BABU JAGJIVAN RAM GOVERNMENT DEGREE COLLEGE, HYDERABAD

GREEN AUDIT REPORT

Ela Green Buildings & Infrastructure Consultants Pvt. Ltd.
ela
Design Certification Training

Title	Babu Jagjivan Ram Government Degree College, Hyderabad
Consultant	Ela Green Buildings & Infrastructure Consultants Pvt. Ltd.
Year	2021
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Audit Team

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2	Dr. N. Ravi Babu	Department of Botany, Babu Jagjivan Ram Government Degree College
3	Ms. Sunitha Reddy	Department of Botany, Babu Jagjivan Ram Government Degree College

About Us

We are a one-stop solution for all your sustainability, green design, and energy-efficiency needs. With more than ten years of experience in sustainability & energy industry, we offer holistic turnkey solutions for making your project truly sustainable.

Team

An enviable mix of multi-disciplinary team consisting of veterans, experienced professionals, to the young crops with a diverse technical background including; architects, sustainability engineers from civil, electrical, mechanical domains.

Key Strengths

- Technical know-how – Most of our employees have master's degree in sustainability & related fields. We also possess various coveted "Accredited Professionals" tag from leading bodies including LEED, GRIHA, IGBC, EDGE & WELL
- Ethics & professionalism – Our company value-system and experience in scaling numerous learning curves ensures timely delivery of projects
- Network & Relationship – Our reputation amongst the certification bodies and our contacts with vendors, manufacturers of green products & services

Services

- Green Building Certification – LEED, GRIHA, IGBC, WELL, EDGE etc. across all types of buildings ranging from commercial, residential, factories, metro stations, IT data-centres etc.
- Simulation services: Energy modelling, Daylight analysis, CFD analysis etc.
- Energy audits, HVAC commissioning, TAB, ECBC compliance
- Impact assessment, sustainability reports, feasibility studies, capacity-building and training

Acknowledgement

We wish to express our sincere gratitude to the management of Virtusa, Hyderabad for giving us opportunity to conduct a walkthrough ASHRAE Level 1 energy audit in their facility. The energy audit was conducted remotely via live stream conferencing.

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Foreword

A nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. A clean and healthy environment aids effective learning and provides a conducive learning environment. Present day educational institutions are becoming more sensitive to environmental factors and more concepts, measures and technology are being introduced to make them sustainable.

To preserve the ecology inside the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. 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.

Green audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for all the college, the learners and the planet.

It provides staff and students better understanding of Green impact on campus. Green auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers.

Executive Summary

The main findings of the audit show that, in general, all the departments and students at Babu Jagjivan Ram Government Degree College[1] are aware about the need for environmental protection at a general level. It was also observed that a number of best practices such as maintaining potted plants, roof top solar PV system etc. are being followed in the campus.

Also, on a detailed review, it was observed that the college is implementing some of the best practices in terms of facility improvements, ease of learning, energy savings measures, and water conservation activities. Many eco-friendly measures followed in the institution and in certain processes, it could benefit from further review in order to improve their efficiency, fairness and consistency.

About Babu Jagjivan Ram Government Degree College

BJR Government Degree College, Narayanaguda, a sterling landmark of higher education in the district of Hyderabad is established in the year 1974 by the government of erstwhile Andhra Pradesh with the prime motive of ensuring quality education within the reach of rural and urban students hailing from all the corners of the state.

The college has been inculcating the most pragmatic and idealistic education to more than 2,400 students. In the wide spectrum of Science, Arts and Commerce, taught in English and Telugu media. The college grew by leaps and bounds in the initial stage and successfully completed the journey of forty five years with many under graduate and certificate programmes. The collective vigour of these programmes has been applied for NIRF ranking during the past three years to re calibrate its strengths and to go ahead with more holistic approaches.

Vision & Mission

- To make education accessible to all the students to enable holistic development.
- To impart all necessary skills to face challenges of competitive world.
- To imbibe human values and scientific temper to be informed citizens.
- To promote creative, innovative and research thinking.
- To enable the students to pursue higher education and research in reputed national universities/institutions.
- To constantly strive to enhance the quality of education.

[1] *Will henceforth be referred to as BJR College in this report*

Introduction

Green Audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of conducting a Green Audit is to upgrade the environment condition in and around the campus. Various audits tasks like waste management, energy, water and others are carried out to bench mark the performance and improve the respective sustainability parameters.

In accordance with the NAAC, Ela Green Buildings & Infrastructure Consultants have conducted a green audit at BJR College in April 2021. The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Audit prescribed by NAAC adopted by the institution.

Table 1 Basic Information on BJR College

Site Name	**Babu Jagjivan Ram Government Degree College**
Address	Street Number 5, Vittalwadi, Narayanguda, Hyderabad, Telangana 500029
Name & Contact Info	1. Dr. P. V. Geetha Lakshmi Patnaik – IQAC Co-ordinator Email: bjrnampally.ejkc@gmail.com 1. Dr. N. Ravi Babu – Assistant Professor Email: ravibabudl@gmail.com 2. Ms. Sunitha Reddy – Associate Professor Email: sunitha2575@gmail.com
Year Built	Year of establishment: 1974 Audited building: 2015
Population Breakdown	Students: 1200 per session Faculty & Maintenance Personnel: 100
Hours of operation	9 AM - 6 PM in 2 sessions Session 1: 9 AM – 1 PM Session 2: 1 PM – 6 PM
Month per year of operation	10 months
Built-up area	7,500 sq. ft
Site Area	0.35 acres (approx.)

Scope & Methodology

The specific objectives of the audit were to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards.

During the planning of the audit, an analysis was conducted in order to identify, evaluate and prioritize the practices, facility operation; academic best practices that are with compliance. The criteria and methods used in the audit were based on the NAAC Criteria 7.

The methodology used included physical inspection of the campus, review of the relevant documentation, and interviews.

Scope of Green Audit involves the following elements:

- Water Audit
- Waste Disposal & Management Audit
- Energy Audit
- Plantation
- Using Renewable Energy
- Carbon Accounting

Recommendations were provided to the project team[2] (listed at the end of each audit section) based on a detailed analysis of conditions, observing and gathering information during the audit.

Run- Time Schedule

Regular functional hours of college are from 9 am to 6 pm, Monday – Saturday in 2 sessions. Morning session starts at 9 am and ends at 1 pm and the afternoon session starts from 1 pm and ends at 6 pm. All classrooms and labs are naturally ventilated. The window openings are large enough to let in daylight during occupancy hours. Mechanical conditioning systems (Split ACs) are provided for computer labs and the Principals' office. The system is remotely controlled using thermostats.

