S.V.K.P & Dr K.S RAJU ARTS SCIENCE COLLEGE (A)

PENUGONDA

GREEN AUDIT REPORT

2023-24

I . INTRODUCTION

In scenario people are not caring of nature they are directly or indirectly damaging the environment and it causes problems like; global warming, difficulties in maintaining ozone layers , air pollution, water pollution etc.

Green audit is the most efficient & ecological way to solve such a environmental problem. For protecting the nature as a human being we have to show our sense of humor towards the mother earth. In corporate sector the practice of saving environment through the various programmes like CSR (Corporate social Responsibility) , Go Green , Save water, save trees , plantation of trees are to be out to safeguard the planet. The Green Audit has been actively taken by the department of P.G BOTANY , S.V.K.P& Dr K.S RAJU ARTS & SCIENCE COLLEGE. It is necessary to conduct a green audit in college campus because student aware of the green country. Green audit and sustainable development process help to reduce the wastage and associated cost as well as increase the product quality Obviously, there relationship between Green Audit and Sustainable development of the any organization. The primarily needs for achieving the sustainable development of the organization are to determine the Green Audit framework, Accurate implementation, and result analysis of it. Strong Green Audit process can help to achieve the sustainability. Green Audit frame work help to achieve the goal set by organization. Green Audit is linked to Sustainable development process.

II. Literature Review

Mathews (1997) and Matis and lenciu(2010)

Mathews, Matis and lenciu found that environmental accounting has known to be in four stages in its development (1970-1980,1981-1994,1995-2001,2002)at the current stage of the knowledge about the green auditing, Although if there are four stages of the development of environmental auditing our knowledge will approach only the last two stages because beneficial study was conducted in this period and also in this period and also concept of environmental audit was started and developed in that period.

MEMBERS OF GREEN AUDIT COMMITTEE

1. Dr . Y.V.V APPA RAO	Principal & Chairman
2. Sri K. SASI KUMAR	IQAC co- ordinator
3. Smt G.JYOTHI	Co- ordinator
4. Sri T. VENKATESWARLU	Member
5. Dr U.D.V.P PULLA RAO	Member
6. Smt P.NIRMALA MARY KUMARI	Member

The Green Audit of is Requirement of NAAC Committee to the Degree & P.G colleges. It is necessary to conduct a green audit in college campus because student aware of the green audit, its advantages to save the planet & they become good citizen of our country. The green audit practically involves use of renewable sources, conservation of the energy, rain water harvesting program, and efforts of carbon neutrality, plantation of trees, E-waste management and hazardous waste management. The national & local governments keeping lots of efforts for maintaining a planet green. Also Environment is a compulsory subject to all batches students and arrange various programme so that students are much aware of the save planet, keep it green & also save energy.

Activities organized to create greenery and its conservation at college campus is as follows

- Plantation of diversified species
- Vegetative propagation
- Uses of Medicinal plants
- Identification of plant Species

Plantation of diversified species:

To create green cover , Eco-friendly atmosphere, pure oxygen at the college campus, plantation program is organized every year with involving all students , Principal and all faculty members of various Departments. In this session VanamManam, Janmabhoomi, VanaMahostsav and Neeru-cheetu programs were organized and Ornamental, Avenue, Medicinal plants with rare and exotic beautiful trees was planted in Botanical garden and other parts of college campus. To keep the greeneries in the campus, we regularly maintain the gardens which are looked after by paid staff under the guidance of Green audit committee members. Moreover , every year we try to plant new plants.

Vegetative propagation:

To learn how to propagate vegetative garden, training program is organized for students every year by expert gardener. Student learned various propagation techniques like cutting , grafting etc.

Uses of Medicinal plants:

There are many Medicinal plants in the Botanical garden which have Medicinal value. However the students are unaware of their use and they can't identify the particular plants. Therefore faculty of Botany Department helps the students in identifying medicinal plants with their scientific names and also their Medicinal use.

Identification of plant Species:

There are so many plant species present in the college campus. The faculty of Botany department audited and identified various plant species with the help of flora. Objectives of the Green Audit Committee.

1. Verifying compliance: Verifying compliance with standards or best available techniques.
2. Identifying problems: Detecting any leakage, splits or other such problems with the operations and processes.
3. Formulating Environmental policy: Formulating the organization's Environmental policy if there is no existing policy.
4. Measuring Environmental impact: Measuring Environmental impact of each and every process and operation on the water, soil, worker health and safety and society at large stage.
5. Measuring performance: Measuring the Environmental performance of an organization under best practice.
6. Conforming Environmental management system effectiveness: Giving an indication of the effectiveness of the system and suggestions for improvement.
7. Providing a database: Providing a database for corrective action and future plans.
8. Developing the organization's Environmental strategy: Enabling management to develop its Environmental strategy for moving towards a greenary corporate and performance culture.
9. Communications: Communicating the Environmental performance to its stakeholders through reporting will enhance the image of the college.

General Steps:

1. Systamatic and comprehensive data collection.
2. Documentation with physical evidences.

3. Independent periodic with regulatory requirements and comprehensive improvement and management of existing system.

The audit process:

The present audit is a Pre-audit to collect the details required for external auditing and Pre-audit activities. The pre-audit activities include the following.

1. The sites/area/division that are to be audited , need to be determined and selected.
2. The audited were informed of the data of the audit enabled them to adjust and become used to the concept.
3. The audit scope were identified. The auditee was consulted when establishing the scope.
4. The audit plan was designed in such a way that it accommodated changes based on information gathered during the audit and effective use of resources.
5. Green Audit Committee and assignment of responsibility were established.
6. The chosen working papers were collected. This facilitated the author's investigation on sites.
7. The background information on the facility including organization, layout and processes, and the relevant regulations and standards were collected.
8. The background information on the site's historical uses, and the location of soil and ground water contamination were collected.
9. The pre-audit questionnaire was informed to auditee

Onsite audit activities:

The onsite audit includes

1. The opening meeting is the first step between the Green audit team and dept of Botany. In this meeting the purpose of audit, the procedure and the time schedule were discussed. Site inspection is the second step for onsite activity. In this step the audit team discovered matters which are important to the audit but which were not identified at the planning stage.
2. Onsite phase of the audit developed a working understanding of how the facility manages the activities that influence the environment .
3. If there is one works assessed strengths and weaknesses of the auditee's management controls and risks associated with their failure were established.
4. Gathering audit evidence i.e collecting data information using audit protocol.
5. Communicated with the staff of the auditee to obtain most information.
6 Evaluated the audit evidence against the objectives established for the audit team discovered matters which are important to the audit but were not identified at the planning stage.
7. Onsite phase of the audit developed a working understanding of how the facility manages the activities that influence the environment.
8. If there is one work assessed strengths and weakness of how the auditee's management controls and risks associated with their failure were established.
9. Gathering audit evidence i.e collecting data and information using audit protocol.
10. Communicated with the staff of the auditee to obtain most information.
11. Evaluated the audit evidence against the objectives established for the audit.
12. An exit meeting to explain the audit findings. Team discovered matters which are important to the audit but which were not identified at the planning stage.
13. Team discovered matters which are important to the audit but which were not identified at the stage.
14. Onsite phase of the audit developed a working understanding of how the facility manages the activities that influence the environment.
15. Gathering audit evidence i.e collecting data and information using audit protocol.
16. Communicated with the staff of the auditee to obtain most information.

17. Evaluated the audit evidence against the objectives established for the audit.
18. An exit meeting to explain the audit findings.

Procedure followed:

The students were divided into four groups and under the guidance of the teaching staff of the Department of Botany, each group collected data on the assigned topics. The assigned topics were as follows.

a. Identification of plant species and Bio-diversity.
b. Analysis of Energy consumption and costs.
c. Analysis of waste generation and disposal all the data were united and based on these, a report was formulated.

Report 1:

Identification of plant species and Bio-diversity in the college campus, based on our college contributes to the Oxygen supply that we utilize. Our college is exposed to various atmospheric pollutants from vehicles as well as by other external means. Based on our calculation, the different sources of carbon-dioxide emitted to our college are

i. Refrigerators
ii. Air conditioners
iii. RO Water plants
iv. Mobiles etc

1. Vehicles on the days of data collection, there wer cars, 62 bikes and 18 scooters in our campus, which in turns proves us that these vehicles may contribute to high carbon –dioxide emission. There are 8 refrigerators, 16 air conditioners in our campus. The students, teaching and non-teaching staff and the visitors also contribute to carbon-dioxide emission.
2. The Vermi-compost unit recently established by the dept. of zoology. All the fallen leaves and food waste are collected from the Botanical garden and hostels are used as compost. Plastic wastes, plastic papers and bottles are collected by the students and stored at Vermi-compost compound wall for the purpose of recycling.
3. Analysis of water quality and usage of the college campus possesses many water outlets. Our students have counted the total number of taps, rain water harvesting pits .We have found that in total there are 75 taps, rain water plants and rain water harvesting pits worth 20,000 liters.
4. Analysis of Energy consumption and costs the college is well equipped with electricity supply. Each department possess computers, printers, fans, plug points, tube lights, bulbs etc.
5. General information about college:

S. V. K. P & Dr K. S. Raju Arts & Science college is present in 11.45 Acars.

Administrative Block	- 2688 sq.m
U.G Block (North)	- 3817 sq.m
U.G Block (West)	- 3386 sq.m
P.G Block (West)	- 1612 sq.m
P.G Block (South)	- 5161 sq.m
Asbestas shed	- 2957 sq.m
Women's Hostel	- 8748 sq.m
Men's Hostel	- 4738 sq.m
Open Air Theater	- 6937 sq.m
U.G.C IX Plan building	- 314 sq.m
Canteen	- 627 sq.m
Play ground	- 12573 sq.m

Cricket ground	-	8000 sq.m
Basket ball court	-	420 sq.m
Running track	-	2247 sq.m
Hand ball court	-	800 sq.m
Wally ball court	-	824 sq.m
Ball bat menten court	-	288 sq.m
Chemistry back side	-	2012 sq.m
Botany garden	-	1166 sq.m
Rusa building	-	471.3 sq.m

In addition to these equipment, our college also has

Spectrophotometer

Horizontal and vertical electrophoresis

A distillation unit

Digital calorimeter

Autoclaves;

Laminar air flow

An incubator

Hot air oven

Centrifuges

Telephones

LCD Projectors

Hand mikes

A bell

Analysis of waste generation and disposal wastes cannot be avoided in any environment. Wastes can be classified as biodegradable and non-bio degradable wastes. Bio–degradable wastes include food wastes which can be easily decomposed by the bacteria in soil. But non-biodegradable wastes are those which cnnot be degraded by any organism and remain as such for many years.

