



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:

CERTIFICATE

This is to certify that the Department of Civil Engineering, Rajarambapu Institute of Technology, Rajaramnagar has conducted detailed "Green Audit" of Rajarambapu Institute of Technology, Rajaramnagar, Maharashtra State, India during academic year 2017-18. The green audit was conducted in accordance with the applicable standard 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 of 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 audited principles accepted in India.



[Signature]

Head,

Department of Civil Engineering



K. E. Society's

Rajarambapu Institute of Technology

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GREEN AUDIT REPORT

K.E. Society's

**RAJARAMBAPU INSTITUTE OF
TECHNOLOGY RAJARAMNAGAR.**

Introduction

K.E.Society's, Rajarambapu Institute of Technology (RIT), Rajaramnagar, Tal- Walwa, Dist. - Sangli was established in the year 1983. RIT is one of the renowned technological autonomous TEQIP funded institute in the state of Maharashtra. The institute has been approved by AICTE, New Delhi and all its eligible programs have been accredited by NBA, New Delhi and also by NAAC with "A" grade. The College is located near Islampur, 7 km away from Peth Naka off Pune – Bangalore highway (National Highway 4). Google location map is given in Fig. 1.



Fig. No:1 Location Map Of RIT Campus



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Fig. No. 2: Photographs of Main Buildings

RIT has a green beautiful campus of **17 hectare** and the total built up area (including under construction) is 53028 Sqm. 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 five years.

Number of students in the College	3778 (including UG and PG)
Teaching Staff	211
Non-Teaching Staff	198
Others	600
Total	4787

As per information from office, total number of students (UG and PG) is 3778. Teaching staff is 211 and non-teaching staff 198. Total strength of RIT campus is 4787.



The College buildup area is given in Table 1:

Table 1: Building Area

Sr. No.	Name of Building	Area in Sq.m
1	Main Building No. 1	8689.70
2	Class Rooms Building	3500.00
3	Workshop No. 1	1730.00
4	Workshop No. 2	1730.00
5	Smithy and Foundry	271.40
6	Central Store	154.00
7	Generator Room	49.40
8	Vehicle Stand	878.75
9	Canteen	208.53
10	Guest House (Old)	348.00
11	Mess No. 1 & 2	682.60
12	Hostel No. 1 (Aryabhata)	1333.00
13	Hostel No. 2 (Bhaskaracharya)	1411.70
14	Hostel No. 3 (Chanakya)	1804.70
15	Hostel No. 4 (Dronacharya)	2200.50
16	Staff Quarters	670.00
17	Spark (Servicing Centre)	343.00
18	Hydraulics Lab	654.00
19	Boiler House	204.60
20	Civil Store	22.60
21	Welding Shop	270.00
22	Ladies Hostel (Esha)	1482.40
23	Main Building No. 2	6080.00
24	Ladies Hostel (Fairy)	1500.00
25	Recreation Hall	270.58
26	Instruction Building	3500.00
27	Structural Lab	640.00
28	Continuous Education Center	1040.00
29	Ladies Hostel (Haripriya)	2586.00
30	Central Library	3000.00
	Total Built up Area	53029.00

The college campus is surrounded by Municipal Landfill, Open drainage and sugar factory which also cause some problems of odor, emission of Short Lived Climate Pollutant, Flies, etc.

RIT civil engineering department prepared a Green Audit Report after visiting and doing field



assessment of the college campus. The team consisted of Er. Aboli S. Mandrupkar (M.Tech CM), Mr. B. G. Chavan (Maintenance Engineer), Dr. Y. M. Patil (Asst. Prof.) and Dr. P. D. Kumbhar (HOD Civil Engineering).

This Audit Report is based on the following five major points –

1. Biodiversity Audit
2. Solid Waste Management
3. Water Audit
4. Energy Audit

1. Biodiversity Audit –

Biodiversity generally refers to the variety and variability of life on earth. It is a measure of the variety of organisms present in different ecosystems.. All species of plants taken together are known as flora and about 70,000 species of plants are known to date. All species of animals taken together are known as fauna which includes birds, mammals, fish, reptiles, insects, crustaceans, mollusks, etc. It is an essential component of the nature and it ensures the survival of human species by providing food, fuel, shelter, medicines and other resources to mankind.

The census of Flora and Fauna is the major part of the Green Audit. The total Green cover area in RIT campus is about 10,800 Sq. m. and distributed among various parts of Campus Area and residential area.



