

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



**INTEGRATED ENERGY AND GREEN AUDIT FOR THE ASSESSMENT YEAR
2017-18¹, 2018-19 AND 2019-20 IN LINE WITH NAAC REQUIREMENTS**

**Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP), Besa,
Nagpur**



**15/01/2021
Version 01**

**By:
Energy and Green Audit Team,
Sustainability Solutions**

¹Reference and data of old reports was taken for 2017-18 and 2018-19 vintages for consolidating assessments and reporting

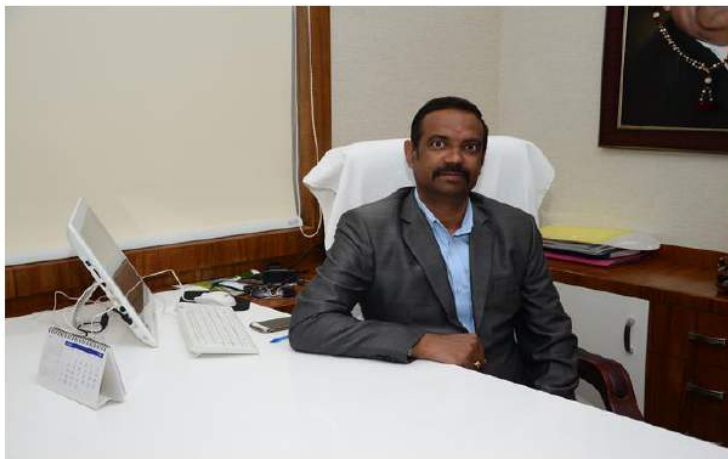
**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Late Shri Vitthalrao Balpande (Dadji)

Inspiration and Founder of Ambe Durga Education Society

MESSAGE FROM PRESIDENT



Over the last 15 years, DBCOP have made remarkable progress and are acknowledged as one of the best Pharmacy College in the Vidarbha region. Our experience taught us that educational institutions have the accountability to sustain the nation's growth. Our responsibility is not just limited to education; we inculcate principles and values. Human society is in the middle of Environmental, Social, and Economic challenges. The major ones are climate change, the greenhouse effect, polluted air, water, soil, etc. After graduation or post-graduation, the students become leaders of tomorrow and get dispersed from the world of education into their specific career. They take with them the Sustainable practices and approaches as a kit to solve problems. We are developing our students so that they are prepared to face global challenges and convert them into opportunities.

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. Hence sustainability is the need of the hour for our country to provide our future generation a cleaner, safer environment. .

The purpose of green audit was an independent review of the practices followed in our campus with reference to the Sustainable Policies. We will take the learning from this independent review as a "value addition" to promote better environmental performance and continually improve the College Campus and Community. Educational institutions must play an active role in creating and modelling solution for such environmental problems. .

I am thankful to the entire Green Audit Team for taking sincere efforts and hard work for this green audit. We are ascertained that the report will help society, staff, students, and all concerned in the College Campus and will motivate for sustainable and green practices throughout.

Shri Manoj V. Balpande
President, ADES Nagpur

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https://www.youtube.com/channel/UCv80w0IBi7Eudwd_A1_EY3A

MESSAGE FROM PRINCIPAL



Environment is no one's property to destroy; it's everyone's responsibility to protect.

— Mohith Agadi

The world in 21st century is facing many challenges related to environment. On one hand world is developing at alarming rate while on the other hand the destruction of natural resources is going on. That means world's present development path is not sustainable. Efforts to meet the needs of a growing population in an interconnected but unequal and human-dominated world are ignoring the Earth's essential life-support systems.

Today, the human society is facing severe environmental problems like climate change, greenhouse effect, energy crisis, depletion of natural resources, biodiversity loss, pollution of air, water, soil, etc. The ever increasing population and changing life styles are increasing the severity of the environmental problems.

The time has come to protect the natural environment through precise efforts. At the same time sustainable development through higher education provides a pivotal role in nations building. Sustainable development remains barely a significant social, economic or environmental challenge for any country.

Though teaching and learning must begin to reflect environmental issues, there is an emerging consensus that institutions must also model sustainable practices. Such education contributes strongly to sustainable development by training and expanding young minds in researching solutions to the environmental challenges. Eco-campus or Ecological Campus has its meaning in itself.

DBCOP's SGD performance are –

Good Health and Well Being: This goal shall be achieved by promoting the NSS program through Unnat Bharat Abhiyan, Blood donation camps, general awareness on Hygiene, Malaria, Contagious diseases.

Affordable and Clean Energy: This goal shall be achieved by use of solar energy at college campus.

Responsible Consumption and Production: This goal shall be achieved by designing energy efficiency projects, using energy efficient equipment's, solar passive architecture.

Climate Change: Offsetting the scope 1 and scope 2 GHG emissions with carbon credits, planting trees, rainwater harvesting, Wastage of RO water machine uses for gardening, Drip irrigation, Solar lightening, MoU with waste handler.

DBCOP recognizes the need to function all year round in a manner which minimizes its harmful environmental impact by designing Environment protection policy. Implementation of Environment protection policy provides chance for exploitation of opportunities for better performance in the future. Green audit will help us not only in

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

understanding our environment in a scientific way but also in spreading the awareness to the remote villages through our students

By following the recommendations made by the report of the audit, we will be able to work for the sustainability of the environment in a more efficient way, and thus tread towards a better future. So, taking the green audit as a capacity building exercise for our institution, I express my deep thanks to the experts of the audit team and hope that the directions provided by them will go a long way in the development of green practices in our campus.

Dr. Mrs. Ujwala Mahajan
Principal, DBCOP, Besa, Nagpur

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Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Acknowledgement



Green Audit Assessment Team thanks the management of Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Nagpur for assigning this important work of Green Audit. We appreciate the cooperation of our Team for completion of study. Our special thanks to:

Mr. Manoj Vitthalrao Balpande	President
Dr. Mrs. Ujwala N. Mahajan	Principal
Dr. Ajay G. Pise	IQAC Coordinator
Dr. Nilesh M. Mahajan	Associate Professor
Dr. Purushottam S. Gangane	Associate Professor
Mr. Sachin S. More	Asst. Professor
Mr. Sachin Dhande	Librarian
Mr. Viplav Hadke	Computer Operator
Mr. Tekendrakumar Bisen	Store Keeper

All the members of College Development Committee, Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Nagpur.

Team of students as stated under Annexure-I

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Profile of Audit Team Members and Independent Reviewers

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Certified Energy Auditor, M.Tech (Heat & Power Engineering), Expert Global Reporting Initiative, GHG Expert

Ms. Bhakti Thanekar

Certified Energy Auditor, B.Tech (Chemical Engineering), Principal Consultant - Energy and Safety

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Diploma Graduate with 16 years' experience in electrical systems

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M.Tech, Chemical Engineering, IIT Hyderabad (Observer, Reviewer)

Mr. Sushant Deshkar

Electrical Engineer, Assessment Team Member

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

DISCLAIMER


Green Audit Team has prepared this report for Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Nagpur based on input data submitted by the representatives of College and after having complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

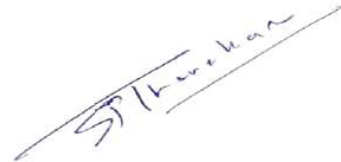
It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any director consequential loss arising from any use of the information, statements or forecasts in the report.



Technical Review by:
(Bhakti Thanekar)
Bureau of Energy Efficiency
Registration Number – EA-
14451



Onsite Assessment Team
Leader,
Ashish V. Soni



Prepared by:
(Swapnil Thanekar)
Bureau of Energy Efficiency
Registration
Number – EA-4416

Scope of Work

Topics to be covered as part of the assessment are:

- ✓ **Solar Passive Architecture**
 - How the buildings are constructed to utilize the solar energy efficiently. This includes use of day light as lighting source and avoidance of GHG intensive technology example AC as source of cooling due to solar heat gains.

- ✓ **Implementation of measures to reduce wastage of energy**
 - This includes effective and objective evidences to create awareness towards wastage of electric energy. Hoardings, placards, messages, posters etc. planted at key locations in college, hostels and cafeterias. PCRA (Petroleum Conservation Research Association, Govt. of India) and BEE (Bureau of Energy Efficiency) posters are exhibited.
 - It can also be extended to include papers presented by the students on avoidance of electricity at college or day to day life.
 - Appointment of joint committees of teachers and students to save electricity
 - Controlling of Power Factor by installation of APFC and getting rebate (up to 5% or MSEDCL norms) from MSEDCL for maintaining unity Power factor

- ✓ **Energy Efficient Procurement**
 - This includes evaluation of energy efficient procurement practices. This does not exactly mean that you need to buy the most efficient, but you need to buy the most efficient which is financially viable. Example AC with efficiency star ratings, Transformer etc.
 - Replacement of lighting sources to CFL or LED
 - Replacement of Copper Ballast with Electronic Ballast
 - Centralized controls of lighting, auditorium etc. to avoid any misuse of electricity
 - Procurement of LED monitors to phase-out CRT Monitors
 - Shift to paperless regime wherever not required, example attendance muster replaced by biometrics, DG logbook replaced by computerized logbook, daily reports converted from paper to paperless, HoD meetings converted to paperless formats, and all such examples.
 - Installation of Solar panels, Power Purchase Agreements with Solar Power Plant owners to buy environmentally friendly energy Source etc.
 - Documentary evidences as feasible to calculate the above impacts and finally into the value of avoidance of tCO₂ emitted to atmosphere.

- ✓ **Rain Water Harvesting**
 - This includes Calculation of Catchment Area (Terrace and ground) and evaluating rough amount of water that is recharged into the water recharge pits if applicable.

- ✓ **Hazardous Waste Management and e-Waste Management**
 - There are various wastes that are generated within the organization. The report will give the list of the procedures for waste handling.

- ✓ **Duration of the Green Audit**
 - The Green audit field observations data collection was carried from 31st December 2020 to 15th January 2021 for the session 2017-2020. The submitted data was monitored by the college throughout the year and assessed by Assessment Team during the visit.

Scorecard

NAAC Criteria		
Key Indicator - 7.1 Institutional Values and Social Responsibilities		
Environmental Consciousness and Sustainability		Audit Team Assessment
<i>The Institution has facilities for alternate sources of energy and energy conservation measures</i>		
1. Solar energy	✓	Annexure –IX: Solar Panel Installations
2. Biogas plant		
3. Wheeling to the Grid		
4. Sensor-based energy conservation	✓	Annexure –V: Lighting Survey 2019 – 20
5. Use of LED bulbs/ power efficient equipment	✓	Annexure –XI: Solar Passive Structure
Options: A. 4 or All of the above B. Any 3 of the above ✓ C. Any 2 of the above D. Any 1 of the above E. None of the above		
<i>Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words)</i>		
1. Solid waste management	✓	Refer chapter 12 and Annexure –XIII: Waste Management
2. Liquid waste management	✓	
3. Biomedical waste management	✓	
4. E-waste management	✓	
5. Waste recycling system	✓	
6. Hazardous chemicals and radioactive waste management	NA	
<i>Water conservation facilities available in the Institution:</i>		
1. Rain water harvesting	✓	Refer chapter 06 and Annexure –XII: Water Management
2. Bore well / Open well recharge	✓	
3. Construction of tanks and bunds	✓	
4. Waste water recycling	NA	

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

<p>5. Maintenance of water bodies and distribution system in the campus</p>	<p>NA</p>	
<p><i>Green campus initiatives include (4)</i> The institutional initiatives for greening the campus are as follows:</p>		
<p>1. Restricted entry of automobiles</p>		<p>Annexure –XIII: Waste Management</p>
<p>2. Use of Bicycles/ Battery powered vehicles</p>		
<p>3. Pedestrian Friendly pathways</p>	<p>✓</p>	
<p>4. Ban on use of Plastic</p>	<p>✓</p>	<p>Chapter 13 and Annexure –XIII: Waste Management</p>
<p>5. Landscaping with trees and plants</p>	<p>✓</p>	
<p>Options:</p>		
<p>A. Any 4 or All of the above</p>		
<p>B. Any 3 of the above ✓</p>		
<p>C. Any 2 of the above</p>		
<p>D. Any 1 of the above</p>		
<p>E. None of the above</p>		
<p><i>Quality audits on environment and energy are regularly undertaken by the institution</i></p>		<p>Covered as part of this report. Please refer the contents of this report</p>
<p>The institutional environment and energy initiatives are confirmed through the following</p>		
<p>1. Green audit</p>	<p>✓</p>	<p>Covered as part of this report under Chapter -11</p>
<p>2. Energy audit</p>	<p>✓</p>	
<p>3. Environment audit</p>		
<p>4. Clean and green campus recognitions/awards</p>	<p>✓</p>	
<p>5. Beyond the campus environmental promotional activities</p>	<p>✓</p>	<p>Please refer Annexure – IV: List of Awareness Program Undertaken by College</p>
<p>Options:</p>		
<p>A. Any 4 or all of the above ✓</p>		
<p>B. Any 3 of the above</p>		
<p>C. Any 2 of the above</p>		
<p>D. Any 1 of the above</p>		
<p>E. None of the above</p>		

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

Table: Summary Clean Campus²

Sr. No.	Aspect	Reference
1.	Cleanliness in and around the campus and waste minimization	<ul style="list-style-type: none"> ➤ Chapter No. 1 & Annexure No. IV ➤ Chapter No. 1 & Annexure No. XIV
2.	Water conservation and management including <ul style="list-style-type: none"> ➤ Water, waste management and reuse ➤ Rain water harvesting, etc 	<ul style="list-style-type: none"> ➤ Chapter No. 12 & Annexure No. XII & XIII ➤ Chapter No. 6 & Annexure No. XII
3.	Environment-friendly activities adopted and practiced by the campus	<ul style="list-style-type: none"> ➤ Chapter No. 1 & Annexure No. IV ➤ Chapter No. 1 & Annexure No. XIV
4.	Greenery within the campus to provide pollution free air and carbon-sink	<ul style="list-style-type: none"> ➤ Chapter No. 13 & Annexure No. XIV

Table: Summary Smart Campus³

Sr. No.	Aspect	Reference
1.	Impact of deployment of digital technology in order for the students, faculty and management in the campus to reduce consumption of natural resources (such as paper, gas, energy etc).	<ul style="list-style-type: none"> ➤ Digital Library. ➤ Meetings on virtual platform. ➤ Digital notes. ➤ E-books. ➤ Online conference's and classes. ➤ Online faculty development programs. ➤ Online poster presentation by faculty members. ➤ Notice circulation via what's app group. ➤ Online poster presentation competition. ➤ Demo experiments on digital platform. ➤ Online internal and university examination conducted. ➤ Double side printers ➤ Use of efficient electronic equipment's smart board, LED projectors. ➤ Procurement of energy efficient equipment's.
2.	Alignment of the latest digital trends like IoT, Big Data and Cloud Networking to achieve various aspects of sustainability in the campus, specifically to contribute to United Nations SDGs	<p>College uses learning management systems like Gnomio Moodle, Google classrooms for online classes. . We also uses Google forms, Testmoz applications for conducting online quiz. This helps us to share data/ links to all students within fraction of second and result will be prepared in less time duration which saves our time, man power and paper work.</p> <p>In this Pandemic situation, we are conducting online classes through Google meet by providing a G-suite ID to all students. Through Google drive</p>

² <http://www.aicte-india.org/csc2019>

³ <http://www.aicte-india.org/csc2019>

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

		<p>we can give access to limited students of particular class only. We provide the online notes of different theory subject and practical's to the students on Google classroom. Faculty also shares link of useful You tube videos and their own you tube videos to the students. These technologies help us to shares the data in short duration of time to all students and also help in saving papers.</p> <p>Ou other projects are as below:</p> <ul style="list-style-type: none"> ➤ Installation of smart photo sensor to regulate the night lighting ➤ Digital notes <p>Cloud is used for Admission process, data entry, TC and all administration process</p> <p>The SDG ranging is summarized under below Table: SDG Performance</p>
3.	<p>Create an ecosystem to 'smartly' connect and share the information with each other at campus, institute and national level. Any international level connect will provide a distinct advantage. The smart connect, though the cloud networking, so established should address concerns of environmental challenges including contribution to United Nations Sustainable Development Goals.</p>	<p>DBCOP insist to print paper only if it is very necessary .We share the data among all the teachers and students, we are using Google. Google Drive is a file storage and synchronization service developed by Google for sharing of information to all users or to specific users. Google drive and WhatsApp helps to share Notes/ Notices/ University important notices by single click to specific group of students/ to all students/ to the teachers.</p> <p>Also the college is conducting regular online classes through Google meet/Zoom App for all classes, college is sharing notes to the students in the form of PDF or in DOC format which ever possible in their Google class.</p> <p>College had organized e-Essay competition, e-Poster competition, and 17 National webinar during COVID lock down. We had connected peoples (Guest, Speakers and participants) globally in one platform. We had taken online verbal and written feedback from participants and we also share E-Certificates to all the participants. This platform is helpful not only to connect the peoples but also it is useful in sharing the also saves paper and with less use of man power. College has collected all data in only soft format.</p> <p>College faculties has attended more than 25 online International conference and 100 online National and local conferences during lock down. Admission process for academic year 2020-21 is undertaken through online platform.</p>

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

Table: Summary SDG Performance

SDG 3 Good Health and Well Being	<ul style="list-style-type: none"> • Awareness through the NSS programs through Unnat Bharat • Blood Donation Camps through NSS • Awareness on Hygiene, Malaria, Contagious diseases, etc.
SDG 4 Quality Education	Please refer NAAC SSR for details
SDG 5	<ul style="list-style-type: none"> • No discrimination based on gender • Gender diversity – Number of male (number) staff and female staff (number) staff
SDG 7 Affordable and Clean Energy	<ul style="list-style-type: none"> • Solar based distillation • Solar lighting in parking area
SDG 9 Industry Innovation	<ul style="list-style-type: none"> • Consecutive winner of Industry Institute Linkage (Platinum Award) awarded by CII (Confederation of Indian Industries) • Winner of Awishkar competition in 2016 and 2018 • Patents • Research work in collaboration • MoU with Industries
SDG 12 Responsible Consumption and Production	<ul style="list-style-type: none"> • Energy efficiency projects • Energy efficient equipment • Solar passive architecture
SDG 13 Climate Change	<ul style="list-style-type: none"> • Offsetting the Scope 1 and Scope 2 GHG emissions with carbon credits • Plantation of trees within and outside college campus • Rain water harvesting • RO water use in gardening • Drip Irrigation • Solar lighting • Sensor based lighting control at night for security • MoU with the waste Handlers

Table – Summary (Chapter wise)

Organizational Level Efforts	<ul style="list-style-type: none"> • Active involvement of Organization is observed. • Adequate awareness amongst the students and other stakeholders (faculty, other staffs, service providers, etc.) is observed and reflected from their behavior.
Creation of Awareness	<ul style="list-style-type: none"> • Visible communication on environmental issues. • Effective use of notice boards and signs. • Water footprint may be calculated in future.
Lighting	<ul style="list-style-type: none"> • The students and employees were interviewed and no complains was identified within respect to the sufficiency of lighting measures. • Sufficient lux levels above 265 are common in class rooms and work-stations based on the survey of audit team. • Negligible lighting load is observed during day time as college makes good use of daylight. • Replacement policy to further improve lighting efficiency (as stated above) is already implemented.
Cooling and Ventilation	<ul style="list-style-type: none"> • The 2 star AC needs to be replaced by at least 3 Star AC or better at the end of their technical lifetime. • Evaporative cooling can be availed for computer lab.
Operation of Electronic Equipment	<ul style="list-style-type: none"> • The Electrical Equipment's are well operated. Redundant operations are avoided.
Water Management	<ul style="list-style-type: none"> • The college is having 01 no. of bore well and NMC water connection which are the sources of water. • The rain water harvesting system is installed in college. • Drip irrigation system is installed in the college.
Water Quality	<ul style="list-style-type: none"> • The students, staff members and guests have access to clean, safe and potable water with the RO system.
Renewable Energy	<ul style="list-style-type: none"> • College Management has installed solar lights in the campus.
Transportation	<ul style="list-style-type: none"> • The college management, its employees and the students observe satisfactory practices of transportation / commutation.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

Purchasing Practices	<ul style="list-style-type: none">• Focus on the replacement of lighting as per above stated recommendation needs to be considered• Focus of the recommendation pertaining to the environmental preference of evaporative cooling over AC needs to be considered.• One sided paper is utilized by college to avoid use of fresh papers
Energy and Carbon Footprint	<ul style="list-style-type: none">• Various energy efficiency measures are implemented• Energy efficient equipment are purchased• Carbon Credits are availed to offset Scope 1 and Scope 2 emissions• Detailed energy audit reveals further installation of capacitors to enhance power factor
Waste Management	<ul style="list-style-type: none">• Vending machine for dispensing sanitary pads has been installed.• Incinerator machine to dispose sanitary pads has been installed.• Incinerator machine to dispose bio medical waste has been installed.
Plantation by College	<ul style="list-style-type: none">• The tree survey is under progress and soon the same will be completed, there are approximately 184 fully grown trees in the campus.• Compost pit is installed in college

Contents

Identification	Page no
Acknowledgement.....	6
List of Annexure	17
<i>Introduction of the College</i>	19
<i>Objective of Green Audit</i>	19
<i>1. Organizational Level Efforts</i>	21
<i>2. Creation of Awareness</i>	24
<i>3. Lighting</i>	26
<i>4. Cooling and Ventilation</i>	28
<i>5. Operation of Electronic Equipment</i>	29
<i>6. Water Management</i>	30
<i>7. Water Quality</i>	32
<i>8. Renewable Energy</i>	32
<i>9. Transportation</i>	33
<i>10.Purchasing Practices</i>	34
<i>11.Energy and Carbon Footprint</i>	34
<i>12.Waste Management</i>	37
<i>13.Plantation by College</i>	39

List of Annexure

Annexure – I:	List of Interviewed College / Students
Annexure –II:	Reference Documents / Surveys
Annexure –III:	Campus Committee
Annexure –IV:	List Awareness Program undertaken by College
Annexure –V:	Lighting Survey
Annexure –VI:	Undertaking by the System Department regarding control of Electronic Equipment's
Annexure –VII:	Water Quality Reports
Annexure –VIII:	List of Electronic Equipment's in College
Annexure –IX:	Solar Panel Installations
Annexure –X:	Water Distribution Data
Annexure –XI:	Solar Passive Structure / Drip Irrigation
Annexure –XII:	Water Management
Annexure –XIII:	Waste Management
Annexure –XIV:	Awareness / Posters
Annexure –XV:	Onsite Measurements (Sample Pictures)
Annexure –XVI:	Energy Audit Report
Annexure –XVI:	Patents Registered by College
Annexure –XVIII:	Snapshot of Annual Rainfall Data, Grid Emission Factor

Abbreviations

AHU	Air Handling Unit
CFL	Compact Fluorescent Lamp
COP	Coefficient Of Performance
DG	Diesel Generator
ECRM	Energy Consumption Reduction Method
HVAC	Heating, Ventilation, And Air Conditioning
ISO	International Standardization Organization
ITHD	Current Voltage Total Harmonic Distortion
km	Kilometer
kV	Kilo Volt
kW	Kilo Watts
Lab	Laboratory
LED	Light-Emitting Diode
MNRE	Ministry of New and Renewable Energy
MSEDCL	Maharashtra State Electricity Distribution Co. Ltd.
MEDA	Maharashtra Energy Development Agency (MEDA)
TR	Tons of Refrigeration
VTHD	Voltage Total Harmonic Distortion

Reference list of Websites

Sr. No.	Websites
1	IEEE 519 - http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=2227
2	http://mnre.gov.in/solar-energy/ch2.pdf
3	BEE - http://www.beeindia.in/
4	ECBC - http://beeindia.in/content.php?page=schemes/schemes.php?id=3
5	http://www.energymanagertraining.com/new_index.php
6	http://www.usailighting.com/stuff/contentmgr/files/1/92ffeb328de0f4878257999e7d46d6e4/misc/lighting_comparison_chart.pdf
7	https://www.bijlibachao.com/lights/use-energy-efficient-lights.html
8	http://www.imd.gov.in/section/climate/climateimp.pdf
9	http://www.bijlibachao.com/air-conditioners/air-conditioner-selection-understand-tonnage-eer-cop-and-star-rating.html
10	http://www.thehindubusinessline.com/opinion/time-to-focus-on-more-crop-per-drop/article9778971.ece
11	http://cgwb.gov.in/District_Profile/Maharashtra/Washim.pdf
12	http://www.indiawaterportal.org/sites/indiawaterportal.org/files/Room%20Top%20Rainwater%20Harvesting_Presentation_2006.pdf
13	http://www.imd.gov.in/section/climate/climateimp.pdf
15	http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf
16	http://cdm.unfccc.int/
17	http://database.v-c-s.org/
18	http://dbcop.org/index.php
19	https://www.mahadiscom.in/
20	https://www.mahaurja.com/meda/

Introduction of the College

Dadasaheb Balpande College of Pharmacy (DBCOP) was established in the year 2006 which offered Degree course in Pharmacy (B.Pharm.) with the intake capacity of 60 seats. With the constant quest of excellence, DBCOP introduced a post graduate course in pharmacy (M. Pharm), in two specializations Pharmaceutics and Pharmaceutical Quality Assurance in 2012-2013.