Water Audit

Scope & Methodology

Water audit at BJR College was done to identify water usage pattern in the campus for identifying potential water conservation opportunities. These are the key objectives of a water-use efficiency audit:

- Understand the water supply and distribution systems
- Identify water-use patterns
- Identify deficiencies in the water network system, including leaks and wastage
- Identify baseline and benchmark water use
- Identify water conservation opportunities, including water reuse

The audit was done by conducting a walkthrough at site, conducting interview with the operational staff present at the campus. The campus located at the heart of the city is highly urbanized. It gets water from the municipal corporation to satisfy its water requirements. As with any urban city in India, the summer months, essentially, are prone to high water stress leading to acute water shortages. **To address this, the team has erected a rain water harvesting pit of 96 cu.ft.** Excess rainwater is directed towards the landscape area catering to the plants' watering needs. The institution employs R.O. filters for catering to its drinking need.

[2] *Project team refers to personnel at BJR Govt. Degree College*

Figure 1 Construction of RWH pit at BJR College

Survey Response pertaining to Water Audit

Table 2 Water Survey Questionnaire

Question	Response
What are the water sources to the facility? How does it cater to the water needs in the campus?	▪ Municipal water. This water is processed through RO plant and filtered water used for drinking purposes. ▪ The rejected water is used for irrigation and flushing purposes
What are the water conservation techniques used in the campus?	▪ Native species are used in the campus reducing the water needs for landscaping. ▪ Rainwater pits available at site. More pits are planned in future. As of now, excess water is used for irrigation.
What are the irrigation methods used in the campus?	▪ Landscape areas on ground are irrigated manually using hose pipes
What are Maintenance procedures & protocols followed for water fixtures & plumbing system in the campus?	▪ It is made mandatory to clean and disinfect water holding tanks are disinfected and cleaned at least once monthly or more, if required. ▪ Water filters are replaced periodically to provide the students and staff with pure drinking water
Are there meters/submeters present?	No
Cooling towers installed at site?	No
What are the significant water end-uses at site?	Landscaping, Drinking & Flushing
Is there STP at site?	No
What are the conservation measures employed at site?	Rainwater collections pits to conserve and use the rainwater collected at site.
Inventory of water fixtures	NA
Is there any evidence of water leaks?	No leaks present. Regular inspections take place to check for leaks.

LOCATION			Hyderabad			
LOCATION	YEAR	PEAK RAINY MONTH	TOTAL RAINFALL	Average peak rainfall	No. of Rainy Days	One day rainfall
Hyderabad	2015	September	129.50	227.94	25.00	5.18
	2016	September	435.00		21.00	20.71
	2017	August	250.00		17.00	14.71
	2018	August	146.50		21.00	6.98
	2019	August	178.70		14.00	12.76
One - day Rainfall/day (mm)						12.07
One - day Rainfall/day (m)						0.012

Total Roof Area	**1875 sq.m**
Total one-day runoff	22.63
RWH capacity	2.7
% of rainwater captured	11.9%

List of Recommendations & Water Conservation measures

1. Waterless urinals can save up to 40,000 gallons of water per urinal per year, but special maintenance is required to avoid odour and plumbing issues. It is recommended to replace the urinal fixtures to water less urinals.
2. During the next renovation and retrofit cycle, the water fixtures installed are to be installed as per the recommended flow and flush rates to reduce the indoor water usage

Flush WCs	**≤2/4 lpf3**
Faucets	≤2 lpm4
Urinal	≤ 1 lpm
Trigger Spray	≤ 2.5 lpm

3. Use of native adaptive plants, limited turf area, mulching, efficient irrigation systems and efficient watering can contribute a large extent to outdoor water savings.
4. Monitoring water use allows us to know where and when water is being used and where the best opportunities for water savings exist. It will aid in accurately tracking the campus water usage. Periodically calibrate the meters for accurate readings. Advantages of water metering include:
5. Identify any abnormal increases due to leaks and any error.
6. Track water saving and evaluate the efficiency interventions.
7. Provide sub-meters to study the end-use consumption patterns. Sub-meter can be installed for the following end-uses:
8. Water supplied to separate buildings
9. Food service areas.
10. Both the feed and product water from the R.O. system.
11. Landscape & roof garden irrigation.
12. Any other intensive water-use systems.
13. Increasing the capacity of the Rainwater pits by adding more pits or instating Injection borewells to charge the groundwater level will further help in managing the water resources better in the campus. Currently, the pits can capture 12 % of the total run-off from roof. The water in roof area such as hardscaped areas are sloped so that the water can flow to the landscaped areas present in the campus.

Waste Management Audit

Scope & Methodology

A waste audit is an analysis of your facility's waste stream. It can identify what types of recyclable materials and waste your facility generates and how much of each category is recovered for recycling or discarded. Using the data collected, your organization can identify the feasibility of enhancing its recycling efforts and the potential for cost savings. Waste Wise program will help the institution identify waste reduction opportunities.

Waste audit was conducted after gaining a preliminary understanding of the buildings' waste management approach

Waste management practices adopted at BJR

The waste generated in the campus is segregated in a centralized collection area. The waste is divided in to five categories namely plastic, paper, glass, wet and e-waste. The management has employed a third- party vendor – Earthbox to handle the dry and e-waste facilities generated at site. The sorted waste will be collected by Earthbox on a regular basis.

AMC is maintained to periodically review the effective functioning of CPU's and Monitors and expert recommendations are followed to dispose the same. The cartridges of printers are refilled outside the college campus. UPS Batteries are recharged and repaired by the suppliers.

It is also ensured that hazardous chemical usage of housekeeping chemicals is minimized. Dry powder, ABC and CO2 type portable fire extinguishers are placed at all the required locations and are HFC free.

Survey Response pertaining to Waste Audit

Table 3 Waste Survey Questionnaire

Question	Response
What is the type of waste generated in the facility?	▪ Dry, Paper, Glass, Wet & E-waste
What are the waste diversion strategies employed to reduce waste sent to landfills?	▪ Third Party vendor – Earthbox is employed to collect the segregated waste at site. ▪ Wet waste is used for vermicomposting

Energy Audit

Energy consumption of the campus was studied using the building meter logs, electricity bills and system records. The main sources of energy supply to the facility is as follows:

Electricity: State Utility. Electricity is supplied to the campus by the southern power distribution company of Telangana.

Monthly electricity consumption from February 2019- March 2021 is provided below. As observed there has been a sharp decline in the total energy consumption. The baseline consumption (Mar 2019- Feb 2020) was 44,337 kWh whereas Mar 2020-Feb 2021 22,554 kWh which is 49% reduction. However, this was due to more operational factors rather than energy efficiency measures. The obvious one is the complete

lockdown initiated from March 2020 due to the COVID-19 outbreak and its subsequent effects. Thus, per capita annual consumption is deemed to be the better indicator for this study.