The following flora species found in campus area during the field assessment details of the species is given in Table No. 2

Table No.2: Flora Species

Sr. No.	Local Name of the tree (English Name)	Botanical/Scientific Name	Number	Height (Appr. In feet)
1.	नारळ (Coconut)	Cocus Nucifera	32	20
2.	बदाम (Almond)	Prunus Dulcis	16	25-30
3.	अशोक	Saraca Asosa	33	35-40
4.	पाम	Borassus	33	20
5.	गुलमोहोर (Gulmohor)	Delonixregia Rafin	22	12-15
6.	मारपखी	Thuja Occidentalis	73	03- 05
7.	सिल्हरओक (Silver Oak)	Grevillearobusta	21	35-40
8.	चंदन	Santalum album	03	12-15
9.	फायस्कि (Ficus)	Ficus Carica	16	05-15
10	आंबा (Mango)	Mangifera Indica	06	15-20
11	कणरी	Cascabelathevetia	15	14-15
12	वड (Banyan)	Ficusbenghalensis	03	35-40



13	चिंच (Tamarind)	Tamarindus Indica	01	15-20
14	जाभळ	Syzygium Cumini	01	20-25
15	लिंब	Azadaracta Indica	02	
16	जंगलीबहावा (Bahava)	Cassia Fistula Linn	09	35-40
17	ख्रिसमस (Christmas)	Araucaniacolumnaris	08	25-30
18	एक्झोरा (Ixora)	Ixora Coccinea	24	05-06
19	फुलझाड	Flowers	17	
Loan cover area –		34611 + 17850= 52461	Sq. feet	

The detailed information flora species found in residential area during the field assessment is given in table 3

Table No. 3: Flora Species (Residential Area)

Sr. No	Local Name of the tree (EnglishName)	Botanical/Scientific Name	Number	Height(Appro. in feet)
1.	नारळ (Coconut)	CocusNucifera	141	20
2.	बदाम (Almond)	PrunusDulcis	21	25-30
3.	अशोक	SaracaAsosa	47	35-40
4.	आरेकापाम+ मोठेपाम	Borassus	71	20
5.	गुलमोहोर (Gulmohor)	DelonixregiaRafin	04	12-15



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6.	मोरपखी	ThujaOccidentalis	62	03- 05
7.	आंबा (Mango)	MangiferaIndica	18	15-20
8.	लिंबू (Lemon)	Citrus aurantium	02	05-06
9.	चिकू	AchrasSapota	07	10-12
10	चिंच (Tamarind)	TamarindusIndica	02	15-20
11	जाभळ	SyzygiumCumini	01	20-25
12	खिसमस (Christmas)	Araucaniacolumnaris	02	25-30
13	हब		03	12-13
14	पाररजातक	Nyctanthes arbor-tristis	02	12-14
15	फणस (Jack Fruit)	Atrocarpusintegra	01	15-18
16	पिंपळ (Peepal)	FicusReligiosa Linn	02	25-30
17	सागवान (teak)	TectonaGrandis Linn	307	50-55
18	सनलसगरी	Eucalyptus globulus	13	30-35
19	आवळा (Indian Gooseberry)	Emblicaofficianalis	01	12-15
20	एक्झोरा (Ixora)	IxoraCoccinea	02	05-06
	Loan cover area –		1800	Sq.m



The list of newly planted trees seen in the campus is given in the table no. 4

Table No. 4: List of Newly planted trees

Sr. No.	Local Name of the tree (EnglishName)	Botanical/Scientific Name	Number
1.	सिल्व्हरओक (Silver Oak)	Grevillea robusta	40
2.	सागवान (teak)	Tectona Grandis Linn	307
3.	(champak)	Michelia Champaca	20
4.	पेरू (Guava)	Psidium Guajava	10
5.	(Devil Tree)	Alstonia Scholaris	20
6.	करजी	Derris Indica	20
7.	आवळा (Indian Gooseberry)	Emblica officianalis	20
8.	चिंच (Tamarind)	Tamarindus Indica	10
9.	पळि (Palas)	Butea monosperma Kuntre	10
10	पुत्रपिजा		10
11	बेल (Bel)	Aegle marmelos correa	05
12	पाम	Borassus	20
13	डालिंब (Pomegrante)	Punicagranatum	10
14	आंबा (Mango)	Mangifera Indica	50