The institute is recognized under section 2f and 12B of UGC and permanently affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. The college has received an approval of research center for Doctorate of Philosophy (Ph.D.) from RTM Nagpur University in 2018.

All the courses at DBCOP are recognized by Pharmacy Council of India (PCI), All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education, Mumbai, Government of Maharashtra state and affiliated to RTM, Nagpur University, Nagpur.

The Institute was accredited by NAAC, the apex accrediting body of Government of India in 2017-18. The institute has been rewarded with Platinum grade in AICTE CII survey. The institute is determinedly obtaining high academic standards along with excellence in teaching and research by providing Quality Pharmacy education.

Laboratories of DBCOP are equipped with latest sophisticated scientific instruments and facilities. The institute primarily aims in satisfying the ever-changing dynamics to create pharmacist of global standards who could provide total pharmaceutical solutions to the society.

Medicinal garden of college is named as "Dhanvantari Medicinal Garden". This garden is spread in 44,000 Sq. Ft. at southern side of the college. More than 184 medicinal plants are present at garden. These plants are selected on the basis of research activities carried out at college. DBCOP received a grant of one lakh rupees from Maharashtra State Biodiversity Board for conservation of endangered medicinal plant species. A small bio-fertilizers unit is functional at DBCOP.

Bio-waste generated from garden is collected and reused as manure processed in bio-fertilizer unit. This manure is used to fortify the plants for their nutritional demand. Arrangement of green shed is made for plants especially in summer to protect them from heat. Plants are adopted by faculty members and students to sensitize them regarding our environment protection responsibility. Each plant is properly labeled for its identity.

At DBCOP the overall personality of students is developed through excellence in academics, co-curricular, extracurricular and social activities. The college strives to develop a sense of social obligation and discipline among students not only to make a better professional but also a better human being.

The college is making steadfast progress under the leadership of honorable President of ADES Shri. Manoj V. Balpande, and Dr. (Mrs.) Ujwala Mahajan, Principal, DBCOP

Objective of Green Audit

The Green Audit Team focused on Material⁴ Issues pertaining to college which have the highest influence on the Green Attributes of the College. To evaluate steps taken by college management towards green campus below material issues are discussed chapter wise:

1. Organization Level Efforts
2. Creation of Awareness
3. Lighting
4. Cooling and Ventilation
5. Operation of Electronic Equipment's
6. Water Management
7. Water Quality
8. Renewable Energy
9. Transportation
10. Purchasing Practices
11. Energy and Carbon Footprint
12. Waste Management
13. Plantation Details

Checklist approach is adopted for transparent evaluation of the topics and increase readability for independent reader.

⁴Definition: as per Global Reporting Initiative : **GRI 101: FOUNDATION2016**

An organization is faced with a wide range of topics on which it can report. Relevant topics, which potentially merit inclusion in the report, are those that can reasonably be considered important for reflecting the organization's economic, environmental, and social impacts, or influencing the decisions of stakeholders. In this context, 'impact' refers to the effect an organization has on the economy, the environment, and/or society (positive or negative). A topic can be relevant – and so potentially material – based on only one of these dimensions.

1. Organizational Level Efforts

<p>Is the college having campus green team?</p>	<p>Yes, the "Environment Protection Committee" is already in place. This committee is highly active and meets twice in a year.</p>
<p>If yes, who are the stakeholders?</p>	<p>Yes, it included stakeholders. The stakeholders include</p> <ul style="list-style-type: none"> ➤ Management ➤ Teaching Faculty ➤ Students ➤ Lab Technician ➤ Computer Operator <p>The Environment Protection Committee is shared with the Audit Team. Refer Annexure III.</p>
<p>Does it meet regularly?</p>	<p>The Team meets once in a semester. This was confirmed during site visit interviews and the review of the minutes of meeting.</p>
<p>Can the Green Campus Team suggest new environmental initiatives to College Management?</p>	<p>Suggestions on improvement of environmental performance are always welcomed by College Management. Installation of solar PV was also discussed as part of brain storming sessions within the meetings. The annexure to this report captures the live projects of the college.</p>
<p>Has the college established an environmental mission/vision for its campus?</p>	<p>The Management of College is persistent and resolved to make the campus eco-friendlier in due course of time. Various efforts are already initiated towards implementation sustainable initiatives, application of efficient technologies to save energy, plantation etc.</p>
<p>Is the college encouraging sustainable behaviour via:</p> <ul style="list-style-type: none"> o education campaigns? o Posters, placards, messages o incentives? o contests? o awards? 	<p>College conducts various activities to create awareness amongst the students and society on environment safety and protection. College has established "Environment Protection Committee" along with the NSS team has conducted various Environmentally Friendly Activities / Trainings</p> <p>Initiatives for college staff and students:</p> <ul style="list-style-type: none"> ➤ Tree Plantation drive was organized at DBCOP campus on 6th July 2017. ➤ Training on Fire Extinguisher handling was organized at DBCOP campus on 27th September 2017. ➤ International Yoga Day was celebrated at DBCOP campus on 21st June 2018.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

- Tree Plantation Program was organized at DBCOP campus on 10th July 2018.
- De-addiction Awareness Program was organized at DBCOP campus on 1st September 2018.
- Blood Donation Camp was organized at DBCOP campus on 25th September 2018.
- Health Check-up Camp was organized at DBCOP campus on 29th September 2018.
- Seminar on Voter Awareness (Voter Registration) was organized at DBCOP campus on 26th October 2018.
- Wheelchair donation to cricket player (Mohd. Hafeez Ansari) at DBCOP campus on 17th December 2018.
- International Yoga Day was celebrated at DBCOP campus on 21st June 2019.
- Orientation of NSS Unit was organized at DBCOP campus on 1st August 2019.
- Swachata Pandharwada was organized at DBCOP campus from 1st August 2019 to 15th August 2019.
- Tree Plantation Program was organized at DBCOP campus on 24th August 2019.
- Oath and Inauguration of Plastic Free Campus Drive was organized at DBCOP campus on 2nd October 2019.
- Road Safety & Safe Living Program was organized at DBCOP campus on 9th October 2019.
- Blood Donation Camp was organized at DBCOP campus on 11th January 2020.
- Health Check-up Camp was organized at DBCOP campus on 11th January 2020.
- Corona Awareness Campaign was organized at DBCOP campus on 14th March 2020.

Please refer Annexure IV for details.

Community Based Initiative's by college:

- Cleanliness Drive was organized at Indira Gandhi Medical College and Hospital, Nagpur on 9th July 2017.
- Awareness Rally on Swine Flu and Dengue was organized at Besa Grampanchayat and Manish Nagar, Nagpur on 25th September 2017.
- Cleanliness Drive under Swachha Bharat Abhiyan was organized at Besa Grampanchayat, Nagpur on 2nd October 2017.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

	<ul style="list-style-type: none"> ➤ Health Check-up Camp was organized at Besa and Ghogli Grampanchayat, Nagpur on 2nd October 2017. ➤ Seminar on Human Excellence program was organized at Deshpande Sabhagruha Civil Line, Nagpur on 28th November 2017. ➤ Health Awareness Campaign was carried out at Velahari Grampanchayat, Nagpur from 26th February 2018 to 1st March 2018 in which: <ul style="list-style-type: none"> • Health Check-up Camp was organized on 26th February 2018. • Rally on Health Awareness was organized on 27th February 2018. • Cleanliness Drive was organized under Swachha Bharat Abhiyan was organized on 28th February 2018. • Street Play was organized on 1st March 2018. ➤ Cleanliness Drive under Swachha Bharat Abhiyan was organized at Besa – Beltarodi Grampanchayat, Nagpur on 24th August 2019. <p>Please refer XIV for details.</p>
<p>Is the college staff modelling sustainable behaviour for students, peers, and community?</p>	<p>Total 59 staff members are there in the college, during interviews it was confirmed that:</p> <ul style="list-style-type: none"> ➤ 44% staff of the college commute by walking. ➤ 32% staff of the college travel by their own vehicles. ➤ 14% staff of the college travel by car / two wheeler pulling on sharing basis. ➤ 5% staff of the college utilize the public transport (Municipal Transport). ➤ 5% staff of the college travel by college bus. ➤ Please refer above assessments for additional details.
<p>Do students model sustainable behaviour for staff, peers, and community?</p>	<p>Total 308 students are enrolled for 2019-20 session. Approximately:</p> <ul style="list-style-type: none"> ➤ 34 % students of the college come to the college by walk ➤ 27% students of the college utilize public transport (Municipal Transport) ➤ 21% students of the college travel by two wheeler pulling on sharing basis. ➤ 12% students of the college travel by their own vehicles ➤ 6% students of the college utilize college bus.

	Students participate in activities conducted by college on environment and sustainable development. In addition, please refer above assessments.
Is the college sharing learning internally via o Posters, placards, messages? o assemblies? o classroom presentations? o training/professional development? o posters/bulletin boards? o newsletter? o website?	Data is shared via posters, placards and messages. The assessment team is appraised that the awareness poster includes topics related to minimization of energy usage by avoiding wastage, improvements on energy efficiency, minimization of water wastages, proper disposal of wastes. Please refer Annexure XIV for details.
Does the college offer energy conservation lessons?	Yes, College organizes lectures and motivates students for Energy and Environment conservation.
Is the college sharing its learning externally via o Paper presentations? o newsletter? o website?	The students are encouraged to present projects on topic related to environmental aspects. College is extensively engaged in the research work. The college is also going to make the Green Audit Report public so that learning's of college are shared.
Further Scope of Improvement:	
<ul style="list-style-type: none"> ➤ At organization level, the college needs to establish long term improvement objectives to further reduce energy consumption, water consumption and reflect the same in form of dedicated Environment Policy. 	
Conclusion:	
<ul style="list-style-type: none"> ➤ Active involvement of Organization is observed. ➤ Adequate awareness amongst the students and other stakeholders (faculty, other staffs, service providers, etc.) is observed and reflected from their behavior. 	

2. Creation of Awareness

Are the objectives of green audit clearly understood by the institute	Yes To spread awareness amongst the students and the surrounding community about the environmental impact due to operations associated with their teaching institution. <ul style="list-style-type: none"> ➤ To sensitize them how to address the situation at the local and personal level by conducting programs, camps and other means as feasible ➤ To reduce the negative environmental footprint on the environment
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Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

	<ul style="list-style-type: none"> ➤ To explore possibilities to use renewable energy sources to avoid GHG emissions and also reduce power cost ➤ To introduce renewable energy and to continuously improve its share in total energy mix ➤ To increase share of the efficient LED based lighting ➤ To introduce the automatic controls on the lighting systems ➤ To mitigate the carbon emission ➤ To increase the green cover ➤ To vigorously and responsibly position the institute for active contribution in Clean India Mission undertaken by the Governments. ➤ To identify ways and means to sustainably contribute and reduce gaps and become environment friendly ➤ To support community to combat various environmental and social issues as feasible
Are there posters/guidance displayed to remind students and staff of good practices?	Yes
Are the students aware of energy sources?	The major source of energy is electricity (grid electricity) followed by usage of diesel in the DG as back in case of failure of grid electricity. Students are aware of these sources of energy which are utilized by the college.
Is college tracking its electrical energy usage?	There is a single meter, which measures the electricity imported by the college. The readings of electricity consumption are included as part of this report under chapter 11.
Is college offering energy conservation lessons and programs?	<ul style="list-style-type: none"> ➤ College has created awareness among the faculty and students to reduce energy wastage. ➤ The college has appropriately disabled the screen savers and programmed the computers for sleep mode operations. ➤ The usage policy of photocopiers, fax machines and other equipment users is "POWER ON" when in use and "POWER OFF" when not in use. There is no idle power consumption. <p>Please refer Annexure VI and XIV for details.</p>
Do students and staff know where their water comes from?	There are two sources of water one is from Nagpur Municipal Corporation (NMC) and the other is bore well. NMC water is utilized for drinking (after purification), in the wash rooms and cleaning.
Is college encouraging responsible water use via: o posters, placards? o incentives? o contests? o awards?	Yes, by posters, placards, contests and winner of contest are awarded.

How is trash managed outside the campus?	The waste is given to the Grampanchayat for disposal.
Further Scope of Improvement	
<ul style="list-style-type: none"> ➤ College may calculate the water footprint to compare its performance with national and international consumption standards and communicate with its stakeholders. 	
Conclusion	
<ul style="list-style-type: none"> ➤ Visible communication on environmental issues. ➤ Effective use of notice boards and signs. ➤ Water footprint may be calculated in future. 	

3. Lighting

How college is utilizing daylight?	The college building is situated in such a manner that it is getting the full advantage of good airflow enabling good ventilation and sun light. It is a building having large windows and open space in all directions. During the day time, it is possible to carry out activities without air conditioners and air fans during operational days.																																
Is college utilizing any incandescent lights? Can they be replaced with compact fluorescents (energy saving bulbs)?	<p>The college timings are from 10:00 AM to 5 PM. Thus, requirement of daytime lighting (powered by electricity) is limited.</p> <p>Energy efficient lighting system is followed. the contemporary best practices will recommendations on lighting by Bureau of Energy Efficiency, Book-3, Chapter 8, table 8.1</p> <table border="1"> <caption>Table 8.1 Luminous Performance Characteristics of Commonly Used Lamps</caption> <thead> <tr> <th rowspan="2">Type of Lamp</th> <th colspan="2">Lumens / Watt</th> <th rowspan="2">Colour Rendering Index</th> <th rowspan="2">Typical Application</th> </tr> <tr> <th>Range</th> <th>Avg.</th> </tr> </thead> <tbody> <tr> <td>Incandescent</td> <td>8-18</td> <td>14</td> <td>Excellent (100)</td> <td>Homes, restaurants, general lighting, emergency lighting</td> </tr> <tr> <td>Fluorescent lamps</td> <td>46-60</td> <td>50</td> <td>Good w.r.t. coating (67-77)</td> <td>Offices, shops, hospitals, homes</td> </tr> <tr> <td>Compact fluorescent lamps (CFL)</td> <td>40-70</td> <td>60</td> <td>Very good (85)</td> <td>Hotels, shops, homes, offices</td> </tr> <tr> <td>High pressure mercury (HPMV)</td> <td>44-57</td> <td>50</td> <td>Fair (45)</td> <td>General lighting in factories, garages, car parking, flood lighting</td> </tr> <tr> <td>LED lamps</td> <td>30-50</td> <td>40</td> <td>Good (70)</td> <td>Reading lights, desk lamps, night lights, spotlights, security lights, signage lighting, etc.</td> </tr> </tbody> </table> <p>Thus, LED's are considered for installation as night lights, security street lights by the college. The term reading light⁵ normally refers to lamps or lights which focus light dedicated for readings, thus LEDs were not considered for class room lightings initially. Fluorescent lamps were utilized for class rooms (as the same are stated to be suitable for office illumination level requirements). LED lights started replacing the conventional tube light as a replacement measure after failure. LED lighting survey was also undertaken by the Audit</p>	Type of Lamp	Lumens / Watt		Colour Rendering Index	Typical Application	Range	Avg.	Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting, emergency lighting	Fluorescent lamps	46-60	50	Good w.r.t. coating (67-77)	Offices, shops, hospitals, homes	Compact fluorescent lamps (CFL)	40-70	60	Very good (85)	Hotels, shops, homes, offices	High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking, flood lighting	LED lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security lights, signage lighting, etc.
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⁵<https://www.collinsdictionary.com/dictionary/english/reading-light>

	<p>Team. Please refer below assessments in details. During the onsite visit the Audit Team visited each department and physically counted the installed lights by their types (Fluorescent tube lamp, CFL and LED). It is confirmed that there is no incandescent light installed for lighting purpose. As per the published article: http://www.usalighting.com/stuff/contentmgr/files/1/92ffeb328de0f4878257999e7d46d6e4/misc/lighting_comparison_chart.pdf LED light has lumen/ watt in the range of 80-100 whereas CFL has lumen/ watt in the range of 70-90 Recommendation: As per the replacement policy the college should continue to install LED lights in the class rooms in place of conventional tube lights. The existing CFL lamps⁶ should be replaced by the LED lamps.</p>
<p>Has the college evaluated existing lighting for opportunities to reduce lighting in over-lit areas?</p>	<p>The lighting arrangements are well balanced with arrangements to switch ON and OFF lights independently. There are therefore practically no over lit areas.</p>
<p>Are the light switched duly labelled to make more obvious which switches relate to which appliances?</p>	<p>Switch arrangements are lucid. The fan switches are adjacent to fan speed regulators. Light switches are arranged in order of lighting. The buttons are marked.</p>
<p>Are the lights switched off to make use of daylight? (e.g. lights parallel to windows or in corridors)</p>	<p>There is minimum or practically negligible use of lights during day time as the building structure has possibility of daylight usage. The lux level in the classrooms was measured and found above 265. On the outcast days some places register lower lux level. The locations were pinned and college management confirmed to take subsequent corrective actions.</p>
<p>Is the college utilizing natural lighting when possible?</p>	<p>Yes, natural lighting is first preference.</p>
<p>For the spaces like store rooms, toilets, kitchen areas, copying rooms, corridors etc is there scope for automatic lighting controls?</p>	<p>The college avails the sensor-based lighting arrangements to control the night illumination. The lighting sensors automatically switch on and switch off lights depending on the lux levels. Recommendation: The students and staff washrooms can be equipped with the proximity sensors to control the lighting arrangements.</p>
<p>Can main lighting ever be switched off and dedicated lighting be used?</p>	<p>As such there are no dedicated lamps which can replace overhead lighting. However, redundant lighting can be switched off when it is not required.</p>
<p>Are the light fittings clean?</p>	<p>The staff responsible for day to day cleaning was interviewed during onsite visit. Cleanliness is well maintained. In-house light fittings are cleaned regularly some light fittings need cleaning. However, the installed fittings were not cleaned as Covid-19 Pandemic caused shortage of staff.</p>

⁶The CFL lamps have problem as they contain mercury. Mercury is very toxic to human health and the environment.

Do windows and skylights need cleaning to allow in more natural light?	The window and skylight were not clean as Covid-19 Pandemic caused shortage of staff.
Has the college installed lighting occupancy sensors?	No, lights are negligibly operated during day time. The lights are operated manually. The night lights are however operated based on the sensors which operate lights based on the illumination levels.
Is there mechanism in place to immediately report inoperable occupancy light sensors?	Yes, in case of failure of the existing sensor, the night lights will not operate.
What is the % contribution of the LED lighting?	We have evaluated the % LED installation at Passage and ground and all other floor. The value is determined and presented under Annexure V.
Further Scope of Improvement	
<ul style="list-style-type: none"> ➤ The students and staff washrooms can be equipped with the proximity sensors to control the lighting arrangements. 	
Conclusion	
<ul style="list-style-type: none"> ➤ The students and employees were interviewed and no complains was identified within respect to the sufficiency of lighting measures. ➤ Sufficient lux levels above 265 are common in class rooms and work-stations based on the survey of audit team. ➤ Negligible lighting load is observed during day time as college makes good use of daylight. ➤ Replacement policy to further improve lighting efficiency (as stated above) is already implemented. 	

4. Cooling and Ventilation

How are the Air Conditioning Controls? For the local controls, how it is ensured that AC is working only ON when necessary. What is temperature setting of the AC?	The AC usage is very high as the temperature in Nagpur district is (Max temperature is above 42°C ⁷) hottest day in Nagpur was registered with temperature of 47.9°C ⁸). The AC temperature is set at 28°C. Awareness is created and measures are implemented in line with the recommendations of Ministry of Power (https://www.cseindia.org/a-step-in-the-right-direction-says-cse-of-power-ministry-s-move-to-fix-starting-temperature-of-room-air-conditioners-at-24oc-and-not-lower-to-save-energy-8814)
What is the mechanism of reducing heat in-grace? Are the closing blinds or fitting reflective film to windows installed to reduce solar gain?	The building is designed to make best use of day light and avoid the heat in-grace. Blinds are available in office to control unnecessary heat in-grace.
Are all external doors and windows closed when air conditioning is on?	There are 10 number of AC's in college. Based on interviews, it is confirmed that the practice of closing doors and windows is maintained when air conditioning is in operation.

⁷<http://www.imd.gov.in/section/climate/climateimp.pdf>

⁸<https://timesofindia.indiatimes.com/city/nagpur/Nagpur-records-all-time-high-temperature-at-47-9-C/articleshow/20216419.cms>

<p>Is there a scenario where air conditioning is wasted in unused spaces, such as cupboards, corridors?</p>	<p>There are no such instances observed. Arrangements are duly implemented to avoid losses.</p>
<p>Are Efficient and energy labelled AC's utilized for cooling purposes?</p>	<p>There are 10 number of AC's in the college out of which 4 are central AC's, 5 are 3 star and 1 is 2 star. These AC's run for 5-6 hours during summer and rainy season,</p> <p>Recommendation:</p> <p>The 2 start AC is not the most economical AC for the sustained working hours of 5-6 hours for approximately 100 days a year. It is recommended to replace the AC with more energy efficient AC (at least 3 Star ratings or above).</p> <p>Below guidelines can be considered by college in future while selecting between the AC and evaporative cooling.</p> <p>Evaporative Cooling System (for computer lab)</p> <p>The Assessment team has undertaken document review and analysis of the data for the assessment of the air conditioning system. Based on the same it was found that there exists scope for the use of evaporative based cooling which is energy effective compared to the reversed Bryon cycle i.e. Vapour Compression Cycle. The basic reason for the same installed system has COP of 1.5 kW/TR of refrigeration compared to evaporative cycle which draws 0.3-0.5 kW based on the size of installation.</p>
<p>Further Scope of Improvement</p> <ul style="list-style-type: none"> ➤ The 2 start AC is not the most economical AC for the sustained working hours of 5-6 hours for approximately 100 days a year. It is recommended to replace the AC with more energy efficient AC (at least 3 Star ratings or above). ➤ Evaporative cooling can be availed for computer lab. 	
<p>Conclusion</p> <ul style="list-style-type: none"> ➤ The 2 star AC needs to be replaced by at least 3 Star AC or better at the end of their technical lifetime. ➤ Evaporative cooling can be availed for computer lab. 	

