided into other sectors in such bathrooms, washbasins, urinals, laboratory, kitchens and garden. The percentage of use of water is less in the year 2019-20 as compared to last year.
- College has sustainable water practices such as Wastewater treatment plant, Phyto-remediation plant, Biogas plant, farm pond, Drip irrigation, Rain water harvesting plant which are all in working condition.
- The institute cleans the water tanks properly, they have maintained the cleaning report of water tank. It is only necessary to reduce the force of tap water, so that water is not wasted.
- Institute proposed new Water treatment plant which is under construction phase. RIT College fulfil most of the suggestions given in Green audit report 2018-19.

3.3 Solid waste audit of the college:

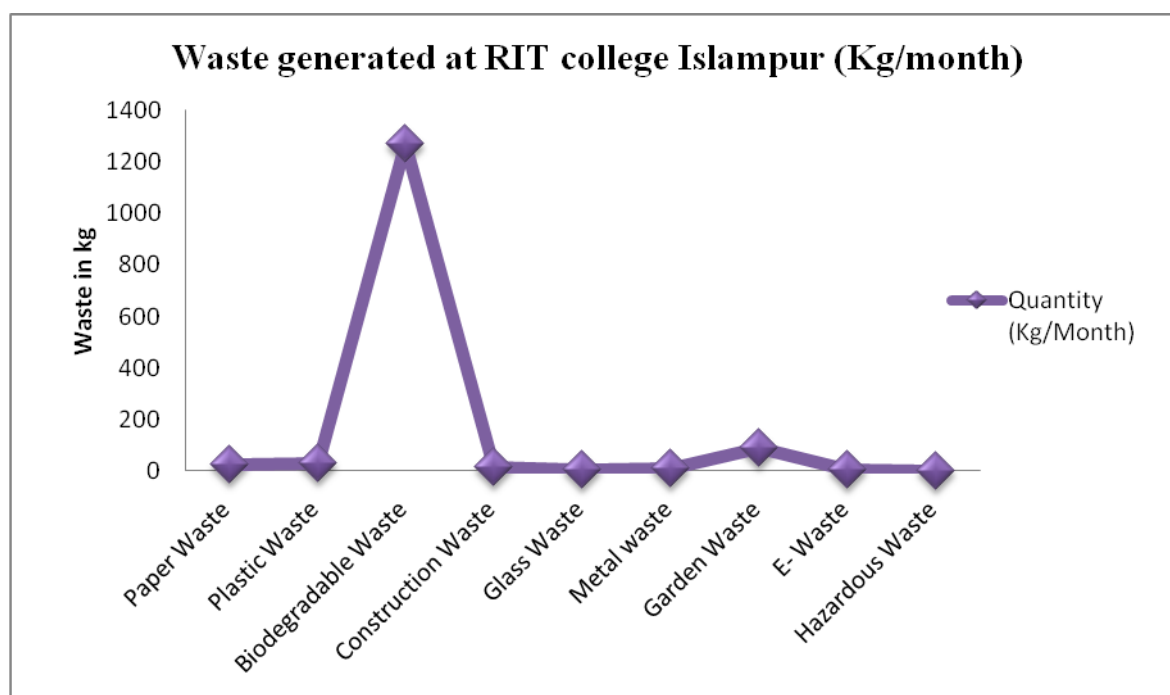
Solid waste management is a term that refers to the process of collecting and treating solid wastes. As long as people have been living in settlements, garbage and solid waste has been an issue. In recent years, it is observed that per capita waste generation has increased due to the changing life style. Improper disposal of solid waste is responsible for pollution of air, water and soil. Disposal of solid waste on open area leads to develop bad odour in the surrounding also it may develop unhygienic conditions. Improper waste disposal is root cause for spreading the infectious diseases among the human and animal. So, it is important to take some steps for the proper management of solid waste followed by reduce, reuse and recycle 3R principle. The intention of this inventory is to find out the quantity of waste generation and disposal methods which are currently followed 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.3.3.1: Category wise solid waste generation in college (kg/month)

Department	Paper Waste	Plastic Waste	Biodegradable Waste	Construction Waste	Glass Waste	Other	Metal waste	Garden Waste	E-Waste	Hazardous Waste
Quantity (Kg/Month)	25.33	30	1,270	11.9	6.3	21.4	7	87.9	2.8	0.6
Quantity (Kg/ Year)	177.3	210	8,890	83.3	44.1	149.8	49	615.3	19.6	4.2



Graph No. 3.3.1: Category wise solid waste generation in college (kg/month)

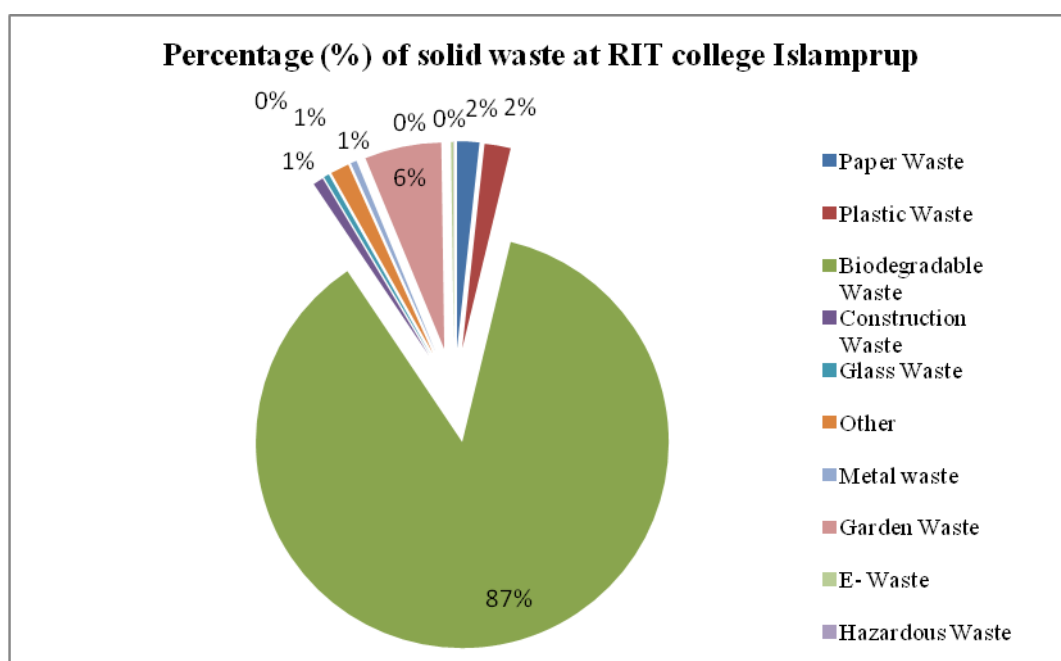
The average amount of solid waste generated per month in Rajarambapu Institute of Technology, Rajaramnagar is approximately 400.23 kg/month. On the basis of observations the highest quantity of solid waste generated is biodegradable waste which is about 1,270 kg/month. This waste is produced from hostel mess, Canteens, Cafeteria, Quarters, Gymkhana and Gardens. The leaf litter produced in the garden and premises is 87.9 kg/month. 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 most generated in workshops. 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. 25.33 kg/month waste is generated in the institution.

The glass waste is produced in minimum quantity i.e. 6.3 kg/month which is generally in the form of broken glassware, cups and glasses used in canteens and hostel mess. Besides, the above mentioned waste, plastic waste is generated in the form of plastic wrappers of food items.

Table No. 3.3.2: Percentage of category wise solid waste in the college (kg/month)

Category	Paper Waste	Plastic Waste	Biodegradable Waste	Construction Waste	Glass Waste	Other	Garden Waste	E- Waste	Hazardous Waste	Total Solid Waste in %
Percentage (%)	1.64	1.94	88.0	0.77	0.41	1.38	5.68	0.18	0.04	100

**Graph No. 3.3.2: 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 Biodegradable waste which is 88% and minimum percentage of Hazardous Waste generated is about 0.04 %. The biodegradable waste is produced mostly through canteens, hostel mess and garden litter in the campus.

3.3.3 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. 3.3.3: Category wise solid waste generation in the college (kg /month)