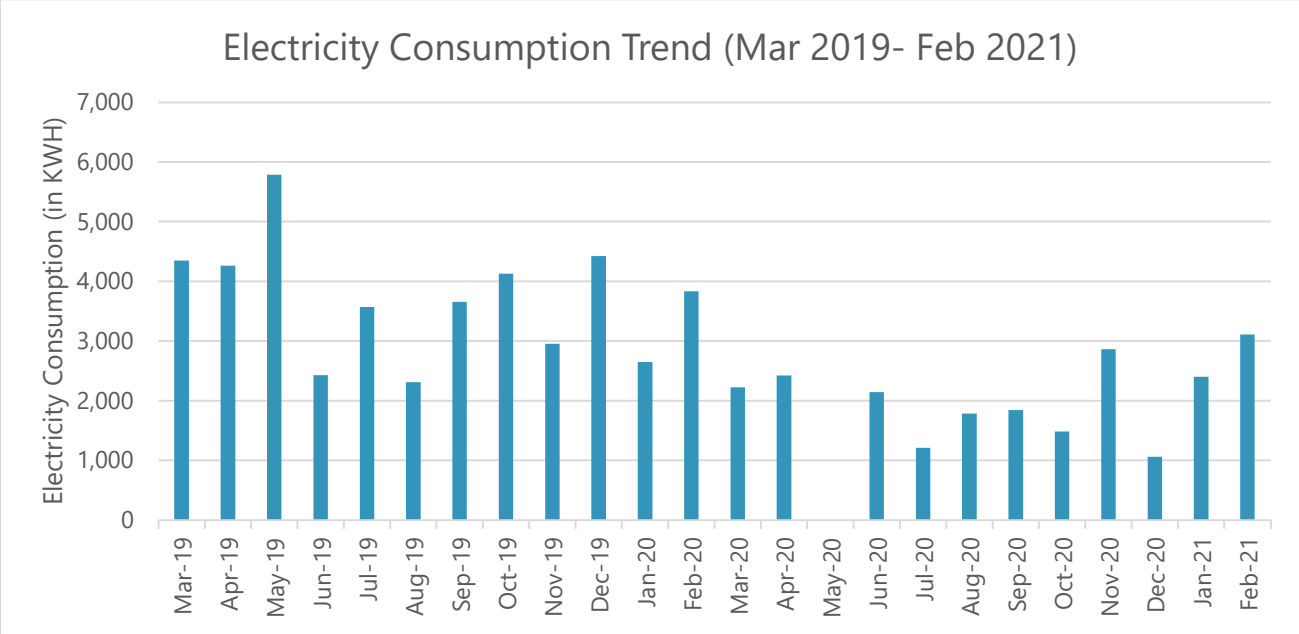


Table below benchmarks the building performance with EPI comparison of SJC

Building	EPI for Mar '19- Feb '20 (kWh/person/year)	EPI for Mar '20- Feb '21 (kWh/sq.m/person/year	% reduction
BJR Government College	22.16	22.5	1% higher (negligible)

Detailed logs are maintained to record demand and power consumption TOD (Time of Day) Data, Power Factor, etc. to support short-range and long-range power consumption planning.

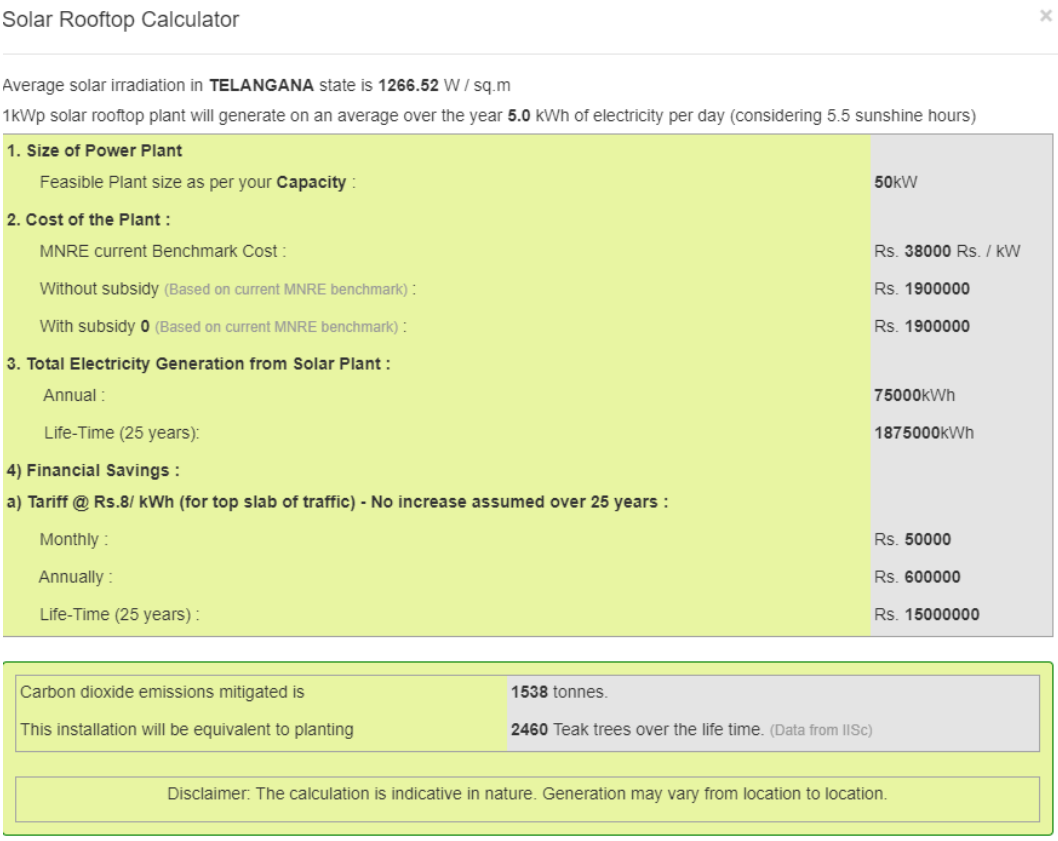
List of Recommendations & Energy Conservation measures

1. Paint high SRI paints on the roof area exposed to sunlight to reduce heat ingress inside the building and mitigate heat island effect.
2. Improvement of Power Factor for rotating machinery by use of Automatic PF Control Capacitors. The power factor of building must be close to unity.
3. Increases general awareness of energy efficiency among building occupants, which in turn will impact occupant behaviour.
4. Replacing conventional external lights with SPV powered LED lights will help in further energy consumption.
5. Replace conventional pumps with solar pumps.
6. Usage of BEE star rated appliances (at least 3 star) will lead to lower energy use. There were Split AC units which were really inefficient with cooling and air supply.
7. Sub-metering for energy intensive end uses (typically HVAC & Lighting) will help in devising specific ECMs and performance monitoring of buildings.

Carbon Neutrality & Accounting

Rooftop Solar PV system

The campus is planning to install a 50 kW Solar PV rooftop system for which a DPR has been approved and funds have been sanctioned under RUSA 2.0. The works will be undertaken shortly. The SPIN tool from MNRE estimates that annual electricity generation from these panels 75,000 kWh/ annum. This will help in mitigating 61.5 tons of CO2 annually.