15	नारळ (Coconut)	CocusNucifera	100
16	सिताफळ (Custard Apple)	AnnonaSquamosa	20
17	लिंबू (Lemon)	Citrus aurantium	02
18	शेवगा (Horse Radish)	Moringaoleifera	20
19	गुलमोहोर (Gulmohor)	DelonixregiaRafin	30
20	बकुळ (Indian Medaller)	Mimusopselengi	30

The list of the birds seen in the campus is given in table no. 5

Table No. 5: List of Birds

Sr. No.	Local Name of the Bird (English Name)	Scientific Name
1.	कावळा (crow)	Corvusbrachyrhynchos
2.	कोसकळा (koel)	Eudynamysscolopaceus
3.	बुलबुल (Bulul)	Pycnonotidae
4.	सिंजीर (Hammingbird)	Trochilide
5.	खाटीक (Common Woodshrike)	Tephrodornispon dicerianus
6.	व्हला (Eurasian Collared Dove)	Streptopeliadecaocto
7.	पारवा	



8.	धोबीसचमणी (sparrow)	Passeridae
9.	कबुतर (Pigeons)	Columbidae
10	ब्राम्हणीघार (Red kite bird)	Milvus
11	बहिरीससाणा (Eurasian Sparrowhawk)	Accipiter nisus
12	पोपट (Parrot)	Psittaciformes
13	साळुंखी (Common hoopoe)	Acridotherestrictis
14	सुतारपक्षी (Wood pecker)	Picidae
15	कुदळ्या (Black headed ibis)	Threskiornismelanocephalus
16	गायबगळा (cattle egret)	Ardeidae
17	हदहद (Common Hoopoe)	Upupaepops
18	वेडाराघू (Green Bee eater)	Meropsorientalis
19	पावश्या (Common hawk-cuckoo)	Hierococcyxvarius

SUGGESTIONS:-

1. Plantation of local species and indigenous species of plants are preferred in the area. These species also attract many birds for nesting which helps in increase in bird biodiversity in the campus. These species can help in facilitating the environment for later successional, longer-lived species whose end products are more valuable.



2. Name plate for each plant species with their local name, scientific name, and important uses should be indicated properly. The correct use of formal scientific names of species is key to accurate communication, but despite the simplicity of the system, it is rarely done right. All labels need to be placed so students, teachers and visitors can easily view and understand the importance of planting them.
3. Garden Waste should not be burned, they are used for composting and the compost is also used of gardening.

2. Solid Waste Management

Source of Waste:-

Solid wastes are any discarded or abandoned materials. Solid wastes can be solid, liquid, and semi-solid or containerized gaseous material. The campus generates biodegradable, non-biodegradable and hazardous waste. It is seen that primary collection of waste is done by equipment such as dustbins, small trollies and dumped at open sites masonry bins are used for temporary bulk storage, which necessitates multiple handling of waste. There is no proper system and equipment to segregate the waste at the source. Hence the waste collected at the dump yard is of all categories are given in table no. 6.

Table no. 6: Categories of solid waste

Bio-Degradable Waste	Non-Biodegradable Waste	Hazardous Waste
1. Kitchen Waste, 2. Paper waste, 3. Civil Debris, 4. Furniture Waste, 5. Garden waste.	1. Laboratory waste, 2. Workshop waste, 3. E-Waste.	1. Glass, 2. Mercury 3. Fumes from chemical laboratory.



Solid Waste Management:-

Out of the whole waste generated from the campus some waste is reused, some waste issued as composting, some waste recycled some waste is resale some waste is land filled. The campus follows 3 R facilities i.e. Reuse, Recycle and Reduce. Composting of garden waste is also done at campus. Kitchen waste is used in Bio Gas generation. There is third party which does the segregation of required waste. But most of the part of waste is either burned or it is given to Municipal Corporation. The following methods are used to processing the waste.

Composting:- The partial biodegradable waste (Garden Waste, Kitchen Waste, etc.) generated from the campus is used for composting. The collage has the 2 m³ of composting plant. But this plant is not working properly due to low maintenance.

Vermicomposting:-The waste generated from the campus such as landscaping waste, kitchen waste is used to run vermicomposting plant situated near boys hostel. This plant is not managed properly. The existing vermicomposting plant details are shown in photographs (Fig no.3)



Fig. No. 3: Vermicomposting Plant

Recycling:-The some of the gray water waste generated from the campus which is been recycled using the gray water treatment plant of about 4500 lit. / Day capacity. This treatment plant removes TS-80%, BOD- 82%, and COD -80%. The plant works with efficiency of about



80-85 %. The water treated from this plant is further used for gardening.