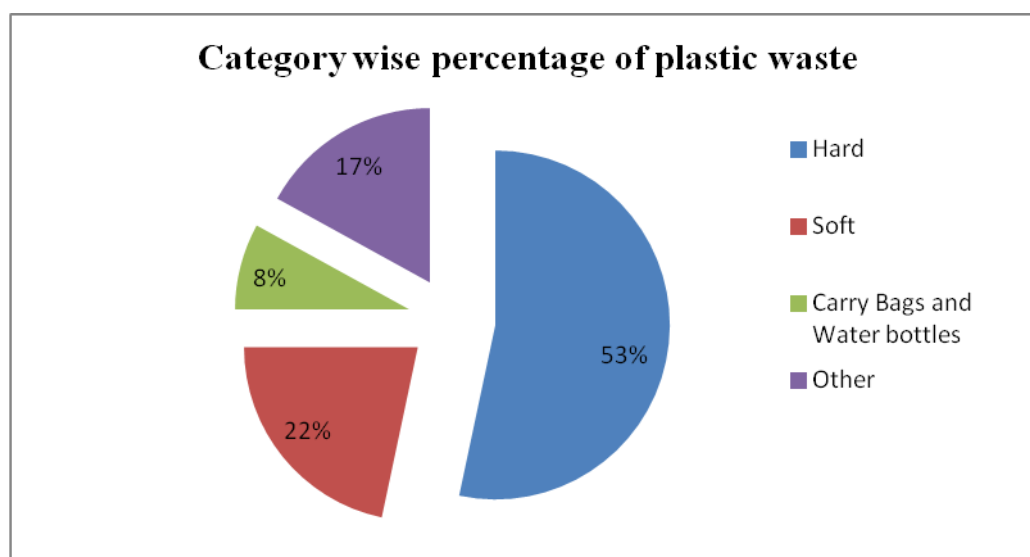
Building and Categories of waste	Paper Waste	Plastic Waste	Biodegradable Waste	Construction Waste	Glass Waste	Other	Metal waste	Garden Waste	E-Waste	Hazardous Waste
Admin, Civil and IT	2.3	0.2	0	1.4	0.7	0.2	0	0	0.3	0.2
Mechanical	0.8	0.1	0	0	0	0	0	0	0.2	0.1
Electrical	0.5	0.1	0	0	0	0	0	0	0.8	0.1
MBA	0.7	0.2	0	0	0	0	0	0	0.4	0
Workshops	7.33	0.2	0	0	0	20.4	1	0	0.5	0.2
Library	0.6	1.4	0	0	0	0	0	0	0	0
Girls Hostel	1.8	0.8	13	3.4	0.4	0.2	3	0	0.1	0
Boys hostel	1.5	0.5	14	3.2	0.3	0.2	3	0	0.1	0
Gymkhana	0.2	0.4	1	0	0	0	0	0	0.1	0
Canteen and cafeteria	5.2	25.2	1200	0	3.3	0	0	0	0.1	0
Guest House	1	0.2	2	0	0.2	0.1	0	0	0	0
Quarters	3.2	0.2	5	0.5	0.2	0.1	0	0	0.2	0
Garden and college premises	0.2	0.5	35	3.4	1.2	0.2	0	0	0	0
Total solid waste generated (kg/month)	25.33	30	1270	11.9	6.3	21.4	7	87.9	2.8	0.6
Total solid waste generated (kg /year)	177.31	210	8890	83.3	44.1	149.8	49	615.3	19.6	4.2

3.4.1 Plastic Waste:

Table No.3.3.4: Plastic waste generation and its distribution in the college

Category	Plastic Kg/month				Total
	Hard	Soft	Carry Bags and Water bottles	Other	
Quantity	16	6.5	2.4	5.1	30
Percentage	53.33	21.67	8	17	100

Plastic waste in the form of packaged food wrappers, old broken chairs, old broken water tanks, etc and plastic water bottles is approximately 30 kg/ month. Plastic wastes are difficult to dispose because it is non-biodegradable waste or it takes many years to degrade naturally. It can cause adverse impacts on environment.



Graph No. 3.3.4: 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 53.33%. The soft plastic accounts 21.67 % of plastic while the carry bags, packaged food items in canteens are present about 8 %.

3.4.2 Hazardous waste audit of the college:

Hazardous waste is waste that has substantial or potential threats to public health or environment. The sources of hazardous waste in the RIT college are very less. The amount of hazardous waste generated in the college is 0.6 kg/month. The major source of hazardous waste in campus is the sanitary napkin waste generated in girl's hostels. and other one is the waste from diesel generator (DG) set. 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.

Diesel generator set is also the source for hazardous waste such as Oil soaked cotton, Lube oil and filters. This waste is handed over to the vendor for disposal process. Very less quantity of hazardous waste and effluent are generated through chemical laboratories during the use of acids and various 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.

3.4.3 E-waste generation in the college:

Generation of e-waste is found in every educational institute. All discarded electronic appliances are called as E-waste. E-waste requires special treatment for disposal so it is also called as special waste. 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, fused bulbs and tubes 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 hand overed them about 5500 kg and 3540 kg of e waste on 24th January and 6th February 2019 respectively.

3.4.5 Construction waste:

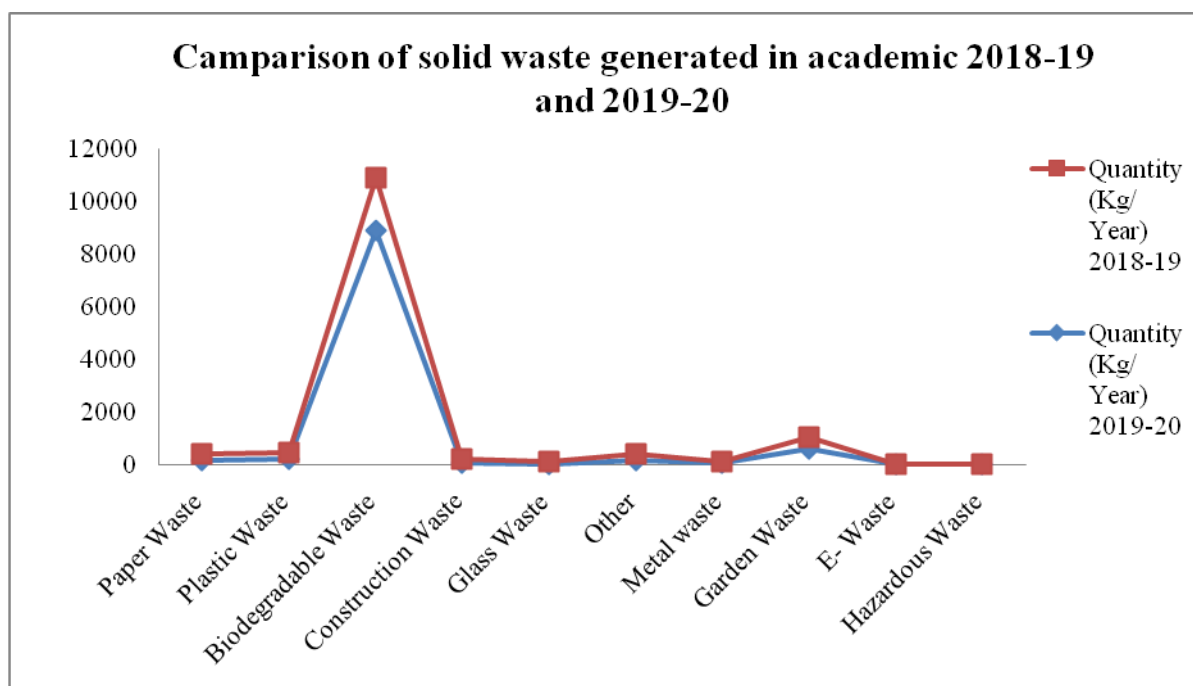
Construction waste is generated from construction of new buildings and demolition activities consisting of concrete, tiles, bricks, drywall, asphalt, plastics, metals, wood, rock and more. These construction waste materials are often inert and non-biodegradable, heavy, bulky and responsible for overload landfills. About 143 m³ of construction waste which is generated in the college premises used for the construction of road in the college campus which is around 500m in length.

3.4.6 Metal waste

Metal waste is generated from workshops through various activities. The activities in workshops generate approximately 6.3 kg of metal fragments with small pieces per month. The good thing about metal is they can be recycled over and over without changing its properties. Metal waste includes scrap of benches, table, cupboard, cots and other things which are made up of metals.

3.3.5 Comparison between solid wastes generated in RIT College premises in academic year 2018-2019 and 2019-2020

Category	Paper Waste	Plastic Waste	Biodegradable Waste	Construction Waste	Glass Waste	Other	Garden Waste	E-Waste	Hazardous Waste
Quantity (Kg/ Year) 2019-20	177.31	210	1442	83.3	44.1	149.8	615.3	19.6	4.2
Quantity (Kg/ Year) 2018-19	257	251	2010	138	59	279.6	419	20.5	5



Graph No. 3.3.5 Comparison of solid waste generated in academic year 2018-19 and 2019-20.

As per the observations it is observed that in academic year 2019-20 paper waste, plastic waste, biodegradable waste, construction waste, glass waste, other waste, E-waste and hazardous waste is generated in less quantity than that was generated in year 2018-19. This might be effect of lockdown days. Garden waste is generated in more quantity than that was

generated in year 2018-19. This might be due to the plantation activity which is done for Miyawaki plantation.

3.4.7 Eco-friendly solid waste management practices:

The college follows following eco friendly solid waste management practices.

1. Composting and Mulching –

The collage has four composting plants, each of 2 m³ near library and plantation area. The leaf litter used as a composting will increase the productivity of crop by supplying vitamin, nutrients and hormones. Utilizing the leaf litter waste by composting process will reduce the air pollution, health problems caused by leaf litter burning, decrease in municipal solid waste disposal and fire incidents in forests. The leafy waste is collected from the campus and dumped here for composting purpose and also they have kept leaf litter of the plantation area as it is for improving quality of soil by natural degradation process which is also called as mulching.



1. Composting pit near library

2. Garden waste generated in the campus

2. Biogas Plant:-

The food waste from hostel is approximately 1200 kg/month this waste is treated in the biogas plant having capacity of 10m³. 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 in boys hostel mess.



Biogas digester near boy's hostel

3.E waste recycling:

All the E waste generated in RIT college premises is recycled through the Mahalaxmi e recyclers.





4.Reuse of construction waste

Construction waste whichever generated during the construction of new structures in RIT college is reused for construction of road in premises. The road is of around 500m length connecting ladies hostel and end of Miyawaki plantation site.



Road built up by use of construction waste

5. Recycling of wooden waste:

Wood waste generated in the RIT College is recycled for making some useful things like teapoi, small cupboards, stools, wooden temple for home etc.



Usable things made from wood waste.