Solar Rooftop Calculator

Average solar irradiation in **TELANGANA** state is **1266.52** W / sq.m

1kWp solar rooftop plant will generate on an average over the year **5.0** kWh of electricity per day (considering 5.5 sunshine hours)

1. Size of Power Plant	
Feasible Plant size as per your **Capacity** :	**50**kW
2. Cost of the Plant :	
MNRE current Benchmark Cost :	Rs. **38000** Rs. / kW
Without subsidy (Based on current MNRE benchmark) :	Rs. **1900000**
With subsidy **0** (Based on current MNRE benchmark) :	Rs. **1900000**
3. Total Electricity Generation from Solar Plant :	
Annual :	**75000**kWh
Life-Time (25 years):	**1875000**kWh
4) Financial Savings :	
a) Tariff @ Rs.8/ kWh (for top slab of traffic) - No increase assumed over 25 years :	
Monthly :	Rs. **50000**
Annually :	Rs. **600000**
Life-Time (25 years) :	Rs. **15000000**

Carbon dioxide emissions mitigated is	**1538** tonnes.
This installation will be equivalent to planting	**2460** Teak trees over the life time. (Data from IISc)

Disclaimer: The calculation is indicative in nature. Generation may vary from location to location.

Total Installed Capacity	**50 kW**
Annual Energy Generation	75,000 kWh
Annual Co2 Emission Reduction	61,500 kg

Gases other than Carbon di-oxide

The campus has no CFC refrigerants on site.

Transport

Vehicular pollution is being minimized by encouraging the use of public transport to the maximum possible extent. 80% of the students and teachers use the local TSRTC buses/carpool to reach the campus. Vehicle pooling is encouraged for those who are not in a position to use the public transport facility.

Fugitive emissions from fuels & solid fuels

Use of firewood and other solid fuels, in raw or pellet form, is prohibited within the campuses. Care is also taken to avoid supplies of various items and commodities, from outside the campuses, which use unacceptable fuels in their preparation / manufacture.

Solvent and other product use: Except for laboratory chemicals, solvents do not form part of the Campus' teaching and research activities. Care is taken to dispose-off effluents in safe and acceptable fashion.

Environment

Plantation in Campus

The Campus has various trees and plants in their campus. Being in the middle of densely urban area, it is vital to maintain the green cover in the campus. Students and faculty are active participants in numerous plantations drives in the nearby localities.

A variety of trees, more of native and adaptive plants which also requires less water are used. Also, a number of medicinal plants has been planted in the campus.

As of 31.03.2021, the department boasts of having planted saplings, and different kinds of plants in the college campus. The details are as follows:

Sl. No.	Type of Garden	Length	Breadth	Total Area
1.	Wall Garden	24ft.	5.5 ft.	132 sft.
2.	Medicinal/Herbal Plant Unit	29 ft.	5 ft.	145 sft.
3.	Composting/Bio-fertilizer/Medicinal Plant Unit	18 ft.	11 ft.	198 sft.
4.	Botanical Garden	43 ft.	2 ft.	86 sft.
		34 ft.	9 ft.	306 sft.
		22 ft.	3.5 ft.	77 sft.
		12 ft.	1 ft.	12 sft.
5.	Flower Garden	38 ft.	2 ft.	76 sft.
6.	B.J.R.G.D.C. Logo	17 ft.	3.3 ft.	56 sft.
	TOTAL			**1088 sft.**

VanMahotsav

Van Mahotsav is an annual pan-Indian tree planting festival, occupying a week in the month of July. During this event millions of trees are planted to counter the fact that deforestation is spreading all over the world, in rural and urban areas. Forests and trees help us to maintain ecological balance and keep the carbon footprint low, but still trees are being felled and burnt without any concern for the ecological damage.

Students & Faculty of BJR College undertook owing activities:

- Create awareness and importance of planting trees to the people in the communities around Hyderabad.
- Inculcate tree consciousness and love of trees amongst the people.
- Popularize the planting and tending of trees in farms, villages, municipal and public lands for their aesthetic, economic and protective needs.

Eco friendly Ganesha: Training, Awareness and Self-Employability

Every year, the festival of Ganesh Chaturthi has become cause for concern due to the harm caused to the environment. This is because the idols are made from Plaster of Paris and are non-biodegradable. After immersion, they continue to float on the water for a long time thereby choking the water bodies and adversely impacting aquatic ecosystem.

Eco-friendly Ganesha idols are those that are made of clay, natural fibers, paper and other biodegradable materials. These idols, when immersed in water degrade faster and do not harm the environment as much as the ones made of POP. Eco-Friendly Ganesh Chaturthi: Ganapati Idols That Grow into Plants After Immersion.

The workshop was conducted by Department of Botany for the students of B. Sc. I, II and III year (BZC TM & EM). The first-year students study Environmental studies as an Ability Enhancement Compulsory Course (AECC I) in their Semester.

Environmental consciousness and Entrepreneurship

The students gained Hands on experience in this workshop titled "ORGANIC COMPOSTING" by Mrs. Aruna Shekar, director Sun Green Organics. Preparation was done using sanitreat and bioculum. Sanitreat helps in odourless process while composting and Bioculum helps in Fast composting due to the presence of multiple microbes.

Composting satisfies the proximity principle and is the most sustainable waste management option available for dealing with biodegradable household waste in that the producer is responsible for the segregation, treatment and ultimate end-use of the waste. Compost and organic matter is a renewable and sustainable resource.

Reliance on landfill and negative environmental associations with waste disposal by this method will be reduced. Compost is an effective soil conditioner replacement, which conserves soil organic matter and maintains and improves soil physical properties. `

Other Sustainability Activities

Sl. No.	Conservation Initiative	Objective	Status
1.	Installation of transformer	To reduce power consumption.	Will be completed by the end of April 2021.
2.	Fixing of LED Bulbs		
3.	Installation of solar panels of 50 KV capacity		

4.	MOU with "Sun Green Organics"	To train students in organic composting and prepare them to become entrepreneurs.	All three initiatives have been taken up.
5.	Training on Bio-Enzymes	To facilitate a chemical free campus	
6.	Training on PRB (Prolonged Release Bio-Fertilizers)	To provide students with hands-on training that is required to begin a start up	

Annexure

LIST OF THE PLANT SPECIES PRESENT IN THE COLLEGE CAMPUS

1. Plant Species for teaching Taxonomical families

Sl. No	Botanical Name	Vernacular Name	Family	Quantity
1.	*Annonasquamosa*	Custard apple - seethaphal	Annonaceae	2
2.	*Clitoria trenata*	Butterfly pea Shankupushpam - Aparajitha	Fabaceae	4
3.	*Jatropha rosea* *Jatropha integerrima*	Every-day-flowered cherry blossom	Euphorbiaceae	2
4.	*Murraya paniculata*	Orange jasmine NagagolunguKamini	Rutaceae	1
5.	*Calotropis procera*	Rubber Bush ErraJilledu	Asclepideaceae	1
	Calotropis gigantica	Crown Flower TellaJilledu	Asclepideaceae	1
6.	*Delonix regia*	Gulmohar, Flame of the forest	Caesalpinaceae	1
7.	*Ocimum basilicum*	Basil Sabja	Lamiaceae	10
8.	*Gompherena globosa*	Bachelors buttons	Amaranthaceae	1
9.	*Zea maize*	Maize makkalu	Poaceae	1
TOTAL				24