Canteen: The food waste generated from the canteen is collected given to vermin compost unit and dogs. Plastic waste is generally less generated from the canteen. The plastic waste kept at blocks of the vermin compost compound wall.

Library: The most generated waste is paper waste. It is taken for recycling.

Store: Not much waste is generated .But the paper waste and plastic covers are collected, separated and kept at blocks of the vermin compost compound wall.

Office: Paper waste generated are recycled and reused.

Garden: Plastic and paper waste is comparatively less. Fallen leaves are collected and used in vermin compost unit.

Seminar hall: The wastes are collected after each programme and dumped it.

Bathrooms: The wastes are collected and burned behind the college.

Class rooms: Paper wastes are collected in the waste basket and recycled.

Laboratory: The broken glass wastes and the useless instruments are disposed for recycling after through washing.

College premises: Plastic waste generated is usually less .But paper waste is in larger amount.

Observations:

There are sufficient water outlets for all the departments .But it is essential to check whether all these are working or not and whether the taps are leaking or not. Fortunately , the students of UG &PG ,Teaching and Non –teaching staff of the college are available to clean the college campus.

From entrance gate to administrative block:

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Duranta repens*	Verbinaceae	S	Avenue	443
2	*Azadirachta indica*	Meliaceae	T	Timber	251
3	*Ficus blakiana*	Moraceae	T	Timber	161
4	*Murraya koenigii*	Rutaceae	T	Edible	118
5	*Cassia fistula*	Fabaceae	T	Timber	03

India map to silver jublee park:

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Phyllanthus niruri*	Euphorbiaceae	H	Medicinal	197
2	*Duranta repens*	Verbinaceae	S	Avenue	180
3	*Azadiracta indica*	Meliaceae	T	Timber	171
4	*Ruellia tuberosa*	Apocynaceae	H	Weed	137
5	*Tridax procumbens*	Asteraceae	H	Weed	132
6	*Vernonia cineria*	Asteraceae	H	Weed	105
7	*Acalypha wilkesiana*	Euphorbiaceae	S	Avenue	95
8	*Ixora coccinea*	Rubiaceae	S	Avenue	36
9	*Ficus blackiana*	Moraceae	T	Timber	27
10	*Hibiscus rosa-sinensis*	Malvaceae	S	Ornamental	22
11	*Ocimum sanctum*	Lamiaceae	S	Medicinal	19
12	*Agave Americana*	Asparagaceae	H	Avenue	15
13	*Tagetus species*	Asteraceae	H	Ornamental	10
14	*Euphorbia hirta*	Euphorbiaceae	H	Weed	09
15	*Clitoria ternata*	Fabaceae	C	Ornamental	08
16	*Terminalia catappa*	Combretaceae	T	Timber	08
17	*Nerium odorum*	Apocynaceae	S	Ornamental	07
18	*Syzygium jambo*	Myrtaceae	T	Timber	05
19	*Mangifera indica*	Anacardiaceae	T	Timber	04

MBA block side garden to MCA block front side

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Duranta repens*	Verbinaceae	S	Avenue	105
2	*Ruellia tuberosa*	Apocynaceae	H	Weed	46
3	*Acalypha indica*	Euphorbiaceae	H	Weed	41
4	*Murraya koienigi*	Rutaceae	T	Timber	30
5	*Hibiscus rosa-sinensis*	Malvaceae	S	Ornamental	18
6	*Ocimum sanctum*	Lamiaceae	S	Ornamental	20
7	*Parthenium hysterophorus*	Asteraceae	H	Weed	21
8	*Croton bonplandianum*	Euphorbiaceae	H	Weed	06
9	*Crossandra infundibuliformis*	Lamiaceae	S	Ornamental	06
10	*Carica papaya*	Caricaceae	T	Edible	06
11	*Phyllanthus niruri*	Euphorbiaceae	H	Medicinal	05
12	*Plumeria pudica*	Apocynaceae	S	Ornamental	05
13	*Ixora coccinea*	Rubiaceae	S	Ornamental	05
14	*Azardiracta indica*	Meliacae	T	Timber	04
15	*Allmanda cathartica*	Apocynaceae	S	Ornamental	05
16	*Psidium guajava*	Myrtaceae	T	Edible	03
17	*Elaeocarpus serratus*	Elaeocarpaceae	T	Timber	01
18	*Araucaria sp*	Aracariaceae	T	Ornamental	01
19	*Catharanthus roseus*	Apocynaceae	H	Medicinal	04
20	*Aegle marmelos*	Rutaceae	T	Timber	01
21	*Jasminum sps*	Jasminaceae	S	Ornamental	01
22	*Curcuma longa*	Zingiberaceae	S	Edible	02
24	*Ficus blackiana*	Moraceae	T	Timber	83
26	*Terminalia catappa*	Combretaceae	T	Edible	15
27	*Reodiscolor sps*	Commalinaceae	H	Ornamental	15
28	*Agave sps*	Asparagaceae	H	Ornamental	12
29	*Nerium odorum*	Apocynaceae	S	Ornamental	11
30	*Cassia fistula*	Fabaceae	T	Timber	10
31	*Thuja*	Cupressaceae	T	Ornamental	01
32	*Musa paradisiaca*	Musaceae	T	Edible	01
33	*Anthocephalus cadamba*	Rubiaceae	T	Timber	01
34	*Peltophorum – pterocarpus*	Fabaceae	T	Timber	01

Hostel Garden and College Garden:

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Duranta repens*	Verbinaceae	S	Avenue	334
2	*Murraya koenigii*	Rutaceae	T	Edible	173
3	*Azardiracta indica*	Meliacae	T	Timber	57
4	*Euphorbia mili*	Euphorbiaceae	H	Ornamental	49
5	*Agave americana*	Asparagaceae	H	Ornamental	24
6	*Ruellia tuberosa*	Apocynaceae	H	Weed	20
7	*Plumeria alba*	Apocynaceae	S	Ornamental	09
8	*Anthocephalus cadamba*	Rubiaceae	T	Timber	06
9	*Psidium guajava*	Myrtaceae	T	Edible	06
10	*Pongamia glabra*	Fabaceae	T	Timber	05
11	*Cocos nucifera*	Arecaceae	T	Edible	05
12	*Hibiscus rosa-sinensis*	Malvaceae	S	Ornamental	05
13	*Araucaria*	Aracariaceae	T	Ornamental	04
14	*Ocimum sanctum*	Lamiaceae	S	Medicinal	04
15	*Delonix regia*	Fabaceae	T	Timber	04
16	*Tectona grandis*	Lamiaceae	T	Timber	04
17	*Syzygium jumbo*	Myrtaceae	T	Edible	04
18	*Citrus aurantifolia*	Rutaceae	T	Edible	04
19	*Ixora coccinea*	Rubiaceae	S	Ornamental	04
20	*Couropitia guinensis*	Lecythediaceae	T	Timber	03
21	*Mangifera indica*	Anacardiaceae	T	Edible	03
22	*Acalypha indica*	Euphorbiaceae	H	Weed	01
23	*Terminalia catappa*	Combretaceae	T	Edible	01
24	*Artocarpus heterophyllus*	Moraceae	T	Timber	01

Fountain park

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Ocimum sanctum*	Lamiaceae	S	Medicinal	11
2	*Araucaria sps*	Aracariaceae	T	Avenue	4
3	*Durantha repens*	Verbinaceae	S	Avenue	48
4	*Psidium guajava*	Myrtaceae	T	Edible	3
5	*Couropitia guinensis*	Lecythediaceae	T	Timber	5
6	*Murayya koenigii*	Rutaceae	T	Edible	12
7	*Azardiracta indica*	Meliaceae	T	Timber	4
8	*Delonix regia*	Fabaceae	T	Timber	3
9	*Anthocephalus cadamba*	Moraceae	T	Timber	2

11	*Cocos nucifera*	Aricaceae	T	Edible	2
12	*Parthenium hysterophorus*	Asteraceae	H	Weed	53
13	*Tridax procumbens*	Asteraceae	H	Weed	15
14	*Rosa indica*	Rosaceae	S	Medicinal	55
15	*Chrysanthemum indica*	Asteraceae	H	Medicinal	11
16	*Hibiscus- rosa – sinensis*	Malvaceae	S	Avenue	15
17	*Almonda cathertica*	Apocynaceae	T	Avenue	9
18	*Plumeria pudica*	Apocynaceae	T	Avenue	8
19	*Agave angustifolia*	Asparagaceae	H	Avenue	31
20	*Ficus microcarpa*	Moraceae	T	Timber	8