5. Operation of Electronic Equipment

<p>Are computers, printers, photocopiers and other equipment switched off at the end of the day?</p>	<p>Yes</p>
<p>Is there any mechanism by which the screens and other equipment be controlled during the day?</p>	<p>The college has availed the services of the Green Audit from session 2017-18 onwards. The college has appropriately disabled the screen savers and programmed the computers for sleep mode operations. Please refer to Annexure VI.</p>
<p>Are the screen savers disabled?</p>	<p>Yes, please refer above assessment.</p>

Are computers programmed to 'power down' mode?	Computers are programmed for the sleep operation.
Is the user entrusted with the rights to modify standby settings? (E.g. TVs, LCD projectors, printers etc.)	No, the college has the administrative rights. Such changes cannot be initiated by users.
What is status of the photocopiers, fax machines and other equipment? Are they programmed on 'Energy Saver' mode during the day?	The equipment like photocopiers, fax machines are shutdown when not in use, computers are turned to sleep mode whenever not in use.
Are the power management settings enabled on all the computers/ monitors/ all-in-one machines?	All machines are governed by the college. All are equipped by power management settings as already described above.

Conclusion:

- **The Electrical Equipment's are well operated. Redundant operations are avoided.**

6. Water Management

Are any water leaks identified?	The urinals are flushed periodically and manually. The urinals need to be equipped with push button taps. Please refer below recommendation.
Are taps left running? Are there any dripping taps? Do taps need maintenance?	No such instance was observed.
Are push button taps utilized?	The toilet washrooms are not equipped with the push buttons. Please refer below recommendation.
Is water escaping from overflows either inside or outside buildings?	No such instance was identified during onsite audit. There is a dedicated pipeline to direct water / chemicals to soak pit (from chemical lab).
Has the college installed low-flow faucets, automatic faucets, and/or faucet aerators?	Recommendation: The college Management needs to consider dedicated flush at urinals (in place of periodic manual flushing), low-flow faucets, automatic faucets, and/or faucet aerators as the replacement for the existing conventional taps.
Has the college installed low-flow shower heads at Hostel?	NA
Has the college harvested rainwater?	Yes, the rain water is harvested over the college building. Some harvested water is recharged in the ground and some water is flown in an underground tank and the same accumulated water

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande

College of Pharmacy (DBCOP), Besa, Nagpur

	is used for watering plants via drip irrigation.
Is the college collecting the condensation from A/C units for onsite watering needs?	No. Recommendation College needs to collect the AC condensed water or recharge it into the ground.
Has the college optimized its irrigation system for gardening to o operate at night or early morning hours to minimize evaporation? o water the minimum time and frequency necessary for the applicable vegetation?	Yes, the college has installed drip irrigation system for gardening. As per the latest publication from "The Hindu" drip irrigation is one of the most important measures to achieve "more crop per drop". Share of Agriculture consumption is approximately 83 per cent of India's water resources, thus approximately 17 per cent water resources are available for domestic and industrial use (http://www.thehindubusinessline.com/opinion/time-to-focus-on-more-crop-per-drop/article9778971.ece).
What is amount of rain water harvested?	Total roof top area of the college building is 929 m ² . The rainfall for Nagpur Region (Gramin) approximately 1064 mm. Total rain water harvesting is 889 m ³ at the run off coefficient of 0.9. The college has also laid the cement blocks. This enables the rain water falling on the cement blocks to get recharged in the ground. The area under the cement block is 464 m ² . The run off coefficient is considered as 0.3 based on the Manual on Artificial Recharge of Ground Water, issued by Government of India, Ministry of Water Resources, Central Ground Water Board, September 2007. The water rain water harvested from the cement blocks is 148 m ³ . Total quantity of water harvested = 889 + 148 = 1037 m ³
Are there any community based projects implemented by the college?	Yes.
Further Scope of Improvement:	
<ul style="list-style-type: none"> ➤ Long Term Measure: ➤ The college Management needs to consider dedicated flush at urinals (in place of periodic manual flushing), low-flow faucets, automatic faucets, and/or faucet aerators as the replacement for the existing conventional taps. ➤ College needs to install the metering arrangement to measure the water drawn from bore well. ➤ College can undertake determination of water footprint and calibrate its specific water consumption with the established National and International Norms. ➤ College needs to collect the AC condensed water or recharge it into the ground. 	
Conclusion:	
<ul style="list-style-type: none"> ➤ The college is having 01 no. of bore well and NMC water connection which are the sources of water. ➤ The toilet washrooms are not equipped with the push buttons. ➤ Drip irrigation system is installed in the college. 	

7. Water Quality

<p>Is the college campus maintained clean to minimize litter polluting water table?</p>	<p>The college premise is kept clean. Thus, the chances of litter polluting water table are negligible. The Assessment Team has also observed that the effluent from the chemical lab is directly sent to soak pit for treatment.</p> <p>Recommendation: College needs to perform study of all the effluent chemicals (volume, weight, impact) used and accordingly develop mitigation measures under its sustainable strategy.</p>
<p>Is the college monitoring drinking water quality regularly? If yes, what is the frequency?</p>	<p>Yes. Third party water testing is done by the college. Water Quality Test Reports are included as part of Annexure VII to this Report.</p>
<p>Further Scope of Improvement:</p> <ul style="list-style-type: none"> ➤ College needs to perform study of all the effluent chemicals (volume, weight, impact) used and accordingly develop mitigation measures under its sustainable strategy. 	
<p>Conclusion:</p> <ul style="list-style-type: none"> ➤ The students, staff members and guests have access to clean, safe and potable water with the RO system. 	

8. Renewable Energy

<p>Is the college having solar, wind, or other forms of renewable energy?</p>	<p>Yes. The college has installed Solar lights in the campus.</p> <p>Recommendation: The college needs to install Solar PV System.</p>
<p>Is the college purchasing renewable power from third party or renewable energy certificates for its electricity use?</p>	<p>No.</p>
<p>Is the college offering renewable energy lessons / programs?</p>	<p>This already assessed under chapter 01 of this report.</p>
<p>Further Scope of Improvement</p> <ul style="list-style-type: none"> ➤ The college needs to install Solar PV System. 	
<p>Conclusion</p> <ul style="list-style-type: none"> ➤ College Management has installed solar lights in the campus. 	

9. Transportation

<p>Is college encouraging transportation measures like bicycle, Bulk transport, walking?</p>	<p>Students: Total 308 students are enrolled for 2019-20 session. Approximately:</p> <ul style="list-style-type: none"> ➤ 34 % students of the college come to the college by walk ➤ 27% students of the college utilize public transport (Municipal Transport) ➤ 21% students of the college travel by two wheeler pulling on sharing basis. ➤ 12% students of the college travel by their own vehicles ➤ 6% students of the college utilize college bus. <p>Faculties: Total 59 staff members are there in the college, during interviews it was confirmed that:</p> <ul style="list-style-type: none"> ➤ 44% staff of the college commute by walking. ➤ 32% staff of the college travel by their own vehicles. ➤ 14% staff of the college travel by car / two wheeler pulling on sharing basis. ➤ 5% staff of the college utilize the public transport (Municipal Transport). ➤ 5% staff of the college travel by college bus. <p>Please refer above assessments for additional details.</p>
<p>Is the college providing eco-friendly or less GHG intensive transportation matching services? (Example carpools, college buses etc)</p>	<p>Refer above response.</p>
<p>What are the good practices pertaining to Transport?</p>	<p>Recommendation: College Management should encourage use of bi-cycle and mass transport systems amongst students and faculties.</p>
<p>Further Scope of Improvement:</p> <ul style="list-style-type: none"> ➤ College Management should encourage use of bi-cycle and mass transport systems amongst students and faculties. 	
<p>Conclusion:</p> <ul style="list-style-type: none"> ➤ The college management, its employees and the students observe satisfactory practices of transportation / commutation. 	

10. Purchasing Practices

Describe the purchasing that confirms the better environmental performance?	Printers with duplex printing facility is installed at the computer lab and Library. There is culture of the two-sided printing. Paper is not wasted.
How does the college limit the purchase of single-serve bottles and containers?	The college has RO system; guests are served with water from RO system. Single serve bottles are not utilized unless requested by the guest.
Is the college having water fountains/stations to promote easy filling of reusable water bottles?	Yes, the water dispensers are connected to output of RO system. Clean and potable water is available to staff, student and guests.

Further Scope of Improvement:

The college should further emphasize on the purchase of:

- No- to low-odor (VOC) markers
- No- to low-VOC paints? (via Facilities)
- paper/paper products with maximum recycled content
- refillable pens/pencils
- compostable bags for compost collection

Conclusion:

- Focus on the replacement of lighting as per above stated recommendation needs to be considered
- Focus of the recommendation pertaining to the environmental preference of evaporative cooling over AC needs to be considered.
- One sided paper is utilized by college to avoid use of fresh papers

11. Energy and Carbon Footprint

Has the college undertaken energy audit?	<p>Yes, the energy audit was undertaken and electrical measurements were undertaken at the college. Please refer the Annexure –XVI of this report.</p> <p>Energy audit is an effective tool in identifying and perusing a comprehensive energy management program. Energy Audit highlights the areas of energy savings, thereby reducing the energy costs. The following are the major consumers of electricity in the facility</p> <ul style="list-style-type: none"> ➤ Computers ➤ Lighting ➤ Air-Conditioning ➤ Fans ➤ Pumps ➤ Other Lab Equipment
--	---

<p>What are the steps undertaken during the energy audit?</p>	<p>The Assessment Team undertook the analysis of the college premise:</p> <ul style="list-style-type: none"> ➤ To study electricity bills ➤ Study of lighting system and its measurement. ➤ Air conditioner ➤ Study of loads in particular at the labs ➤ Identification of energy saving opportunity and energy conservation. 																														
<p>What methodology was adopted?</p>	<p>The energy assessment involved desk review and onsite measurements. Review of energy bill received from MSEDCL was undertaken. Review of lighting, HVAC, fuel usage, pumping systems etc. was undertaken. Energy conservation and saving opportunities are identified and included below.</p>																														
<p>What are the suggested energy conservation measures?</p>	<p>Below energy conservation measures are suggested</p> <ul style="list-style-type: none"> ➤ The one switch for college concept should be implemented in the college. This will avoid unwanted operation and wastage of electricity. ➤ There are 40 W tube lights with copper chokes. As per replacement policy the LED tube-light should be installed. The T8 LED tube has wattage of 20 W, thus the energy saved is 40-20 = 20 watt/fitting. As per study there are 86 tubes of 40 W in college. After the replacement based on failure the energy savings will be approximately 1720 kWh. With average electricity cost of INR 13 /kWh, the annual savings will be approximately INR 22360 per year. ➤ Air conditioner shall be operated between temperature range of 24-28°C to maintain lower cooling load on compressor to save energy. ➤ The existing non-star labelled AC's and reached end of their service life. The AC's should be replaced by the 5-star AC's (as daily usage is above 4 hours). <table border="1" data-bbox="502 1126 1386 1473"> <thead> <tr> <th></th> <th>0.75 ton</th> <th>1 ton</th> <th>1.5 ton</th> <th>2 ton</th> </tr> </thead> <tbody> <tr> <td>1 Star AC (mostly non Inverter)</td> <td>627</td> <td>843</td> <td>1246</td> <td>1648</td> </tr> <tr> <td>2 Star AC (mostly non Inverter)</td> <td>596</td> <td>800</td> <td>1184</td> <td>1626</td> </tr> <tr> <td>3 Star AC (mix of Inverter and non Inverter)</td> <td>542</td> <td>747</td> <td>1104</td> <td>1448</td> </tr> <tr> <td>4 Star (mostly Inverter)</td> <td>464</td> <td>645</td> <td>945</td> <td>1293</td> </tr> <tr> <td>5 Star (mostly Inverter)</td> <td>450</td> <td>554</td> <td>840</td> <td>1113</td> </tr> </tbody> </table> <p style="text-align: center;"><i>Annual Electricity Consumption (Units or kWh for 1600 hrs) based on data from BEE</i></p> <ul style="list-style-type: none"> ➤ Application of evaporative cooling should be promoted in place of AC's. The basic reason for the same installed system has COP of 1.5 kW/TR of refrigeration compared to evaporative cycle which draws 0.3-0.5 kW based on the size of installation. If even the 5 non labelled AC are replaced, then the savings will be (1-0.5)*300 days*4 hours per day*4 (number of AC) = 3000 kWh. With cost of INR 6/kWh, the savings will be INR 18,000 per year. ➤ All Class Rooms and labs must sensitize students regarding optimum use of electrical appliances in the room like, lights, fans, computers ➤ The comfort air conditioning temperature to be set between 24°C to 26°C. ➤ Lights in toilet area may be kept OFF during day time. Additional sensors can be installed in washrooms to automatically regulate the light and exhaust fans. 		0.75 ton	1 ton	1.5 ton	2 ton	1 Star AC (mostly non Inverter)	627	843	1246	1648	2 Star AC (mostly non Inverter)	596	800	1184	1626	3 Star AC (mix of Inverter and non Inverter)	542	747	1104	1448	4 Star (mostly Inverter)	464	645	945	1293	5 Star (mostly Inverter)	450	554	840	1113
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Has the college calculated its carbon footprint?	For the first time college is calculating the carbon footprint. The data applicable to Scope-2 emission (electricity purchase from grid) is available. The emissions pertaining to Scope-01 are limited to HSD use in DG, buses and LPG usage in Labs.																																																		
How is college promoting zero emission transportation options?	Not applicable. There is no internal transportation within the college.																																																		
Are all the applicable emission sources calculated?	<p>The emission source pertaining to grid-based electricity source is calculated. Scope-01 emission source data pertaining to DG, HSD consumption in DG, LPG consumption in labs are calculated, Scope 2 emission on account of electricity imported from grid is considered.</p> <p>Scope-01 Emissions:</p> <table border="1" data-bbox="486 862 1396 1122"> <thead> <tr> <th>Year</th> <th>HSD Consumption in DG</th> <th>LPG consumption in Labs</th> </tr> </thead> <tbody> <tr> <td>Session</td> <td>lit</td> <td>kg</td> </tr> <tr> <td>2017-18</td> <td>2474.34</td> <td>60</td> </tr> <tr> <td>2018-19</td> <td>2725.89</td> <td>150</td> </tr> <tr> <td>2019-20</td> <td>1426.36</td> <td>240</td> </tr> </tbody> </table> <p>Equivalent Scope-01 Emissions are as below⁹:</p> <table border="1" data-bbox="486 1198 1396 1496"> <thead> <tr> <th>Year</th> <th>HSD Consumption in DG</th> <th>LPG consumption in Labs</th> <th>Total GHG Emission (Scope-1)</th> </tr> </thead> <tbody> <tr> <td>Session</td> <td>tCO₂</td> <td>tCO₂</td> <td>tCO₂</td> </tr> <tr> <td>2017-18</td> <td>9.10</td> <td>0.22</td> <td>9.32</td> </tr> <tr> <td>2018-19</td> <td>10.03</td> <td>0.55</td> <td>10.58</td> </tr> <tr> <td>2019-20</td> <td>5.25</td> <td>0.88</td> <td>6.13</td> </tr> </tbody> </table> <p>Scope -2 Emissions are tabulated as follows¹⁰:</p> <table border="1" data-bbox="486 1579 1396 1839"> <thead> <tr> <th>Year</th> <th>Annual Electricity Consumption</th> <th>Total GHG Emission (Scope-2)</th> </tr> </thead> <tbody> <tr> <td>Session</td> <td>kWh</td> <td>tCO₂</td> </tr> <tr> <td>2017-18</td> <td>49248</td> <td>49.25</td> </tr> <tr> <td>2018-19</td> <td>32712</td> <td>32.71</td> </tr> <tr> <td>2019-20</td> <td>38039</td> <td>38.04</td> </tr> </tbody> </table>	Year	HSD Consumption in DG	LPG consumption in Labs	Session	lit	kg	2017-18	2474.34	60	2018-19	2725.89	150	2019-20	1426.36	240	Year	HSD Consumption in DG	LPG consumption in Labs	Total GHG Emission (Scope-1)	Session	tCO ₂	tCO ₂	tCO ₂	2017-18	9.10	0.22	9.32	2018-19	10.03	0.55	10.58	2019-20	5.25	0.88	6.13	Year	Annual Electricity Consumption	Total GHG Emission (Scope-2)	Session	kWh	tCO ₂	2017-18	49248	49.25	2018-19	32712	32.71	2019-20	38039	38.04
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⁹With 10 % uncertainty

¹⁰With 10 % uncertainty

Total CO₂ emissions for financial year 2019 - 020

= Scope-01 + Scope-02

Year	Total GHG Emission (Scope-1)	Total GHG Emission (Scope-2)	Total GHG Emission (Scope-1+2)
Session	tCO₂	tCO₂	tCO₂
2017-18	9.32	49.25	58.57
2018-19	10.58	32.71	43.29
2019-20	6.13	38.04	44.17

Web link of purchase of carbon credits: The college has tried to offset the scope 1 and scope 2 emission by purchase of equivalent offset from VERRA Registry. The cancellation certificate is available publically on below web link.

From Vintage	To Vintage	Serial Number	Quantity of Credits	Credit Type	Project ID	Project Name	Project Type	Additional Issuance Certifications	Origination Program	Project Site State/Province	Project Country	Account Holder	Retirement Reason	Beneficial Owner	Retirement Reason Details	Date Retired
01/01/2017	28/02/2017	6402-319472466-319472510-VCU-029-MER-IN-1-1659-01012017-28022017-0	45	VCU	1659	Bundled Wind Power Project by Citra Enterprises	Energy Industries (renewable/non-renewable sources)			Madhya Pradesh & Gujarat	India (IN)	EKI Energy Services Limited	Retirement for Person or Organization	Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy Besa, Nagpur	Offsetting the Scope 1 and Scope 2 emissions.	06/01/20

<https://registry.verra.org/myModule/rpt/myrpt.asp?r=206&h=32792>

The certificate is attached under Annexure XV for ready reference.

12. Waste Management

How the college reduces its paper waste via:
o encouraging digital reading, note-taking, and activities?

- o setting printers and computers to default to duplex (double-sided) printing?
- o reducing margins and white space on documents that must be printed?
- o printing multiple pages per sheet?
- o minimizing paper correspondence with families?
- o opting out of unwanted mail?

Is the college undertaking recycling collection for additional recyclable materials—like plastic bags, CFL (spiral) light bulbs, batteries, drink pouches, candy wrappers, and electronics?

- The class room and labs are well ventilated and spacious. This minimizes suffocation to students by improving air changes and hence the air quality.
- The college has adopted the duplex printers, which enables the complete usage of the paper areas
- College has taken initiatives towards plastic free campus. The students are encouraged to use waste bins which are placed in the college.
- The internal correspondences and various functionalities are taken care by the electronic means like emails, sms etc.

- The recycling / disposal system adopted by the college is as below.

Different types are generated within campus which include:

- **E-Waste:**
The E-waste generally includes the tube-lights, CFL, LED, computer waste, etc. are stored into the scrap bin and is given to the agency for proper disposal. MOU of E-waste handling is executed.
- **Plant Waste:**
The plant waste is composted in-house. Vermi culture compost is obtained from waste leaves.
- **Sewage Waste:**
The liquid waste from lavatories and other sources are disposed through sewer line.
- **Chemical Waste:**
The chemical waste is initially flown into a soak pit for filtration and then flown into the sewer line.
- **Cellulose and Paper Waste:**
Cellulose and paper waste is stored in a particular place and given to the agency for proper disposal. MOU of cellulose waste handling is executed.
- **Broken Glassware:**
The broken glassware from labs is collected in a dedicated bin and then handed over to an agency for proper handling. MOU of glass waste handling is executed.
- **Expired Chemicals:**
Expired chemicals of the college are stored in dedicated rack and then handed over to an agency for proper disposal. MOU of expired chemical handling is executed.

Please refer Annexure XIII and XVI for details

Further Scope of Improvement:

- **Considering the huge volume of paper usage college needs to work out feasible solution for recycling of waste papers.**

Conclusion :

- Vending machine for dispensing sanitary pads has been installed.
- Incinerator machine to dispose sanitary pads has been installed.
- Incinerator machine to dispose bio medical waste has been installed.

13. Plantation by College

The College campus has several trees i.e. a college garden and a Botanical garden with various rare and medicinal important species.

Every year, plantation programme is carried out in the campus as well as outside the campus. Students are also involved in plantation programme in surrounding locality. In the current session, the Institution planted several trees in the vicinity.