2. Medicinal and Herbal Plant Species in the college campus

Sl. No	Botanical Name	Vernacular Name	Family	Quantity
1.	*Ocimum tenuiflorum*	Rama Tulasi	Lamiaceae	4
2.	*Ocimum Sps*	Krishna Tulasi	Lamiaceae	5
3.	*Ocimum sanctum*	LaxmiTulasi	Lamiaceae	5

4.	*Ocimum gratissimum*	Clove Tulasi	Lamiaceae	5
5.	*Withania somnifera*	Aswagandha	Solanaceae	2
6.	*Phyllanthus emblica/ Emblica officinalis*	Amla	Phyllanthaceae	4
7.	*Phyllanthus acidus*	Small Amla	Phyllanthaceae	4
8.	*Centella asiatica*	Brahmi,Saraswathiakku	Apiaceae	8
9.	*Zinziber officinale*	Ginger	Zingiberaceae	4
10.	*Curcuma longa*	Turmeric	Zingiberaceae	4
11.	*Laurus nobilis*	Bayleaf	Lauraceae	2
12.	*Elettaria cardamomum*	Elachi	Zingiberaceae	1
13.	*Teriminalia bellirica*	Tanikaya	Combretaceae	3
14.	*Catharanthus roseus*	Billaganneru,Vincarosea	Apocyanceae	6
15.	*Aegle marmelos*	Bilva ,maredu	Rutaceae	6
16.	*Piper betel*	Betel Leaf,Thamalapakku	Piperaceae	1
17.	*Myristica fragrans*	Nutmeg	Myristicacaae	1
18.	*Cymbopogon citratus*	Nimmagaddi, Lemon Grass	Poaceae	20
19.	*Lawsoniai nermis*	Henna.Mehendi	lythraceae	5
20.	*Vitex negundo*	Vavilli	Lamiaceae	2
21.	*Cissus quadrangularis*	Naleru,Hadjod	Vitaceae	7
22.	*Asparagus officinalis*	Wild Asparagus, shatavari	Asparagaceae	5
23.	*Chamaecostus cuspidatus*	Insulin Plant	Costaceae	4
24.	*Gymnema sylvestre*	Poda pathri	Asclepediaceae	1
25.	*Andrographis paniculata*	Nela vemu	Acanthaceae	5
26.	*Pterocarpus santalinus*	Red sandal wood	Fabaceae	2
27.	*Santalum Album*	Sri chandanam	Santalaceae	2
28.	*Piper longum*	Pippallu, long pepper	Piperaceae	1
29.	*Eclipta alba*	Guntagaragara,Bhringraj	Asteraceae	2

30.	*Moringa oleifera*	Drum stick,Munaga	Moringaceae	1
31.	*Murraya koenigii*	Curry leaf	Rutaceae	1
32.	*Tinospora cordifolia*	Tippatheega	Menispermaceae	5
33.	*Lavendula*	Lavender	lamiaceae	5
34.	*Origanum marjorana*	Maruvam	Lamiaceae	5
35.	*Artemisia pallaens*	Davanam	Asteraceae	1
36.	*Artemisia vulgaris*	Machipatram	Asteraceae	11
37.	*Plectranthus amboinicus*	Coleous, vamuakku	Lamiaceae	5
38.	*Piper Nigrum*	Pepper	Piperaceae	1
39.	*Pimenta diocia*	All spice	Myrtaceae	2
40.	*Syzygium aromaticum*	Clove	Myrtaceae	1
41.	*Cinnamomum verum*	Cinnamom	Lauraceae	1
42.	*Justicia Adhatoda*	Adasara	Acanthaceae	4
43.	*Basella rubra*	Red Bachalli	Basellaceae	4
44.	*Basella alba*	White Bacchalli	Basellaceae	4
45.	*Mirabilus jalapa*	Chandrakanta	Nyctaginaceae	4
46.	*Plumbago zeylanica*	Chitramullam	Plumbaginaceae	4
47.	*Geranium dissectum*	Geranium	Geraniaceae	4
48.	*Abrus precatocrius*	Gurivinda	Fabaceae	4
49.	*Caesalpinea bonduc*	Gachhakaya	Fabaceae	2
50.	*Thespesia populnea*	Ganga Ravee	Malavaceae	2
51.	*Prosopis cineraria*	Jemmi	Fabaceae	5
52.	*Jatropha curcas*	Bio diseal	Euphorbiaceae	5
53.	*Euphorbia triucalli*	Indian Tree Spurge, Naked Lady	Euphorbiaceae	5
54.	*Aerva lanata*	KondaPindi	Amaranthaceae	5
55.	*Sterculia urensis*	Kovellajiguru	Malvaceae	4
56.	*Mentha piperita*	Mint Pudina	Lamiaceae	10
57.	*Scauropus androgynus*	Multi Vitamin	Phyllanthaceae	5

58.	*Datura metel*	Black Datura	Solanaceae	5
59.	*Indigofera tinctoria*	Neelimandhu	Fabaceae	2
60.	*Cortalaria laburnifolia*	Peddagilligicha	Fabaceae	2
61.	*Bryophyllum pinnacum*	RanaPala	crassulaceae	5
62.	*Barrringtonia acutangula*	SamudraPala	lecythidaceae	5
63.	*Cassia angustifolia*	Senna	Fabaceae	4
64.	*Hemidesmus Indicus*	Sugandha Pala	Convolulaceae	1
65.	*Ocimum basilicum*	Sabjja,Basil	Lamiaceae	10
66.	*Termanlia arujana*	TellaMaddi	combretaceae	2
67.	*Termanlia elliptica*	Maddi	combretaceae	2
68.	*Vetiveria zizanioides*	Vetiveru	Poaceae	4
69.	*Acorus calanuis*	Vasa	Acanthaceae	5
70.	*Allium ursinum*	Wild Garlic	Amaryllidaceae	5
71.	*Tylophora asthmatica*	AasthammaTheega	Apocyanaceae	1
72.	*Bauhinia purpurea*	Devakanchana	Fabaceae	4
73.	*Commiphora wightii*	Gugullu	burseraceae	3
74.	*Bacopa monnieri*	JalaBrahmi	Plantagenaceae	4
75.	*Rutac halepensis*	Sadapaku	Rutaceae	4
76.	*Emilia sonchifolia*	KundelluChevvu	Asterceae	5
77.	*Holostem maadakodien*	Pala gadallu	Apocyanaceae	1
78.	*Aegle marmelos*	EkaBilvam	Rutaceae	4
79.	*Cinchona pubescens*	Pampin	Rubiaceae	2
TOTAL				**311**