Administrative Block Left Side And Water Plant

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1.	*Agave angustifolia*	Asparagaceae	H	Avenue	2
2.	*Jasminum grandiflorum*	Oleaceae	S	Avenue	3
3.	*Dieffenbachia bowmannii*	Araceae	H	Avenue	59
4.	*Oreodoxa regia(Palm sps)*	Areaceae	T	Avenue	4
5.	*Rheo discolor*	Commelinaceae	H	Avenue	22
6.	*Durantha repens*	Verbinaceae	S	Avenue	146
7	*Nerium odorum*	Apocynaceae	S	Avenue	1
8.	*Ocimum sanctum*	Lamiaceae	S	Avenue	8
9	*Cycus revoluta*	Cycadaceae	S	Avenue	2
10	*Pteris quadriaurita*	Pteridaceae	S	Avenue	12
11	*Ficus benjamina*	Moraceae	H	Avenue	63
12.	*Psidium guajava*	Myrtaceae	T	Edible	11
13	*Hibiscus rosa sinensis*	Malvaceae	S	Avenue	4
14	*Tagetus patula*	Asteraceae	S	Avenue	3
15	*Syzygium jambo*	Myrtaceae	T	Edible	1
16	*Araucaria sps*	Aracariaceae	T	Avenue	2
17	*Cycas quadriaurita*	Cycadaceae	S	Avenue	2

Botany Garden

S.No	Name of the plant	Family	Habitat T/S/H/ C	Uses	No.of plants
1	*Rosa indica*	Rosaceae	S	Avenue	19
2	*Bougainvillea spectabilis*	Nyctaginaceae	S	Avenue	13
3	*Agave angustifolia*	Asparagaceae	S	Avenue	66
4	*Ocimum sanctum*	Lamiaceae	S	Avenue	14
05	*Areca catechu*	Arecaceae	T	Avenue	21
6	*Ixora*	Rubiaceae	S	Avenue	11
7	*Durantha repens*	Verbinaceae	S	Avenue	102
8	*Kaempferia galanga*	Zinziberaceae	S	Medicinal	9
9	*Spathodea campanulata*	Bignoniaceae	T	Timber	1
10	*Rheo discolar*	Commalinaceae	H	Avenue	17
11	*Ficus microcarpa*	Moraceae	T	Timber	13
12	*Nycthanthes arbor- tristis*	Nyctaginaceae	S	Avenue	2
13	*Aclypha wilkesiana*	Euphorbiaceae	S	Avenue	1
14	*Ravenela madagascariensis*	Strelitziaceae	T	Avenue	2
15	*Carica papaya*	Caricaceae	T	Edible	2
16	*Pteris*	Pteridaceae	T	Timber	10
17	*Plectranthus amboinicus*	Lamiaceae	S	Medicinal	1
18	*Aerva lanata*	Amaranthaceae	H	Weed	2
19	*Andrographis paniculata*	Acanthaceae	H	Weed	1
20	*Aloe barbadensis*	Asphodelaceae	H	Medicinal	2
21	*Chrysanthemum indicum*	Asteraceae	H	Avenue	1
22	*Bryophyllum pinnatum*	Crassulaceae	H	Avenue	5
23	*Tecoma stans*	Bignoniaceae	T	Avenue	1
24	*Acalypha indica*	Euphorbiaceae	H	Weed	2
25.	*Euphorbia sps*	Euphorbiaceae	H	Avenue	5
26	*Catharanthus roseus*	Apocynaceae	H	Medicinal	2
27	*Hibiscus rosa-sinensis*	Malvaceae	S	Avenue	10

28	*Asparagus recemosus*	Asparagaceae	S	Medicinal	2
29.	*Cinnamomum zeylanicum*	Lauraceae	S	Medicinal	1
30	*Plumeria rubra*	Apocynaceae	S	Avenue	1
31	*Phyllanthus cicirus*	Euphorbiaceae	H	Avenue	2
32	*Mentha piperita*	Lamiaceae	H	Medicinal	1
33	*Cycas revoluta*	Cycadaceae	S	Avenue	1

Herbal Garden

S.No	Name of the plant	Family	Habitat T/S/H/C	Uses	No.of plants
1	*Carica papaya*	Caricaceae	T	Medicinal	21
2	*Musa paradisiaca*	Musaceae	T	Medicinal	5
3	*Phyllanthus emblica*	Phyllanthaceae	T	Medicinal	3
4	*Azardiracta indica*	Meliaceae	T	Medicinal	2
5	*Saraca asoca*	Caesalpinaceae	T	Medicinal	1
6	*Ficus religiosa*	Moraceae	T	Medicinal	1
7	*Pachygone ovate*	Menispermaceae	S	Medicinal	1
8	*Feronia limonia*	Rutaceae	T	Medicinal	1
9	*Sapindus laurifolius*	Sapindaceae	T	Medicinal	8
10	*Annona muricata*	Annonaceae	T	Medicinal	1
11	*Annona reticulata*	Annonaceae	T	Medicinal	1
12	*Ziziphus mauritiana*	Rhamnaceae	T	Medicinal	18
13	*Calotropis procera*	Apocynaceae	S	Medicinal	2
14	*Manilkara zapota*	Sapotaceae	T	Medicinal	2
15	*Cleome viscosa*	Cappridaceae	H	Medicinal	3
16	*Punica granatum*	Punicaceae	S	Medicinal	5
17	*Acalytha indica*	Euphorbiaceae	S	Medicinal	13
18	*Vernonia cineria*	Asteraceae	S	Medicinal	10
19	*Boerhavia diffusa*	Nyctaginaceae	S	Medicinal	5
20	*Cassia absus*	Fabaceae	H	Medicinal	3
21	*Ruellia tuberosa*	Acanthaceae	S	Medicinal	25
22	*Psidium guajava*	Myrtaceae	T	Medicinal	11
23	*Couropita guianensis*	Lecythidiceae	T	Medicinal	1
24	*Syzygium aromaticum*	Myrtaceae	S	Medicinal	2
25	*Myristica fragrans*	Myristicaceae	T	Medicinal	1
26	*Abrus precatorius*	Fabaceae	T	Medicinal	4
27	*Aerva lanata*	Amaranthaceae	S	Medicinal	8
28	*Solanum surattense*	Solanceae	S	Medicinal	10
29	*Aegle marmelos*	Rutaceae	T	Medicinal	6
30	*Phyllanthus acidus*	Phyllanthaceae	T	Medicinal	3
31	*Vitex negundo*	Verbinaceae	T	Medicinal	4

32	*Aloe vera*	Asparagaceae	H	Medicinal	13
33	*Costus speciosus*	Costaceae	T	Medicinal	1
34	*Agave Americana*	Asparagaceae	H	Medicinal	1
35	*Aristolochia indica*	Aristalocaceae	S	Medicinal	1
36	*Rauwolfia serpentina*	Apocynaceae	S	Medicinal	1
37	*Cinnamomum verum*	Lauraceae	T	Medicinal	1
38	*Terminalia bellerica*	Combretaceae	T	Medicinal	5
39	*Vitex negundo*	Lamiaceae	S	Medicinal	1
40	*Amorphophallus paeonifolius*	Araceae	S	Medicinal	10
41	*Leucas aspera*	Lamiaceae	S	Medicinal	4
42	*Jatropha multifida*	Euphorbiaceae	S	Medicinal	1
43	*Bixa orellana*	Bixaceae	S	Medicinal	1
44	*Cissus quadrangularis*	Vitaceae	S	Medicinal	1
45	*Hemionitis arifola*	Pteridaceae	H	Medicinal	1
46	*Strychnos nux-vomica*	Loganiaceae	H	Medicinal	1
47	*Tylophora indica*	Apocynaceae	S	Medicinal	1
48	*Adhatoda zeylanica*	Acanthaceae	S	Medicinal	1
49	*Dalbergia latifolia*	Fabaceae	T	Medicinal	2
50	*Datura fastuosa*	Solanaceae	S	Medicinal	2
51	*Ocimum basilicum*	Lamiaceae	H	Medicinal	1
52	*Bauhinia variegata*	Fabaceae	T	Medicinal	1
53	*Acorus calamus*	Acoraceae	H	Medicinal	1
54	*Aristolochia bracteata*	Aristalocaceae	H	Medicinal	1
55	*Alpinia galanga*	Zinziberaceae	H	Medicinal	1
56	*Murraya koenigii*	Rutaceae	T	Medicinal	8
57	*Gymnema sylvestre*	Apocynaceae	H	Medicinal	3
58	*Piper longum*	Piperaceae	H	Medicinal	30
59	*Plumbago zeylanica*	Plumbaginaceae	H	Medicinal	3
60	*Argyreia nervosa*	Convolvulaceae	H	Medicinal	1
61	*Ophiorrhiza mungos*	Rubiaceae	H	Medicinal	1
62	*Cymbopogon flexuosus*	Poaceae	H	Medicinal	1
63	*Hemidesmus Indicus*	Apocynaceae	H	Medicinal	1
64	*Thespesia populnea*	Malvaceae	T	Medicinal	1
65	*Datura metel*	Solanaceae	S	Medicinal	2
66	*Sphaeranthus indicus*	Asteraceae	H	Medicinal	1
67	*Asparagus racemosus*	Asparagaceae	H	Medicinal	1
68	*Vetiveria zizanioides*	Poaceae	H	Medicinal	1
69	*Cinnamomum tamala*	Lauraceae	T	Medicinal	1
70	*Clitoria ternatea*	Fabaceae	H	Medicinal	6
71	*Citrus aurantifolia*	Rutaceae	T	Medicinal	1
72	*Asystasia gangetica*	Acanthaceae	H	Medicinal	1