The tree survey is under progress and soon the same will be completed, there are approximately **184** fully grown trees in the campus. The list is as follows:



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samarth Mandir, Besa, Nagpur-37

LIST OF PLANTS AT DBCOP

SR. NO.	PLANT NAME	BIOLOGICAL SOURCE	NO. OF PLANTS
1	Erand	<i>Ricinus communis</i> F-Euphorbiaceae	2
2	Mango	<i>Mangifera indica</i> F-Anacardiaceae	5
3	Aapta	<i>Bauhinia racemosa</i> F-Fabaceae	2
4	Bamboo	<i>Bambusa vulgaris</i> F-Poaceae	7
5	Amla	<i>Phyllanthus emblica</i> F-Phyllanthaceae	3
6	Drum sticks	<i>Moringa oleifera</i> F-Moringaceae	5
7	Peepal	<i>Ficus religiosa</i> F-Moraceae	3
8	Chichbhilai	<i>Pithecellobium dulce</i> F- Leguminosae	1
9	Vinea	<i>Catharanthus roseus</i> F-Apocynaceae	4
10	Gulmohar	<i>Delonix regia</i> F-Fabaceae	4
11	Bakan	<i>Melia azedarach</i> F-Meliaceae	1
12	Amaltas	<i>Cassia fistula</i> F-Fabaceae	1
13	Jacaranda	<i>Jacaranda mimosifolia</i> F-Bignoniaceae	1



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)

Near Swami Samarth Mandir, Besa, Nagpur-37

14	Tamarind	<i>Tamarindus indica</i> F-Fabaceae	1
15	Saptparni	<i>Alstonia scholaris</i> F-Apocynaceae	3
16	Shemal	<i>Bombax ceiba</i> F-Malvaceae	4
17	Ritha	<i>Sapindus mukorossi</i> F- Sapindaceae	2
18	Vekhand	<i>Acorus calamus</i> F-Acoraceae	1
19	Guggul	<i>Commiphora wightii</i> F- Burseraceae	3
20	Ashoka	<i>Saraca indica</i> F-Fabaceae	3
21	Sarpgandha	<i>Rauwolfia serpentina</i> F-Apocynaceae	1
22	Ashwagandha	<i>Withania somnifera</i> F-Solanaceae	1
23	Shikakai	<i>Acacia concinna</i> F-Fabaceae	1
24	Tulsi	<i>Ocimum sanctum</i> F- Labiatae	1
25	Moh	<i>Madhuca indica</i> F- Sapotaceae	1
26	Bael	<i>Aegle marmelos</i> F-Rutaceae	3
27	Lemon	<i>Citrus limon</i> F-Rutaceae	3
28	Anar	<i>Punica granatum</i> F-Lythraceae	4



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)

Near Swami Samarth Mandir, Besa, Nagpur-37

29	Jam	<i>Psidium guajava</i> F-Myrtaceae	5
30	Behera	<i>Terminalia bellirica</i> F-Combretaceae	2
31	Cotton	<i>Gossypium barbedense</i> F-Malvaceae	1
32	Papaya	<i>Carica papaya</i> F-Caricaceae	1
33	Korphad	<i>Aloe barbadensis</i> F- Liliaceae	4
34	Kavat	<i>Limonia acidissima</i> F- Rutaceae	1
35	Jasvand	<i>Hibiscus rosa Sinensis</i> F-Malvaceae	2
36	Adulsa	<i>Adhatoda vasica</i> F- Acanthaceae	1
37	Bramhi	<i>Bacopa monnieri</i> F- Plantaginaceae	1
38	Shatavari	<i>Asparagus racemosus</i> F- Liliaceae	3
39	Shehtoot	<i>Morus indica</i> F- Moraceae	2
40	Hadjod	<i>Cissus quadrangularis</i> F- Vitaceae	2
41	Orange	<i>Citrus reticulata</i> F- Rutaceae	1
42	Katesawar	<i>Bombax ceiba</i> F- Malvaceae	1
43	Aparajit	<i>Clitoria ternatea</i> F- Fabaceae	1



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
 Near Swami Samartha Mandir, Besa, Nagpur-37

44	Rudraksh	<i>Elaeocarpus ganitrus</i> F- Elaeocarpaceae	1
45	Long pepper	<i>Piper longum</i> F- Piperaceae	1
46	Lemongrass	<i>Cymbopogon citratus</i> F- Poaceae	1
47	Mehendi	<i>Lawsonia inermis</i> F- Lythraceae	1
48	Lavang tulas	<i>Ocimum basilicum</i> F- Labiatae	1
49	Vala	<i>Chrysopogon zizanioides</i> F- Poaceae	1
50	Bhuiamla	<i>Phyllanthus niruri</i> F- Phyllanthaceae	1
51	Gunj	<i>Abrus precatorius</i> F- Fabaceae	1
52	Curry leaves	<i>Murraya koenigii</i> F- Rutaceae	3
53	Guggul bol	<i>Commiphora wightii</i> F- Burseraceae	1
54	Turmeric	<i>Curcuma longa</i> F- Zingiberaceae	2
55	Mandukparni	<i>Centella asiatica</i> F- Apiaceae	1
56	Insulin	<i>Chamaecostus cuspidatus</i> F- Costaceae	1
57	Pashanbhed	<i>Bergenia ligulata</i> F- Saxifragaceae	1
58	Kate koranti	<i>Barleria prionitis</i> F-Acanthaceae	2



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samartha Mandir, Besa, Nagpur-37

59	Gudvel	<i>Tinospora cordifolia</i> F- Menispermaceae	1
60	Chitrak	<i>Plumbago zeylanica</i> F- Plumbaginaceae	1
61	Kanher	<i>Nerium indicum</i> F- apocynaceae	1
62	Bhokar	<i>Cordia dichotoma</i> F- Boraginaceae	1
63	Biba	<i>Semecarpus anacardium</i> F- Anacardiaceae	1
64	Palash	<i>Butea monosperma</i> F- Papilionaceae	1
65	Ratangunj	<i>Adenanthera pavonina</i> F- Fabaceae	1
66	Rui	<i>Calotropis gigantean</i> F-Apocynaceae	1
67	Chickoo	<i>Manilkara zapota</i> F-Sapotaceae	1
68	Tejpan	<i>Cinnamomum tamala</i> F-Lauraceae	1
69	Jamun	<i>Syzygium cumini</i> F-Myrtaceae	2
70	Neem	<i>Azadirachta indica</i> F-Meliaceae	4
71	Arjuna	<i>Terminalia arjuna</i> F- Combretaceae	1
72	Stevia	<i>Stevia rebaudiana</i> F- Compositae	1
73	Kalmegh	<i>Andrographis paniculata</i> F- Acanthaceae	1



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samarath Mandir, Besa, Nagpur-37

74	Kapur Tulas	<i>Ocimum kilimandscharicum</i> F- Lamiaceae	1
75	Karanj	<i>Pongamia pinnata</i> F- Poaceae	3
76	Paanfuti	<i>Bryophyllum pinnatum</i> F-Crassulaceae	1
77	Lavang tulas	<i>Ocimum tenuiflorum</i> F- Lamiaceae	1
78	Palm	<i>Areca catechu</i> F- <u>Arecaceae</u>	15
79	Sindi	<i>Phoenix loureiroi</i> F- <u>Arecaceae</u>	2
80	Shami	<i>Prosopis cineraria</i> F- <u>Fabaceae</u>	1
81	Christmas	<i>Araucaria columnaris</i> F-Araucariaceae	1
82	Badam	<i>Prunus amygdalus</i> F- <u>Rosaceae</u>	2
83	Banyan	<i>Ficus benghalensis</i> F- <u>Moraceae</u>	2
84	Sitafal	<i>Annona squamosa</i> F- <u>Annonaceae</u>	1
85	Umber	<i>Ficus racemosa</i> F- <u>Moraceae</u>	2
86	Acacia	<i>Acacia penninervis</i> F- Fabaceae	2
87	Krushnkamal	<i>Passiflora platyloba</i> F- Passifloraceae	1
88	Clematis janava	<i>Clematis janava</i> F- Ranunculaceae	1



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)

Near Swami Samarth Mandir, Besa, Nagpur-37

89	Anjeer	<i>Ficus carica</i> F- Moraceae	1
90	Gunj	<i>Abrus precatorius</i> F- Fabaceae	1
91	Samudravel	<i>Argyrea nervosa</i> F- Convolvulaceae	1
92	Jarul	<i>Lagerstroemia speciosa</i> F- Lythraceae	3
93	Charoli	<i>Buchanania lanzan</i> F-Anacardiaceae	1
94	Cinnamon	<i>Cinnamomum verum</i> F- Lauraceae	1
95	Karvand	<i>Capparis carandas</i> F- Apocynaceae	2
		<i>Total</i>	184

PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Annexure

Annexure – I: List of Interviewed College / Students

List of Teaching and Non-Teaching staff were present for Green Audit 2017-18

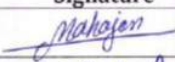

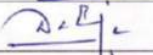
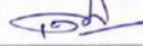

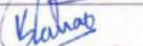


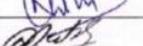
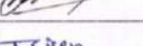
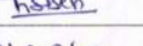
Sr. No.	Name	Designation	Signature
1	Dr. (Mrs.) Ujwala Mahajan	Principal	
2	Dr.(Mrs.) Vidya P. Sable	Professor	
3	Dr. Nilesh M. Mahajan	Professor	
4	Dr. Vinod M. Thakare	Associate Professor	
5	Mr. Purushottam S. Gangane	Assistant Professor	
6	Mr. Kishor R. Danao	Assistant Professor	
7	Mrs. Monali N. Dumore	Assistant Professor	
8	Mrs. Rohini S. Kharwade	Assistant Professor	
9	Mr. Chintaman N. Matre	Office Superintendent	
10	Mr. Tekendrakumar Bisen	Store Keeper	
11	Mr. Jatin M. Channe	Accountant	
12	Mr. Manas G. Gadge	Environmental Officer	 M. Gadge

List of Students who were present for Green Audit 2017-18

Sr. No.	Name	Class
1	Priyanka Sudhakar Somkuwar	M. Pharm Final Year
2	Raj Shankar Taiwade	M. Pharm Final Year
3	Savita Haridas Ghughuskar	M. Pharm Final Year
4	DIPALI BHASHKAR BHURE	M. Pharm I Year
5	DIVYA DINESHKUMAR HARINKHEDE	M. Pharm I Year
6	Deepika Ashok Kumar Kushwaha	B. Pharm Final Year
7	Dnyaeshwari Dudharam Dhore	B. Pharm Final Year
8	Harsha Vilasrao Thakre	B. Pharm Final Year
9	Kailash Bhagwan Bobade	B. Pharm III Year
10	Karishma Chudaman Dharmik	B. Pharm III Year
11	Ashish Sunil Akkewar	B. Pharm II Year
12	Ashwin Deochand Nanwatkar	B. Pharm II Year

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**

List of Teaching and Non-Teaching staff were present for Green Audit 2018-19

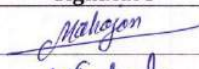
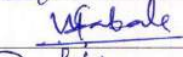
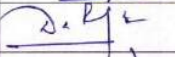
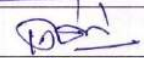
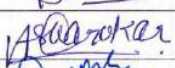


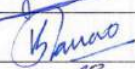
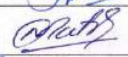
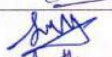

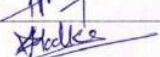
Sr. No.	Name	Designation	Signature
1	Dr. (Mrs.) Ujwala Mahajan	Principal	
2	Dr.(Mrs.) Vidya P. Sable	Professor	
3	Dr. Nilesh M. Mahajan	Associate Professor	
4	Dr. Vinod M. Thakare	Associate Professor	
5	Mr. Purushottam S. Gangane	Assistant Professor	
6	Mr. Kishor R. Danao	Assistant Professor	
7	Mrs. Monali N. Dumore	Assistant Professor	
8	Mrs. Rohini S. Kharwade	Assistant Professor	
9	Mr. Chintaman N. Matre	Office Superintendent	
10	Mr. Tekendrakumar Bisen	Store Keeper	
11	Mr. Nandu B. Kadbe	Clerk	
12	Mr. Manas G. Gadge	Environmental Officer	

List of Students who were present for Green Audit 2018-19

Sr. No.	Name	Class
1	<u>MANJUSHA HARBAJI CHARDE</u>	M. Pharm I Year
2	<u>MAYURI ARVINDJI BOBADE</u>	M. Pharm I Year
3	<u>MONIKA ASHOKRAO NIMBALKAR</u>	M. Pharm I Year
4	Amol Krushanarao Khante	B. Pharm Final Year
5	Ananta Bhivraj Chavan	B. Pharm Final Year
6	Bhupendra Banduji Nikhade	B. Pharm Final Year
7	Dipali Santosh Masurkar	B. Pharm III Year
8	Gaytri Khemraj Titarmare	B. Pharm III Year
9	DNYAN P. GAWANDE	B. Pharm II Year
10	GAURAV O. CHINCHGHARE	B. Pharm II Year
11	NIVEDITA ARVIND UPRIT	B. Pharm I Year
12	PAWAN MUKESH THAKUR	B. Pharm I Year

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**

List of Teaching and Non-Teaching staff were present for Green Audit 2019-20

Sr. No.	Name	Designation	Signature
1	Dr. (Mrs.) Ujwala Mahajan	Principal	
2	Dr.(Mrs.) Vidya P. Sable	Professor	
3	Dr. Nilesh M. Mahajan	Professor	
4	Dr. Vinod M. Thakare	Associate Professor	
5	Dr. Amol S. Warokar	Associate Professor	
6	Ms. Mohali N. Dumore	Assistant Professor	
7	Dr. Purushottam S. Gangane	Assistant Professor	
8	Mr. Kishor R. Danao	Assistant Professor	
9	Mr. Chintaman N. Matre	Office Superintendent	
10	Mr. Jatin M. Channe	Accountant	
11	Mr. Sheshraj C. Wath	Clerk	
12	Mr. Viplav V. Hadke	Clerk	

List of Students who were present for Green Audit 2019-20

Sr. No.	Name	Class
1	ASHISH SANJAY LEKURWALE	M. Pharm. Final Year
2	JUHI ANIRUDDHA SAGANE	M. Pharm. Final Year
3	JYOTI ARJUN HINGE	M. Pharm. Final Year
4	PRERANA CHANDRABHAN PATIL	M. Pharm. II Year
5	SONAL NAVINCHAND TATED	M. Pharm. II Year
6	NIRNAYA SHEKHAR MESHRAM	M. Pharm. II Year
7	Heena Santosh Patil	B. Pharm Final Year
8	Kajal Asaram Chafale	B. Pharm Final Year
9	Kajal Toljram Bawankule	B. Pharm Final Year
10	KARISHMA T. SHELKE	B. Pharm III Year
11	Kaustubh Hiranman Dhaskat	B. Pharm III Year
12	KOMAL PURUSHOTTAM DHAWALE	B. Pharm III Year

Annexure – II: Reference Documents / Surveys

Sr. No	Reference Documents / Surveys pertaining to
1.	Functionality of RO water plant
2.	Roof top area by College
3.	Setup for rain Water Harvesting
4.	Information regarding Garden Waste Management
5.	Information regarding Liquid Waste Management
6.	Measures for maintaining Cleanliness in Campus.
7.	Measures for Garbage Collection and disposal
8.	Plantation Measures
9.	Electricity Bills for duration of April 2017 to March 2020
10.	Nature Conservation Club composition
11.	Declaration on Operational Controls Of System Department With Respect To IT Management & Other Electronic Equipment's.
12.	Roll Of Staff, Students & Management to Save Electricity In Campus.
13.	Lighting Survey undertaken by the Green Audit Team
14.	AC Survey undertaken by the Green Audit Team
15.	Water Harvesting Survey undertaken by the Green Audit Team
16.	Waste Water Management Survey undertaken by the Green Audit Team

Annexure –III: Green Campus Committee



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samarth Mandir, Besa, Nagpur-37

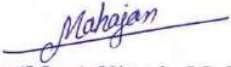
Environment Protection Committee
(Constituted on 20th May 2017 for Academic Year 2017-18)
With effect from 1st June 2017

Members

S.N.	Name	Designation
01	Dr (Mrs) Ujwala Mahajan	Chairperson
02	Mrs. Vaishali Balpande	Management Representative
03	Dr Ajay G. Pise	Secretary
04	Dr Nilesh Mahajan	Member
05	Mr. P. S. Gangane	Member
06	Mr. Jatin Channe	Representative of Supporting Staff
07	Mr. Manas G. Gadge	DBCOP Environment Protection Officer

Role and responsibilities of committee

10. To set measurable objectives on Environment Protection activities.
11. Execution and review of outcomes of Environment Protection Policy.
12. To submit annual report to Governing Body and Academic Council on yearly activities of committee.


Dr (Mrs.) Ujwala Mahajan
Principal
DBCOP, Besa, Nagpur
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37



Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur Environment Protection Committee




Environment Protection Committee
(Revised for Academic Year 2018-19)

Members

S.N.	Name	Designation
01	Dr (Mrs) Ujwala Mahajan	Chairperson
02	Mrs. Vaishali Balpande	Management Representative
03	Dr Ajay G. Pise	Secretary
04	Dr Nilesh Mahajan	Member
05	Mr. P. S. Gangane	Member
06	Mr. Jatin Channe	Representative of Supporting Staff
07	Mr. Manas G. Gadge	DBCOP Environment Protection Officer
08	Sopan Pund	Student Representative
09	Pallavi Ingale	Student Representative

Role and responsibilities of committee

7. To set measurable objectives on Environment Protection activities.
8. Execution and review of outcomes of Environment Protection Policy.
9. To submit annual report to Governing Body and Academic Council on yearly activities of committee.


PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37
Dr (Mrs.) Ujwala Mahajan
Principal
DBCOP, Besa, Nagpur





Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samarth Mandir, Besa, Nagpur-37


Environment Protection Committee
(Revised for Academic Year 2019-20)

Members

S.N.	Name	Designation
01	Dr (Mrs) Ujwala Mahajan	Chairperson
02	Mrs. Vaishali Balpande	Management Representative
03	Dr P. S. Gangane	Secretary
04	Dr Nilesh Mahajan	Member
05	Dr Ajay G. Pise	Member
06	Mr. Jatin Channe	Representative of Supporting Staff
07	Mr. Manas G. Gadge	DBCOP Environment Protection Officer
08	Kailas Bobade	Student Representative
09	Nilima Modak	Student Representative

Role and responsibilities of committee

4. To set measurable objectives on Environment Protection activities.
5. Execution and review of outcomes of Environment Protection Policy.
6. To submit annual report to Governing Body and Academic Council on yearly activities of committee.


Dr (Mrs.) Ujwala Mahajan
Principal
DBCOP, Besa, Nagpur
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Ambe Durga Education Society's
Dadasaheb Balpande College of Pharmacy (DBCOP)
Near Swami Samarth Mandir, Besa, Nagpur-37

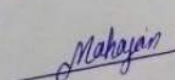
Environment Protection Committee
(Revised for Academic Year 2020-21)

Members

S.N.	Name	Designation
01	Dr (Mrs) Ujwala Mahajan	Chairperson
02	Mrs. Vaishali Balpande	Management Representative
03	Dr P. S. Gangane	Secretary
04	Dr Nilesh Mahajan	Member
05	Dr Ajay G. Pise	Member
06	Mr. Jatin Channe	Representative of Supporting Staff
07	Mr. Manas G. Gadge	DBCOP Environment Protection Officer
08	Kailas Bobade	Student Representative
09	Nilima Modak	Student Representative

Role and responsibilities of committee

1. To set measurable objectives on Environment Protection activities.
2. Execution and review of outcomes of Environment Protection Policy.
3. To submit annual report to Governing Body and Academic Council on yearly activities of committee.


Dr (Mrs.) Ujwala Mahajan
Principal
DBCOP, Besa, Nagpur

PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37



Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur Environment Protection Committee

Annexure – IV: List of Awareness Program Undertaken By College



Tree Plantation drive at DBCOP on 6th July 2017.



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Training of Fire Extinguisher handling at DBCOP on 27th September 2017.



International Yoga Day celebration at DBCOP on 21st June 2018.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Tree Plantation drive at DBCOP on 10th July 2018.



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



De-addiction Day celebrated at DBCOP on 1st September 2018.



Blood Donation Camp organized at DBCOP on 25th September 2018.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Health Check-up Camp organized at DBCOP on 29th September 2018.



Seminar on Voter Awareness was organized at DBCOP on 26th October 2018.



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Wheel Chair Donation at DBCOP on 17th December 2018.



International Yoga Day celebrated at DBCOP on 21st June 2019.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Orientation of NSS Unit at DBCOP on 1st August 2019.



Swachata Pandharwada organized at DBCOP from 1st August to 15th August 2019.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Tree Plantation drive organized at DBCOP on 24th August 2019.



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Oath taking Ceremony and Inauguration of Plastic Free Campus drive at DBCOP on 2nd October 2019.



Road Safety & Safe Living Program at DBCOP on 9th October 2019.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Blood Donation Camp organized at DBCOP on 1st January 2020.



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande
College of Pharmacy (DBCOP), Besa, Nagpur**



Health Check-up Camp organized at DBCOP on 11th January 2020.



Corona Virus Awareness program at DBCOP on 14th March 2020.

Annexure –V: Lighting Survey (2019 – 20)

List of Assumptions:

- During the survey specific hours for each class room, wash room, office space was assessed and accordingly average daily hours were considered
- The kW ratings of the installed lights is taken from the College data
- The calculations cover the two approaches
 - Approach: Calculation of LED contribution based on the total lighting load energy consumption.

Note: The Lumen/Watt for 28 W tube light is up to 110; which is almost same as LED is: 110-120¹¹

- The Green Audit Team acknowledges the criteria for introduction of LED lights as LED lights do not have disposal problems. Tube lights face problem of mercury contamination.
- Conversely the college also faces the problem of disposal of existing tube lights. The sudden disposal of tube lights on large scale and within their service life will lead to huge amount of e-waste which has critical impact on environment. The college management is thus looking for the replacement policy and lighting (tube light, CFL) will be upgraded to eco-friendly LED after failure of existing lighting system.

Lux Levels observed at working place - 250

Calculated Contribution of various lighting arrangements: Calculated for 200 working days

Light Sources	Daily Wh Consumption
Tube light	11880
LED	8726
CFL	1275

Light Sources	% Contribution
Tube light	54
LED	40
CFL	6

Light Sources	Number
Tube light	86
LED	119
CFL	16

Light Sources	% Contribution
Tube light	39
LED	54
CFL	7

¹¹<https://www.google.co.in/amp/s/www.bijlibachao.com/lights/comparing-led-lights-with-fluorescent-lights.html%3fisamp=1>

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Lighting Survey 2019 – 20

Sr. No	Room Name/no.	Tube light	Watts	Daily average hrs.	W.hr	LED	Watts	Daily average hrs.	W.hr	CFL	Watts	Daily average hrs.	W.hr
1	Girls Common Room	3	40	4	480	-	-	-	-	-	-	-	-
2	Sick Room	2	40	2	160	-	-	-	-	-	-	-	-
3	Store Room 1	1	40	4	160	-	-	-	-	-	-	-	-
4	Store Room 2	2	40	4	320	-	-	-	-	-	-	-	-
5	Laboratory	3	40	4	480	-	-	-	-	-	-	-	-
6	Aseptic Room	-	-	-	-	2	20	4	160	3	15	4	180
7	Laboratory	3	40	4	480	-	-	-	-	-	-	-	-
8	Preparation Room	1	40	4	160	-	-	-	-	-	-	-	-
9	G - 17	1	40	4	160	1	20	4	80	-	-	-	-
10	IQAC Room	1	40	4	160	-	-	-	-	-	-	-	-
11	Principal's Cabin	1	40	8	320	6	20	8	960	1	15	8	120
12	Placement Cell	-	-	-	-	5	20	4	400	-	-	-	-
13	Pantry	-	-	-	-	1	20	4	80	-	-	-	-
14	Administration Office	-	-	-	-	6	15	8	720	4	15	8	480
15	Store Room 3	-	-	-	-	1	15	4	60	1	15	4	60
16	Conference Hall	-	-	-	-	4	40	2	320	-	-	-	-
17	President's Cabin	-	-	-	-	7	12	4	336	-	-	-	-
18		-	-	-	-	1	10	2	20	-	-	-	-
19		-	-	-	-	10	4	4	160	-	-	-	-
20	Corridor 1	2	40	4	320	2	20	4	160	-	-	-	-
21	Corridor 2	-	-	-	-	4	20	4	320	-	-	-	-
22	Staff Room	2	40	4	320	-	-	-	-	1	10	4	40
23	Laboratory	3	40	4	480	-	-	-	-	-	-	-	-
24	Laboratory	1	40	4	160	-	-	-	-	1	15	4	60

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

25	Laboratory	3	40	4	480	-	-	-	-	-	-	-	-
26	Laboratory	4	40	4	640	1	20	4	80	-	-	-	-
27	Laboratory	3	40	4	480	-	-	-	-	-	-	-	-
28	Class Room	3	40	4	480	-	-	-	-	-	-	-	-
29	Animal House	1	40	2	80	-	-	-	-	-	-	-	-
30	Corridor	2	40	1	80	3	20	1	60	-	-	-	-
31	Class Room	2	40	4	320	-	-	-	-	-	-	-	-
32	Boys Common Room	3	40	2	240	-	-	-	-	-	-	-	-
33	M Pharm Class Room	-	-	-	-	-	-	-	-	4	20	4	320
34	Instrumental Lab	-	-	-	-	9	20	8	1440	-	-	-	-
35		-	-	-	-	3	20	16	960	-	-	-	-
36	M Pharm Lab	-	-	-	-	-	-	-	-	-	-	-	-
37	S - 11	3	40	2	240	-	-	-	-	-	-	-	-
38	S - 10	2	40	2	160	-	-	-	-	-	-	-	-
39	S - 9	2	40	2	160	-	-	-	-	-	-	-	-
40	S - 8	3	40	4	480	-	-	-	-	-	-	-	-
41	S - 7	3	40	4	480	-	-	-	-	-	-	-	-
42	Corridor	4	40	1	160	-	-	-	-	-	-	-	-
43	Seminar Hall	-	-	-	-	12	20	2	480	-	-	-	-
44	Library	-	-	-	-	13	20	4	1040	-	-	-	-
45	T - 05	3	40	4	480	-	-	-	-	-	-	-	-
46	Preparation & Staff Room	1	40	4	160	1	15	4	60	-	-	-	-
47	T - 7	3	40	4	480	-	-	-	-	-	-	-	-
48	T - 8	3	40	4	480	-	-	-	-	-	-	-	-
49	Preparation & HOD Department	1	40	4	160	1	15	4	60	-	-	-	-
50	T - 10	3	40	4	480	-	-	-	-	-	-	-	-

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

51	Computer Lab	-	-	-	-	15	20	2	600	-	-	-	-
52	T - 12	3	40	4	480	-	-	-	-	-	-	-	-
53	Boys Toilet	-	-	-	-	1	20	1	20	1	15	1	15
54	Corridor	1	40	1	40	10	15	1	150	-	-	-	-
55	Stair Case	4	40	3	480	-	-	-	-	-	-	-	-
		86			11880	119			8726	16			1275

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



On & off culture practiced in college



Use of LED lights in college



Sensor based lighting installed in college

**Annexure –VI: Undertaking by the System Department regarding control of Electronic
Equipment's**



Ambe Durga Education Society's
DADASAHEB BALPANDE COLLEGE OF PHARMACY
Near Swami Samarth Dham Mandir, Besa, Nagpur - 440037

Accredited by NAAC & AICTE-CII "PLATINUM" RANK

- Approved by A.I.C.T.E., P.C.I., D.T.E. & Govt. of Maharashtra
- Permanently Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Founder : Late Shri Dadasaheb alias Vitthalrao C. Balpande

07103-281244, 281277 | www.dsbcp.org | www.dbcop.org | dbcop.office@gmail.com

President: Shri Manoj V. Balpande

Principal: Dr (Mrs.) Ujwala Mahajan

Ref. No. / DBCOP / 3989-A/2017

Date: 22/09/2017

Certificate

The administrative Rights of computer setting are with the administrative department of the college.