Key Observations:

- The average waste generated in the college is app. 7897.23 kg /month
- Highest quantity of solid waste is biodegradable waste around 1361 kg/month.
- Biodegradable waste is utilized properly for composting and biogas generation.
- Plastic waste is generated 25.33 kg/month in the college campus. This generated waste is used to dump on open area which causing loss of aesthetic beauty of premises. To dispose plastic waste properly, this waste can be used for road construction along with other construction material.
- Leaf litter from Teak plantation site is kept as it is for improving the soil quality.
- It is observed that fused tube lights, Plastic bags and some other waste are disposed on open ground which needs special attention.
- Segregation according to the categories of waste should be done at source of waste generation.
- 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.
- The construction waste is reused for road construction of around 300 to 500 m from girl's hostel to Miyawaki plantation site.
- Cleanliness and hygienic conditions were maintained in the campus.
- Metal is used for making jobs in workshop and Wood waste is also recycled by student for making showpieces.

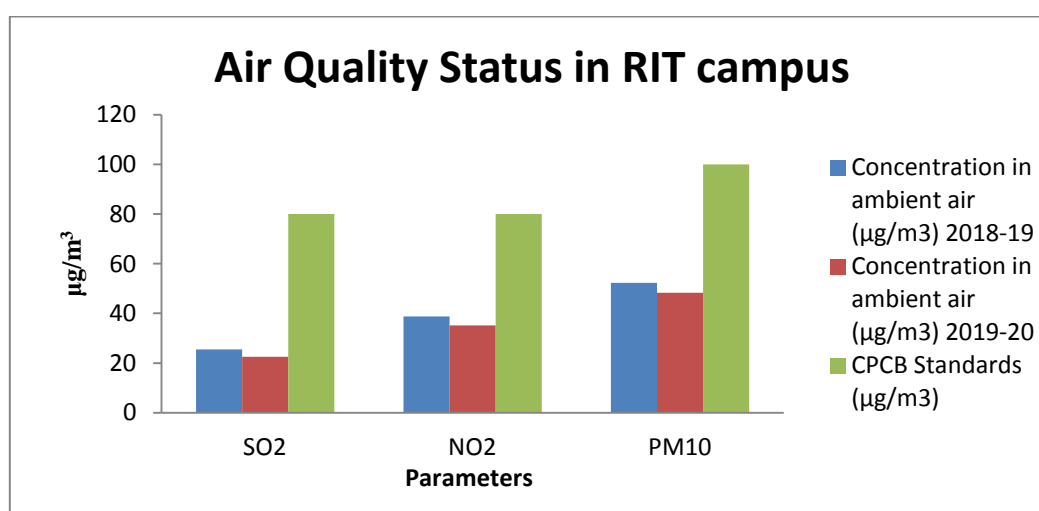
3.5. Air Quality Status:

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. Air monitoring was also done in last year 2018-19.

Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO₂) 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. 3.5.1. Ambient air quality status in Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

Parameters	SO ₂	NO ₂	PM ₁₀
Concentration in ambient air (µg/m ³) 2018-19	25.45	38.76	52.24
Concentration in ambient air (µg/m ³) 2019-20	22.51	35.14	48.36
CPCB Standards (µg/m ³)	80	80	100



Graph No. 3.5.2 Ambient air quality status in Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

The graph shows last year air quality status. The graph shows that the SO_x and NO_x levels decreased as compared to last year. The similar observations were observed for particulate matter also. It was observed that very few activities in the campus are responsible for air pollution. The green belt developed to reduce the air emission occurring through traffic on the road. Plantation present in the campus is playing a very important role in reducing the amount of carbon dioxide and making air clean.

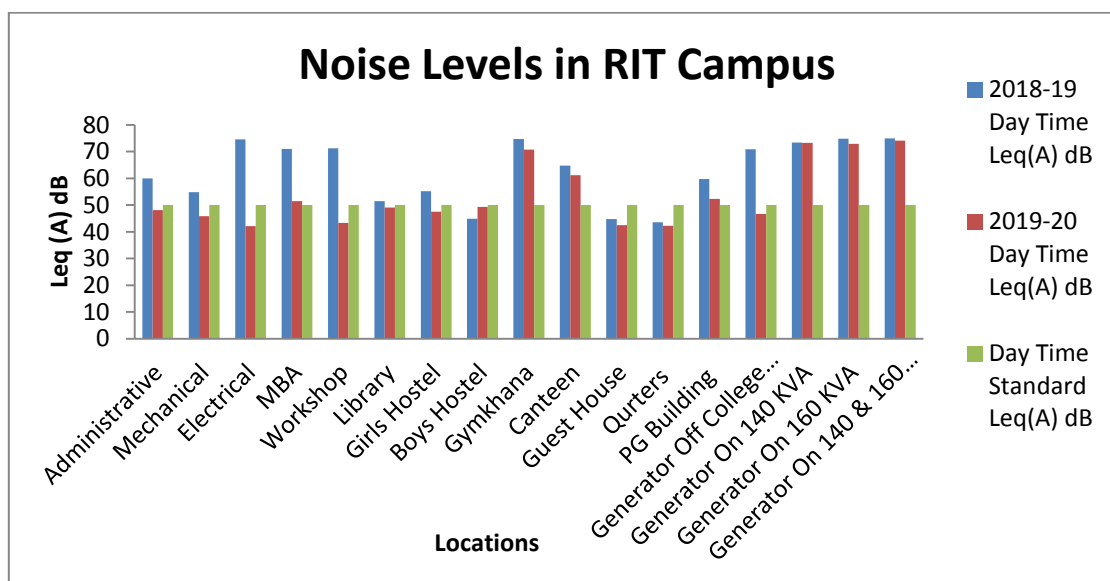
3.6 Ambient noise monitoring status:

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. 3.5 and Graph No. 3.5

Table No. 3.6.1 Ambient Noise levels in Rajarambapu Institute of Technology, Urun Islampur, Maharashtra.

Sr. No.	Name	2018-19 Day Time Leq(A) dB	2019-20 Day Time Leq(A) dB	CPCB Day Time Standard Leq(A) dB
1	Administrative	60.01	48.08	50
2	Mechanical	54.81	45.81	50
3	Electrical	74.62	42.11	50
4	MBA	70.99	51.46	50
6	Workshop	71.19	43.32	50
7	Library	51.5	49.12	50
8	Girls Hostel	55.23	47.50	50
9	Boys Hostel	44.92	49.29	50
10	Gymkhana	74.72	49.71	50
11	Canteen	64.80	61.14	50
12	Guest House	44.78	42.54	50
13	Quarters	43.61	42.26	50
14	PG Building	59.68	52.34	50
15	Generator Off condition	70.86	46.63	50
16	Generator On 140 KVA	73.32	73.23	50
17	Generator On 160 KVA	74.85	73.90	50
18	Both Generator on condition	74.92	74.12	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.
 4. Bold values are above Standards.



Graph No.3.6. 2 Ambient Noise levels in Rajarambapu Institute of Technology, Urun, Islampur, Maharashtra.

Noise levels were measured in different places. Some places in college noise levels are above the CPCB standards like Generators, MBA, canteen and PG building. Graph shows the noise levels of 2019-20 are lower than 2018-19.

Noise levels were measured in the college campus and compared with the CPCB standards. The day time noise standard for the silent zone is 50dBA. It was observed that generators, MBA department, canteen and PG building's noise levels are above the CPCB standards. As per the observations of two consecutive years, the noise levels during 2019-20 saw less noise than 2018-19.

3.7 Details of green inventory on college campus:

The modern world facing the biggest and toughest, still unsolved problem is Climate Change. The modern civilization in the earlier 21st Century comes with major concerned issues like population growth, food security, global warming, inequitable distribution of natural resources and poverty. The major concerns about the emission of Greenhouse Gases (GHGs) are unplanned civilization, industrialization, low cost products or lifestyles. CO₂ is the main contributor among these GHGs causing global warming. Atmospheric Carbon dioxide levels have increased to 409.8 parts per million till 2019. On this background, it is a need of time to cover the educational campuses with green cover interrelated with climate change as such campuses are spread in large areas.

The current observations are related to present status of tree cover, vegetation and carbon storage assessment of area under Rajarambapu Institute of Technology, Urun Islampur. In the current time, institutional areas can play key role for sequestration, mitigation of carbon from their own area by various carbon reducing technologies. The institutional green cover acts as carbon sink. 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.

The carbon sequestration potential of RIT was studied for the Green Audit preparation. Here tree census methodology has been adopted from the guidelines set by Indian Institute of Remote Sensing, Dehradun, Government of India. All the collected data is tabulated and analysed with the help of MS- Excel spreadsheets and objected findings were extracted by using various factors given by Intergovernmental Panel on Climate Change (IPCC).

3.7.1. Green inventory of Rajarambapu Institute of Technology, Urun, Islampur campus

The Rajarambapu Institute of Technology, Urun, Islampur is located in Sangli district of Maharashtra state. The Islampur receives medium to high rainfall during the monsoon season. The Institute campus covers the total 43.76 acres area. Total 710 numbers of trees with more than 10cm girth and height more than 4 feet have been enumerated. The total 34 species of woody trees is identified during the visit. The campus has more native species of woody trees which is important aspect for the biodiversity. The inventory found highest number of *Tectona grandis* because of the monoculture plantation on campus. The institute has planted trees having more potential of carbon sequestration. The Institute took the initiative for plantation of native plants which is the best practice to conserve the local biodiversity. Total 160 fruiting plants were planted on the campus during 2019-20 which can be the good roosting spot for the native fruit eating birds as well as animals. The 0.9665 tons CO₂ sequestered by lawn area in the campus per year. The lawn area occupies the total 18.28% of total campus. Total 300 *Duranta erecta* beautification plants or ornamental plants are planted on the campus. The sugarcane field on the campus also stores the atmospheric carbon during the photosynthesis in the form of biomass.