73	*Citrus medica*	Rutaceae	T	Medicinal	1
74	*Benincasa hispida*	Cucurbitaceae	H	Medicinal	1
75	*Elaeocarpus serratus*	Elaeocapaceae	T	Medicinal	1
76	*Santalum albumlaceae*	Santalaceae	T	Medicinal	1
77	*Centella asiatica*	Apiaceae	H	Medicinal	2
78	*Jasminum nitidum*	Oleaceae	S	Medicinal	1
79	*Terminalia chebula*	Combritaceae	T	Medicinal	10
80	*Artocarpus heterophyllus*	Moraceae	T	Medicinal	2
81	*Tinosporia cordifolia*	Menispermaceae	H	Medicinal	1
82	*Terminalia catappa*	Combritaceae	T	Medicinal	2
83	*Sida cordifolia*	Malvaceae	S	Medicinal	1
84	*Operculina turpethum*	Convolvulaceae	C	Medicinal	1
85	*Cocos nucifera*	Arecaceae	T	Medicinal	21
86	*Cassia fistula*	Fabaceae	T	Medicinal	7
87	*Anthocephalus cadamba*	Rubiaceae	T	Medicinal	1
88	*Ocimum kilimandscharicum*	Lamiaceae	S	Medicinal	1
89	*Semecarpus anacardium*	Anacardiaceae	T	Medicinal	1
90	*Hibiscus rosa – sinenses*	Malvaceae	H	Medicinal	3
91	*Catharanthus roseus*	Apocynaceae	H	Medicinal	3
92	*Pongamia pinnata*	Fabaceae	T	Medicinal	15
93	*Delonix regia*	Fabaceae	T	Medicinal	4
94	*Mimusops elengi*	Sapotaceae	T	Medicinal	1
95	*Kaempferia galanga*	Zinziberaceae	H	Medicinal	1
96	*Tabernaemontana divaricata*	Apocynaceae	S	Medicinal	1
97	*Alstonia scholaris*	Apocynaceae	T	Medicinal	1
98	*Andrographis paniculata*	Acanthaceae	H	Medicinal	3
99	*Trianthema portulacastrum*	Aizoaceae	H	Medicinal	1
100	*Butea monosperma*	Fabaceae	T	Medicinal	1
101	*Psoralea corylifolia*	Fabaceae	H	Medicinal	1
102	*Lawsonia inermis*	Latheraceae	S	Medicinal	1
103	*Solanum nigrum*	Solanaceae	S	Medicinal	1
104	*Artemisia vulgaris*	Asteraceae	H	Medicinal	1
105	*Mimosa pudica*	Memosaceae	H	Medicinal	1
106	*Anacyclus pyrethrum*	Asteraceae	H	Medicinal	1
107	*Plectranthus amboinicus*	Lamiaceae	H	Medicinal	3

108	*Withania sominifera*	Solanaceae	H	Medicinal	1
109	*Basella alba*	Basellaceae	H	Medicinal	1
110	*Gloriosa superba*	Colchicaceae	H	Medicinal	1
111	*Adenanthera pavonina*	Fabaceae	T	Medicinal	1
112	*Nyctanthes arbour-tritis*	Oleaceae	S	Medicinal	1
113	*Sterculia urens*	Malvaceae	T	Medicinal	1
114	*Abelmoschus moschatus*	Malvaceae	S	Medicinal	1
115	*Eucalyptus citriodora*	Myrtaceae	T	Medicinal	2
116	*Anethum graveolens*	Apiaceae	H	Medicinal	1
117	*Phyllanthus amarus*	Phyllanhtaceae	H	Medicinal	1
118	*Euphorbia neriifolia*	Euphorbiaceae	T	Medicinal	1
119	*Euphorbia hirta*	Euphorbiaceae	H	Medicinal	5
120	*Sansevieria roxburghiana*	Asparagaceae	H	Medicinal	1
121	*Coccinea grandis*	Cucurbitaceae	H	Medicinal	2
122	*Achyranthes aspera*	Amaranthaceae	H	Medicinal	1
123	*Eclipta prostrata*	Asteraceae	H	Medicinal	1
124	*Crossandra infundibuliformis*	Acanthaceae	S	Medicinal	1
125	*Annona squamosa*	Annonaceae	T	Medicinal	1
126	*Indigofera tinctoria*	Fabaceae	S	Medicinal	1
127	*Mentha piperata*	Lamiaceae	H	Medicinal	1
128	*Mucuna pruriens*	Fabaceae	S	Medicinal	1
129	*Ricinus communis*	Euphorbiaceae	S	Medicinal	2
130	*Zingiber officinalis*	Zinziberaceae	H	Medicinal	1
131	*Ocimum sanctum*	Lamiaceae	S	Medicinal	10
132	*Curculigo orchiodes*	Hypoxidaceae	H	Medicinal	1
133	*Cycus circinalis*	Cycadaceae	T	Medicinal	1
134	*Nerium odorum*	Apocynaceae	S	Medicinal	2
135	*Tridax procumbens*	Asteraceae	H	Medicinal	5
136	*Tectona grandis*	Lamiaceae	T	Medicinal	10
137	*Morinda citrifolia*	Rubiaceae	S	Medicinal	1
138	*Mangifera indica*	Anacardiaceae	T	Medicinal	3
139	*Rauvolfia tetraphylla*	Apocynaceae	S	Medicinal	1
140	*Cynodon dactylon*	Poaceae	H	Medicinal	1
141	*Tamarindus indica*	Fabaceae	T	Medicinal	2
142	*Sauropus andogynus*	Phyllanthaceae	S	Medicinal	1
143	*Bryophyllum pinnatum*	Crassulaceae	H	Medicinal	2
144	*Oroxylum indicum*	Bignoniaceae	T	Medicinal	1
145	*Ficus racemosa*	Moraceae	T	Medicinal	1
146	*Chrysalidocarpus lutescens*	Aracaceae	T	Medicinal	1

147	*Areca catechu*	Aracaceae	T	Medicinal	1
148	*Phyllanthus reticulatus*	Phyllanthaceae	S	Medicinal	1
149	*Stevia rebaudiana*	Asteraceae	S	Medicinal	1
150	*Ficus benghalensis*	Moraceae	T	Medicinal	1
151	*Abutilon indicum*	Malvaceae	S	Medicinal	2
154	*Chrysanthemum*	Asteraceae	H	Medicinal	1
155	*Tagetus patula*	Asteraceae	S	Medicinal	2

S.V.K.P & Dr.K.S.RAJU A&S COLLEGE(A) PENUGONDA 534320

Signature of the Principal

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320. W.G.Dt.A.P


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S.V.K.P. & Dr. K.S. Raju Arts & Science College

(Autonomous)
Recognized by UGC as "College with Potential for Excellence"
Accredited by NAAC with grade 'A'

Dr.Y.V.V. APPARAO M.Sc., Ph.D.,
PRINCIPAL

PENUGONDA - 534 320.
West Godavari District
Andhra Pradesh

22 -04 -2024

GREEN AUDIT CERTIFICATE

This is to certify that S. V. K. P & Dr. K. S. RAJU Arts & Science College(A), Penugonda. Has conducted detailed Green Audit of the campus to assess the Green Initiative planning, efforts, activities implemented in the college campus, like Plantation, Waste water management, Energy Audit and various Environmental activities. The Green Audit aimed to maintain the campus Eco-friendly.

Coordinator

Auditors

T. Venkateswarlu T. Venkateswarlu

P.Nirmal Mary Kumary P.N.M Kumary

S.V.K.P. & Dr.K.S. RAJU A&S COLLEGE (A) PENUGONDA 534320

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320.W.G.Dt.A.P

Tel : 08819 - (O) : 246126, 246926 I Mobile : 90663 65365
email : svkp_penugonda@rediffmail.com, svkp.penugonda@gmail.com, Web:www.svkpandksrajucollege.edu.in
Mobile : 9704448889 I email : yvvarao@gmail.com

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PRINCIPAL

PENUGONDA - 534 320.
West Godavari District
Andhra Pradesh

10 – 03 -2023

GREEN AUDIT COMMITTEE

The following are the members of the Green Audit Committee for the year 2023- 2024.

1	Dr. Y. V. V. Appa Rao,Principal	Chairman
2	Sri K. Sasi Kumar , H. O. D of English	IQAC Coordinator
3	Smt G. Jyothi, Lecturer in P.G Botany	Coordinator
4	Sri T. Venkateswarlu, Lecturer in P.G Chemistry	Auditor
5	Smt P.Nirmala Mary Kumary, Lecturer in P.G Botany	Auditor

S.V.K.P. & Dr.K.S. RAJU ARTS COLLEGE(A) PENUGONDA 534320

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320.W.G.Dt.A.P

Tel : 08819 - (O) : 246126, 246926 I Mobile : 90663 65365
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Certificate

HYM International Certifications Pvt. Ltd.