As part of the sustainable and eco-friendly setting, the system department has initiated below setting in the copeters of all the users.

1. All the computers screen savers are disabled.
2. The computers are turned to sleep mode if they are Ideal.
3. The computers setting cannot change as the administrative rights are with the department.
4. With regards to the uses policy of photocopier and other equipment user "POWER ON" when in used and "POWER OFF" when not in use.

The statement is issued in response to the query raised during the green audit.



Ujwala Mahajan
22-09-2017
Dr. (Mrs.) Ujwala Mahajan
Principal
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Ambe Durga Education Society's
DADASAHEB BALPANDE COLLEGE OF PHARMACY
Near Swami Samarth Dham Mandir, Besa, Nagpur - 440037

Accredited by NAAC & AICTE-CII "PLATINUM" RANK
▪ Approved by A.I.C.T.E., P.C.I., D.T.E. & Govt. of Maharashtra
▪ Permanently Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Founder : Late Shri Dadasaheb alias Vitthalrao C. Balpande

07103-281244, 281277 | www.dsbcop.org | www.dbcop.org | dbcop.office@gmail.com

President: Shri Manoj V. Balpande

Principal: Dr (Mrs.) Ujwala Mahajan

Ref. No. / DBCOP / 4063-A/2018

Date: 01/09/2018

Certificate

The administrative Rights of computer setting are with the administrative department of the college.

As part of the sustainable and eco-friendly setting, the system department has initiated below setting in the copiers of all the users.

1. All the computers screen savers are disabled.
2. The computers are turned to sleep mode if they are Ideal.
3. The computers setting cannot change as the administrative rights are with the department.
4. With regards to the uses policy of photocopier and other equipment user "POWER ON" when in used and "POWER OFF" when not in use.

The statement is issued in response to the query raised during the green audit.



Ujwala Mahajan
01-09-2018
Dr. (Mrs.) Ujwala Mahajan
Principal
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

Ambe Durga Education Society's
DADASAHEB BALPANDE COLLEGE OF PHARMACY
Near Swami Samarth Dham Mandir, Besa, Nagpur - 440037

Accredited by NAAC & AICTE-CII "PLATINUM" RANK

- Approved by A.I.C.T.E., P.C.I., D.T.E. & Govt. of Maharashtra
- Permanently Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Founder : Late Shri Dadasaheb alias Vitthalrao C. Balpande

07103-281244, 281277 | www.dsbcp.org | www.dbcop.org | dbcop.office@gmail.com

President: Shri Manoj V. Balpande | Principal: Dr (Mrs.) Ujwala Mahajan
Ref. No. / DBCOP / 4595-A/2019 | Date: 10/09/2019

Certificate

The administrative Rights of computer setting are with the administrative department of the college.

As part of the sustainable and eco-friendly setting, the system department has initiated below setting in the copters of all the users.

1. All the computers screen savers are disabled.
2. The computers are turned to sleep mode if they are Ideal.
3. The computers setting cannot change as the administrative rights are with the department.
4. With regards to the uses policy of photocopier and other equipment user "POWER ON" when in used and "POWER OFF" when not in use.

The statement is issued in response to the query raised during the green audit.



Ujwala Mahajan
10-09-2019
Dr. (Mrs.) Ujwala Mahajan
Principal
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Ambe Durga Education Society's
DADASAHEB BALPANDE COLLEGE OF PHARMACY
Near Swami Samarth Dham Mandir, Besa, Nagpur - 440037
Accredited by NAAC & AICTE-CII "PLATINUM" RANK
▪ Approved by A.I.C.T.E., P.C.I., D.T.E. & Govt. of Maharashtra
▪ Permanently Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Founder : Late Shri Dadasaheb alias Vitthalrao C. Balpande

07103-281244, 281277 | www.dsbcop.org | www.dbcop.org | dbcop.office@gmail.com

President: Shri Manoj V. Balpande | Principal: Dr (Mrs.) Ujwala Mahajan

Ref. No. / DBCOP /

Date: 15/01/2021

Certificate

The administrative Rights of computer setting are with the administrative department of the college.

As part of the sustainable and eco-friendly setting, the system department has initiated below setting in the copeters of all the users.

1. All the computers screen savers are disabled.
2. The computers are turned to sleep mode if they are Ideal.
3. The computers setting cannot change as the administrative rights are with the department.
4. With regards to the uses policy of photocopier and other equipment user "POWER ON" when in used and "POWER OFF" when not in use.

The statement is issued in response to the query raised during the green audit.



Mahajan
15-01-2021
Dr. (Mrs.) Ujwala Mahajan
Principal
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Annexure –VII: Water Quality Reports

महाराष्ट्र राज्य
सार्वजनिक आरोग्य सेवा
प्रादेशिक आरोग्य प्रयोगशाळा नागपूर दूरध्वनी/फॅक्स क्र. 2586014
पाण्याच्या नमुन्याचा सूक्ष्मजीवी अहवाल

पाठविणा-यांचे नाव व पत्ता : दादासाहेब बाळपांडे कॉलेज डॉ.फा.फार्मसी, व्हा.गो.
समर्थ मंदिराजवळ, बेसा, नागपूर

पाठविणा-यांचे पत्र क्रमांक व दिनांक : 3350/11/09/2017

प्रयोगशाळा संदर्भ क्रमांक : 24682

नमुना घेतल्याचा दिनांक : —

नमुना पोहोचल्याचा दिनांक : 11/09/2017

परीक्षण सुरू केल्याचा दिनांक : —

अ.क्र.	नमुन्याचे प्रकार	परीक्षणाचे निष्कर्ष		इतर अभिप्राय
		प्रति १०० मि.ली. नमुन्यातील संपाव्य सूक्ष्मजंतूंची संख्या कोलीफॉर्मस	थर्मोटॉलरंट जीवाणू	
1	पिण्याचे पाणी महाविद्यालयामधील	0	—	पिण्यासाठी

अभिप्राय :
पिण्यास अयोग्य पाण्यावर योग्य प्रमाणात क्लोरीनची प्रक्रिया केल्यानंतर व सूक्ष्मजीवीय पुर्णतपासणीनंतर पिण्यास योग्य असल्याची खात्री झाल्यानंतर ते पाणी पिण्यासाठी वापरता येईल.

अहवाल क्रमांक: प्रभाप्रशा/१/ 24682/3528/2017 दिनांक : 15/09/2017

प्रत सादर
१) जिल्हा आरोग्य अधिकारी, जिल्हा परिषद, जिल्हा नागपूर
२) शल्यचिकित्सक, जिल्हा रुग्णालय, जिल्हा नागपूर.

प्रभारी अधिकारी
प्रादेशिक आरोग्य प्रयोगशाळा
नागपूर-४४००२९

Water Testing Report for 2017.

महाराष्ट्र राज्य
सार्वजनिक आरोग्य सेवा
प्रादेशिक आरोग्य प्रयोगशाळा नागपूर दूरध्वनी/फॅक्स क्र. 2586014
पाण्याच्या नमुन्याचा सूक्ष्मजीवी अहवाल

पाठविणा-यांचे नाव व पत्ता : दादासाहेब बालपॉईंट कॉलेज ऑफ फार्मसी, स्वामी समर्थ धाम
पाठविणा-यांचे पत्र क्रमांक व दिनांक : 4094-A/2018 दि. 28/09/18 माँपिराजवठ बेसा, नागपुर.
प्रयोगशाळा संदर्भ क्रमांक : 8266

नमुना घेतल्याचा दिनांक : 28/09/2018
नमुना पोहोचल्याचा दिनांक : 28/09/2018
परीक्षण सुरू केल्याचा दिनांक : —

अ.क्र.	नमुन्याचे प्रकार	परीक्षणाचे निष्कर्ष		इतर अभिप्राय
		प्रति १०० मि.ली. नमुन्यातील संभाव्य सूक्ष्मजंतूंची संख्या कोलीफॉर्म्स	थर्मोटॉलरंट जीवाणू	
①	दादासाहेब बालपॉईंट कॉलेज ऑफ फार्मसी बेसा, नागपुर. (नळाचे पाणी)	0	—	महाविद्यालय पाणी पिण्या योग्य

अभिप्राय :
पिण्यास अयोग्य पाण्यावर योग्य प्रमाणात क्लोरीनची प्रक्रिया केल्यानंतर व सूक्ष्मजीवीय पुर्णतपासणीनंतर पिण्यास योग्य असल्याची खात्री झाल्यानंतर ते पाणी पिण्यासाठी वापरता येईल.

अहवाल क्रमांक: प्राआप्रशा/१/ 8266/2147/2018 दिनांक : 04/10/2018

प्रत सादर
१) जिल्हा आरोग्य अधिकारी, जिल्हा परिषद, जिल्हा नागपूर
२) शल्यचिकित्सक, जिल्हा रुग्णालय, जिल्हा नागपूर.

प्रकारी अधिकारी
प्रादेशिक आरोग्य प्रयोगशाळा
नागपूर-४४००२९

Water Testing Report for 2018.

महाराष्ट्र राज्य
सार्वजनिक आरोग्य सेवा
प्रादेशिक आरोग्य प्रयोगशाळा नागपूर दूरध्वनी/फॅक्स क्र. 2586014
पाण्याच्या नमुन्याचा सूक्ष्मजीवी अहवाल

पाठविणा-याचे नाव व पत्ता : दादासाहेब बालपंडे कॉलेज ऑफ फार्मसी, बेसा, नागपूर
पाठविणा-याचे पत्र क्रमांक व दिनांक : 4594/2019 दि. 09/09/2019
प्रयोगशाळा संदर्भ क्रमांक : 8727

नमुना घेतल्याचा दिनांक : 09/09/2019
नमुना पोहोचल्याचा दिनांक : 09/09/2019
परीक्षण सुरु केल्याचा दिनांक : 11/09/2019

अ.क्र.	नमुन्याचे प्रकार	परीक्षणाचे निष्कर्ष		इतर अभिप्राय
		प्रति १०० मि.ली. नमुन्यातील संचायक सूक्ष्मजंतूंची संख्या		
		कोलीफॉर्म्स	थर्मोटॉलरंट जीवाणू	
1)	दादासाहेब बालपंडे कॉलेज ऑफ फार्मसी, बेसा, नागपूर येथील (नळाचे पाणी)	0	0	पानी पिण्यास योग्य

अभिप्राय :
पिण्यास अयोग्य पाण्यावर योग्य प्रमाणात क्लोरीनची प्रक्रिया केल्यानंतर व सूक्ष्मजीवीय पुर्णतपासणीनंतर पिण्यास योग्य असल्याची खात्री झाल्यानंतर ते पाणी पिण्यासाठी वापरता येईल.

अहवाल क्रमांक: प्रान्ताप्रशा/१/ 8727/2914/2019 दिनांक : 13/09/2019

प्रत सादर
१) जिल्हा आरोग्य अधिकारी, जिल्हा परिषद, जिल्हा नागपूर
२) शल्यचिकित्सक, जिल्हा रुग्णालय, जिल्हा नागपूर.

प्रमुख अधिकारी
प्रादेशिक आरोग्य प्रयोगशाळा
नागपूर-४४००२९

Water Testing Report for 2019.

महाराष्ट्र राज्य
सार्वजनिक आरोग्य सेवा
प्रादेशिक आरोग्य प्रयोगशाळा नागपूर दूरध्वनी/फॅक्स क्र. 2586014
पाण्याच्या नमुन्याचा सूक्ष्मजीवी अहवाल

पाठविणा-यांचे नाव व पत्ता : दादासाहेब बालपांडे कॉलेज ऑफ फार्मसी, स्वामी रामेश्वर काम मंदिराजवळ
बेसा, नागपूर.
पाठविणा-यांचे पत्र क्रमांक व दिनांक : ४९२६-बी/२०२० दि. ११/११/२०२०
प्रयोगशाळा संदर्भ क्रमांक : ८८२४

नमुना घेतल्याचा दिनांक : ११/११/२०२०
नमुना पोहोचल्याचा दिनांक : ११/११/२०२०
परीक्षण सुरु केल्याचा दिनांक : १८/११/२०२०

अ.क्र.	नमुन्याचे प्रकार	परीक्षणाचे निष्कर्ष		इतर अभिप्राय
		प्रति १०० मि.ली. नमुन्यातील संभाव्य सूक्ष्मजंतूंची संख्या कोलीफॉर्म्स	थर्मोटॉलरंट जीवाणू	
१	दादासाहेब बालपांडे कॉलेज ऑफ फार्मसी, बेसा, नागपूर, येथील बऱ्याच पिण्याचे पाणी.	०	—	पाणी पिण्यास योग्य

अभिप्राय :
पिण्यास अयोग्य पाण्यावर योग्य प्रमाणात क्लोरीनची प्रक्रिया केल्यानंतर व सूक्ष्मजीवीय पुर्णतपासणीनंतर पिण्यास योग्य असल्याची खात्री झाल्यानंतर ते पाणी पिण्यासाठी वापरता येईल.

अहवाल क्रमांक: प्राआप्रशा/१/ ८८२४/२००४/२०२० दिनांक : २३/११/२०२०

प्रत सादर
१) जिल्हा आरोग्य अधिकारी, जिल्हा परिषद, जिल्हा नागपूर
२) शल्यचिकित्सक, जिल्हा रुग्णालय, जिल्हा नागपूर.

प्रगारी अधिकारी
प्रादेशिक आरोग्य प्रयोगशाळा
नागपूर-४४००२९

Water Testing Report for 2020.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Annexure– VIII: List of Electronic Equipment's in College

Dadasaheb Balpande College Of Pharmacy

Near Swami Samarth Dham Mandir, Besa, Nagpur – 440037

Electricals equipment bill detail

Session 2017-18					
Sr.no	Date	Bill No	Vendor Name	Material Name	Qty
1	29/8/2017	5537	Bright Eletricals	Celling Fan 1200 mm Bianco	100
2	22/09/2017	2537	Yashraj Automation	Hitachi LCD Projector	3
				With locking Systems	
3	22/09/2017	2536	Yashraj Automation	wall mounted screen	6
				and Camera instalation	
4	22/09/2017	INV/17-18/00128	Yashraj Automation	Audio podium with asseceries	1
5	22/09/2017	INV/17-18/00128	Yashraj Automation	BENQ DLP Projector	2
6	22/09/2017	INV/17-18/00128	Yashraj Automation	LED Panel	4
7	18/11/2017	INV/17-18/00273	Yashraj Automation	BENQ DLP Projector	1
Session 2018-19					
Sr.no	Date	Bill No	Vendor Name	Material Name	Qty
1	3/9/2018	YAS/18-19/09/382	Yashraj Automation	Dell Desktop	10.00
2	8/12/2018	YAS/12/18-19/671	Yashraj Automation	Computer spare part	sets
3	5/6/2019	2897	Ocean Computer	Cannon Scanner	1.00
				Scanner Epson	1.00
Session 2019-20					
Sr.no	Date	Bill No	Vendor Name	Material Name	Qty
1	15/06/2019	948	Aim Solutions	Microtek jumbo UPS	1
2	15/06/2019	949	Aim Solutions	Microtek jumbo UPS(Auto Bat)	3
3	9/7/2019	2185	Deepika Enterprises	LG Casstte AC	3
4	14/01/2020	1946	Shree Computer Bazar	AOC 18.5 LED Moniter	1
				with other spare part	
5	29/01/2020	2082	Shree Computer Bazar	Desktop CPU	1
Session 20-21					
Sr.no	Date	Bill No	Vendor Name	Material Name	Qty
1	9/9/2019	8271	Bright Eletricals	Celling Fan 1200 mm Bianco	25
2	10/10/2020	1069	Shree Computer Bazar	Desktop Asseceries	sets
3	2/10/2020	SC/DEC20-21/0010	Sunita computer & mobile	Desktop Asseceries	sets

Annexure –IX: Solar Panel Installations



Solar Lamps Installed in Campus



Solar Pv System for Water Distillation System



Water Distillation System operated by Solar Energy

Annexure –X: Water Distribution Data

The water is drawn from 1 no. of bore well. The water drawn is not measured. Recommendation to monitor the water drawn is raised under chapter 6 of this report.

Annexure –XI: Solar Passive Structure / Drip Irrigation



Drip Irrigation system used in college for gardening

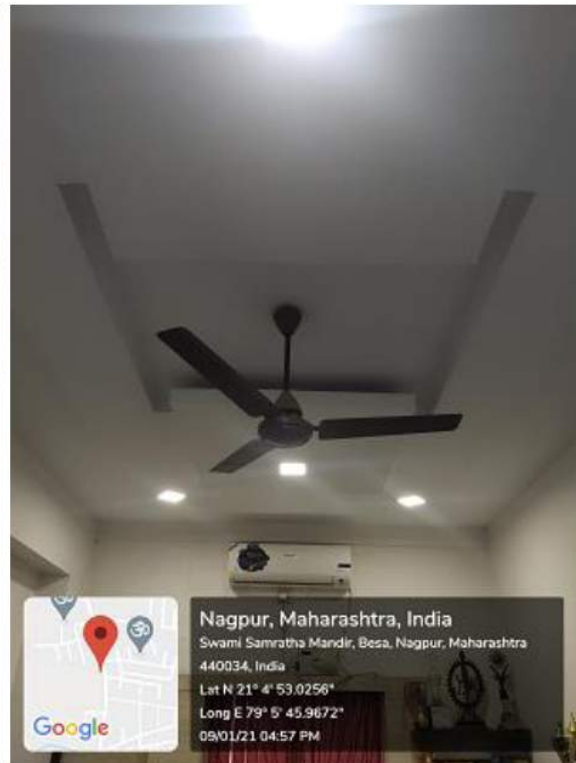


Adequate light in classrooms without using electrical lighting

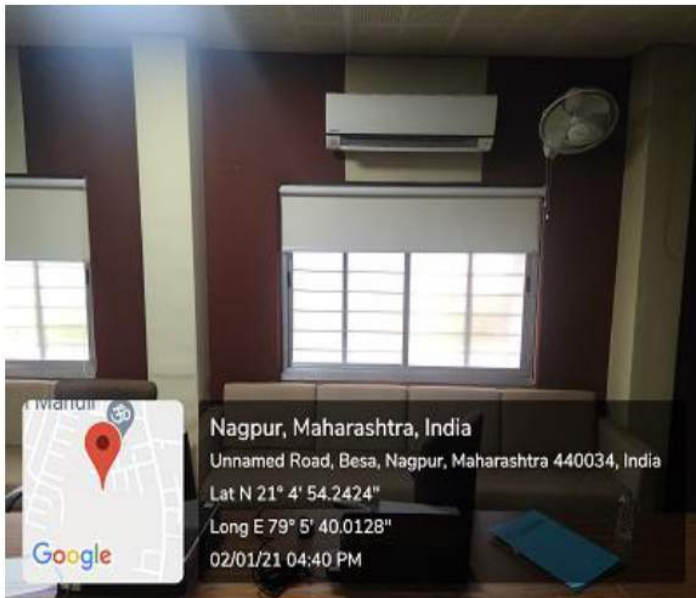


Adequate light in labs without using electrical lighting

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Use of false ceiling to reduce air-conditioned volume and reducing AC load

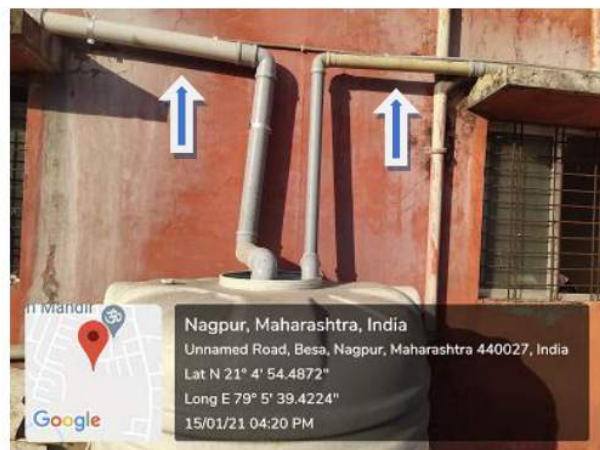


Use of blinds for windows to reduce heat

Annexure –XII: Water Management



Rain Water Harvesting tanks in college



Pipeline to flow harvested rain water to tanks

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Pipeline to flow harvested rain water to soak pit



Soak pit to recharge harvested rain water to ground



RO water used for drinking purpose



Taps to be replaced by faucets

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Flush to be replaced by push buttons



Bore well only source of water



Tank constructed in college to accumulate rain water

Annexure –XIII: Waste Management



RO Waste water used for gardening



Ban of single use plastic in college campus

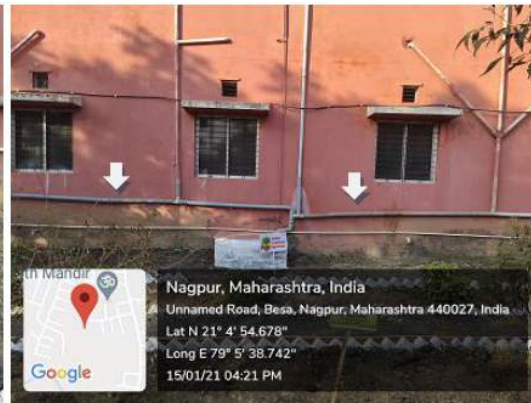


Compost pit

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Liquid waste collection tank



Pipeline for flowing liquid waste to the tank



Dustbins used to segregate waste



Dustbins in classrooms



Dustbins in labs



Vending machine in girls' common room



Incinerator machine in girls' common room

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Animals incinerator machine



Broken glassware collection point



Expired chemicals collection point




Pedestrian friendly pathways



Fly Ash Bricks for construction in college

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

सामाजिक, शैक्षणिक, सांस्कृतिक व पर्यावरण
स्वच्छते कार्यकाय समितीचे कार्यालय
महोदय, भवन २, १०१/१०२, मंगळूर रोड, नागपूर-४४११०१