Biogas Plant:-The kitchen waste from the canteen, mess is used to run the biogas plant installed near the mess. There are two biogas plants. The kitchen waste first fed into shredder and then mixed with water to form slurry. Now this slurry is allowed to enter in the dome. The biogas generated from these plants is then used for cooking. The plant is not working properly due to less maintenance.

Reuse:-Waste like old furniture, aluminum, plastic, cardboard, Tubes, Batteries, electrical wires, switches, scrap such as steel, aluminum etc. are stored at the civil store room and may be used for further need for projects or repairing.

The waste which cannot be recycled or reused is directly sent to Landfill. At present they do not have the proper source segregation system for the waste. They only use one waste bin at the door for each room.

Electronic waste: The electronic waste generated from the collage is repaired and used for demonstration for students or made available to students for the project work. Electronic waste is collected at central computing facility and sold to MPCB approved agency. Also old working computers are donated to nearby schools according to their demand.

SUGGESTIONS:-

Solid waste management at college is not well managed. Source segregation of waste is also need to be done for proper management. Biogas and composting plant is also not working properly in the campus so maintenance activity needs to be done. Capacity of the composting plant and Biogas plant is very low so need to be increased.

The following are some suggestions regarding solid waste management.



1. The waste should be categorized into Bio-degradable and Non-biodegradable waste at source.
2. The grey water treatment plant should be properly maintained. Either capacity of plant or number of plants should be increased to achieve zero waste discharge.
3. For Demolition waste like old furniture, a spate yard should be made to reuse after some time.
4. There should be separate scrap disposal yard (Suggested place- area nearer to old boiler). The waste should not be burned out. It should be segregated into bio-degradable and non-biodegradable waste before disposal.
5. If in-situ composting or vermicomposting of garden waste is not possible it is better to give this waste to Sugar factory composting plant as they can maintain it well.
6. The students should be encouraged to use the waste materials in their projects. Separate points should be given to those students according to percentage of waste reused in project to increase the waste use.
7. The old, equipment's or electronic devices which are not in use not sent to scrap, these should be used for demonstration to students. Some parts of these equipment's may become useful to students in their projects.
8. Old computers, books, tables which are not in use needs to be donated to some needful.



3. Water Audit:-

The purpose of this program is to identify cost effective water saving measures and encourage conservation among those users and assist them in implementing the savings measures recommended. In water audit the sources water, Water distribution system, water use and water disposal is carefully studied and the water wastage is encountered.

The water mainly used for the following purposes in the collage.

1. Drinking
2. Irrigation
3. Cleaning
4. Cooking
5. Construction
6. Laboratories.
7. Commercial service station.

Sources of water

The water available in the collage is come from the following sources.

1. Islampur Municipal Corporation.
2. MIDC.
3. Irrigation department.
4. Bore well.
5. Rainwater harvesting (1500 sq.Sm.)

The total water requirement of the collage is about 2.30 lakh lit/day which include 1.20 lakh lit/day in residential area and about 1.10 lakh lit/ day in college campus area.

Hence total water requirement per month = 6,900 m³/month.



- ❖ MIDC water consumption meter reading per month in the campus.
- ❖ Month wise water consumption are given

Table no. 7: Month wise Water Consumption details

Sr. No.	Month	Place	
		College Campus	Hostel
1.	May 2018	850	3960
2.	June 2018	925	2789
3.	July 2018	915	4390
4.	August 2018	900	5348
5.	September 2018	876	5499
6.	October 2018	912	5305
7.	November 2018	964	4143
Avg. Per month		906	4490.57
Total water taken from MIDC per month		=	906+4490.57= 5397m³

- ❖ Irrigation department average water consumption record per month in year 2018.
 - Average Water consumption per month in 2018 = 2479m³/month
- ❖ Water conservation through Rain water harvesting per year =1000m³/Yr.
- ❖ Approximately Water available for use through rain water harvesting per month = 83.33 m³/month.
- ❖ Water available from the waste water treatment plant = 135m³/month



- ❖ The water available from municipal corporation per month= Negligible (taken according to need).