Certified that the Environmental Management System

SRI VASAVI KANYAKA PARAMESWARI AND

DR.KALIDINDI SURYANARAYANA RAJU ARTS AND SCIENCE COLLEGE

Penugonda, West Godavari District, Andhra Pradesh, India

has been assessed and found to be in accordance with the requirements of the environmental standards

ISO 14001 : 2015

(Environmental Management System)

for the following scope of certification

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Further information about the scope of this certificate and applicability of ISO 14001 : 2015 requirements may be obtained by consulting the organization.

Certificate No : HYM/IAS/EMS/ 9186414/0024

Issue Date : 22/12/2023

Renewal Date : 21/12/2026

1st Surveillance 21/12/2024

2nd Surveillance 21/12/2025

IAS ACCREDITED Management Systems Certification Body MSCB-324

HYM International Certifications Pvt. Ltd. Corporate Seal

Authorised Signature

HYM International Certifications Pvt. Ltd

NOTE: This Certificate is Valid From 22/12/2023 to 21/12/2024

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E-mail: siva@hymcertifications.com, Website: www.hymcertifications.com

S.V. K. P. & Dr. K. S. RAJU ARTS & SCIENCE COLLEGE (A), PENUGONDA

College with Potential for Excellence, Accredited by NAAC with A Grande

ENVIRONMENT AUDIT REPORT

2023-2024

Environment Audit Assessment Team

Sl. No	Name of the Person	Designation
01	Dr. Y.V.V. Appa Rao, Principal,	Chairman
02	K. Sasi Kumar, HOD in English	IQAC Co-Ordinator
03	Dr. K. Srilakshmi, Lecturer in Botany	Co- Ordinator
04	T.Ramesh, lecturer in Bio-technology	Member
05	Dr. K. Lakshmikantamma, Lecturer in Zoology	Member

Objectives

The broad aims/ benefits of Environmental Audit

- Benchmarking for environmental protection initiatives
- Sustainable use of natural resource in the campus.
- Development of ownership, personal and social responsibility for the College campus and its environment
- Enhancement of College profile
- Developing an environmental ethics and value system in the youth.

Executive Summary

An environmental audit is to assess campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. The College has already done internal green assessment. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. This audit report contains observations and recommendations for improvement of environmental consciousness.

- Waste Minimization
- Greening
- Energy Conservation
- Water Conservation
- Clean Air
- Environmental Legislative
- General Practices

The following are available in the college.

- Normal Flora Garden area
- Medicinal Plants Garden
- Play ground
- Toilets
- Laboratory
- Canteen
- Hostel Facility
- Guest House
- Gymnasium
- Yoga Practice Hall
- Departmental Stores
- Water RO Plant for Drinking water
- Open Auditorium
- Seminar Hall
- Ladies Waiting Hall
- Library
- Rain Water Pits
- Open drainage System
- Underground Drainage system

The following are found near the college.

- Public convenience
- Industry—(Rice Mills)
- Bus station
- Public halls
- Temples
- Agriculture Area
- Fresh water Canal

- **Waste Minimization**

1	Solid waste, Canteen waste, paper waste, plastic waste, toiletry waste, e-waste are minimized in the college.			
2	Bio degradable	Non-Biodegradable	Hazardous	others
	100kg	1kg	Nil	<20kg
3	Composting pits are available in the campus; Waste bins are provided at campus for biodegradable and non-biodegradable waste at different places.			
4	Reuse of one side printed Paper for internal communication.			
5	All kind of waste is managed in an adequate manner without any deviation.			

- **Greening the Campus**

1	Gardens in the institute	About 3 Acre is the Green Area at different places	
2	Students spent time in the garden	2-4Hours a day	
3	Total number of Plants in Campus	Plant type	Number of species
		Trees	118
		Shrubs	98
		Herbs	102
		Grass Cover	2.5Acres
4	Department working for the greening the campus Number of Staff working in Botany Department for garden development	Botany Four Gardeners	
5	Number of Tree Plantation Drives Organized by College per annum.	Four Tree Plantation Drives was Organized Annually.	
6	Number of plants Planted in Last academic yearSurvival Rate	85 90%	
7	Plant Distribution Program for Students and Community	Seed bank is developed and, Saplings are distributed to Students and visitors at various Occasions.	
8	Plant Ownership Program	Some interested students from the Botany department are adopting some plants and they are taking care about plants for better growth.	

Energy

- Electricity is saved by use of LED bulbs for illumination
- Use of Natural Lighting and Natural Ventilation are promoted.
- 70% of Total Conventional bulbs are replaced by LED Lights.
- Computers and other equipment's put-on power-saving mode
- Machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time

Power Consumption Areas

More power consumption areas are 2 hostels, UG & PG blocks and e-class rooms. The energy audit team suggested to maintain energy conservation and reduce energy utilization

Water Conservation

- Basic usage of water in campus are; Drinking, Gardening, Toilets, and Others. and total consumption is 400KL/ month.
- Water tank is used for storage of water.
- Water wastage.
- Entry-Groundwater exit-from water drainage system to natural sewage drain.
- Reducing the amount of water used in our institute through 1. RWH, Closing the taps after usage 2. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage 3.Water Conservation awareness for new students

Water Quality assessment

Water samples from four different locations were collected and analyzed for its quality parameters. The sample include tap water which are the main water source of the college campus and 8 tap water samples which is used for canteen and drinking water systems. The samples were collected, and analyzed for various physio-chemical parameters. The major parameters analyzed include hardness, pH, conductivity, total dissolved solids and Alkalinity.

Table Indicates Quality of Water

S.NO	Collection point	Date of sampling	Hardness (Mg/L)	Alkalinity (Mg/l)	TDS (ppm)	pH	Conductivity µs/cm
1	Ground Water	20-02-2023	195	200	500	7.0	350
2	Canal Water	20-02-2023	200	290	118	7.1	70
3	RO water	20-02-2023	400	300	400	7.1	100

General

- The institution participated in Swatchh Bharat in promotion of environmentalprotection.
- Periodically Plantation is carried out by institution.
- The college observes world Environmental Day, Ozone Day etc.
- Initiatives for Environment
- The college is utilizing Solar Energy.
- The college has lush green campus which provides various species.
- Periodically the plantation drives by students and staff are carried out.
- 100% recharge of the rain water.
- Reduction in Air Pollution through vehicle emission.
- E-waste is sent to the authorized recyclers for adequate disposal

Recommendations

- Formation of Environment Policy and communicate to all faculties and other staff members.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, StackMonitoring of DG sets, Water monitoring need to be conducted by A.P. State Pollution Control Board, approved laboratory with frequency of six months)
- Reduction of paper use replacing by digital system.
- Water Meter to install at institute for monitoring of water consumption forlandscape.
- Increase the Environmental promotional activities for spreading awareness atcampus.
- As practically feasible, avoid personal vehicles inside the campus.

Conclusion

This audit involved extensive with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. The College has Environmental Committee for sustainable use of resources. Overall 60% of the campus is for landscaping. The audit team has identified several observations for making the campus premises more environmental friendly. The recommendations are also mentioned with observations for campus team to initiate actions.

K. Srilakshmi

(Dr. K. Srilakshmi)

S.V.K.P & Dr.K.S.RAJU A&S COLLEGE(A) PENUGONDA 534320

(Dr. Y. V. V. APPA RAO)

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320, W.G.Dt.A.P

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Dr.Y.V.V.APPARAO M.Sc., Ph.D.,
PRINCIPAL

PENUGONDA - 534 320.
West Godavari District
Andhra Pradesh

Dt: 27-03-2023

ENVIRONMENT AUDIT CERTIFICATE

This is to certify that the internal Environment Audit for S. V. K. P. & Dr. K. S. RAJU ARTS & SCIENCE COLLEGE (AUTONOMOUS), PENUGONDA, has been conducted during April 2023-March 2024 to assess waste minimizing and greening the campus, energy and water conservation activities implemented in the college campus. The audit team mainly focused on Environmental awareness activities and future plans to maintain eco-friendly campus. This environment audit was conducted in accordance with the applicable standards.

K. Srilakshmi
Coordinator
(Dr. K. Srilakshmi)

Auditors

1. T. Ramesh
(T.Ramesh)

2. K. Lakshmikantamma
(Dr. K. Lakshmikantamma)

(Dr. Y. V. V. APPA RAO)
PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320.W.G.Dt.A.P

Tel : 08819 - (O) : 246126, 246926 I Mobile : 90663 65365
email : svkp_penugonda@rediffmail.com, svkp.penugonda@gmail.com, Web:www.svkpandksrajucollege.edu.in
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Penugonda, West Godavari District, Andhra Pradesh, India

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E-mail: siva@hymcertifications.com, Website: www.hymcertifications.com

ENERGY AUDIT REPORT - 2023-24

S.V.K.P. & Dr.K.S. RAJU ARTS & SCIENCE COLLEGE (A)

PENUGONDA-534320

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PRINCIPAL

PENUGONDA - 534 320.
West Godavari District
Andhra Pradesh

ENERGY AUDIT COMMITTEE : 2023-24

1. Dr.Y.V.V.APPA RAO	Principal & Chairman
2. Sri K.SASI KUMAR	IQAC Co-ordinator
3. Sri S.SRINIVASA RAO	Co-ordinator
4. Smt. G.JYOTHI	Auditor
5. Sri P.B.V.A.S.RAVI KIRAN	Auditor
6. Sri D.V.S.SARMA	Auditor

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
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Mobile : 9704448889 I email : yvvarao@gmail.com

1. Introduction

An energy audit is a survey in which the study of energy flows for the purpose of conservation is examined at an Organization. It refers to a technique or system that seeks to reduce the amount of energy used in the Organization without impacting the output. The audit include suggestions of alternative means and methods for achieving energy savings to a greater extend. Conventionally, electrical energy is generated by means of fossil fuels, hydraulic and wind. The availability of fossil fuels and their depletion rate, insist the need for alternate energy systems and conservation of electric energy. In general, the primary objective of an energy auditing and management of energy consumption is to offer goods or services at the lowest possible cost and with the least amount of environmental impact (Backlund and Thollander, 2015). The need for an energy audit is to identify the savings potential and cost reducing methods, understand the ways in which fuel is used, where, the waste occurs and find the scope for improvement.