Plantation around Cricket ground

3.7.2 Miyawaki forest on the Campus:

In the 1980s the Japanese Professor Akira Miyawaki introduced the innovative and new technique of afforestation called “Miyawaki Forest”. The innovative technique mainly focuses on the plantation of indigenous or native plant trees which restores the native ecosystem and also to maintain global environment including disaster prevention and carbon dioxide mitigation. The Miyawaki forest is the natural vegetation succession process which includes the conversion of bare soil to mature forest. The planted tree in the Miyawaki forest shows good growth in the short period which can store the atmospheric carbon dioxide in the form of carbon stock. The Miyawaki forest is the theoretical and practical method of restoration of natural and native ecosystem for the future as well as for the mitigation of global problem like Climate Change. The Rajarambapu Institute of Technology, Urun, Islampur follows the new trending famous concept of “Miyawaki Forest” on the campus area. The Miyawaki method, also called “the Potted Seedling Method”, is an afforestation technique that uses native species to create dense, multilayered forests. Akira Miyawaki is the earliest known pioneer of this Miyawaki forest system.

The total 500 Sq.m area is selected by the institute for the Miyawaki forest. The total 751 native plants are planted into the Miyawaki forest. The institute build up the new pond with 15, 00,000 litres waterpond for the Miyawaki forest. The various native species like *Mangifera Indica*, *Azadirachta indica*, *Ficus religiosa*, *Ficus Benghalensis*, *Polyalthia*

Longifolia are planted on this site. The 15 species of high rise plants, 17 species of medium rise plants and 26 species of shrub are planted by the Institute in the Miyawaki forest. The forest shows good growth of plants. The planted tree shows 1 to 2 feet height in one year of their growth. The trees selected for the forest are native to the local area and having the great symbiosis with each other. It is assumed that a single tree supports oxygen demand of two people for their life. Thus, these 751 trees will support the oxygen amount required for 1502 people on and around the campus. The forest will have the good and fast carbon sequestration rate as the forest contains fast growing plants. As the campus possess Miyawaki forest with 751 plants, these plant will store 16.37 tons of CO₂ approximately annually. The Miyawaki forest will be the carbon potential site on the campus in the future.



Miyawaki Plantation site on the campus

3.7.3 Carbon sequestration potential of the campus in future:

The Rajarambapu Institute of Technology, Urun, Islampur currently nurtures the 710 woody trees sequester 39.05 tons of atmospheric carbon dioxide annually while the lawn area s store 0.9665 tons of CO₂. The total planted 911 trees on the campus including Miyawaki forest will store 19.85 tons of CO₂ in the future. The total carbon potential of the campus in the future will be 59.86 tons annually.

3.7.4 Threats to the Green campus

The Rajarambapu Institute of Technology, Urun, Islampur take good efforts to maintain the greenery on the campus by planting trees, Miyawaki forest and by building the water tank for the trees. Though all the factors responsible for a good ecosystem are in good condition, need to be considered by the Institute to avoid the damage to ecosystem in the future. The threats are as follows:

3.7.4.1 No Fire lines and monoculture plantation:

The Rajarambapu Institute of Technology, Urun, Islampur is having large area covered with monoculture *Tectona grandis* which is having the 3.76 tons of carbon stock. There is no fire line around the site. As the same area posses the sugarcane field nearby there will be risk of fire as the farmers burn the remaining litter of sugarcane. This can lead to vanishing of whole carbon stock as the site is monoculture. Also, the campus is having the large area of grassland, during the summer season the fire disaster can take place by small ignition events.

3.7.4.2 Plantation of mono cultural trees for noise barrier:

Polyalthia longifolia trees were planted on campus to distinguish the sites on the campus as well as for noise barrier. This plantation can also lead to another mono cultural site on the campus with the same fire issues. There should be mix culture of plantation for more habitats of birds and animals. The species like *Mangifera Indica*, *Azadirachta indica*, *Saraca Ashoka*; *Terminalia catappa* etc should be planted on the campus.

3.7.4.3 Plantation of Ornamental plants:

The Institute is having the huge area in front of the Administrative building which highly occupied by lawn area as well as the ornamental plants. There should be more local plants or should plant more oxygen releasing plants like *Ocimum tenuiflorum* or *Ocimum sanctum* commonly called as Tulas or Holy Basil. For beautification, *Areca Palm*, *Sansevieria Zeylanica* can be planted on the campus area which release more oxygen in the day as well as night.

3.7.4.4 Agricultural area:

The campus possesses agricultural area of Sugar cane. The sugarcane field store the atmosphereric carbon, but the burning of remaining leaf litter of sugarcane emits the carbon. The use of more amount of water as well as transportation of sugarcane also produces more water footprint as well as carbon footprint. The absence of fire line between the campus and agricultural field can be threat due to natural or manmade fire.

3.7.5 Scope of Area:

The Institute is having the agricultural field which store atmospheric carbon during the photosynthesis. This is needed to be considered about sugarcane field. If the remaining leaf litter can be converted into compost by using the vermicomposting plants available on the campus can store the carbon in the form of organic carbon. This compost can lead to increase in the soil fertility on the campus area.

3.7.6 Area needs to be concerned:

The Institute need to reduce their carbon footprint. The institute use more amount of water for the lawn area that sequestrates very less amount of carbon with respect to total area occupied by lawn. The lawn area consumes the water and manpower which can produce carbon footprint in the future.

Key Observation:

- Absence of fire lines can cause fire disaster on the Campus.
- Miyawaki forest can be a good potential site of carbon sequestration in the future.
- The Institute take good initiative for green cover by planting fruiting plants and built up of water pond for the plantation area as well as Miyawaki forest.
- The institute possess 18.28% lawn area which sequest the less carbon.

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.

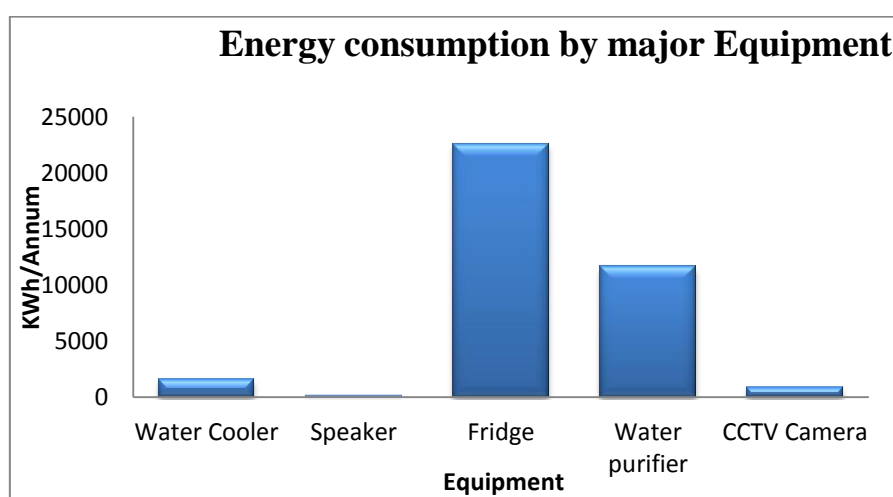
Fuel consumption by vehicles on campus is also an important criterion for energy audit. Count of two wheelers is 400 and of four wheelers are 60. But vehicles are not running on college campus but only parked on the campus.

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 37,714.88 KWh/ Annum.

Table No.3.8.1a: Energy consumed per annum by major instruments in all the departments in the college

Sr. No.	Equipment	Number	KWh/Annum
1	Water Cooler	5	1610
2	Speaker	10	109.2
3	Fridge	8	22579.2
4	Water purifier	15	11592
5	CCTV Camera	20	900.48
6	Aqua guard	22	924
Total		80	37,714.88



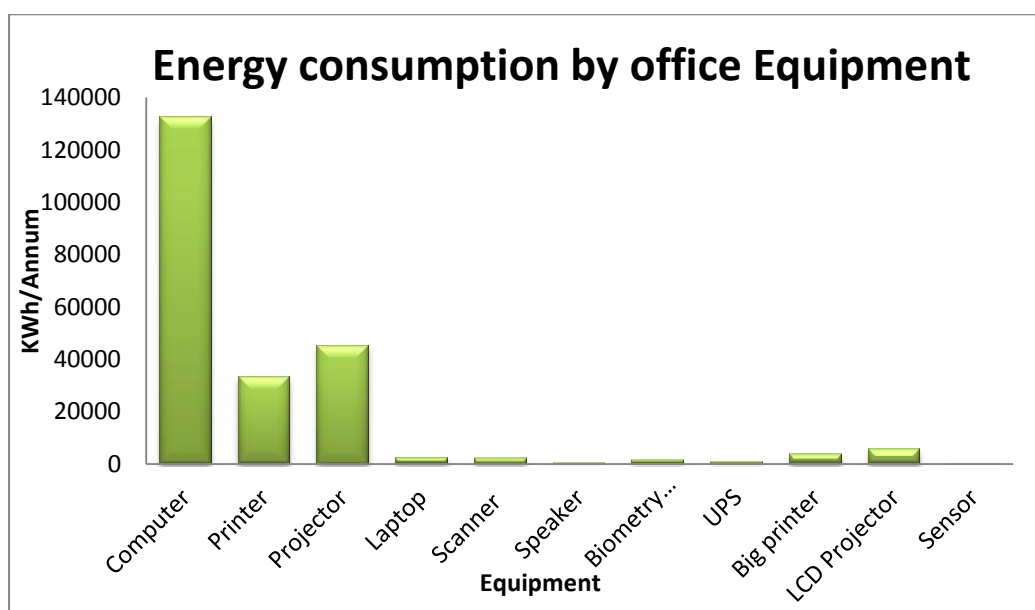
Graph No.3.8.1a: Energy consumed per annum by major instruments at all departments in the college

Total number of major energy consuming equipments at all departments energy consumption is 37,714.88 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. 37,714.88 KWh/ Annum. Number of fridge is 8 at all departments but the energy consumption is highest i.e. 22579.2 KWh/ Annum. Followed by water purifier 11592 KWh/Annum, and Water Cooler 1610 KWh/Annum, Aqua guard 924 KWh/Annum, CCTV Camera 900.48 KWh/Annum respectively.