Water storage and distribution:-

The water from these sources is then stored in well, underground storage tank, elevated storage tanks located at various location in the campus. From these storage the water is then distributed to various departments through pumping.

The water from MIDC is distributed to Hostels, Guest house and the water from the Municipal Corporation is distributed in academic campus area. The water from irrigation department is stored in a well and it is used for irrigation purpose.

Waste Water management:

The total waste water 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. Waste water of south half portion of residential area is collected at a point and then released to municipal drainage line and north half side waste water is released to sugar factories agricultural land. All this water is flow through open drainage lines.

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

Water conservative Activities:

Rain Water Harvesting:-

The college has about 1500 sq. m roof top area under rain harvesting. Total water collected from rain water harvesting is about 1000 m³/ yr. Rain Water Harvesting is mainly done above the class



room buildup area which is about 1000 sq. m. The water collected from roof is collected through pipelines and stored in a underground tank of about 80,000 lit. Capacity. Boy's hostel number 1 roof of area 500 sq. m also contribute in rain water harvesting. The water collected from this building is used to recharge the bore well.

To increase the ground water percolation rate, they made the different layers using bricks, sand and stones below every grass loan. Hence in rainy season the water percolates easily into ground and there is no problem of water clogging due to heavy rainfall. Water level controller is used to reduce overflow runoff.

SUGGESTIONS:-

1. The rain water is the best way of water conservation. Hence entire campus rooftop is used in rain water harvesting. The water harvested in Boys hostel is used only to recharge the bore well, but the excess water may be stored in the nearby well which will definitely reduce the water meter reading of irrigation department.
2. The waste water which is released in municipal drainage or in sugar industry or in agriculture land can be used to develop the wet land. The root zone technology may become the income source if managed properly.
3. There should be awareness slogan near the each tap regarding water conservation.
4. The special workshops should be arranged periodically for students and all faculty members regarding precise use of water.
5. We observed that all drainage lines in college are open to atmosphere, which is really unhygienic. These all drainage lines should be closed or covered.



4. Energy Audit:

An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints.

Electrical department of the college always tries to reduce energy consumptions and electricity bill. RIT is H.T. consumer of MSEDCL having express feeder of 11 kV. They have sanctioned maximum demand of 350 KVA. There is a 360 KVA diesel generating set is available for backup. RIT gets incentives in MSEDCL bill of 5 % per month because of maintaining good P.F. from last 19 years.

Table No. 8: Total Load in RIT

Sr. No.	Location	Connected load in KW
1.	Main Building	230.066
2.	Instructional building	76.923
3.	Mech. & Auto building	59.543
4.	CSE, ETC, MBA building	212.001
5.	Hostel Building	83.066
6.	Workshop building	146.224
	Total	808.417 KW



Table No: 9 Diesel Consumption of generator backup of 140 Kva KIRLOSKAR made.

Sr. No	Year	Total Running hours of D.G.	Consumption in KW	Consumption in KWh (Units)	Diesel consumption in ltr.
1.	2012	74	42	3100	1850
2.	2013	150	21.33	3200	3750
3.	2014	151	34.10	5150	3775
4.	2015	110	29.09	3200	2750

Table No: 10 Diesel Consumption of generator backup of 160 Kva KIRLOSKAR made.

Sr. No	Year	Total Running hours of D.G.	Consumption in KW	Consumption in KWh(Units)	Diesel consumption in ltr.
1.	2012	149	43.32	7350	3725
2.	2013	126	57.76	6900	3150
3.	2014	150	48.67	7300	3750
4.	2015	155	46.12	7150	3875