An energy audit is proposed and conducted to ensure that energy from Fossil Fuel to be minimized through saving practices are implemented and followed in Educational Institutions and Industrial sectors in a sustainable way. Preparation and completion of a questionnaire, physical examination of the campus, observation and examinationofdocumentation,keypersoninterviews,dataanalysis,measurementsand suggestions are all part of the audit process. Energy audit involves several facts including energy savings potential, energy management, finding alternatives, etc. (Cabrera *et al.*, 2010) With these facts in mind, the audit's specific objectives are to assess the competence of the sustainability management and control system, as well as the departments' compliance with applicable rules, policies, and standards. It has the potential to have a significant influence on the organization's operational cost as well as the environmental impact (Singh *et al.*, 2012).

Energy Conservation Building Code (ECBC) is established in the year 2017 which provides minimum requirements for the energy-efficient design and construction of buildings across India. Energy- efficiency labels are information affixed to manufactured products and usually communicate the product energy performance (Ingle, 2014). BEE has developed a scheme for energy efficiency labeling of buildings coinciding with the star ratings of the building at accelerating energy efficiency activities. BEE Star Rating Scheme is based on actual performance of the building as well as equipment in terms of specific energy usage termed as 'Energy Performance Indicator' by means of star ratings labeled items used which will be useful for energy savings in a sustainable manner (Mishraand and Patel, 2016).

Energy audit programme provide aid in maintaining a focus on energy price variations, energy supply availability and efficiency, determining an appropriate energy mix, identifying energy-saving technology, retrofitting for energy-saving equipment and so on. In general, an energy audit process dealt with the driving conservation concepts into reality by giving technically possible solutions within a specified time limit while also considering the economic and other organizational issues (Asnani and Bhawana,2015).

It also dealt with the uncover ways to cut operating expenses or reduce energy use per unit of production in terms of savings. It serves as a "benchmark" (reference point) for managing energy in the organization for planning more energy- efficient use across the board (Cabrera *et al.*, 2010).

2. Need for an Energy Audit

In an organization, the top three operating expenses are energy, labour and materials .Relating the manageability of the cost or potential cost savings in each of the above components, energy management is found to be the top ranker, and thus energy management constitutes the essential part in reducing the cost. Energy Audit helps in understanding the ways energy and fuel are being used in any organization, and identifies the areas where wastes occur and the scope for improvement exists. The Energy Audit gives a positive orientation to the energy cost reduction, preventive maintenance quality control programmes and will help to keep focus on variations which occur in the energy costs, availability, and reliability of supply of energy. The main objective of Energy Audit is to find ways to reduce energy consumption per unit of product output. The Energy Audit provides a "bench-mark" (Reference point) and a basic planning for managing energy and for more effective use of energy throughout the organization.

The Eco friendly-campus concept essentially focuses on the efficient use of energy conservation and its savings opportunities in a sustainable way. It also gives importance for reduction of contribution to carbon emissions, carbon footprint calculation, use of star rated equipment, encouraging energy use conservation practices in all buildings, reduce the organization's energy consumption, reduce wastes to landfill, and integrating environmental considerations into all contracts and services considered to have significant environmental impacts.

Auditing for Energy Management may be studied in terms of energy savings and opportunities. In general, energy cannot be seen, but we know it is there in wire, pipes and other non-living materials because it shows visible effects in the forms of heat, light and power. The energy consumption, energy sources, energy monitoring, lighting, vehicle movement, electrical and electronics appliances, and transportation are addressed by this indicator. Energy usage is an important aspect of campus sustainability and requires no explanation for its inclusion in the assessment. However, energy saving, and opportunities may be taken into consideration while energy is extensively used. An old incandescent bulb uses approximately 50W to100Wwhile an energy efficient LED uses only less than 10W which shows the positive indication on energy savings. Energy auditing deals with the conservation methods to reduce its consumption related to environmental degradation. In addition, suggestions and recommendations might be given after auditing which in turn useful for energy savings.

Thus it is essential for any environmentally responsible institution to review its energy use practices periodically using at management level as well as through internal and external auditors.

The conduct of energy audit using internal and external energy auditors is playing important role in any organization interms of energy management. The Energy audit is able to measure the impact of energy potential in an organization so that it helps in determining the better ways to manage the impact on environment. In addition to liquid and solid wastes, biomedical and electronic wastes energy potential and biodiversity audits, attempts may be made to measure the carbon footprint in the organization based on the amount of carbon emissions created by the electrical appliances, vehicles, and human population. It takes into consideration the measure of bulk of CO_2equivalents exhaled by the organization by which the carbon footprint accounting is done. It is necessary to know how much the organization is contributing towards sustainable development in terms of energy management is being done. It is therefore recommended to measure the carbon footprint in each organization which may be useful for maintaining the eco friendly campus to the stakeholders.

3. Aims and Objectives of an Energy Audit

An energy audit is a useful tool for developing and implementing comprehensive energy management plans of an organization. The aim of an energy audit is to identify the energy efficiency, conservation, and savings opportunities at the premises of the audit sites in a systematic manner. The audit process is carried out as per the following.

- Review of energy saving opportunities and measures implemented in the audit sites and identification of additional various energy conservation measures and saving opportunities.
- Implementation of alternative energy resources for energy saving opportunities and decision making in the field of energy management.
- Providing a technical information on how to build an energy balance as well as guidance to be sought for particular applications.
- Detailed analysis on the calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the central and State Electricity Board.
- List ways that the use of energy in terms of electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others.
- Analysis of electricity bill amount for the last two to three years, amount paid for LPG cylinders for last one year and amount paid for water consumption for human beings and watering to the plants.
- Use of incandescent (tungsten) bulb and CFL bulbs, fans, air conditioners, cooling apparatus, heaters, computers, photo copiers, inverter, generators and laboratory equipment and instruments installed in the organization (for example- 60-watt bulb x 6 hours x number of bulbs = Wh).
- Alternative energy sources / nonconventional energy sources are employed / installed in the organization (photovoltaic cells for solar energy, windmill, energy efficient stoves, Biogas, etc.).
- Creating awareness among the stakeholders on energy conservation and utilization.

4. Benefits of an Energy Audit

- **Reduced Energy Expenses:** The most obvious benefit is that the less energy the Organization uses, the less money that the Organization will have to spend on energy costs.
- **Identify Problems:** An energy audit can also help to identify any issues that the equipment might have. For example, the auditor could find small leaks in the compressed air system. These leaks would cost a significant amount of money if it is not noticed. Auditors can also detect dangerous health risks like the carbon monoxide that's emitted from equipment that hasn't been vented properly. With a regular energy audit, the organization will be able to address these kinds of issues promptly to help ensure the health and safety of the staff members.
- **Increased Employee Comfort:** During the audit, the Organization might learn about changes that have been made regarding insulation and air sealing. Completing these enhancements will help create a more reliable and more efficiently cooled or heated space for the employees. In turn, more comfortable employees tend to be more productive, so not only will the Organization save on energy costs, but may also improve overall well-being.
- **Personalized Recommendations:** Working with an energy expert can help learn about new energy-efficient technologies. The professional will customize a plan, recommending which upgrades will give the most return on investment. These might include updated lighting systems, a new HVAC system, weatherization measures like insulation and air sealing, and more. While some of the recommendations might have a substantial up-front cost that many of them will pay for themselves in a short period of time with significantly reduced energy expenses.
- **Show Environmental Concern:** By taking steps to be more energy efficient, the Organization will be showing the employees and clients that the organization cares about the impact on the environment.
- **Increased Property Value:** Using the recommendations of an energy auditor to make facility more energy efficient could also help to increase its overall worth. Things like solar panels, high-efficiency LED lighting, and weatherization procedures are all things that contribute to a higher property value.
- **Longer Equipment Lifespan:** An energy auditor might recommend to update some of the equipment for maximum energy savings. If the Organization decide to upgrade, it will not only save on energy costs, but also expect the equipment to last a long time. This is because newer, more energy-efficient equipment doesn't have to work as hard as older, outdated units to provide the same level of performance.
- **Energy audit evaluation:** Energy audits will evaluate the Organization "as a whole", the aim is to consider a wide range of available alternatives (Electrical, Mechanical, Thermal Water and Transportation).
- **Energy audit Opportunities:** The audit will not only inform about the opportunities but also provide information with financial analysis. This will enable prioritization based on financial benefit and return on investment. It provides technical information regarding the proposed energy conservation measures.