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

Table No. 3.8.1b: Office equipments and their energy consumption (KWh/Annum) at all departments in the college

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	1351	132398
2	Printer	105	33075
3	Projector	76	45220
4	Laptop	25	2352
5	Scanner	10	2240
6	Speaker	20	364
7	Biometry Machine	15	1270.08
8	UPS	20	742.56
9	Big printer	10	3500
10	LCD Projector	13	5460
11	Sensor	24	6.72
	Total	1669	226628.36



Graph No. 3.8.1b: Office equipments and their energy consumption (KWh/ Annum) at all departments in the college

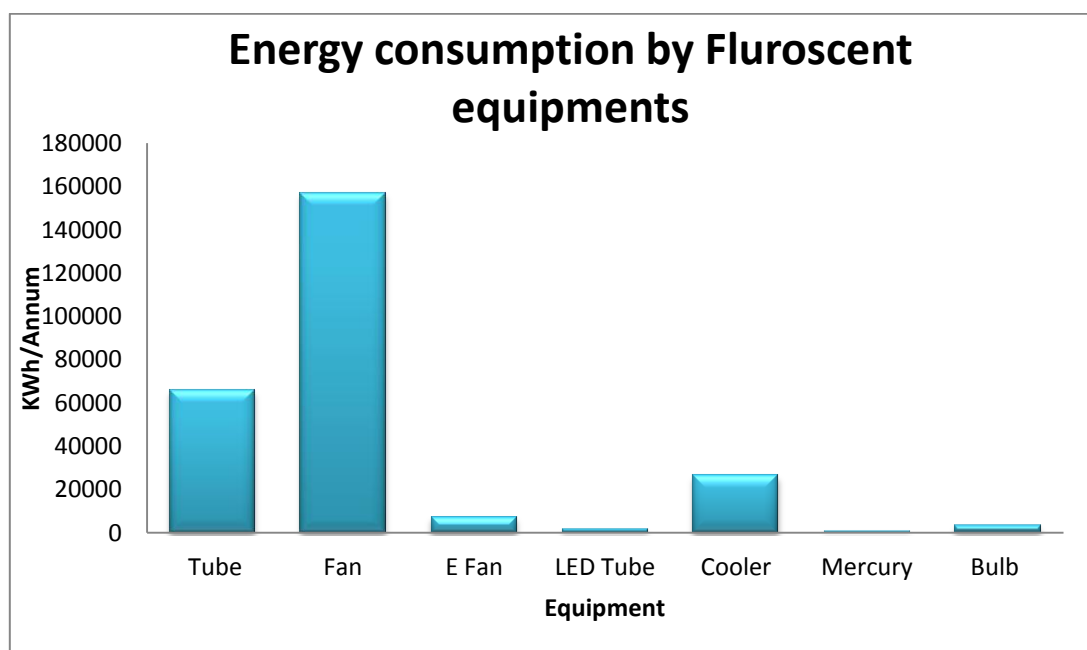
All the office equipments at all departments energy consume is 226628.36 KWh/Annum. As office equipment, number of computers is (1351) than Printers, Laptops, LCD projectors and Xerox machine hence also the energy consumed by computers is also

maximum i.e. 1,32,398 KWh/Annum followed by projectors i.e. 45,220 KWh/Annum, Printers 33,075 KWh/ Annum, LCD Projectors 5460 KWh/Annum, Biometry machine 1270.08 KWh/Annum respectively

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

Table No. 3.8.1.c: 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	57428
2	Fan	1,090	137340
3	E Fan	50	6473.6
4	LED Tube	60	1478.4
5	Cooler	30	23184
6	Mercury	5	604.8
7	Bulb	20	2800
	Total	3306	229308.8



Graph No.3.8.1.c: Number of fluorescent Tubes, bulbs and fans and their energy Consumption (KWh/ Annum) at all departments in the college

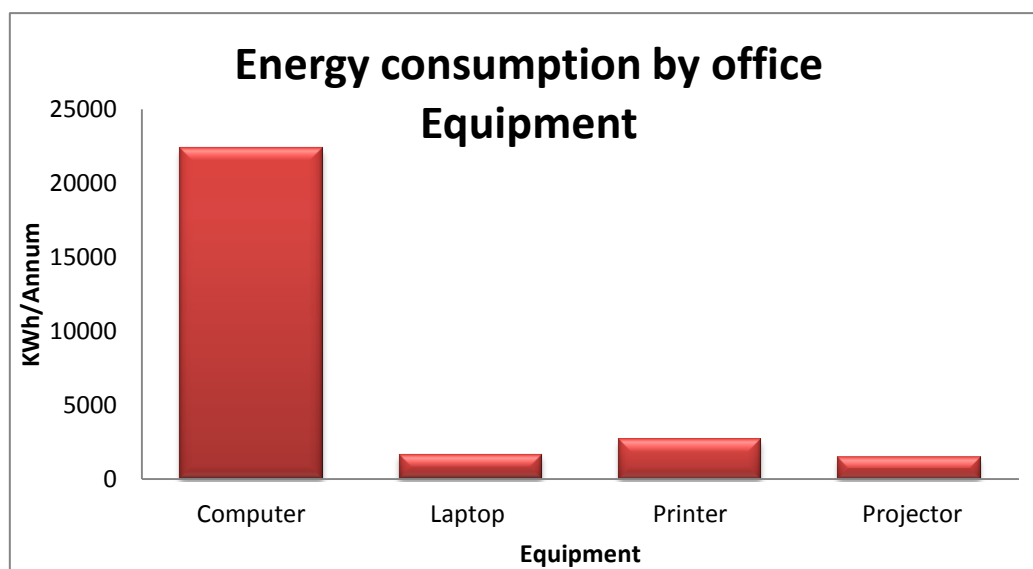
Maximum use of energy is for lightning and fans in all the buildings. The total number of fluorescent tubes is 2,051 and their electricity consumption is 57,428 KWh/Annum. In the building total number of ceiling fans and LED bulbs are 60 and their electricity consumption were respectively i.e. Fan 1,37,340 KWh/Annum and Exhaust Fan (E fan) 6,473.6 KWh/Annum, LED Tube 1,478.4 KWh/Annum, Cooler 23,184 KWh/Annum.

3.8.2 Energy Consumption at Workshops:

It has been observed that the Workshops has maximum number of major energy consuming equipments with energy consumption of 28,185.5 KWh/Annum.

Table No.3.8.2a: Energy consumed per Annum by office equipment at Workshops

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	76	22344
2	Laptop	17	1666
3	Printer	8	2688
4	Projector	5	1487.5
	Total	106	28,185.5



Graph No 3.8.2b: Energy consumed per annum by office equipment at Workshops

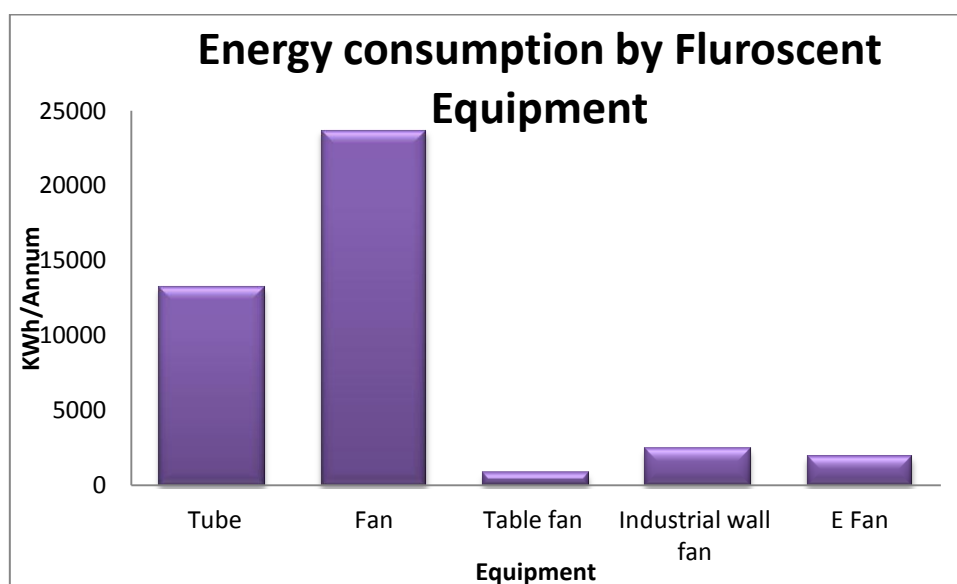
Total number of major energy consuming equipments at Workshops energy consumption is 28,185.5 KWh/Annum. Number of Computer is 76 at all Workshops, but the energy consumption is highest i.e. 22,344 KWh/ Annum .As major energy consuming

equipments, number of Laptop is 17 also the energy consumed by major energy consuming equipments is also maximum i.e. 1,666 KWh/Annum. Followed by Printer i.e. 2,688KWh/Annum, Projector 1,487.5 KWh/Annum.