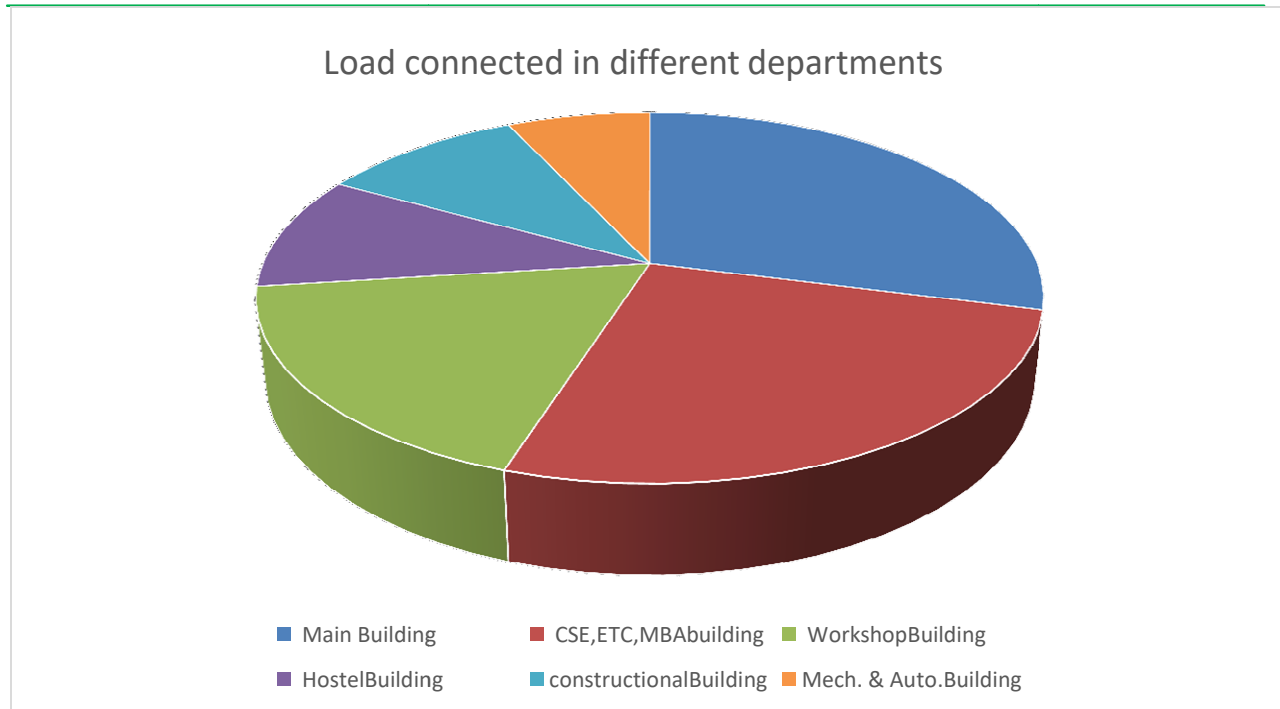


Fig. No.4: Chart shows the load distribution in different sectors.

Measures Taken to reduce energy consumption:

Replacement of old tubes Ballast (choke) by efficient electronic Ballast:

Electrical dept. has taken action to replace the old inefficient tube set choke by the new energy efficient electronic type tube set choke at some departments. It consumes less amount of power at same illumination electronic ballast consumes 40 w and regular ballast consumes 51 w power considering 24 hrs. running per months



Name of dept.	No. of Tube set	Energy Consumption of New electronic Ballast Kwh/ month (A)	Energy consumption of Traditional (old) Ballast Kwh/ Month (B)	Energy Saved Kwh/ Month (A-B)
Civil Engg.	98	94.08	119.95	25.87
Central Computer centre	23	22.08	28.15	6.25
Sci. & Humanities	17	15.91	20.80	4.89
IT Dept.	11	10.29	13.46	3.17
CSE dept.	38	35.56	46.51	10.95
ETC dept.	23	21.52	28.15	6.63
Total	210	199.44	257.02	57.58

College campus street light:-

At college campus previously 250w Mercury vapor and street lights were used and running hour of street lights is 7 pm to 6 am i.e. 11 Hrs. per day.

Sr. No	Name of the Equipment	Rating of the Equipment (KW)	No. of Street light	Connected load (KW)	Connected Load of 250 w mercury vapor or sodium street light(KW)	Saving of power in KW
	LED Street Light	50	2	0.100	0.5	0.4



	LED Street Light	80	1	0.080	0.25	0.17
	CFL Street Light Lamp	85	6	0.51	1.5	0.99
	CFL street light	65	6	0.39	1.5	1.461
	CFL street light	23	12	0.276	3.0	2.86
	LED Tube	22	2	0.044	0.5	0.456

Total Solar Street lights in the college campus: 13

Under maintenance solar street light: - 08

New Digital library Building

RIT implemented the energy saving policy in newly constructed library building having G+4 floors. Library starts at 8 am and closed at 9 pm every day.