- **Analysing the quality of Energy Audit:** A good quality audit will investigate the historical energy usage and find the essential issues using statistical methods. It provides information with emissions analysis to help understand the benefits of the decisions from an environmental standpoint. The audit provides benchmark information to help compare the energy use performance with others.

5. Procedures followed in an Energy Audit

In order to conduct an energy audit, several methods are adopted in the audit sites in which walk-through audit is conducted. The balance of total energy inputs with total energy outputs and identification of all energy streams in a facility are taken into account. The amount of energy used by each of its energy streams are calculated as per the methodology mentioned in the Manual. The top three operating expenses of the Organization are typically observed to be energy (both electrical and thermal), labour and materials. During the audit, physical verification of Lighting, Ceiling, Table and Exhaust Fans, A/C machines, Solar panels, Heaters, Generators, Uninterrupted power supply machines and ventilators load fixtures and verification of installed energy efficient system's capacities are carried out. Inspection of when the cost or prospective cost savings in each of the above components are considered, energy always wins, and the energy management task becomes a key cost reduction area. The energy audit assisted in better understanding how energy and fuel are used in the Organization as well as identifying waste factors and development potential towards energy savings opportunities. Finally, after the audit process, the energy audit included suggestions/ recommendations for energy cost reduction, preventive maintenance and quality control activities, all of which are critical for the utility operations in the auditee (Organization).

The audit involved visiting the campus and physical verification of the loads and sources installed. The analyzing pus is divided into different sections and those sections are audited in which electrical fittings and energy supply are monitored. The production process flow is studied and electricity consumption are measured. Location of the electrical machines, conditions of them and their accessories are inspected through physical verification is observed. The energy bill from the supply utility company (Example: Tamil Nadu Electric Generation and Distribution Corporation Limited, Chennai) is audited and assessed for the load demand requirement and efficient consumption of energy. Stakeholders are interacted with the scope for improvement and energy management during the audit. Potential areas in which the scope of energy conservation and saving opportunities available in the current context have been identified and suggested for implementation to the Organization.

The audit involves visiting physical position of load & carry out inventory of load. Due measurement of electrical load of equipment & circuit is carried out. Energy bill received from TNEB is audited & studied for KWH requirement & how efficiently energy is used. Various positions are interacted, familiarized with energy audit & involved for successful & result oriented energy audit. Energy conservation & saving opportunities are identified during round & measurement for implementation.

Preliminary Energy Audit Methodology

Preliminary energy audit gives a quick access to:
Estimating and establishing energy consumption in the organization
Estimate the scope of audit
Identify the areas of maximum energy consumption
Identify the areas of improvement
Setting benchmark
Performing Preliminary energy audit uses existing data.

Detailed Energy Audit Methodology

The detailed Energy audit offers the most accurate estimation of energy savings and cost. A comprehensive audit provides a detailed energy implementation plans for a facility, as it evaluates all major energy consumption systems. It considers the effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. Energy Balance is the key element in detailed energy audit. The estimated use is compared to utility bill charges. There are three phases in detailed energy audit

Phase I- Pre-Audit Phase
Phase II- During-Audit Phase
Phase III- Post Audit Phase

8. Potential and Magnitude of Energy Audit

A systematic and structured method is necessary for an efficient working of energy audit process. An initial site study is carried out for planning the procedures necessary for an audit.

Initial Site Study and Preparation for Detailed Auditing

An initial site study visit might take one or two days and gives the Energy Auditor an opportunity to meet the concerned person (Auditee),to familiarize with the site and to assess the procedures necessary to carry out the energy audit.
During the initial site visit the Energy Auditor carries out the following actions:-

Discussing the aims of the energy audit with the audit study site's management.
Discussing the economic factors associated with the recommendations of the audit.
Analysing the major energy consumption data with the concerned person.
Obtaining the available audit site drawings–building layout, electricity distribution, steam distribution, compressed air distribution, etc. Conducting Walk-through audit around site.

The main aims of this visit are:

Finalising the Audit team members
Identifying and analyzing the main energy consuming areas during the audit.
Identifying existing instrumentation/additional metering required.
To decide if any meters will have to be installed prior to the audit eg .KWh, steam, oil/ gas meters. Identifying the instruments required for carrying out the audit.
Planning the time management
Collecting the macro data on major energy consuming areas.
Conducting awareness meetings/programmes.

9. Comprehensive Energy Audit

A comprehensive audit can take from several weeks to several months depending on the nature and complexity of the site to complete the audit process. Detailed study is carried out to establish, and investigate, energy and material balances for specific departments. Possible check so plant operations were carried out over extended periods of time, at nights and at week ends as well as during normal daytime working hours, to ensure that nothing is over looked.

The audit report includes list of energy inputs and product outputs by major department or by major processing function and estimates the efficiency of each step of the Organization. The methods for improving the efficiency will be listed, and also includes preliminary assessment of the cost of the improvements and expected payback on any capital investment needed. The audit report concludes with specific recommendations for detailed engineering studies and feasibility analysis. The comprehensive energy audit is useful in identifying the major energy consuming areas to be surveyed during then audit and to identify any existing instrumentation/additional metering required. Proper care should be taken while identifying the instrumentation required for carrying out the audit and to plan the time management for collecting the macro data from energy consuming areas. The audit report is definitely useful for energy management.

The information to be collected during the detailed audit includes:

1. Energy consumption by type of energy, by department/area, by type of process equipment, by end-use
2. Energy cost and tariff data
3. The distribution and generation of site services (eg. Electricity, Compressed air, steam).
4. Sources of energy and its supply(e.g. electricity from the grid or self-generation)
5. Potential alternative for fuel substitution, process modifications, and the use of co-generation systems (combined heat and power generation).
6. Energy conservation and management awareness strain in programs with in the organization

The Audit team collects the following base line data:

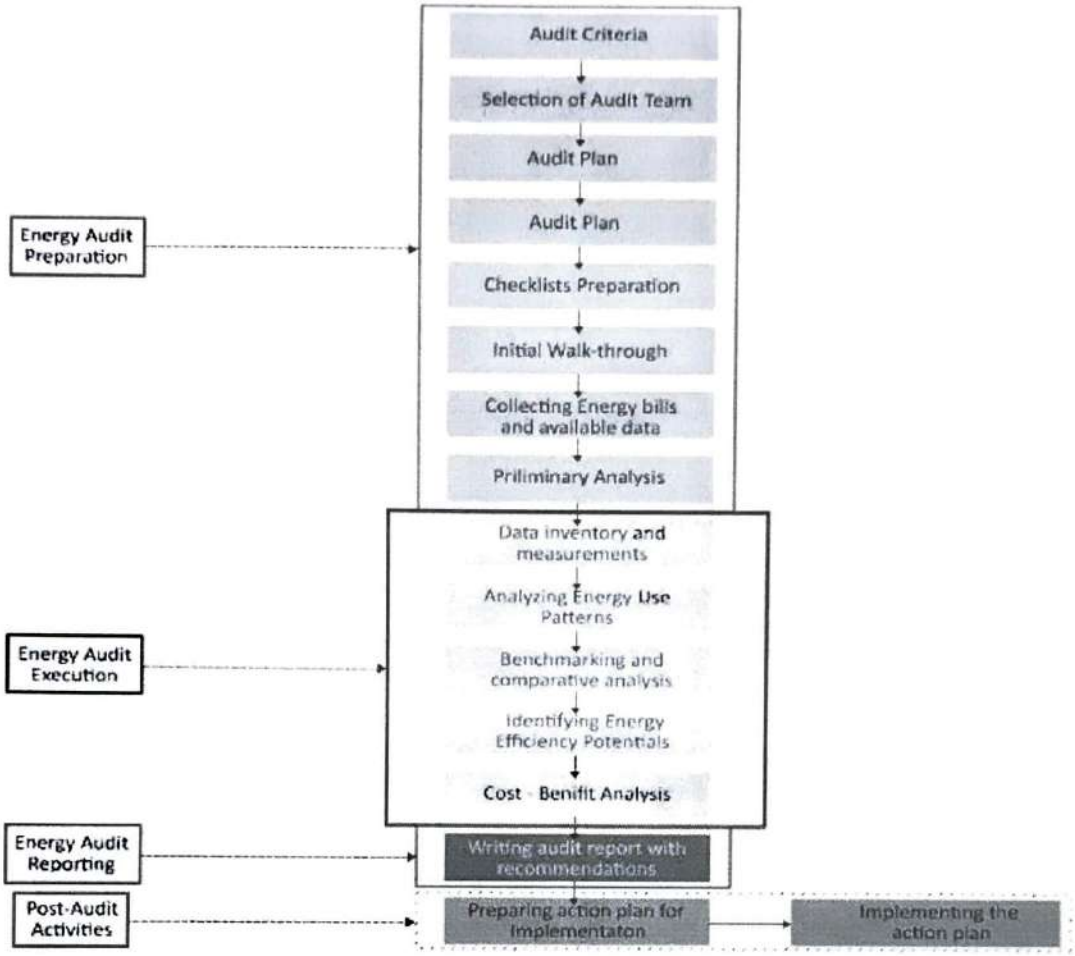
S.NO	ROOM NO	LIGHTS	FANS	SYSTEMS	PRINTERS	REFREGI-RATORS	AIR CONDI TI-ONERS
1	OFFICE	4	4	5	4	1	1
2	MANAGEMENT	5	4				
3	PRINCIPAL ROOM	4	3	1	1	1	1
4	LIBRARY (UG)	29	18	10	2		
5	5	2	2				
6	6	4	5				
7	4	4					
8	3	2					
9	COMMERCE	4	2	1	1		
10	POLITICS	3	2		1		
11	ECONOMICS	2	2	1	1		
12	MATHS	3	2	1	1		
13	ENGLISH	2	2	1	1		
14	BOTANY- I	7	4	1			
15	BOTANY- II	7	4		I		
16	ZOOLOGY	4	4	1	I	1	
17	ZOOLOGY LAB	7	17		1		
18	MICRO BIOLOGY	4	4	1		1	
19	BIO-CHEMISTRY	5	3				
20	BIO-TECHNOLOGY	5	3	1	1		
21	COMPUTERS	12	3	20	2		3
22	PHYSICS	26	21		2	1	
23	ELECTRONICS	11	10		2		
24	CHEMISTRY	23	4	1		1	
25	TELUGU& HINDHI	2	2	1			
26	HISTORY	4	2	1			
27	22	1	3				
28	23	1	2				
29	24		2				
30	25	4	4	1			
31	27	4	4				
32	28		4				
33	29		4				
34	30		4				
35	31	1	3				
36	32	1	3				