3. List of Flowering and Fruit Plant Species in the College Campus

Sl. No.	Botanical Name	Vernacular Name	Family	Quantity
1.	*Carissa carandas*	Karonda	Apocynaceae	5

2.	*Acacia concinna*	Shikai	Fabaceae	1
3.	*Sapindus mukorossi*	Kunkudukaya,Reeta	Sapindaceae	1
4.	*Morus alba*	Mulberry	Moraceae	5
5.	*Morinda citrifolia*	Noni	Rubiaceae.	1
6.	*Myristica fragrans*	Nutmeg	Myristicaceae	1
7.	*Terminalia bellirica*	Tani Kaya	Combretaceae	2
8.	*Limonia acidissima*	Wood apple	Rutaceae	1
9.	*Averrhoa carambola*	Star Fruit	Oxalidaceae	1
10.	*Punica granatum*	Anar ,pomegranate	Lythraceae,	2
11.	*Psidium guajava*	Taiwan Guava	Myrtaceae	2
12.	*Psidium guajava*	White Guava	Myrtaceae	2
13.	*Cocos nucifera*	Coconut Dwarf	Arecaceae	1
14.	*Ficus carica*	Anjeer	Moraceae	1
15.	*Syzygium samarangense*	Water apple-Pink	Myrtaceae	1
16.	*Syzygium malaccense*	Water apple –White	Myrtaceae	1
17.	*Malpighia emarginata*	Barbodos Cherry	Malpighiaceae	1
18.	*Annona reticulata*	Ramaphal	Annonaceae	1
19.	*Annona muricata,*	Laxmanphal, Sour sop	Annonaceae	1
20.	*Annona squamosa*	Sithaphal, custard apple	Annonaceae	1
21.	*Selenic ereusundatus*	Dargon Fruit	Cactaceae	1
22.	*Terminalia catappa*	Badam	Combretaceae	1
23.	*Citrus limon*	Lemon	Rutaceae	2
24.	*Manilkara zapota/sapodilla, sapota*	Sapota	Sapotaceae	2
25.	*Persea americana*	Avacado	Lauraceae	1
26.	*Vitis vinifera*	Grapes	Vitaceae	1
27.	*Garcinia mangostana*	Mangosteen	Clusiaceae	1
28.	*Carica papaya*	Papaya	Caricaceae.	1
29.	*Nephelium lappaceum*	Rambutan	Sapindaceae.	1

30.	*Synsepalum dulcificum*	Miracle Fruit	Sapotaceae	1
31.	*Passiflora edulis*	Passion fruit	Passifloraceae	1
32.	*Hibiscus rosa-sinensis*	Mandaram	Malvaceae	2
33.	*Butea monosperma*	Moduga	Fabaceae	1
34.	*Magnolia champaca*	Shimhachalemsampenge	Magnoliaceae	1
35.	*Artibortyus hexapetalus*	Harichampa	Annonaceae	1
36.	*Neolamarckia cadamba*	Kadamba	Rubiaceae	1
37.	*Nerium oleander*	Nerium- Babypink	Apocynaceae	2
38.	*Nerium oleander*	Nerium-half yellow	Apocynaceae	2
39.	*Neriumindicum*	Nerium- Light Pink	Apocynaceae	2
40.	*Nerium oleander*	Nerium-Dark Pink	Apocynaceae	2
41.	*Gardenia jasminoides*	Nandivardhanam	Rubiaceae	2
42.	*Nyctanthes arbor-tristis*	Parijatham	Oleaceae	1
43.	*Jasminum multiflorum/ Jasminumpubescens*	Kakadamalli	Oleaceae	1
44.	*Rosa*	Rose	Rosaceae	1
45.	*Combretum indicum*	Madhumalathi	Combretaceae	1
46.	*Allamanda cathartica*	Alamanda-Yellow	Apocynaceae	1
47.	*Hibiscus rosa-sinensis*	Hibiscus- Pink	Malvaceae	1
	Hibiscus rosa-sinensis / *Hibiscus brackenridgei*	Hibiscus- Yellow	Malvaceae	1
48.	*Hibiscus rosa-sinensis*	Hibiscus-Red	Malvaceae	2
49.	*Hibiscus rosa-sinensis*	Hibiscus-orange	Malvaceae	1
50.	*Hibiscus rosa-sinensis*	Hibiscus-mudda	Malvaceae	2
51.	*Jasminum sambac*	Gundumalli	Oleaceae	1
52.	*Jasminum auriculatum*	JajjiMalli	Oleaceae	1
53.	*Portulaca grandiflora*	Table rose	Portulacaceae	60
54.	*Tabernaemontana divaricata*	Chakram flowers,Pin wheel flowers	Apocynaceae	2
TOTAL				137

4. List of Huge and Avenue Plant Species in the College Campus

S.NO	Botanical Name	Vernacular Name	Family	Quantity
1.	*Boswellia serrata*	Guggilam	Bursaraceae	3
2.	*Morinda pubescens*	Maddichettu	Rubiaceae	2
3.	*Phyllanthus emblica*	Usiri	Euphorbiaceae	4
4.	*Terminalia arjuna*	Tellamaddi	Combretaceae	2
5.	*Butea monosperma*	Moduga	Fabaceae	1
6.	*Cassia fistula*	Rela	Ceasolpinaceae	1
7.	*Limonia acidissima*	Velaga	Rutaceae	1
8.	*Annona squamosa*	Seethaphal	Annonaceae	2
9.	*Vitex negundo*	Nallavavili	Verbenaceae	1
10.	*Arbus precatorius*	Gurivinda	Fabaceae	4
11.	*Jasminum auriculatum*	Adavimalle	Oleaceae	2
12.	*Acalyph aindica*	Muripenda	Euphorbiaceae	2
13.	*Cymbopogon citratus*	Nimmagaddi	Poaceae	20
`14.	*Calotropis gigantea*	Tellajilledu	Asclepediaceae	1
15.	*Calotropis. procera*	Nallajilledu	Asclepediaceae	1
16.	*Datura innoxia*	Nallaummetha	Solanaceae	5
17.	*Delonix regia*	Aggichettu	Ceasalpinaceae	1
18.	*Mangifera indica*	Mamidi	Anacardiaceae	3
19.	*Pongamia pinnata*	Kanuga	Fabaceae	2
20.	*Caesalpinia bonduc*	Gachakai	Ceasalpinaceae	2
21.	*Justicia spp.,*	Addasaram	Acanthaceae	4
22.	*Pterocarpus santalinus* L. f	Red Sanders	Fabaceae	1
23.	*Morinda citrifolia*Linn.	Noni Indian Mulberry	Rubiaceae	1
24.	*Justicia adhatoda*Linn.	Malbar Nut Adhasara	Acanthaceae	4
25.	*Lawsonia inermis*Linn.	Henna	Lythraceae	5