Total working days are 6 and hrs. / Month i.e. 264 hrs. / Month. Considering 60% of total load

Name of the Luminaries	Rating of Luminaries (w)	No. of Luminaries	Connected Load (w)	Total running hours per month	Consumption of Energy per month (Kwh)
LED tube set	28x2	101	5656	158	893.64
LED Aslimline	45	57	2565	158	405
LED tube	42	45	189	158	772.58
LEDRound DownLight	17	621	10557	158	1668



LED strip	14.5	13	188.5	158	29.78
LED Batten Tube	28	57	1596	158	252.16
LED cob Down Light	9	62	558	158	88.16
LED projector Light	17	24	408	158	88.16
LED Down Light	17	5	85	158	13.43
Sodium vapor Lamp	250	4	1000	180	180
CFL Bulk Head	9	17	153	158	24.17
LED Flood Light	50	4	200	158	31.60
LED Wall Light	13	21	273	158	43.13
Pendant Mounted light	36	34	1224	158	193.39
LED Round Lighting 8	22	32	704	158	11.23
Bollard Light	18	8	144	158	22.75
LED wall Light	7	11	77	158	12.16
Total		1116	27975.5		



Total power consumption of LED luminaries in Library building = 27.975 kW

Total Energy consumption per month = 4805.58 kWh.

In the new construction library

Total no. of LED luminaries in the library building is 1116

By traditional luminaries (40W regular tube set) connected load may be $1116 \times 40w = 44.640 \text{ kW}$

and total units per months = $44.640 \text{ kW} \times 158 \text{ hrs.} = 7053.12 \text{ kwh/months.}$

Power saved by using LED luminaries = $44.640 \text{ KW} - 27.975 \text{ KW} = 16.665 \text{ KW}$

Table NO.Details of Hostel Solar Water Heater System.

Sr. No.	Department	Student Capacity	Require Heat water/person/Lit.	Total water Required Liter	Total available capacity of solar water heater in liter.
1.	New Ladies Hostel	184	20	3680	4000
2.	A Hostel	150	20	3000	2000
3.	B Hostel	150	20	3000	2500
4.	C Hostel	150	20	3000	2000
5.	D Hostel	167	20	3340	2500
6.	E Hostel	135	20	2700	2000
7.	F Hostel	194	20	3880	2000
	Total	1130		22600	18000



No. of rooms available in hostel = 662 room.

One electrical geyser will required for a room. Therefore minimum 662 no. of geysers having 2kw capacity will be required.

Total power required= 662 geysers x 2 kW = 1324 kW/ day.

Energy awareness program conducted by Electrical department.

Sr. No.	Name of the program	Date	Conducted For
1.	One day workshop on Electrical Appliances, maintenance and safety for electrical.	09/01/2011	MSEDCL persons
2.	One day workshop on floor mill owners and operators	07/05/2013	Islampur city Floor mill owners and operators.
3.	Vidyut Surakshasaptah	12/01/2016	MSEDCL, PWD, students.

SUGGESTIONS:-

1. Instead of using the whole A.C. in the library if there is natural ventilation in the library that may save huge amount of energy. Replacing old Ac by new 5 stars rated inverter AC with refrigerant R290, H34 can be installed in the entire campus which is very energy efficient and also have less impact on climate.
2. All the lighting equipment is replaced by new LED light technology which helps in reducing electricity bill by 80%.
3. Old and non-operational equipment's should be used for either demonstration or for provided to students for their projects.



4. Solar Photo-voltaic Cell should be installed in the campus for using solar energy in to electrical energy which also reduces their electric bill.
5. Old fridge, fans, Television, Computer, etc. are replaced by new technology i.e. by 5 star rated given by BE.
6. There should be alternate light switches for the illumination during night hours in the campus.
7. The extra lectures or workshops should be arranged for students, teaching and non-teaching members regarding how they can save the energy without compromising the comfort.
8. The equipment's which are generally on standby mode should be switched off after use.
9. There should be notice board or indicator to identify the underground electricity line, substation, Switch boards regarding safety concern.
10. The energy conservative slogans should be there at each switchboard.
11. To minimize the electricity bill the use of solar energy equipment's should be installed and maintained properly.
12. During new construction the green building concept should be taken into consideration.

Collage initiatives in environment related activities and sustainable development.

1.Roof top Solar Power Plant (300 kWp Grid Tied Roof – Top Solar PV System under Net-Metering Scheme at Rajarambapu Institute of Technology, Rajaramnagar.)

In an attempt to promote green energy and energy conservation, Rajarambapu Institute of Technology Rajaramnagar, is ready to generate 300kWp electricity by installing Solar PV system on the roof of its RCC buildings. The institute has installed a 300kWp rooftop solar plant connected to the power grid.