मेत्री परिवार संस्था
Matri Family Society


प्रति,
दादासाहेब बालपण्डे कॉलेज ऑफ फार्मसी
स्वामी रामधर धाम, बेसा नागपूर
महोदय,
मेत्री परिवार संस्थे द्वारा सुरु असलेल्या "प्रकल्प रवी" या प्रकल्पा अंतर्गत आपल्या शाखे द्वारे
दि 05/02/2018 ला 28 किलो आणि 26/05/2018 ला 52 किलो 11/08/2018 ला 28
किलो 29/08/2018 ला 576 किलो, 30/11/2018 ला 36 किलो एकूण 720 किलो रवी
देण्यात आली. संस्थे द्वारे सुरु असलेल्या विद्यार्थी उन्मत्ती गृहाला रवी च्या स्वरुपात आपण
केलेली ही भरीव मदत आहे.
हया सामाजिक कार्याकरिता जी दान स्वरुपात रवी दिली त्या करीता आपले खुप -खुप
धन्यवाद

आपला
मेत्री परिवार संस्था

नागपूर : राम विद्या, जैन रोड, राहुटे कॉलेजी, नागपूर - 22
फोन : +91 712 2424534 2447757 +91 880667750/51
E-mail : +91@matrifamily.org.in www.matrifamily.org.in

पुणे : श्री स्वामी मदन अस्पताल 1126, व्हॉलिवुड, विठ्ठलवाडी, लोदी रोड, 411033
Mobile No : +91 8796141168 +91 942517227
E-mail : yashodhan.admin@matrifamily.org.in

सामाजिक, शैक्षणिक, सांस्कृतिक व पर्यावरण
स्वच्छते कार्यकाय समितीचे कार्यालय
महोदय, भवन २, १०१/१०२, मंगळूर रोड, नागपूर-४४११०१



मेत्री परिवार संस्था
Matri Family Society

प्रति,
दादासाहेब बालपण्डे कॉलेज ऑफ फार्मसी
स्वामी रामधर धाम, बेसा
नागपूर
महोदय,
मेत्री परिवार संस्थे द्वारा सुरु असलेल्या "प्रकल्प रवी" या प्रकल्पा अंतर्गत आपल्या शाखे द्वारे
दि 17/07/2019 ला 54 किलो, 20/04/2019 ला 35 किलो 21/11/2019 ला 24 किलो
रवी एकूण 113 किलो रवी देण्यात आली. संस्थे द्वारे सुरु असलेल्या विद्यार्थी उन्मत्ती गृहाला
रवी च्या स्वरुपात आपण केलेली ही भरीव मदत आहे.
हया सामाजिक कार्याकरिता जी दान स्वरुपात रवी दिली त्या करीता आपले खुप -खुप
धन्यवाद

आपला
मेत्री परिवार संस्था


नागपूर : राम विद्या, जैन रोड, राहुटे कॉलेजी, नागपूर - 22
फोन : +91 712 2424534 2447757 +91 880667750/51
E-mail : +91@matrifamily.org.in www.matrifamily.org.in

पुणे : श्री स्वामी मदन अस्पताल 1126, व्हॉलिवुड, विठ्ठलवाडी, लोदी रोड, 411033
Mobile No : +91 8796141168 +91 942517227
E-mail : yashodhan.admin@matrifamily.org.in

Cellulose waste handling certificate for 2017-18

Cellulose waste handling certificate for 2018-19

सामाजिक, शैक्षणिक, सांस्कृतिक व पर्यावरण
स्वच्छते कार्यकाय समितीचे कार्यालय
महोदय, भवन २, १०१/१०२, मंगळूर रोड, नागपूर-४४११०१



मेत्री परिवार संस्था
Matri Family Society

प्रति,
दादासाहेब बालपण्डे कॉलेज ऑफ फार्मसी
स्वामी रामधर धाम, बेसा
नागपूर
महोदय,
मेत्री परिवार संस्थे द्वारा सुरु असलेल्या "प्रकल्प रवी" या प्रकल्पा अंतर्गत आपल्या शाखे द्वारे
दि 28/02/2020 ला एकूण 43 किलो रवी देण्यात आली. संस्थे द्वारे सुरु असलेल्या विद्यार्थी
उन्मत्ती गृहाला रवी च्या स्वरुपात आपण केलेली ही भरीव मदत आहे.
हया सामाजिक कार्याकरिता जी दान स्वरुपात रवी दिली त्या करीता आपले खुप -खुप
धन्यवाद

आपला
मेत्री परिवार संस्था

Cellulose waste handling certificate for 2019-20

नागपूर : राम विद्या, जैन रोड, राहुटे कॉलेजी, नागपूर - 22
फोन : +91 712 2424534 2447757 +91 880667750/51
E-mail : +91@matrifamily.org.in www.matrifamily.org.in



महाराष्ट्र MAHARASHTRA

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NAGPUR TREASURY
XT 074334

6 E JAN 2021

Stamp Head Clerk / Sr. Clerk

Agreement for Disposal of E-Waste

This indenture of agreement is made on 11 Jan. 2021 between **Principal, Dadasaheb Balpande College of Pharmacy, Besa, Nagpur** (Hereafter Party No.1.) and **Persist Solution, Nagpur** sole proprietor through **Mr. Nilesh Giradkar** (Hereafter Party No. 2.)

Whereas the Party No. 1, is running Bachelor of Pharmacy & Master of Pharmacy college at Besa, Nagpur. The College is recognized by All India Council of Technical Education, Pharmacy Council of India, Government of Maharashtra and Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

And

Whereas the Party No.1, Dadasaheb Balpande College of Pharmacy students are imparted with Computer Knowledge along with Practical

And

Whereas Students of pharmacy performs various experiments on electronic machines

And

P.T.O.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

फक्त प्रतिज्ञापत्रासाठी (अनुच्छेद-४)
प्रतिज्ञापत्र कोणाकडे सादर करावयाचे
प्रतिज्ञापत्रासाठी कारण
मुद्रांक विकत घेणाऱ्याचे नाव व रजिस्ट्रारी पत्ता
मुद्रांक सादरची नोंदवही अनुक्रमांक- /दिनांक
मुद्रांक विकत घेणाऱ्याची सही
पस्थानाधारक: मुद्रांक विक्रेत्याची सही
व पत्ताना क्रमांक तसेच मुद्रांक विक्रीचे ठिकाण/पत्ता
अव्विल स. बनोदे ला. नं. 14/95
फक्तपत्र सोक. गणप. कोड नं. 4601051

प्र.प.
४४३२६ ११/०१/२०२१

दादासाहेब बालपंडे कॉलेज ऑफ फार्मसी
बसा, नागपूर

-- 2 --

Whereas after some period of times the Computers, Monitors, Keyboards
work electronic machines becomes out of order

And

Whereas the disposal of such E-waste creates problem of disposal as per
prevailing environmental laws

And

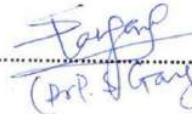
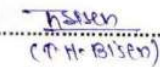
Whereas Party No. 2 is an authorized computer agency and ready to
dispose/reuse/recycle the E-waste provided to them


This agreement witness as under

- 1) The Party No. 1 shall provide all the E-waste generated in the college to Party No.2 free
of cost.
- 2) The party No. 2 agrees to reuse/recycle/dispose the E-waste provided by Party No. 1
as per prevailing environmental law.
- 3) That this agreement is valid for a period of five years from 14 Feb 2021 to 31
December 2025.

In witness thereof signed by Party No. 1 & Party No. 2.

Witness:

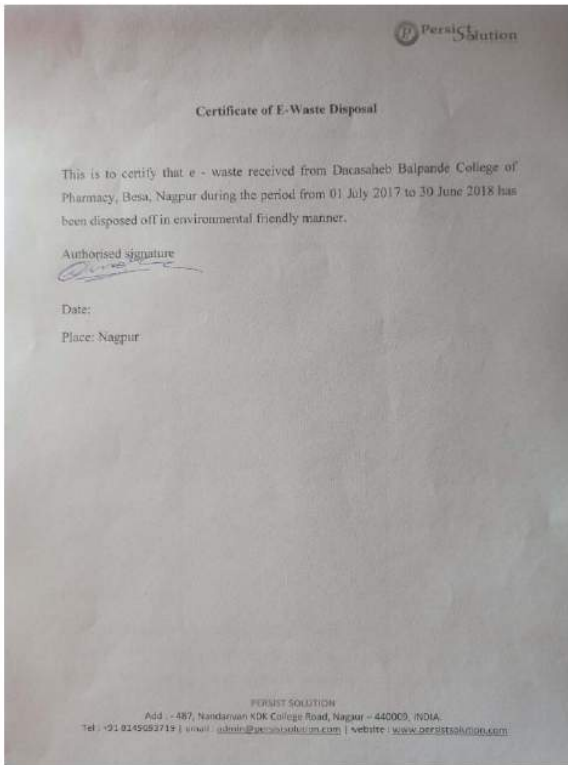
- 1) 
(Dr. P. Grayson)
- 2) 
(P. H. Bisen)


14.01.2021
Party No. 1
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

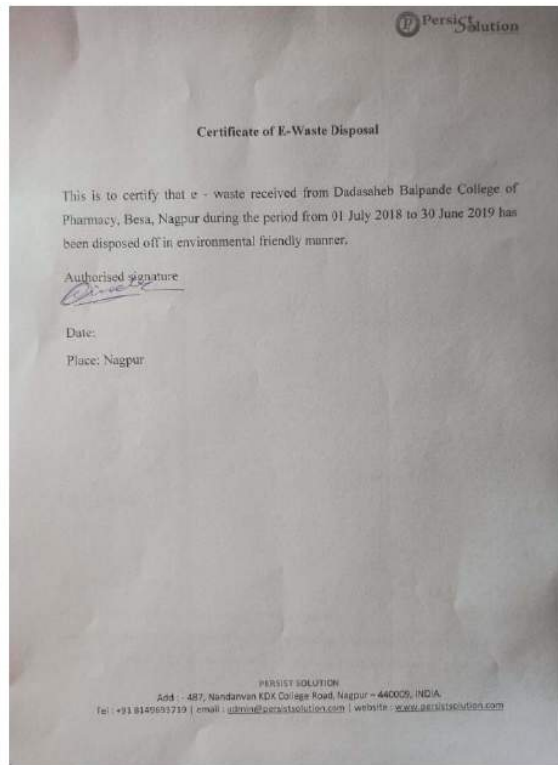

Party No. 2

MOU of E-waste Handling

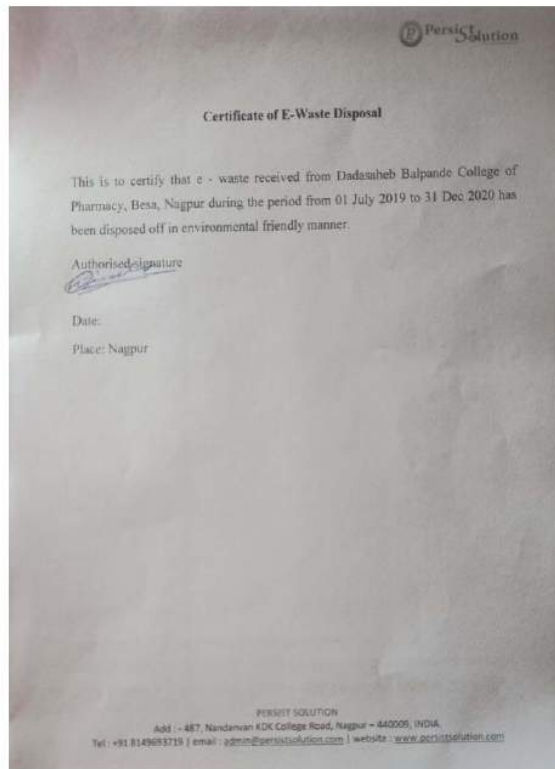
Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



E-waste handling certificate for 2017-18



E-waste handling certificate for 2018-19



E-waste handling certificate for 2019-20



महाराष्ट्र MAHARASHTRA

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NAGPUR TREASURY
XT 074332
E F JAN 2021
Cramp Head Clerk / Sr. Clerk

Agreement for Disposal of Spoiled and Expired Chemical Waste

This indenture of agreement is made on 12 January 2021 between Principal, Dadasaheb Balpande College of Pharmacy, Besa, Nagpur (Hereafter Party No.1.) and N.R. Traders, Nagpur sole proprietor through Mr. Dhiraj Rangari (Hereafter Party No. 2.)

Whereas the Party No. 1, is running Bachelor of Pharmacy & Master of Pharmacy college at Besa, Nagpur. The College is recognized by All India Council of Technical Education, Pharmacy Council of India, Government of Maharashtra and Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

And

Whereas the Party No.1, Dadasaheb Balpande College of Pharmacy students are imparted with Practical and Research activities

And

Whereas Students of pharmacy undergoes various practical's utilizing chemicals, thus institute purchase chemicals in bulk.

And

Whereas during storage many chemicals expired or spoiled.

P.T.O.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

फक्त प्रतिज्ञापत्रासाठी (अनुच्छेद-४)
प्रतिज्ञापत्र कोणाकडे सादर करावयाचे
प्रतिज्ञापत्रासाठी कारण
मुद्रांक दिकत घेणाऱ्याचे नाव व रहिवाशी पत्ता
मुद्रांक वाहतूकी नोंदवही अनुक्रमांक-/दिनांक
मुद्रांक बिकत घेणाऱ्याची सही
परवानाधारक मुद्रांक विक्रेत्याची सही
व परवाना क्रमांक तसेच मुद्रांक विक्रीचे ठिकाण/पत्ता
अनिल स. बनोदे ला. नं. 14/95
फारमसी चौक, गंगार, कोड नं. 4601051

ड.प.

४४३२६ ११/०१/२०२१

दादासाहेब बालपांडे कॉलेज ऑफ फार्मसी
गंगार

३३

-- 2 --

And

Whereas the disposal of such expired and spoiled chemicals create problem of disposal as per prevailing environmental laws

And

Whereas Party No. 2 is an authorized disposable agency and ready to dispose/reuse/recycle the waste provided to them

This agreement witness as under

- 1) The Party No. 1 shall provide all the spoiled and expired chemical waste generated in the college to Party No.2 free of cost.
- 2) The party No. 2 agrees to reuse/recycle/dispose the spoiled and expired chemical waste provided by Party No. 1 as per prevailing environmental law.
- 3) That this agreement is valid for a period of five years from 12th January 2020 to 31st December 2025.

In witness thereof signed by Party No. 1 & Party No. 2.

Witness:

1) [Signature]
(Dr. P. S. Gangare)

2) [Signature]
(M. H. Bish)

[Signature]
13.01.2021
PRINCIPAL Party No. 1
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Party No. 2
[Signature]
N. R. TRADERS
NAGPUR

MOU of Chemical Waste Handling

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**



GSTIN/UIN: 27BMBPR4572A1Z6
N.R. TRADERS
Plot No. 35/8, kunjilalpath, Post. Bhagwan Nagar,
Nagpur - 440027. Mobile No. 8551849316, 9823799854.
Email : niraj.rangan@gmail.com

Date: _____



GSTIN/UIN: 27BMBPR4572A1Z6
N.R. TRADERS

Plot No. 35/8, kunjilalpath, Post. Bhagwan Nagar,
Nagpur - 440027. Mobile No. 8551849316, 9823799854.
Email : niraj.rangan@gmail.com

Date: _____

Certificate of Disposal

This is to certify that, spoiled and expired chemicals received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2017 to 30/06/2018 has been disposed off in environment friendly manner.

Date: 10/07/2018
Place: Nagpur

Authorized Signature

CERTIFICATE OF DISPOSAL

This is to certify that, spoiled and expired chemicals received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2018 to 30/06/2019 has been disposed off in environment friendly manner.

Date: 03/07/19
Place: Nagpur

Authorized Signature

Chemical waste handling certificate for 2017-18 Chemical waste handling certificate for 2018-19



GSTIN/UIN: 27BMBPR4572A1Z6
N.R. TRADERS
Plot No. 35/8, kunjilalpath, Post. Bhagwan Nagar,
Nagpur - 440027. Mobile No. 8551849316, 9823799854
Email : niraj.rangan@gmail.com

Date: _____

CERTIFICATE OF DISPOSAL

This is to certify that, spoiled and expired chemicals received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2019 to 30/06/2020 has been disposed off in environment friendly manner.

Date: 06/07/20
Place: Nagpur

Authorized Signature

Chemical waste handling certificate for 2019-20



महाराष्ट्र MAHARASHTRA

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NAGPUR TREASURY
XT 074331

08 JAN 2021

Stamp Head Clerk / Sr. Clerk

Agreement for Disposal of Broken Glassware Waste

This indenture of agreement is made on 12-January 2021 between Principal, Dadasaheb Balpande College of Pharmacy, Besa, Nagpur (Hereafter Party No.1.) and Vigyan Bharti, Nagpur sole proprietor through Mr. Murlidhar Makde (Hereafter Party No. 2.)

Whereas the Party No. 1, is running Bachelor of Pharmacy & Master of Pharmacy college at Besa, Nagpur. The College is recognized by All India Council of Technical Education, Pharmacy Council of India, Government of Maharashtra and Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

And

Whereas the Party No.1, Dadasaheb Balpande College of Pharmacy students are imparted with Practical and Research activities

And

Whereas Students of pharmacy undergoes various practical's utilizing glasswares, thus institute purchase glasswares in bulk.

And

Whereas during handling many glasswares breaks

P.T.O.

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

फक्त प्रतिज्ञापत्रसाठी (अनुच्छेद-४)
प्रतिज्ञापत्र कोणाकडे सादर करावयाचे
प्रतिज्ञापत्रासाठी कारण
मुद्रांक विकत घेणाऱ्याचे नाव व रहिवाशी पत्ता
मुद्रांक वावतची नोंदवही अनुक्रमांक- /दिनांक
मुद्रांक विकत घेणाऱ्याची सही
परवानाधारक मुद्रांक विक्रेत्याची सही
व परवाना क्रमांक नसेच मुद्रांक विक्रीचे ठिकाण/पत्ता
अनिल स. बनोदे ला. नं. 14/95
राज्य शाळा चौक, नागपूर, कोड नं. 4601051

प.प.
४४३२५ ११/०१/२०२१
दादासाहेब बालपान्दे कॉलेज ऑफ फार्मसी
नागपूर

-- 2 --

And

Whereas the disposal of such broken glasswares create problem of disposal as per prevailing environmental laws

And

Whereas Party No. 2 is an authorized disposable agency and ready to dispose/reuse/recycle the waste provided to them

This agreement witness as under

- 1) The Party No. 1 shall provide all the broken glassware waste generated in the college to Party No.2 free of cost.
- 2) The party No. 2 agrees to reuse/recycle/dispose the spoiled and expired chemical waste provided by Party No. 1 as per prevailing environmental law.
- 3) That this agreement is valid for a period of five years from 1st January 2020 to 31st December 2025.

In witness thereof signed by Party No. 1 & Party No. 2.

Witness:

1) Dr. P. K. Gangane

2) T. H. Bisen
(T. H. Bisen)

Mahajan
Party No. 1
PRINCIPAL
DADASAHEB BALPANDE COLLEGE
OF PHARMACY, BESA, NAGPUR - 37

Party No. 2
VIGYAN BHARATI
Proprietor

MOU of Glassware Waste Handling

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

VAT TIN 27130181703 V WEF 01-04-2006
VAT TIN 27130181703 C WEF 01-04-2006

☎ : 0712-2444264
Mob. - 9422815076

VIGYAN BHARATI

:- DEALERS IN :-
Chemicals, Instrument, Labwares And all kinds of educational aids.
19-A, Amaltash Enclave, Nelco Society, Main Road, Trimurti Nagar, Nagpur - 440 022. E-mail : vgyanbharati07@gmail.com

No. _____ Date : _____

Certificate of Disposal

This is to certify that, broken glassware received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2017 to 30/06/2018 has been disposed off in environment friendly manner.

Date: 16/07/18
Place: Nagpur

Authorized Signature
VIGYAN BHARATI
Proprietor

VAT TIN 27130181703 V WEF 01-04-2006
VAT TIN 27130181703 C WEF 01-04-2006

☎ : 0712-2444264
Mob. - 9422815076

VIGYAN BHARATI

:- DEALERS IN :-
Chemicals, Instrument, Labwares And all kinds of educational aids.
19-A, Amaltash Enclave, Nelco Society, Main Road, Trimurti Nagar, Nagpur - 440 022. E-mail : vgyanbharati07@gmail.com

No. _____ Date : _____

Certificate of Disposal

This is to certify that, broken glassware received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2018 to 30/06/2019 has been disposed off in environment friendly manner.

Date: 02/07/19
Place: Nagpur

Authorized Signature
VIGYAN BHARATI
Proprietor

Glassware waste handling certificate for 2017-18 Glassware waste handling certificate for 2018-19

VAT TIN 27130181703 V WEF 01-04-2006
VAT TIN 27130181703 C WEF 01-04-2006

☎ : 0712-2444264
Mob. - 9422815076

VIGYAN BHARATI

:- DEALERS IN :-
Chemicals, Instrument, Labwares And all kinds of educational aids.
19-A, Amaltash Enclave, Nelco Society, Main Road, Trimurti Nagar, Nagpur - 440 022. E-mail : vgyanbharati07@gmail.com

No. _____ Date : _____

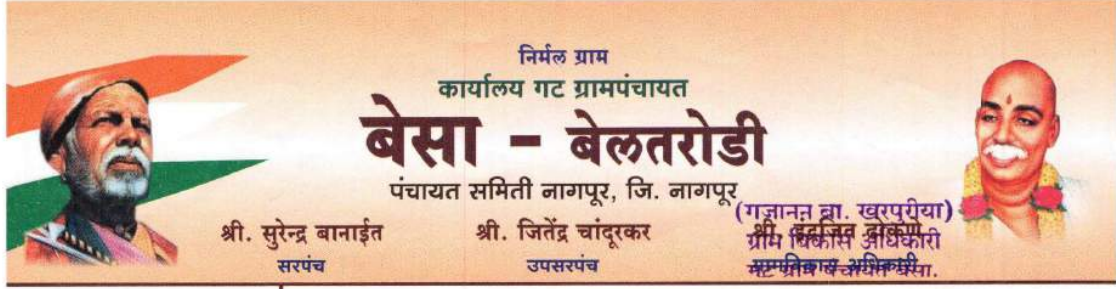
Certificate of Disposal

This is to certify that, broken glassware received from Dadasaheb Balpande College of Pharmacy, Besa, Nagpur during the period from 01/07/2019 to 30/06/2020 has been disposed off in environment friendly manner.

Date: 06/07/20
Place: Nagpur

Authorized Signature
VIGYAN BHARATI
Proprietor

Glassware waste handling certificate for 2019-20



* सभासद *

श्री. रमेश अतकरे	- सदस्य
श्री. गजानन बानार्ईत	- सदस्य
श्री. सुनील सोनटक्के	- सदस्य
श्री. उमेश भलमे	- सदस्य
श्री. मुकेश काळे	- सदस्य
श्री. अविनाश उदावंत	- सदस्य
सौ. माधवी राजुरकर	- सदस्या
सौ. नंदा इंगळे	- सदस्या
सौ. सिमा गडपांडे	- सदस्या
सौ. शालिनी कंगाली	- सदस्या
सौ. अनिता कडू	- सदस्या
सौ. सिमा त्रिनगरीवार	- सदस्या
सौ. कल्पना सुके	- सदस्या
सौ. गंगा गोलहर	- सदस्या
सौ. दिपीका चव्हाण	- सदस्या
सौ. लता इंगळे	- सदस्या

जावक क्र.



प्रमाणपत्र

सरपंच गट ग्रामपंचायत कार्यालय बेसा कडून प्रमाणपत्र देण्यात येते की, ग्रामपंचायत बेसा अंतर्गत मौजा बेसा येथिल दादासाहेब बालपांडे कॉलेज ऑफ फार्मसी या महाविद्यालयातील साधा कचरा ग्रामपंचायतच्या कचरा गाडी मार्फत गोळा केला जातो.