26.	*Azadirachta indica A. Juss*	Neem Tree ,Veepachettu	Mileaceae	1
27.	*Tamarindus indica*	Chinthachettu	Fabaceae	1
28.	*Duranta erecta*	Durantha	Verbenaceae	350
29.	*Alternanthera dentata*	Athernanthera	Amaranthaceae	250
TOTAL				677

5. List of Air Purifying Plant Species in the College Campus

S.No	Botanical Name	Vernacular Name	Family	Quantity
1.	*Dracaena marginata*	Dracena	Asparagaceae	40
2.	*Aloevera(L.)Burm.F*	kalabandha	Asphodelaceae	60
3.	*Epipremnumaureum*	Money Plant,Pothos, Devils Ivy	Araceae	60
TOTAL				160

6. List of Palm family Plant Species in the College Campus

S.No	Botanical Name	Vernacular Name	Family	Quantity
1.	*Phoenix dactylifera,*	Kajur	Arecaceae	1
2.	*Phoenix Sylvestris*	Eethachettu	Arecaceae	1
3.	*Areca catechu*	Pokkallu,Vakkallu	Arecaceae	10
4.	*Cycas revoluta*	Cycas,Sago palm	Arecaceae	1
5.	*Dypsis lutescens*	Areca palm	Arecaceae	1
TOTAL				14

Figure 2 Drinking Water Facility at BJR College

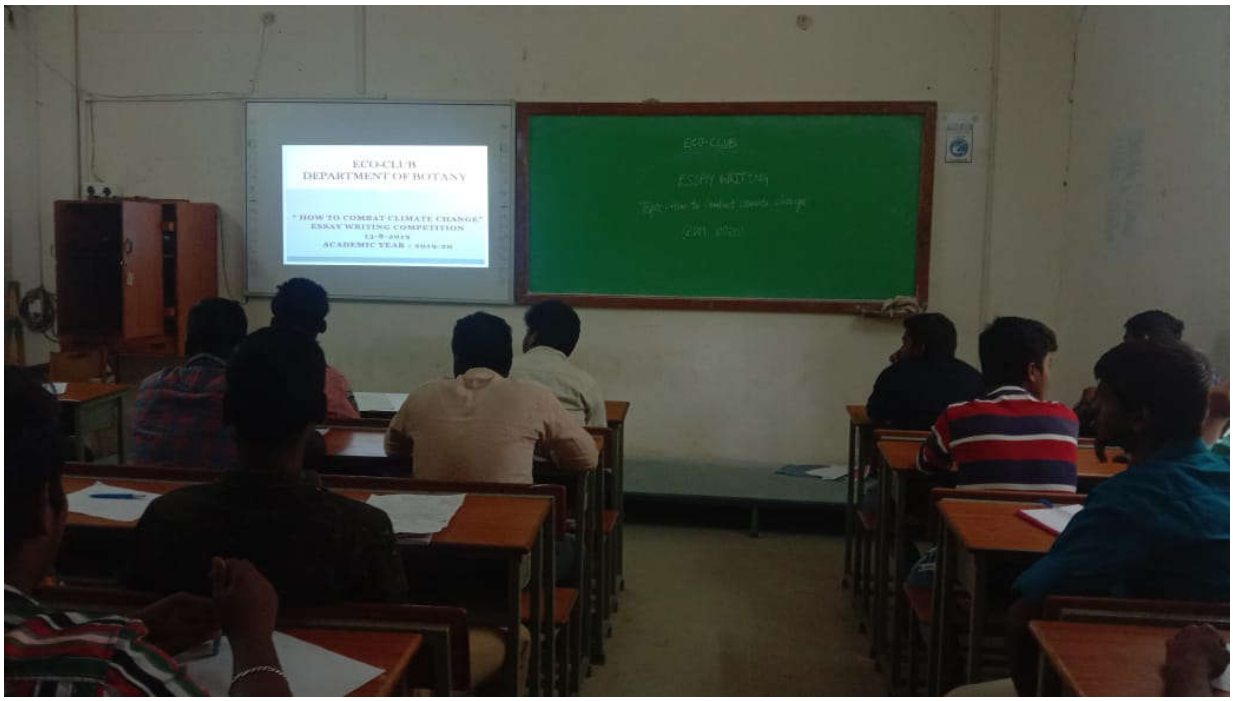


Figure 3 Eco –Club Activity: How to combat Climate Change

Figure 4 Haritha Haram (Tree plantation program)

Figure 5 one day workshop on "Organic Composting, Vermicomposting, Bio-Fertilizers and organic manures – For environmental consciousness and Entrepreneurship "

Figure 6 one day workshop on "Organic Composting, Vermicomposting, Bio-Fertilizers and organic manures – For environmental consciousness and Entrepreneurship "