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

Table No. 3.8.2c: Number of Fluorescent Tubes, Bulbs and Fans and Their Energy Consumption (KWh/Annum) at Workshops

Sr. No.	Equipments	Number	KWh/Annum
1	Tube	374	13194.72
2	Fan	141	23688
3	Table fan	10	806.4
4	Industrial wall fan	46	2415
5	Exhaust Fan	15	1942.08
	Total	586	42046.2



Graph No.3.8.2c: Number of fluorescent tubes, bulbs and fans and their energy Consumption (KWh/ Annum) at Workshops

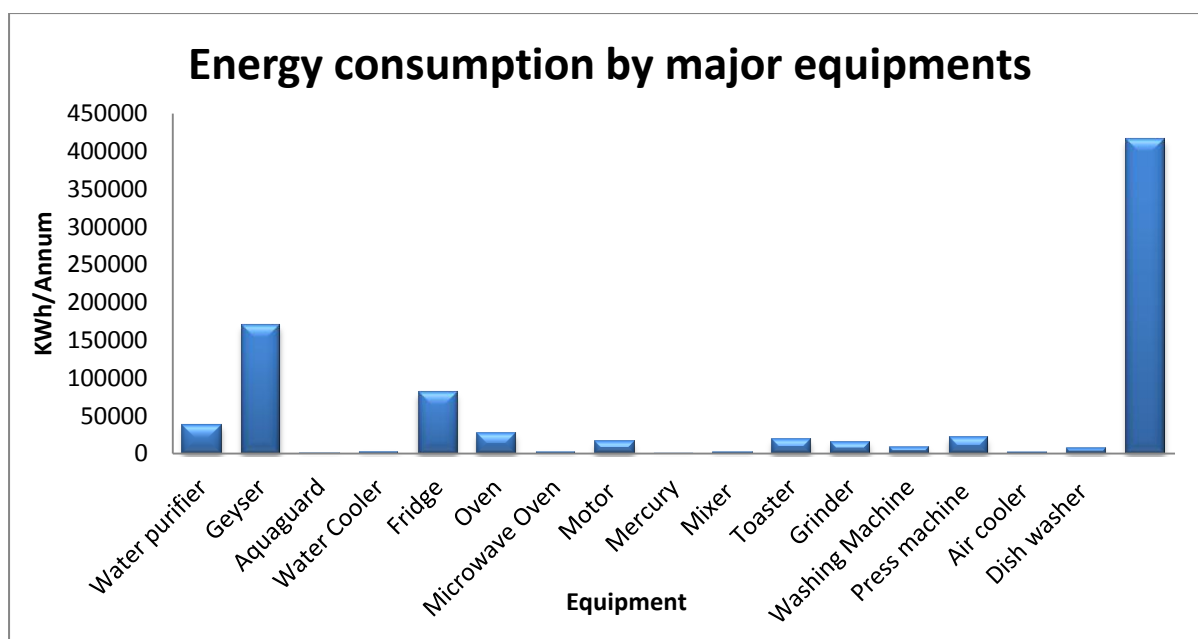
The total number of fluorescent tube is 374 and their electricity consumption is 13,194.72 KWh/Annum. In Workshops total number of fans and is 141 and their electricity consumption is maximum i.e. 23,688 KWh/Annum, Industrial wall fan 46 and their electricity consumption 2,415.

3.8.3 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 **3,61,308.5 KWh/ Annum**.

Table No.3.8.3a: Energy consumed per Annum by major instruments at Support services

Sr. No.	Equipment	Number	KWh/Annum
1	Water purifier	18	33488
2	Geyser	38	148960
3	Aqua guard	20	840
4	Water Cooler	5	2415
5	Fridge	25	70560
6	Oven	8	21504
7	Microwave Oven	5	2187.5
8	Motor	15	14112
9	Mercury	6	378
10	Mixer	15	2016
11	Toaster	10	16800
12	Grinder	20	13440
13	Washing Machine	15	7728
14	Press machine	20	18816
15	Air cooler	10	1680
16	Dish washer	5	6384
	Total	235	3,61,308.5



Graph No.3.8.3a: Energy consumed per Annum by major instruments at support Services

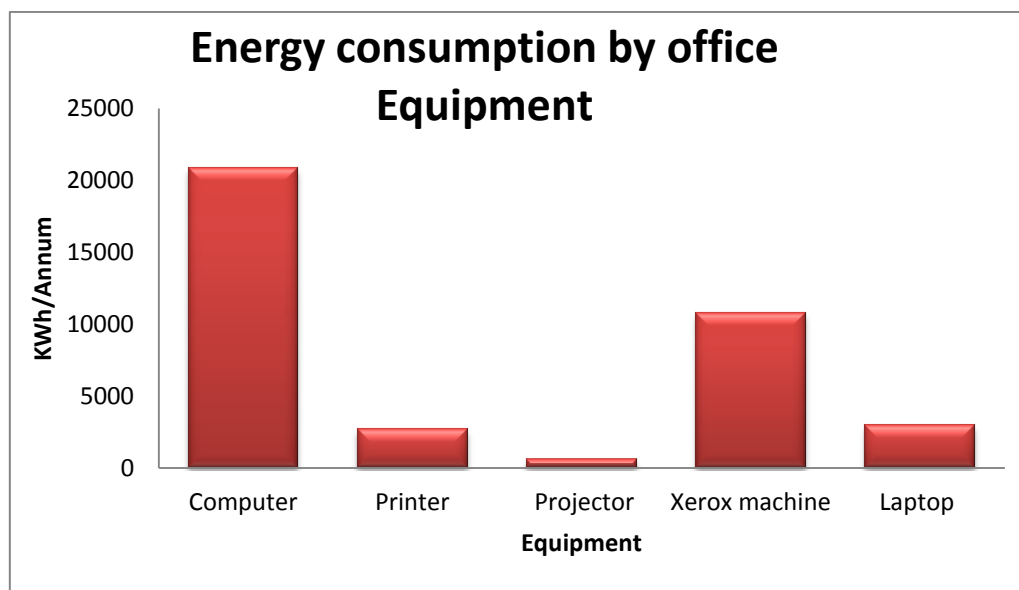
Total number of major energy consuming equipments at Support services energy consumption is 3,61,308.5 KWh/Annum. As major energy consuming equipments, number of Geyser is (38) than other equipments and hence, also the energy consumed by major energy consuming equipments is also maximum i.e. 3,61,308.5 KWh/ Annum. Number of fridge is 25 at Workshops but the energy consumption is highest i.e. 70560 KWh/ Annum, followed by water purifier 33488 KWh/Annum, Oven 21504 KWh/Annum, Press machine 18816 KWh/Annum, Toaster 16800 KWh/Annum, Motor 14112 KWh/Annum, Grinder 13440 KWh/Annum, and Water Cooler 2415 KWh/Annum, Aqua guard 840 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 3.8.3.b: Office equipments and their energy consumption (KWh/Annum) at support services

Sr. No.	Equipment	Number	KWh/Annum
1	Computer	85	20825
2	Printer	8	2688
3	Projector	2	595
4	Xerox machine	5	10752

5	Laptop	30	2940
Total		130	37800



Graph No. 3.8.3d: Office equipments and their energy consumption (KWh/ Annum) at Support services

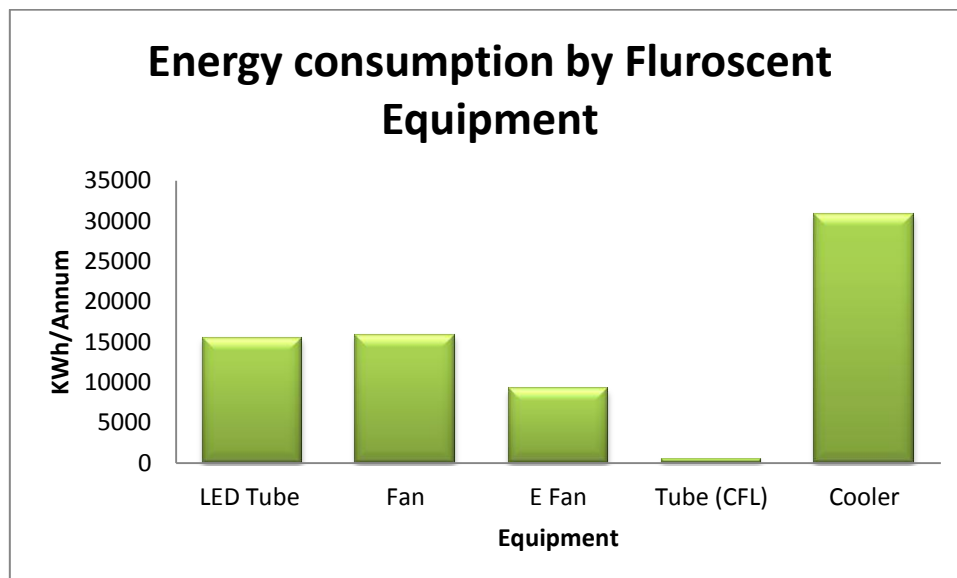
Office equipments at Workshops energy consume is 37,800 KWh/Annum. As office equipment, number of computers is (85) than Printers, Laptops, LCD projectors and Xerox machine hence also the energy consumed by computers is also maximum i.e. 20,825 KWh/Annum, Xerox machine 10,752 KWh/Annum followed by projectors i.e. 595 KWh/Annum, Printers 2,688 KWh/ Annum, Laptop 2,940 KWh/Annum.