करिता सबब प्रमाणपत्र देण्यात येत आहे.


सरपंच
गट ग्राम पंचायत बेसा

Annexure –XIV: Awareness / Posters



Harit Sena certificate awarded by Govt. of Maharashtra

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



AICTE – CII Survey Certificate

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Cleanliness Drive at Indra Gandhi Medical College and Hospital, Nagpur on 9th July 2017.



Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Awareness Rally on Swine Flu and Dengue at Besa Grampanchayat and Manish Nagar, Nagpur on 25th September 2017.



Cleanliness Drive at Besa Grampanchayat, Nagpur on 2nd October 2017.

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Health Check-up Camp at Besa and Ghogli Grampanchayat, Nagpur on 2nd October 2017



Health Awareness Campaign Velahari Grampanchayat, Nagpur from 26th February 2018 to 1st March 2018

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Cleanliness Drive under Swachha Bharat Abhiyan at Besa – Beltarodi Grampanchayat, Nagpur on 24th August 2019.



Display Board in college

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



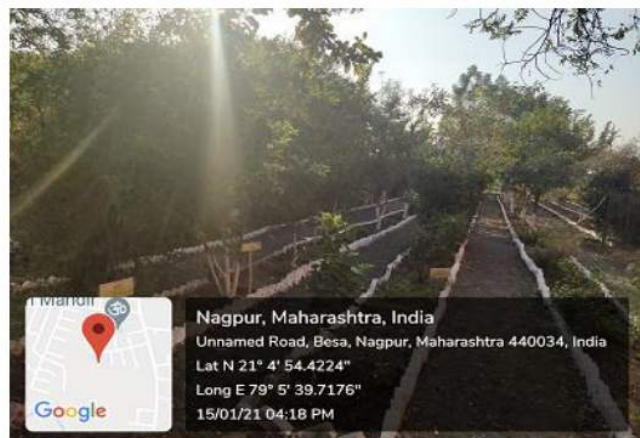
Posters in college



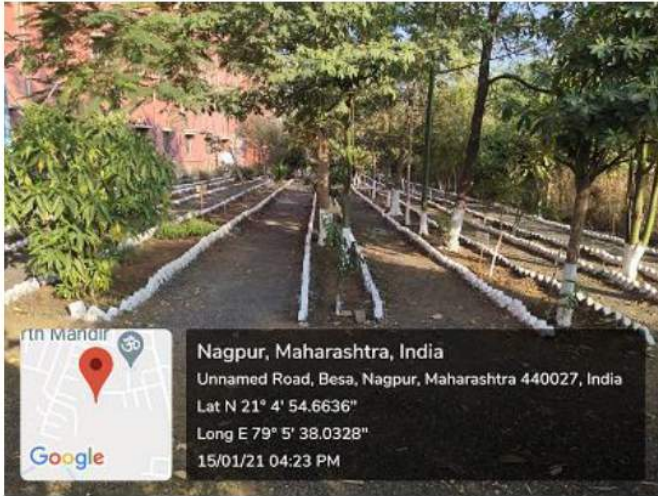
Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Fully grown trees in the college campus



**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**



Medicinal Garden in the college



Diesel Generator in college

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Annexure –XV: Onsite Measurements (Sample Pictures)

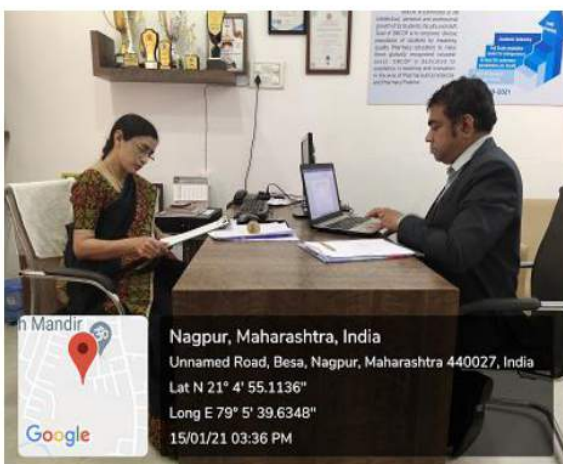


Onsite measurements taken by Green Audit Team

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Energy Audit measurements



Green Audit Team interviewing the Principal

Green Audit Team interviewing the staff members

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



Certificate of Verified Carbon Unit (VCU) Retirement

Verra, in its capacity as administrator of the Verra Registry, does hereby certify that on 06 Jan 2021, 45 Verified Carbon Units (VCUs) were retired on behalf of:

Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy, Besa, Nagpur

Project name:

Bundled Wind Power Project by Giriraj Enterprises

VCU serial number:

6402-319472466-319472510-VCU-029-MER-IN-1-1669-01012017-28022017-0

Additional Certifications:

Additional details on this retirement can be found on the Verra Registry.

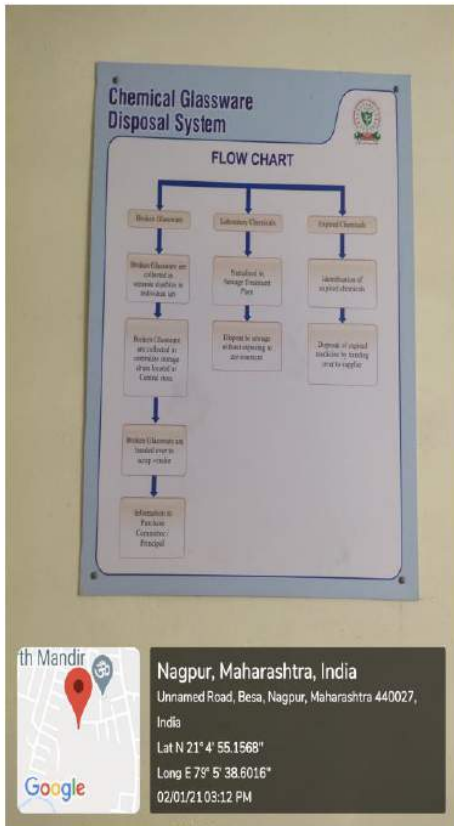


Fire Extinguisher system in college

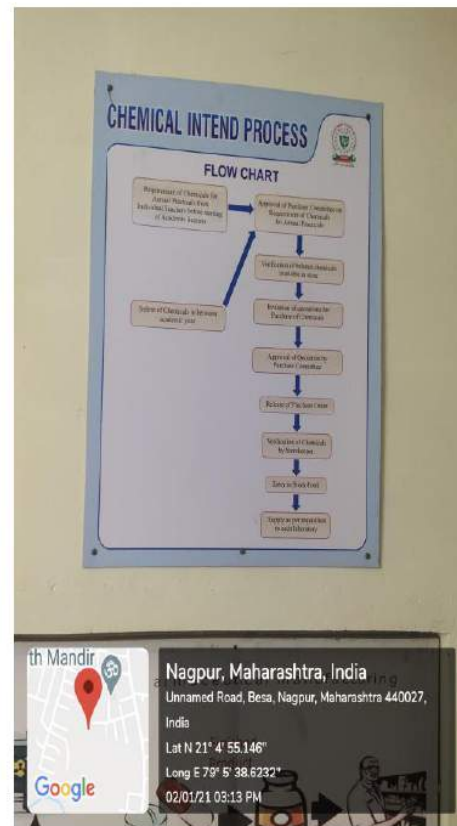


Fire Extinguishers in college

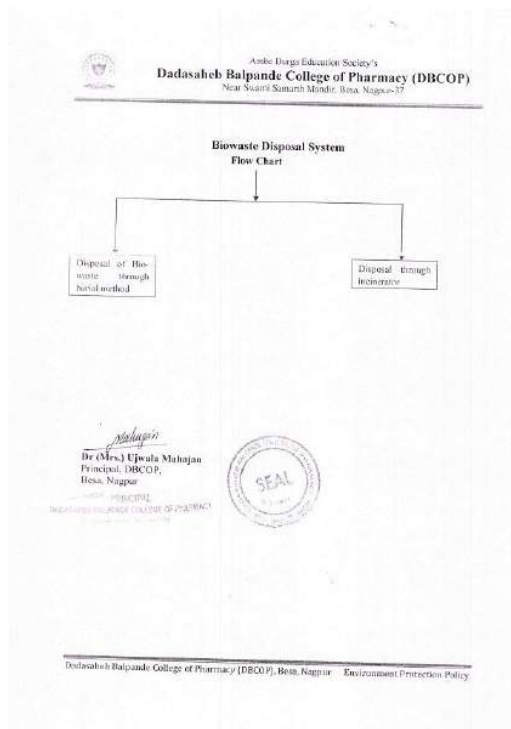
Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur



SOP for Glassware Handling



SOP for Chemical Intend Process



SOP for Bio Waste Disposal

Annexure –XVI: Energy Audit Report

Table 1 : FOLLOWING TABLE SHOW VOLTAGE, CURRENT AND POWER

TIME	VOLTAGE SINGLE PHASE			VOLTAGE LINE TO LINE			CURRENT			POWER		
	R	Y	B	RY	YB	BR	R	Y	B	R	Y	B
11:24:32 AM	246	247	256	426	436	436	12.5	7.5	4.8	2.971609	1.691735	1.148915
11:25:00 AM	246	247	257	426	436	437	11.5	8.7	5.0	2.699195	2.013476	1.181549
11:25:30 AM	246	247	257	426	436	437	11.6	12.8	5.0	2.721469	3.059117	1.17876
11:26:00 AM	246	246	257	426	436	436	12.0	13.1	5.0	2.829362	3.150911	1.183598
11:26:30 AM	246	247	257	426	436	437	12.3	13.0	5.0	2.901875	3.124789	1.187113
11:27:00 AM	246	247	257	426	436	436	12.2	13.0	5.3	2.878329	3.128567	1.252337
11:27:30 AM	246	247	257	427	437	437	12.4	8.9	5.2	2.93086	2.040642	1.230922
11:28:00 AM	246	247	257	427	437	437	12.7	7.7	5.1	3.01785	1.742602	1.203044
11:28:30 AM	247	247	257	427	437	437	11.1	8.1	5.0	2.652543	1.850496	1.187374
11:29:00 AM	247	248	257	427	437	437	11.9	8.3	5.4	2.82906	1.894498	1.253125
11:29:30 AM	247	247	257	427	437	437	12.4	9.6	6.5	2.933041	2.163668	1.473789
11:30:00 AM	247	248	257	427	437	437	12.3	7.1	5.0	2.922208	1.583002	1.191522
11:30:30 AM	246	247	257	427	437	437	11.9	9.3	6.4	2.823392	2.118964	1.429081
11:31:00 AM	247	248	257	427	437	437	12.3	8.6	6.5	2.900289	1.955959	1.460666

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

TIME	VOLTAGE SINGLE PHASE			VOLTAGE LINE TO LINE			CURRENT			POWER		
	R	Y	B	RY	YB	BR	R	Y	B	R	Y	B
11:31:30 AM	247	248	258	427	438	438	12.2	7.8	4.9	2.890474	1.78984	1.164785
11:32:00 AM	247	248	258	428	437	438	11.3	10.7	4.9	2.6951	2.477247	1.161806
11:32:30 AM	247	247	258	427	437	437	11.4	12.6	4.1	2.72134	3.027135	0.928058
11:33:00 AM	247	248	257	428	438	437	11.3	6.8	4.2	2.671984	1.500995	0.958301
11:33:30 AM	247	248	257	428	437	437	13.0	7.0	4.2	3.080564	1.571486	0.943916
11:34:00 AM	247	248	257	428	438	437	12.8	6.7	5.0	3.015687	1.472412	1.086443
11:34:30 AM	247	248	257	428	438	438	11.8	6.5	4.3	2.79812	1.393534	0.950572
11:35:00 AM	247	248	257	428	438	437	11.3	7.0	4.6	2.662075	1.572363	1.037405
11:35:30 AM	247	248	258	429	438	438	11.8	6.4	4.0	2.781766	1.400479	0.905635
11:36:00 AM	247	248	258	428	438	438	11.6	9.7	4.0	2.748125	2.140363	0.900493
11:36:30 AM	247	247	258	428	438	438	11.4	11.9	3.9	2.692657	2.858092	0.886989
11:37:00 AM	247	248	258	428	438	438	11.8	11.7	4.6	2.782327	2.750814	0.992825
11:37:30 AM	247	248	258	428	438	438	12.6	6.8	4.6	2.957807	1.47914	1.004844
11:38:00 AM	247	248	258	428	438	438	11.9	7.1	4.2	2.813168	1.57145	0.929062
11:38:30 AM	247	248	257	428	438	438	12.4	6.6	4.4	2.91975	1.466425	1.005125
11:39:00 AM	247	248	257	428	437	437	11.5	7.2	4.3	2.696439	1.609217	0.989482
11:39:30 AM	247	248	257	428	437	437	11.6	6.6	4.1	2.722045	1.463767	0.935962
11:40:00 AM	247	248	258	427	438	438	12.0	6.8	3.8	2.810792	1.533642	0.856698
11:40:30 AM	246	248	257	427	437	437	12.3	7.1	4.5	2.884835	1.589906	1.006288

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

TIME	VOLTAGE SINGLE PHASE			VOLTAGE LINE TO LINE			CURRENT			POWER		
	R	Y	B	RY	YB	BR	R	Y	B	R	Y	B
11:41:00 AM	247	248	258	428	438	438	11.8	6.8	3.8	2.783625	1.530824	0.853948
11:41:30 AM	247	248	258	428	438	438	11.7	6.4	3.7	2.761743	1.385162	0.850801
11:42:00 AM	247	248	258	428	438	438	12.8	8.3	5.5	3.003583	1.798684	1.168946
11:42:30 AM	247	247	258	428	437	438	11.3	11.8	3.7	2.660934	2.829632	0.842703
11:43:00 AM	247	248	257	428	438	438	11.1	7.3	3.7	2.615941	1.606121	0.845543
11:43:30 AM	247	248	257	428	438	438	11.1	6.5	3.7	2.603631	1.423261	0.847544
11:44:00 AM	247	248	257	428	438	438	11.2	6.1	3.7	2.625779	1.330377	0.844114
11:44:30 AM	247	248	257	428	437	438	11.1	6.9	3.7	2.620276	1.551502	0.844201
11:45:00 AM	247	248	257	428	437	438	11.1	6.2	3.7	2.61204	1.337199	0.845591
11:45:30 AM	247	248	257	428	437	438	11.1	6.7	3.7	2.606534	1.491678	0.845019
11:46:00 AM	247	248	258	428	438	438	11.1	6.2	3.7	2.627226	1.367512	0.847641
11:46:30 AM	247	248	258	428	437	438	10.9	6.8	3.7	2.567879	1.522237	0.846038
11:47:00 AM	247	247	257	427	437	438	10.8	6.5	3.7	2.539098	1.429829	0.846458
11:47:30 AM	247	247	257	426	436	438	10.8	8.3	3.7	2.528999	1.805614	0.849066
11:48:00 AM	247	247	258	427	436	438	11.2	11.3	4.0	2.63375	2.703326	0.908158
11:48:30 AM	247	247	257	427	437	438	11.5	8.1	4.6	2.703787	1.790972	1.026699
11:49:00 AM	247	247	257	427	437	437	13.0	8.4	7.2	2.980334	1.832172	1.458438
11:49:30 AM	247	247	257	427	437	437	11.8	6.5	4.1	2.77078	1.415829	0.924515
11:50:00 AM	247	247	257	427	437	437	11.7	9.3	3.7	2.761342	2.107875	0.846189

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

TIME	VOLTAGE SINGLE PHASE			VOLTAGE LINE TO LINE			CURRENT			POWER		
	R	Y	B	RY	YB	BR	R	Y	B	R	Y	B
11:50:30 AM	247	247	257	427	437	437	11.4	11.5	3.7	2.707301	2.759465	0.844695
11:51:00 AM	247	247	257	428	437	437	10.9	10.4	3.7	2.571641	2.443642	0.846899
11:51:30 AM	247	248	257	428	437	437	11.0	6.0	3.8	2.600583	1.318613	0.850448
11:52:00 AM	247	248	257	428	437	437	10.9	6.8	3.7	2.573937	1.498356	0.843903
11:52:30 AM	247	248	257	427	437	437	11.5	6.8	5.3	2.683874	1.455762	1.060202
11:53:00 AM	247	247	257	427	436	437	12.2	8.1	6.2	2.81825	1.805868	1.234586
11:53:30 AM	247	247	257	427	437	437	10.9	6.0	3.7	2.567034	1.285149	0.843133
11:54:00 AM	247	248	257	427	437	437	13.2	7.7	5.6	3.112187	1.714879	1.183268
11:54:30 AM	247	248	257	428	438	438	10.8	6.5	3.7	2.55052	1.421171	0.841586
11:55:00 AM	247	248	257	428	438	437	10.7	7.5	3.6	2.526741	1.642649	0.830166
11:55:30 AM	247	247	258	428	437	438	10.7	10.7	3.6	2.543071	2.563003	0.823613
11:56:00 AM	247	248	258	428	437	438	10.7	10.1	3.7	2.531948	2.24618	0.836163
11:56:30 AM	247	248	258	428	438	438	10.7	6.4	3.7	2.538362	1.392868	0.83226
11:57:00 AM	247	248	258	428	438	438	10.8	6.4	3.7	2.56677	1.41399	0.832341
11:57:30 AM	247	248	257	428	438	438	12.7	8.4	8.4	2.912794	1.829993	1.70062
11:58:00 AM	247	249	258	429	439	439	10.9	6.4	5.0	2.591887	1.410397	1.102804
11:58:30 AM	248	249	258	429	439	439	11.6	6.6	4.9	2.762236	1.470458	1.0899
11:59:00 AM	248	249	258	430	440	439	11.6	6.4	4.9	2.751406	1.418659	1.096304
11:59:30 AM	248	249	258	429	439	439	11.4	6.8	5.7	2.715529	1.509406	1.256747

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

TIME	VOLTAGE SINGLE PHASE			VOLTAGE LINE TO LINE			CURRENT			POWER		
	R	Y	B	RY	YB	BR	R	Y	B	R	Y	B
12:00:00 PM	248	249	258	429	439	439	10.8	6.1	4.9	2.576005	1.30138	1.09051
12:00:30 PM	248	249	258	430	439	439	10.9	9.7	4.9	2.594826	2.189553	1.084986
12:01:00 PM	248	248	259	430	439	439	11.1	17.3	4.8	2.645279	4.199876	1.080646
12:01:30 PM	248	248	259	429	438	439	11.0	18.3	4.8	2.610714	4.430956	1.077039
12:02:00 PM	248	248	259	429	439	439	11.0	13.6	4.8	2.61916	3.243954	1.077596
12:02:30 PM	248	249	258	429	439	439	11.1	10.9	4.9	2.62803	2.430466	1.0793

Table 2: Following Table show Voltage and Current Harmonic Distortion

Voltage Distortion			Current Distortion		
R	Y	B	R	Y	B
12.5	7.5	4.8	1.9	2.0	1.7
11.5	8.7	5.0	1.9	2.0	1.8
11.6	12.8	5.0	1.9	2.0	1.7
12.0	13.1	5.0	2.0	2.1	1.8
12.3	13.0	5.0	2.0	2.1	1.8
12.2	13.0	5.3	1.9	2.0	1.7
12.4	8.9	5.2	2.0	2.1	1.8
12.7	7.7	5.1	2.0	2.1	1.8
11.1	8.1	5.0	1.9	2.0	1.7
11.9	8.3	5.4	2.0	2.1	1.8
12.4	9.6	6.5	2.0	2.0	1.7
12.3	7.1	5.0	2.1	2.1	1.8
11.9	9.3	6.4	2.0	2.0	1.7
12.3	8.6	6.5	2.0	2.0	1.7
12.2	7.8	4.9	2.0	2.1	1.8
11.3	10.7	4.9	2.1	2.1	1.9
11.4	12.6	4.1	2.0	2.1	1.8
11.3	6.8	4.2	2.0	2.1	1.8
13.0	7.0	4.2	2.0	2.1	1.8

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Voltage Distortion			Current Distortion		
R	Y	B	R	Y	B
12.8	6.7	5.0	2.0	2.0	1.7
11.8	6.5	4.3	2.1	2.1	1.8
11.3	7.0	4.6	2.0	2.1	1.8
11.8	6.4	4.0	2.1	2.1	1.8
11.6	9.7	4.0	2.1	2.1	1.8
11.4	11.9	3.9	2.1	2.1	1.8
11.8	11.7	4.6	2.0	2.0	1.7
12.6	6.8	4.6	2.0	2.0	1.8
11.9	7.1	4.2	2.1	2.1	1.9
12.4	6.6	4.4	2.1	2.1	1.9
11.5	7.2	4.3	2.1	2.1	1.8
11.6	6.6	4.1	2.1	2.1	1.8
12.0	6.8	3.8	2.2	2.2	1.9
12.3	7.1	4.5	2.2	2.2	1.9
11.8	6.8	3.8	2.1	2.1	1.9
11.7	6.4	3.7	2.1	2.1	1.8
12.8	8.3	5.5	2.1	2.1	1.8
11.3	11.8	3.7	2.1	2.2	1.9
11.1	7.3	3.7	2.0	2.1	1.8
11.1	6.5	3.7	2.0	2.1	1.9
11.2	6.1	3.7	2.0	2.1	1.8

Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College of Pharmacy (DBCOP), Besa, Nagpur

Voltage Distortion			Current Distortion		
R	Y	B	R	Y	B
11.1	6.9	3.7	2.1	2.2	1.9
11.1	6.2	3.7	2.1	2.2	1.9
11.1	6.7	3.7	2.1	2.1	1.8
11.1	6.2	3.7	2.1	2.2	1.9
10.9	6.8	3.7	2.1	2.2	1.9
10.8	6.5	3.7	2.3	2.4	1.9
10.8	8.3	3.7	2.3	2.3	1.9
11.2	11.3	4.0	2.0	2.1	1.8
11.5	8.1	4.6	2.0	2.1	1.8
13.0	8.4	7.2	1.9	2.1	1.7
11.8	6.5	4.1	2.0	2.1	1.8
11.7	9.3	3.7	2.1	2.2	1.9
11.4	11.5	3.7	2.1	2.2	1.9
10.9	10.4	3.7	2.0	2.1	1.8
11.0	6.0	3.8	2.0	2.1	1.8
10.9	6.8	3.7	2.1	2.2	1.9
11.5	6.8	5.3	2.1	2.2	1.9
12.2	8.1	6.2	2.0	2.1	1.8
10.9	6.0	3.7	2.0	2.1	1.8
13.2	7.7	5.6	2.1	2.2	1.8
10.8	6.5	3.7	2.1	2.2	1.9

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Voltage Distortion			Current Distortion		
R	Y	B	R	Y	B
10.7	7.5	3.6	2.1	2.2	1.9
10.7	10.7	3.6	2.1	2.2	1.9
10.7	10.1	3.7	2.1	2.2	1.9
10.7	6.4	3.7	2.0	2.1	1.8
10.8	6.4	3.7	1.9	2.0	1.7
12.7	8.4	8.4	1.8	1.9	1.6
10.9	6.4	5.0	2.0	2.0	1.7
11.6	6.6	4.9	1.9	2.0	1.7
11.6	6.4	4.9	1.8	2.0	1.7
11.4	6.8	5.7	1.8	1.9	1.6
10.8	6.1	4.9	1.9	2.0	1.7
10.9	9.7	4.9	2.0	2.1	1.8
11.1	17.3	4.8	1.9	2.0	1.7
11.0	18.3	4.8	1.9	2.0	1.7
11.0	13.6	4.8	1.9	2.0	1.7
11.1	10.9	4.9	1.9	2.0	1.7