37	33	1	3				
38	34	1	3				
39	35		4				
40	36	3	4				
41	M.SC ZOOLOGY		4				
42	CENTRAL LAB	5	2	1	1		1
43	M.SC ZOOLOGY LAB	7	4				
44	M.SC BOTANY LAB	4	4				
45	LIBRARY(PG)	18	12	1	3		
46	MBA LIBRARY	2					
47	MBA	6	4				
48	MBA-II	3	4				
49	NCC	2	2				
50	SPECILIZATION	2	2				
51	MCA LIBRARY	4	4				
52	MCA LAB	11		62	2		6
53	PG FACULTY ROOM	5	3				
54	SEMINAR HALL	26	24	1			7
55	I MCA	4	5				
56	II MCA	4	4				
57	PLACEMENT CELL	6	6	1			2
58	HRD CENTRE	6	6	17	1		2
59	GIRLS HOSTEL	40	35			1	
60	BOYS HOSTEL	35	25			1	
61	STORES	4	2		2	1	
TOTAL		396	323	131	32	9	23

TOTAL ENERGY CONSUMPTION IN KILO WATTS

S.NO	LIGHTS 5 Hrs/Day	FANS 5 Hrs/Day	SYSTEMS 6 Hrs/Day	PRINTERS 3 Hrs/Day	REFRIGERATORS 6 Hrs/Day	AIR CONDITI-ONERS 5 Hrs/Day
1	79.2	129.2	55.02	19.2	43.2	138

Flow chart of Energy Audit Methodology



S.V.K.P. & Dr.K.S.RAJU A & S COLLEGE (A), PENUGONDA

ELECTRICAL BILLS FOR THE YEAR 2023-24

S.NO.	MONTH	MAIN GATE 15254141 00001674	MCA GROUND FLOOR 15254141000 04849	MCA UP STAIRS 15254141 00003447	PG CHEMISTRY BLOCK 1525414100 001318	ADMINISTR-ATIVE BLOCK 15254141000 03451	UG CHEMIST RY BLOCK 15254141 00003448	UG COMPUTERS 152541410000 2890	GIRLS WAITING ROOM 152541410000 3449
1	APRIL	1,381.00	11,015.00	1,477.00	5,240.00	10,894.00	1,884.00	3,877.00	15,001.00
2	MAY	1,376.00	11,777.00	2,003.00	7,172.00	10,914.00	2,672.00	3,363.00	19,371.00
3	JUNE	1,218.00	7,239.00	1,376.00	2,285.00	10,386.00	2,144.00	2,378.00	12,607.00
4	JULY	1,068.00	15,249.00	963.00	5,495.00	9,759.00	1,216.00	5,216.00	21,147.00
5	AUGUST	1,188.00	14,696.00	2,034.00	8,311.00	11,622.00	2,081.00	4,127.00	22,102.00
6	SEPTEMBER	1,292.00	18,663.00	1,838.00	7,179.00	12,725.00	2,328.00	6,177.00	28,276.00
7	OCTOBER	1,257.00	15,019.00	1,770.00	6,234.00	12,316.00	2,175.00	4,545.00	23,476.00
8	NOVEMBER	1,526.00	15,279.00	1,422.00	7,562.00	10,685.00	2,434.00	4,207.00	21,050.00
9	DECEMBER	1,754.00	17,668.00	1,750.00	7,011.00	12,329.00	2,578.00	5,052.00	28,012.00
10	JANUARY	908.00	7,844.00	1,009.00	3,873.00	7,562.00	1,514.00	3,048.00	11,880.00
11	FEBRUARY	1,289.00	9,901.00	1,219.00	4,294.00	7,971.00	2,068.00	3,347.00	15,899.00
12	MARCH	1,417.00	13,545.00	1,185.00	6,649.00	9,589.00	2,574.00	4,804.00	24,738.00
TOTAL		5,674.00	1,57,895.00	18,046.00	71,305.00	1,26,752.00	25,668.00	50,141.00	2,43,599.00
GRAND TOTAL		7,09,040.00							

S.V.K.P. & Dr.K.S. RAJU A&S COLLEGE (A) PENUGONDA 534320

Signature of the Principal

PRINCIPAL
S.V.K.P & Dr.K.S.RAJU ARTS & SCIENCE COLLEGE (A)
PENUGONDA-534320.W G.Dt.A.P

S.V.K.P. & Dr. K.S. Raju Arts & Science College

(Autonomous)

Recognized by UGC as "College with Potential for Excellence"

Accredited by NAAC with grade 'A'

Dr.Y.V.V. APPARAO M.Sc., Ph.D.,
PRINCIPAL

PENUGONDA - 534 320.
West Godavari District
Andhra Pradesh

Dt: 22-03-2024

ENERGY AUDIT CERTIFICATE

This is to certify that Internal Energy Audit for S .V. K. P. & Dr. K. S. RAJU Arts & Science College (A), Penugonda has been conducted during April, 2023 to March, 2024 to assess energy costs, availability and reliability of supply of energy, energy conservation technologies and ways to reduce energy consumption.

Coordinator

Auditors

1. G. Jyothi
2.
3. DVS Somma

Tel : 08819 - (O) : 246126, 246926 I Mobile : 90663 65365
email : svkp_penugonda@rediffmail.com, svkp.penugonda@gmail.com, Web:www.svkpandksrajucollege.edu.in
Mobile : 9704448889 I email : yvvarao@gmail.com

Certificate

HYM International Certifications Pvt. Ltd.

Certified that the Energy Management System

SRI VASAVI KANYAKA PARAMESWARI AND

DR.KALIDINDI SURYANARAYANA RAJU ARTS AND SCIENCE COLLEGE

Penugonda, West Godavari District, Andhra Pradesh, India

has been assessed and found to be in accordance with the requirements of the Energy standards

ISO 50001 : 2018

((Energy Management System)

for the following scope of certification

PROVIDING U.G. COURSES B.A., HONOURS (HISTORY), B.A., HONOURS (ECONOMICS),B.SC., HONOURS (MATHEMATICS) B.SC. HONOURS(PHYSICS) B.SC., HONOURS (CHEMISTRY), B.SC., HONOURS(ELECTRONICS), B.SC, HONOURS (BOTANY), B.SC., HONOURS (ZOOLOGY), B.SC., HONOURS(COMPUTER SCIENCE), B.SC., HONOURS (BIOTECHNOLOGY), B.SC., HONOURS (BIOCHEMISTRY), B.COM.HONOURS(GENERAL), B.COM. HONOURS (COMPUTER APPLICATIONS) BCA., HONOURS PG COURSES MCA,M.B.A M.SC., ORGANIC CHEMISTRY, M.SC.ZOOLOGY, M.SC., BOTANY, M.SC., AQUACULTURE

Further information about the scope of this certificate and applicability of ISO 50001 : 2018 requirements may be obtained by consulting the organization.

Certificate No : HYM/IAS/EN/ 9186414/0019

Issue Date : 22/12/2023

Renewal Date : 21/12/2026

1st Surveillance 21/12/2024

2nd Surveillance 21/12/2025

IAS ACCREDITED Management Systems Certification Body MSCB-324

Authorised Signature

HYM International Certifications Pvt. Ltd

NOTE: This Certificate is Valid From 22/12/2023 to 21/12/2024

This is an accredited certificate authorized for issue by Accreditation Service for Certifying Bodies [Europe] Limited who have assessed M/s.HYM International Certifications Pvt. Ltd. against defined criteria and in cognisance of ISO 17021:2015 "Conformity Assessment - Requirements for bodies providing audit and Certification of management Systems".

www.hymcertifications.com on for checking the validation of the Certification

Regd.Flat No. 201(02nd Floor), Plot No. 163A/164A, A.K Towers, Survey No.183, Addagutta Society,Westeran Hills, Kukatpally,Hyderabad - 500 071, Telangana State, India.
E-mail: siva@hymcertifications.com, Website: www.hymcertifications.com

Certificate

HYM International Certifications Pvt. Ltd.

Certified that the Energy Management System

SRI VASAVI KANYAKA PARAMESWARI AND

DR.KALIDINDI SURYANARAYANA RAJU ARTS AND SCIENCE COLLEGE

Penugonda, West Godavari District, Andhra Pradesh, India

has been assessed and found to be in accordance with the requirements of the Energy standards

ISO 50001 : 2018

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for the following scope of certification

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