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

Table No. 3.8.3e: 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	15516.928
2	Fan	126	15876
3	Exhaust fan (E Fan)	80	9139.2
4	Tube (CFL)	20	560
5	Cooler	40	30912

Total	1503	72004.128
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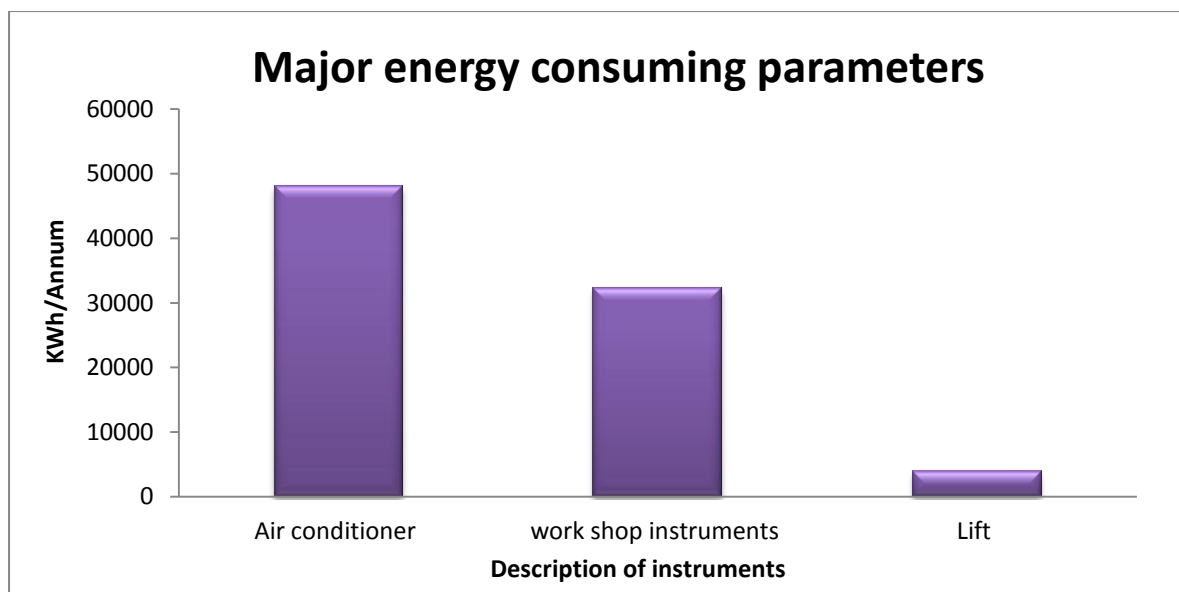


Graph No.3.8.3e: Number of fluorescent Tubes, bulbs and fans and their energy consumption (KWh/ Annum) at support services

Maximum use of energy for lightning and fans occurs in the support services building. The total number of fluorescent Tubes is 1,237 and their electricity consumption is 15,516.928 KWh/Annum. In the support services, total number of ceiling fans and their electricity consumption were respectively i.e. Fan 15,876 KWh/Annum and E Fan 9,139.2 KWh/Annum, Cooler 30,912 KWh/Annum.

Table No. 3.8.3.f: Energy Consumed per annum by major energy consuming gadgets

Sr. no	Description of instruments	Energy consumption KWh/ Annum
1	Air conditioner	42500
2	work shop instruments	29245
3	Lift	3700
Total		75,445

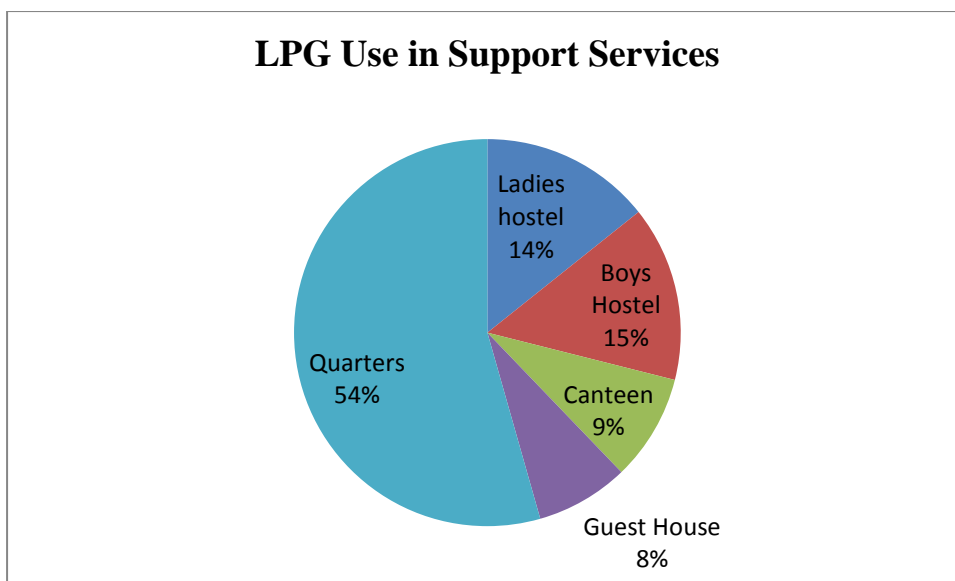


Graph No. 3.8.3.f: Energy Consumed Per Annum by major energy consuming parameters

Total 75,445 KWh/Annum of energy is consumed by all Air conditioner, workshop instruments and Lift on campus. Air conditioner has utilizes maximum energy of 42500 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 utilized energy of 29,245 KWh /Annum. The college has lifts also and their energy consumption is 3,700 KWh /Annum.

Table No.3.8.3g LPG Use in Support Services

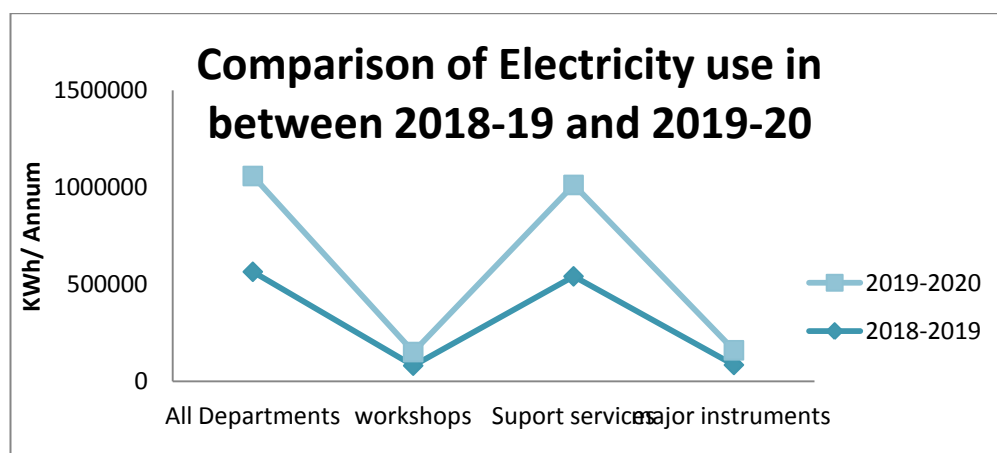
Sr. No.	Support Services	Kg/Annum
1	Ladies hostel	1286
2	Boys Hostel	1320
3	Canteen	800
4	Guest House	700
5	Quarters	4900
Total		9006



Maximum LPG use is in Support services. LPG is used as a fuel for cooking purpose in canteen. The total number of LPG Cylinder required were 602 and their consumption is 9,831 kg/Annum. In the Support services LPG Gas consumption 9006 Kg total and their consumption were respectively i.e. in Quarters 4900 kg/Annum (54%), Boys Hostel 1320 kg/Annum (15%), Ladies hostel 1286 kg/Annum (14%), Canteen 800 kg/Annum (9%), Guest House 700 kg/Annum (8%) respectively (Graph No. 3.10).

Caparison between electricity audit in year 2018-19 and 2019-20

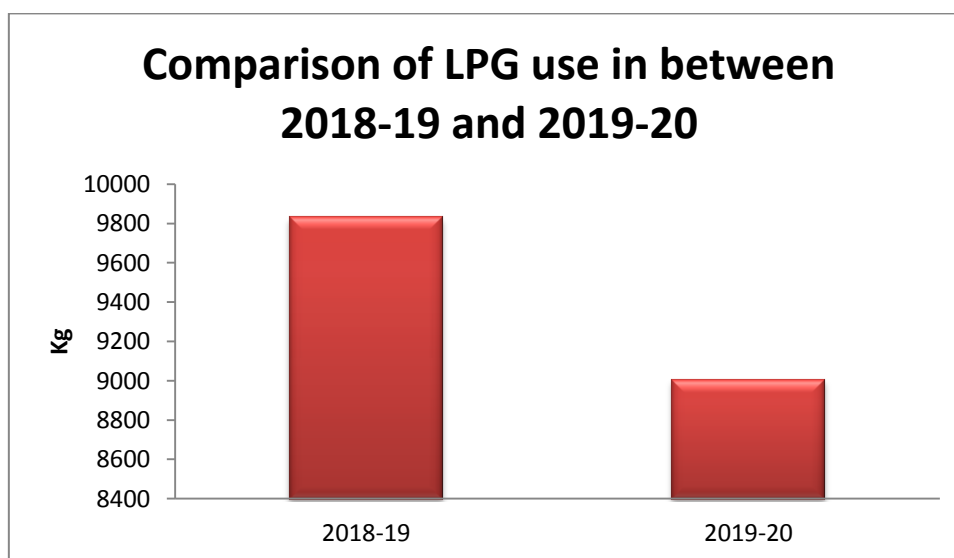
Sr. No.	Section	2018-19	2019-20
1	All Departments	564173.8	493652
2	Workshops	80264.8	70231.7
3	Support services	540718.4	471112.1
4	Major instruments	84075	75445
Total		12,69,232	11,10,441.36



As per the observations in academic year 2019-20 electricity consumption from all departments, workshops and support services is lower than electricity consumption in year 2018-19. This is might be effect of lockdown days and also college had applied some energy saving schemes like sensors in corridor and washroom and LED lights.