Figure 7 Landscaping at BJR College

Figure 8 Landscaping at BJR College

Figure 9 Landscaping at BJR College

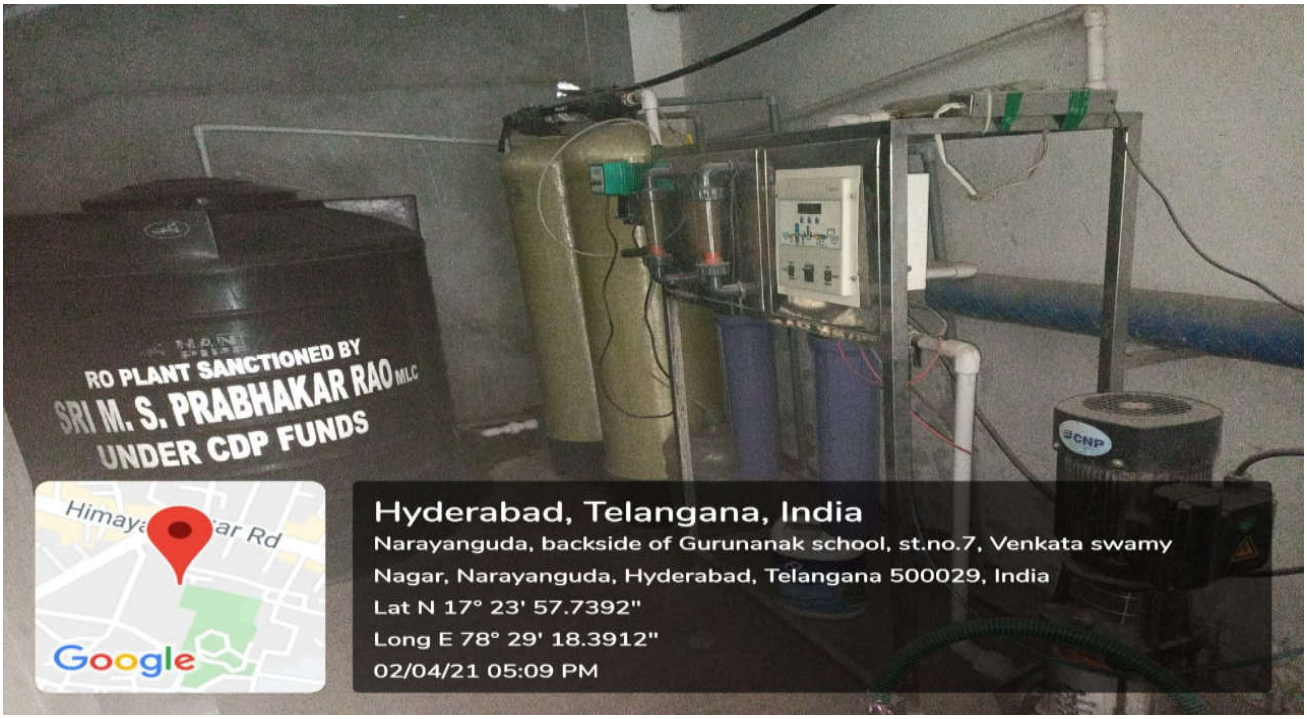


Figure 10 RO System at BJR College

earthbox
green tomorrow

MEMORANDUM OF UNDERSTANDING

This **Memorandum of Understanding** is made and executed **on 1st April 2019** at **Hyderabad.**

BY AND BETWEEN

Babu Jagjeevan Ram Government Degree College, Vittalwadi, Narayanaguda, itsadministrators, assigns and successors represented by Principal Who is duly authorized to sign and execute the MoU.

Being the First Part

AND

Earthbox Ventures Private Ltd,an authorized agency of ITC having its principal office situated at Plot No # 52, IDA Nacharam, Hyderabad 500076 and Represented by Mr.CH. Raju Managing Director referred as "**Earthbox**"

Being the Second Part

Whereas Babu Jagjeevan Ram Government Degree College has agreed to collect and give away the dry recyclable waste including any kind of paper waste and old records generated in its college and form Swachh WOW Hyderabad Chapter.

1. **NOW THIS MOU WITNESSETH AS UNDER:**
This is an agreement for a synergic alliance between Babu Jagjeevan Ram Government Degree College , Narayanaguda and Earthbox for the social cause of recycling of Dry Waste and Environment Protection through recycling.

2. **Time period**: This MOU shall be for a period of one year commencing from the date ofsigning of this MOU.

3. **Roles and Responsibilities of Babu Jagjeevan Ram Government Degree College:**

   a. To ensure source segregation of dry and wet waste at College premise through its Teaching staff, housekeeping staff and Students.

   b. Babu Jagjeevan Ram Government College will give away any kind of paper waste, dry recyclable waste and old records to Earthbox at price agreed mutually. Earthbox will pay Rs.7/kg for any kind of Paper waste and old records and Rs. 5/kg for Plastic Waste (pet bottles, polythene bags etc.,).

   c. Babu Jagjeevan Ram College shall form Swachh WOW Hyderabad Chapter in the college with Student Volunteers and adopt nearby Schools or Colonies to promote Source Segregation through student volunteers.

Registered Office: Plot#52, IDA Nacharam, Hyderabad – 500 076
www.earthboxventures.com; sales@earthboxventures.com;
CIN:U74999TG2016PTC112088; GSTIN:36AAECE4086D2ZQ

TELANGANA STATE
EDUCATION & WELFARE INFRASTRUCTURE DEVELOPMENT CORPORATION
(AN ENTERPRISES OF GOVT. OF TELANGANA)
DISTRICT COLLECTORATE PREMISES :: NAMPALLY STN.ROAD:: HYDERABAD

From
A.Ravinder, B. Tech.,
Executive Engineer,
TSEWIDC, Hyderabad.

To
The Principal,
BJR Degree College,
Narayanguda, Hyderabad.

Lr.No. /HD/EE/EWIDC/HYD/2021

Dated: 24 -03-2021

Sir,

Sub: TSEWIDC – Hyd. Division – Works – Construction / Creation of New Facilities in B.J.R. Degree College, Narayanguda, Hyderabad - Submission of Modified Estimate for obtaining approval- Request - Reg.

Ref: Instructions of the Commissioner, Collegiate Education, Telangana, Hyderabad Dt: 20-03-2021

&&&

With reference to the subject cited, it is to inform that as per the instructions issued by the Commissioner, Collegiate Education, Telangana, Hyderabad, the Modified Estimate is hereby prepared for the following work with solar roofing 50KW load with a designed load capacity of 40KW as reported by the Principal BJR Degree College, Narayanguda, Hyderabad for which tenders have been already called with VRCC Roofing and is herewith submitted as mentioned below.

S.no	Description	Amount
1	Construction / Creation of New Facilities in B.J.R. Degree College, Narayanguda, Hyderabad. (Civil Works)	Rs. 50.34 Lakhs
2	Supply & providing of ATUM solar roof VIL-325P Panels at BJR Degree College, Narayanguda Hyderabad	Rs 29.66 Lakhs
	Grand Total	**Rs 80.00 Lakhs**

Hence, the Principal, BJR Degree College, Narayanguda, Hyderabad is hereby requested to obtain approval from the competent authority for taking up the work..

Yours faithfully,

24/03/2021

Executive Engineer
TSEWIDC, Hyd.

Encl: Estimate (01) No.

Copy submitted to the Commissioner, Collegiate Education, Telangana, Hyderabad for favour of kind information
Copy submitted to the Chief Engineer, TSEWIDC, Hyderabad for favour of kind information

File No.CCE-GDCS/ACCF/28/2021-ACCF

PROCEEDINGS OF THE COMMISSIONER OF COLLEGIATE EDUCATION : TELANGANA, HYDERABAD.

Present: Sri Navin Mittal, I.A.S.,

Sub: COLLEGIATE EDUCATION -BJR Government Degree College, Narayanaguda - NAAC-Permission to Utilize accumulated Special fee funds of the College towards fixing of LED bulbs in class rooms -Orders-Issued.

Read: File No. NRGD-ESST/65/2021-ESST,dated:05.03.2021 received from the Principal, BJR Government Degree College, Narayanaguda.

In the circumstances stated by the Principal, BJR Government Degree College, Narayanaguda in the reference read above, the Commissioner of Collegiate Education has accorded permission to the Principal, BJR Government Degree College, Narayanaguda to utilize an amount of **Rs.3,65,000/-(Rupees three lakhs and sixty five thousand only)** from the available accumulated funds of the College towards fixing of LED bulbs in the class rooms for NAAC preparation works as per the estimates of Executive Engineer, TSEWIDC, Hyderabad .

The Principal, BJR Government Degree College, Narayanaguda is informed to follow the rules and guidelines while incurring the expenditure from the accumulated funds and maintain the books of accounts properly and produce the records to the Audit whenever it takes place and report compliance.

(Orders of the CCE have been obtained in this regard)

Validity unknown

Digitally signed by Ghanshyam
Date: 2021.03.26 16:12:46 IST
Reason: Approved

For Commissioner of Collegiate Education

To
The Principal, BJR Government Degree College, Narayanaguda.