The step has helped the institute partially to meet its own power requirement. The plant will make us less dependent on grid supply and make our own system more reliable. The plant will enable us to



reduce electricity bills and the investment will be recovered in coming years. This plant will provide an opportunity to enhance the associated teaching and research activities in RIT. Thus, it is not just an initiative to save money and reduce carbon footprint, but also an opportunity to understand the functions of these renewable energy systems.

The power plant is set up at a cost of around Rs 1.09 core considering subsidy with 300kWp generation capacity. Ravindra Energy Ltd. Pune has been deputed for the designing, supplying, testing, commissioning, and operation & maintenance of the 300kWp grid-tied solar power plant for a period of six years.

The solar panels on the roof of Mechanical Engineering department and Electrical Engineering department has rating of 60 kWp each (total of 120 kWp), the panels on Main building 2 (ETC, MBA) has 120kWp capacity, and the Guest house and hostel produces 60 kWp electricity. Thus, total rating is 300 kWp. Technical aspects of solar power plant is given in in Table No.11

Table No.11: Technical aspects of Solar Power plant

Sr.no.	Description of Item
1	Vikarm Solar Make 320W(peak) Polycrystalline PV panels as per BIS /Equivalent IEC Standards, Applicable MNRE Specifications Quantity 940
2	Grid Tied Inverters of SMA Germany Make having Grid connectivity utility Interface of Capacity 360kW
3	Surge protection devices provide on AC and DC side and Earthing as per IS 3043: 1986 / 1987 for safety precautions.
4	General Test and Measuring Method PVC insulated cables for working voltage up to 1.1kV and UV resistant for outdoor installation for A.C. cables

The plant is synchronized with grid in 18th May 2018.

The total generation up to February 2019: - 200328 kWh

Average generation per month (monsoon & winter season): 25041 kWh.



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Photographs of Rooftop Solar System

The collage take initiative to aware the people regarding environmental issues, renewable energy, and sustainable development. The collage have many social groups such as UNNAT, Nature club, NSS etc. which take part in such activities.

Some of the activities done by these groups are as follow.

Nature Club: - (Head: - Prof. Y.M. Patil)

1. Tree Plantation.
2. Sewage Treatment plant.



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UNNAT: - (Head: - Prof. S.S. Kumbhar)

1. Drought mitigation action plan.
2. Eco-Bappa activity (Environment friendly idols.)
3. Hazarwadi village development plan.
4. Bhilawadi Village development Plan.
5. Bhilawadi Solid Waste Management Plan.
6. Third party consultancy in Sangli drainage system.
7. Chullha Project –MoRD, IIT Bombay.
8. Women Empowerment.

Tree plantation and awareness program organized in RIT, Rajaramnagar is given below:



Tree Plantation at RIT, Rajaramnagar



Tree Plantation at RIT, Rajaramnagar



Social Program organized by NSS



Run for unity organized by NSS



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Blood donation Camp organized by NSS



Social Program organized by NSS

Directives and Guidelines for sustainable Campus

1. The separate Environment committee should be formed to conduct different environment related activities, to observe the environmental status of the campus.
2. This environment committee should have to form separate guidelines, by laws and rules regarding environmental issues.
3. This committee is supposed to be plan and work on zero garbage and energy efficient campus.
4. Formation of Nature / Green Club for students to promote & create awareness for Environmental conservation activity.
5. Organize workshops, trainings & awareness programs for students & staff.
6. Solid waste handling and disposal, 2000 rules should be followed for disposal of waste.
7. The waste should be controlled and segregated at source.
8. The waste paper from the collage should be collected in library. The library is supposed to do this paper available for students for Xerox and one side blank paper is also used by the college rough work or notes etc.
9. All canteens including cafeteria should have mini-biogas which will run on Kitchen waste.



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10. At the topmost floor there is cafeteria if the terrace garden is made there, it will solve the problem of waste water & kitchen waste generated in cafeteria.
11. Green Cover should be increased, and mostly indigenous plant should be used for plantation. Artificial nest is hanged on trees to increase bird diversity in the campus.
12. Attempts should be made to minimize the use of fresh water for gardening by using treated gray water for the same.
13. There should be Area identification name plate in the campus.
14. Eco boards, posters Slogan regarding environmental awareness should be displayed in the campus.

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