Caparison between consumption of LPG in year 2018-19 and 2019-20

2018-19	2019-20
9831	9003



As per the observations it is observed that in academic year 2019-20 LPG consumption is lower than electricity consumption in year 2018-19. This is might be effect of lockdown days. Because during lockdown period hostels and college canteen was closed.

Key Observations:

- The total energy consumption of college is 11,10,441.368 KWh/Annum
- Highest consumption of energy is by equipments i.e. 3,61,308.5 KWh/Annum.
- The energy consumption of equipments is more than office equipments and fluorescent lamps.
- Electricity and LPG consumption is less than previous academic year.
- Institute has been installed 300KW Solar Panel Set.
- The College reduces wastage of electricity by installing sensors in necessary areas.

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. 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.

5. “Swachhata Pakhwada” undertaken in Higher Educational Institutions (HEIs) during 16th to 31st Jan. 2020

Sr.No.	Date	Activity	Venue
1	16.01.2020	Swachhta Pledge taking ceremony	RIT
2	17.01.2020	Plantation of Sapling (with high CO2 absorption rate)	RIT
3	20.01.2020	Organized Poster Making Competition Regarding Swachhata	RIT campus
4	21.01.2020	Organized Cleanliness drive in College campus with active participation of students, faculty and non teaching staff	RIT campus
5	22.01.2020	Organized Poster Making Competition Regarding Water Conservation	RIT campus
6	24.01.2020	Organized Poster Making Competition Regarding Forest Conservation	RIT campus
7	25.01.2020	Organized Cleanliness drive in Hostel campus with active participation of students, faculty and non teaching staff	Hostel Campus
8	27.01.2020	Competition on Best out of waste	RIT campus
9	29.01.2020	Village activities - Organized Street Play –“Plastic ek Rakshas” for Say no use plastic	Village Sakharale
10	31.01.2020	Organized Prize distribution ceremony for winners in the various competition	CSE Conference hall



Swachhta Pledge taking ceremony on 16.01.2020



Plantation of Sapling 17/01/2020



Date-20/01/2020-Inauguration of competition for Swachhata



21/01/2020- cleanliness drive at college campus



22/01/2020-competition on water conservation



Competition on forest conservation



25/01/2020- cleanliness drive at hostel



27/01/2020 : Competition on Best out of Waste



Organized Street Play on “Plastic Ek Rakshas” in Village Sakharale on 29.01.2020



31/01/2020- Prize distribution ceremony

Chapter IV

Summary and Conclusion

4.1 Summary:

Green Audit is one of the important tools to check the balance of natural resources and its judicial use. Green auditing is the process of identifying and determining whether institutional practices are eco-friendly and sustainable. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area.

The Department of Environmental Science, Shivaji University, Kolhapur has conducted a Green Audit of Rajarambapu Institute of Technology, Urun, Islampur in the academic year 2019-20. 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. The previous green audit of the Rajarambapu Institute of Technology, Urun, Islampur was conducted during the year 2018-19. This is the second time to conduct green audit of RIT College.

After completing the audit procedure of RIT College for green practices, there are following conclusions, recommendations and Environmental Management Plan (EMP) which can be followed by university in future for keeping campus environment friendly.

4.2 Conclusions:

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

1. The calculation revealed that percentage of use of water is less in the year 2019-20 as compared to last year.
2. Study shows that in academic year 2019-20 electricity consumption from all departments, workshops and support services is lower than electricity consumption in year 2018-19.
3. College had applied some energy saving schemes like sensors in corridor and washroom and LED lights.
4. As per the observations it is observed that in academic year 2019-20 paper waste, plastic waste, biodegradable waste, construction waste, glass waste, other waste, E-waste and hazardous waste is generated in less quantity than that was generated in year 2018-19.

5. Garden waste is generated in more quantity than that was generated in year 2018-19. This might be due to the plantation activity which is done for Miyawaki plantation.
6. The Institute take good initiative for green cover by planting fruiting plants and built up of water pond for the plantation area as well as Miyawaki forest.
7. In case of ambient air quality status the SO_x and NO_x levels decreases as compare to last year but Noise level in some places of college shows the limit above the CPCB standards. Over all the ambient quality of Air and Noise in year 2019-2020 are lower than 2018-2019.
8. As per the observations it is conclude that the consumption of water and electricity is less in 2019-20 than the year 2018-19. Also the less solid and hazardous waste generation in the year 2019-20 than 2018-19. Noise and air parameters also gave less reading as compared to last year. It might be the effect of pandemic effect of Covid spread.
9. RIT done some Environment related activities in the period of 2019-20 under Swachhata Pakhwada program which helps to spread environmental awareness.

4.3 Recommendations:

RIT College fulfil the some of the recommendation given in last year (2018-19) but still have some recommendation in this year as follow.

1. Toilets and bathrooms are consuming more water in the departments. Replacement of taps with advanced nozzle tap can be beneficial.
2. College can do 'No vehicle Day' in every first Saturday of each month so it proves to be one of the good practice to save the fuel and help for green and clean environment on campus.
3. The College should reduce wastage of electricity by installing sensors in necessary areas.
4. Generated plastic waste is used to dump on open area which causing loss of aesthetic beauty of premises. To dispose plastic waste properly, this waste can be used for road construction along with other construction material.
5. Try to avoid the use of plastic in the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus.
6. Layout 'Green Chemistry' that reduces the use or generation of hazardous substances in the design, manufacture and application of chemical products
7. Absence of fire lines in plantation area can cause fire disaster on the campus. Also, the campus is having the large area of grassland, during the summer season the fire disaster can take place by small ignition events. So precaution should be take and make fire line in plantation area

8. For more carbon sequestration plantation of more woody trees around the campus is feasible
9. The institute should convert their leaf litter as well as agricultural waste in to vermin compost or compost to improve soil organic carbon by using this method the institute can store their carbon in the organic form.

Chapter V

MANAGEMENT PLAN AND RATING

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 2019-20
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. 	<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 waste at source of waste. 	<ul style="list-style-type: none"> Segregation of waste need to be done at source only. 	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. • Though college has 300KW solar power plant, Considering the college campus it is insufficient. 	<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. 	<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 • Water saving nozzles should be install in wash rooms. 	<p style="text-align: center;">Medium</p>

2. Waste water	<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 STP to treat laboratory waste and toilet flushing. • Awareness between teaching and non teaching staff about water conservation 	High
Hazardous Waste				
2. E-waste	<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 	Medium
Air and Noise				
1. Air and Noise	<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 • Open burning of crop residues near the forest can emits air pollutants. 	<ul style="list-style-type: none"> • The plantation can be increased by vertical gardening. 	Medium
Tree Census				
1.Tree Vegetation	<ul style="list-style-type: none"> • Plantation cover is good in the campus. • Miyawaki plantation 	<ul style="list-style-type: none"> • Native plant diversity could be increased. • Fire line marking at boundary of college campus and the agricultural field. 	<ul style="list-style-type: none"> • Avoid monoculture, variety of species should be planted in the campus area 	Medium

Table No. 5.1 Shows Rating for Energy Resource Conservation

Sr. No.	Specification	Points obtained (out of 20M)
1	Are sufficient renewable energy resources are utilized by the institute?	4
2	Are energy saving appliances are installed in college?	4
3	Are less energy consuming equipments are used?	3
4	Is the teaching staff and non teaching staff is aware about the energy saving policy?	4
	Total	15

Table No. 5.2 Shows Rating for Water Resource Conservation

Sr. No.	Specification	Points obtained (out of 20M)
1	Is the balance between water consumption and requirement is maintain?	4.5
2	Is the water saving nozzles are installed in the college?	3
3	Is the Sustainable water practices is implement in the college?	4
4	Is the teaching staff and non teaching staff is aware about the water management policy?	4.5
	Total	16

Table No. 5.3 Shows Rating for Solid waste management

Sr No.	Specification	Points Obtained (Out of 20)
1.	Are the generated solid wastes segregated at source and disposed properly to achieve zero waste generation?	2
2.	Are the hazardous waste and E- waste generated at the facility disposed properly?	4
3.	Is biodegradable waste generated at facility used for composting or for fuel production?	5
4.	Is the facility implemented 3R practices for waste management?	4
	Total	15

Table No. 5.4 Shows Rating for Ambient Air and Noise in College Campus

Sr. No.	Specification	Points obtained (out of 20M)
1	Ambient Air Quality of College campus	5
2	Diesel Generator use, Greenery and open burning	4
3	Noise levels in College campus	4
4	Noise reduction management	4
	Total	17

Table No. 5.45 Shows Rating for Green inventory of College Campus.

Sr. No.	Specifications	Points Obtained (out of 20M)
1.	Does the Institute area possess native plants on the campus?	3
2.	Is the campus list shows plant biodiversity?	4
3.	Is there is fire line on the campus for the tree?	2
4.	Does the Institute organize plantation program annually?	3
	Total	12

Table No. 5.6: Total rating for Green Audit Rajarambapu Institute of Technology, Urun, Islampur campus

Sr. No.	Parameters	Points Obtained (out of 20M)
1.	Rating for Energy	15
2.	Rating for Water	16
3.	Solid waste management	15
4.	Rating for Ambient Air Quality	17
5.	Green inventory of College Campus	12
	Total	75/100

Grades for Rating: poor: 0-20 Moderate: 20-40, satisfactory 40-60, Good 60-80, Excellent 80-100



Visit of Green audit team of Shivaji University to RIT College



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