Table 3: FOLOWING TABLE SHOWS POWER FACTOR

Power Factor PF_R	Power Factor PF_Y	Power Factor PF_B	Power Factor PF_Total_AVG
0.964	0.908	0.929	0.871
0.953	0.933	0.923	0.890
0.953	0.969	0.920	0.893
0.953	0.974	0.920	0.893
0.958	0.972	0.921	0.894
0.957	0.973	0.916	0.899
0.961	0.930	0.920	0.889
0.964	0.917	0.917	0.875
0.967	0.925	0.919	0.895
0.964	0.925	0.899	0.890
0.962	0.909	0.882	0.893
0.961	0.904	0.919	0.870
0.960	0.920	0.873	0.894
0.959	0.916	0.868	0.889
0.962	0.923	0.919	0.880
0.966	0.936	0.918	0.893
0.964	0.975	0.883	0.880
0.958	0.886	0.882	0.851

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Power Factor PF_R	Power Factor PF_Y	Power Factor PF_B	Power Factor PF_Total_AVG
0.960	0.904	0.883	0.839
0.952	0.881	0.845	0.836
0.956	0.870	0.864	0.835
0.957	0.906	0.868	0.863
0.954	0.883	0.879	0.835
0.954	0.885	0.877	0.847
0.956	0.970	0.878	0.874
0.952	0.948	0.836	0.868
0.951	0.875	0.841	0.831
0.954	0.898	0.863	0.844
0.952	0.895	0.884	0.840
0.952	0.907	0.884	0.857
0.953	0.894	0.880	0.844
0.953	0.908	-0.878	0.838
0.952	0.900	0.870	0.846
0.954	0.904	-0.883	0.839
0.953	0.872	-0.886	0.828
0.950	0.874	0.827	0.847
0.952	0.971	-0.885	0.870
0.951	0.890	-0.886	0.844

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Power Factor PF_R	Power Factor PF_Y	Power Factor PF_B	Power Factor PF_Total_AVG
0.950	0.876	-0.886	0.836
0.952	0.884	-0.884	0.833
0.954	0.902	-0.883	0.846
0.953	0.873	-0.884	0.833
0.951	0.903	-0.884	0.844
0.955	0.886	-0.884	0.837
0.953	0.899	-0.883	0.847
0.951	0.890	-0.885	0.843
0.951	0.879	-0.885	0.846
0.955	0.968	0.891	0.878
0.952	0.899	0.858	0.859
0.929	0.877	0.784	0.844
0.956	0.877	0.887	0.838
0.957	0.916	-0.883	0.854
0.959	0.971	-0.881	0.873
0.959	0.949	-0.882	0.870
0.958	0.883	-0.883	0.839
0.958	0.890	-0.884	0.847
0.943	0.862	0.785	0.832
0.938	0.906	0.777	0.851

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Power Factor PF_R	Power Factor PF_Y	Power Factor PF_B	Power Factor PF_Total_AVG
0.958	0.873	-0.885	0.836
0.953	0.897	0.821	0.848
0.960	0.887	-0.886	0.846
0.959	0.887	-0.889	0.851
0.960	0.965	-0.890	0.875
0.960	0.895	-0.885	0.851
0.958	0.878	-0.884	0.842
0.961	0.889	-0.880	0.844
0.928	0.878	0.790	0.852
0.959	0.885	0.862	0.861
0.960	0.897	0.858	0.857
0.958	0.890	0.859	0.853
0.958	0.892	0.847	0.866
0.959	0.858	0.860	0.851
0.957	0.903	0.860	0.871
0.959	0.981	0.861	0.861
0.959	0.977	0.862	0.851
0.958	0.958	0.861	0.874
0.956	0.895	0.861	0.863

Figure 1 : FOLLOWING FIGURE SHOW ENERGY STUDY

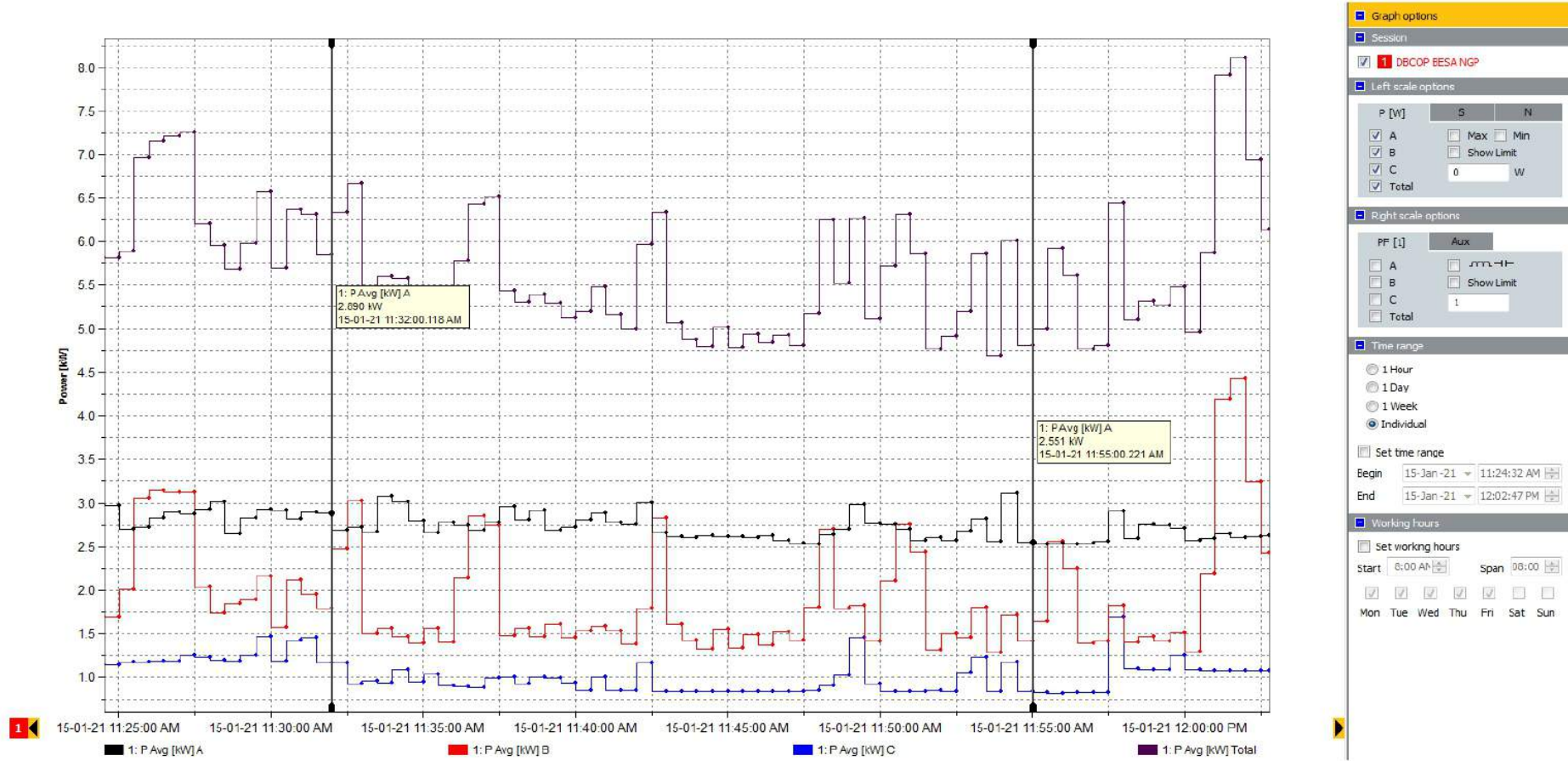


Figure 2: FOLLOWING FIGURE SHOW VOLTAGE HARMONIC

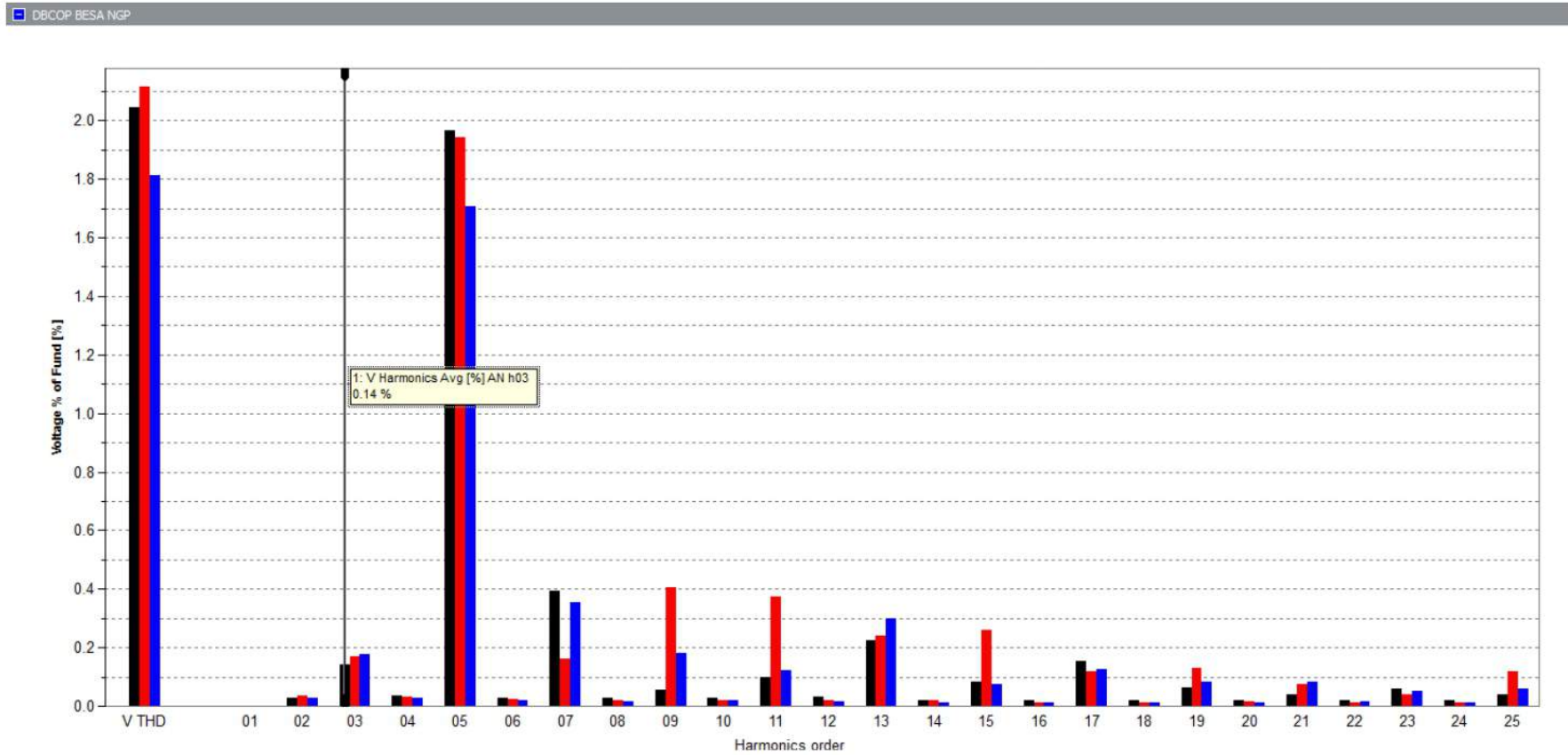
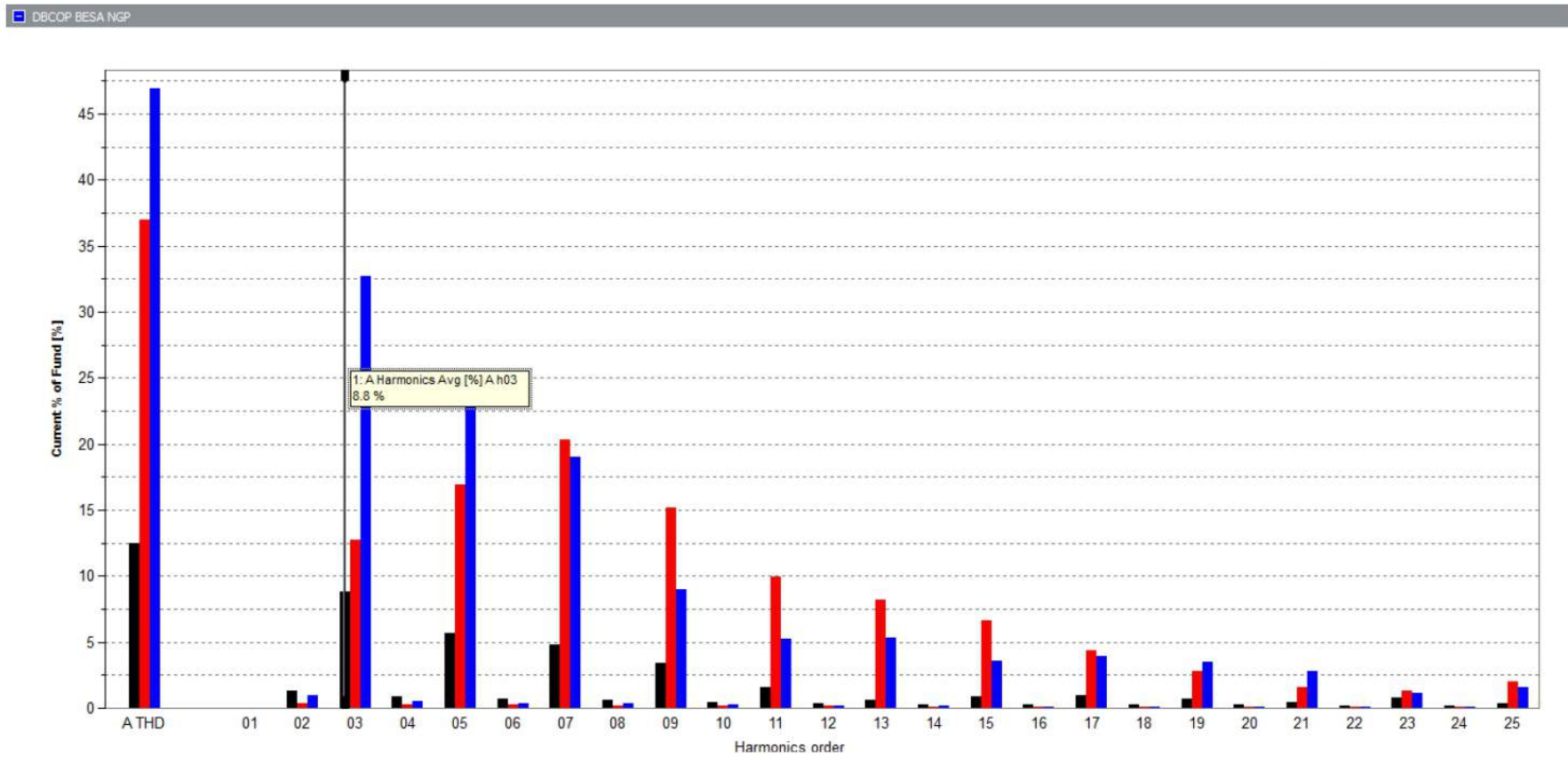


Figure 3: FOLLOWING FIGURE SHOW CURRENT HARMONIC



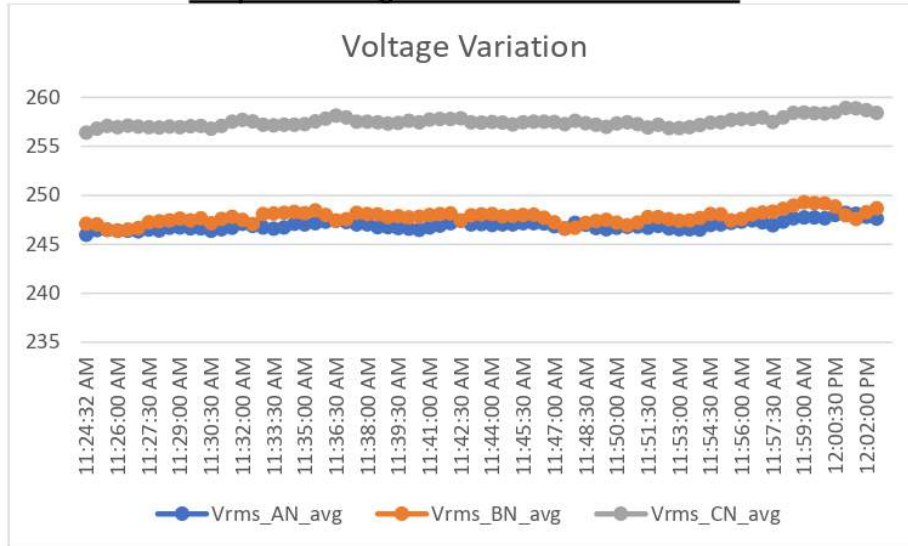
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All electrical parameters for main feeder were logged using electrical data logger.

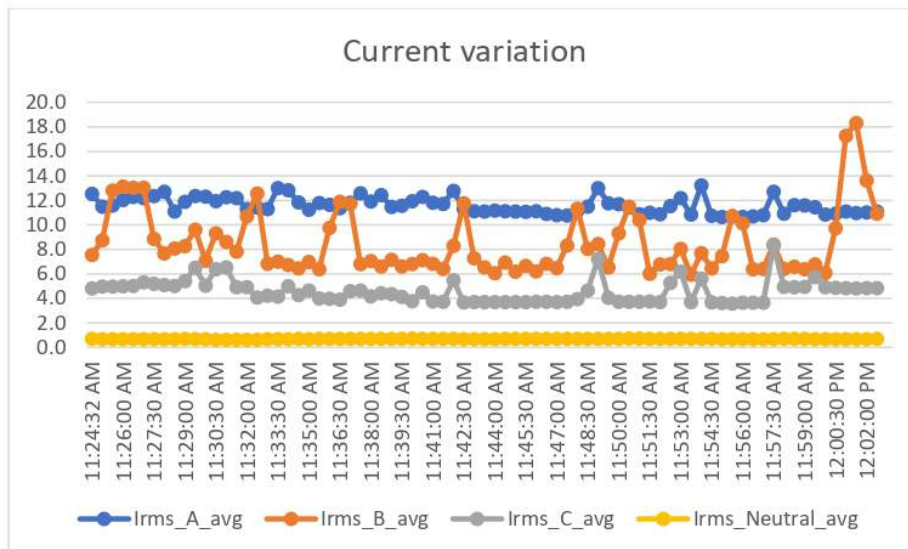
The logging was conducted on 15th January 2021 and all the electrical parameters were recorded at 30 seconds intervals. The cycle was logged during day time at normal college working day.

Below are variations observed during from the measurement.

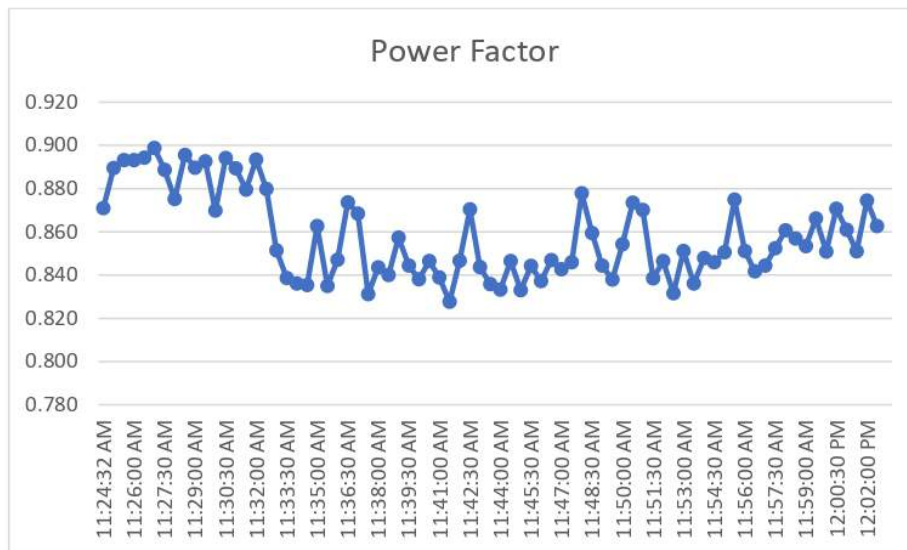
Graph 1. Voltage Variation at Main Feeder



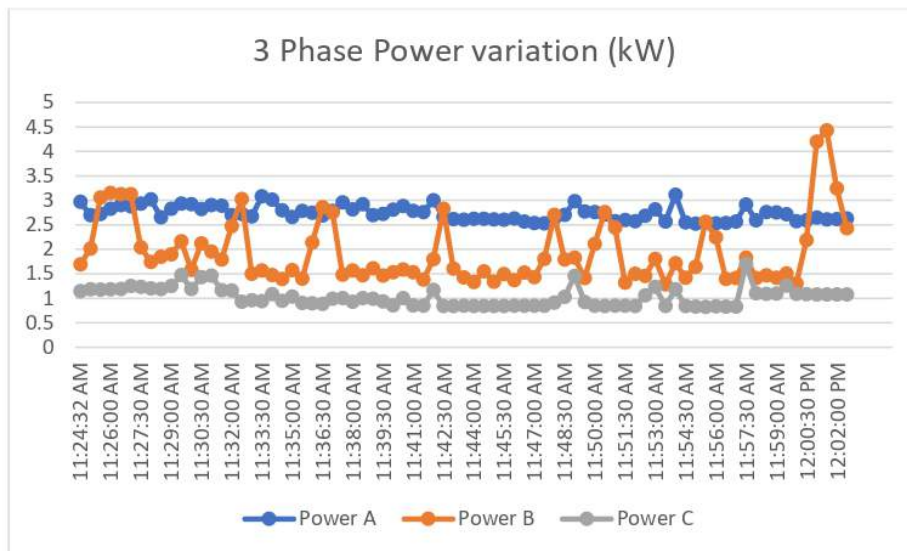
Graph 2. Current Variation at Main feeder



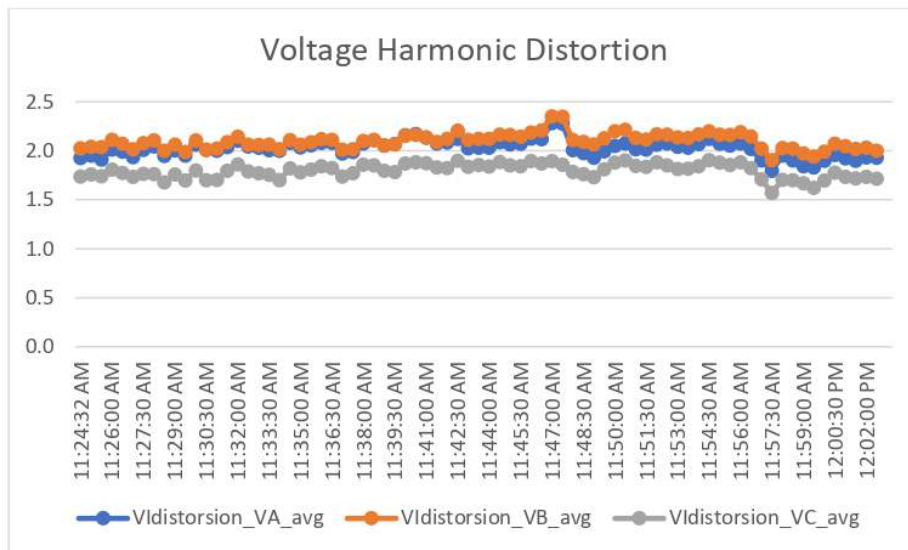
Graph 3. Power Factor Variation at Main Feeder



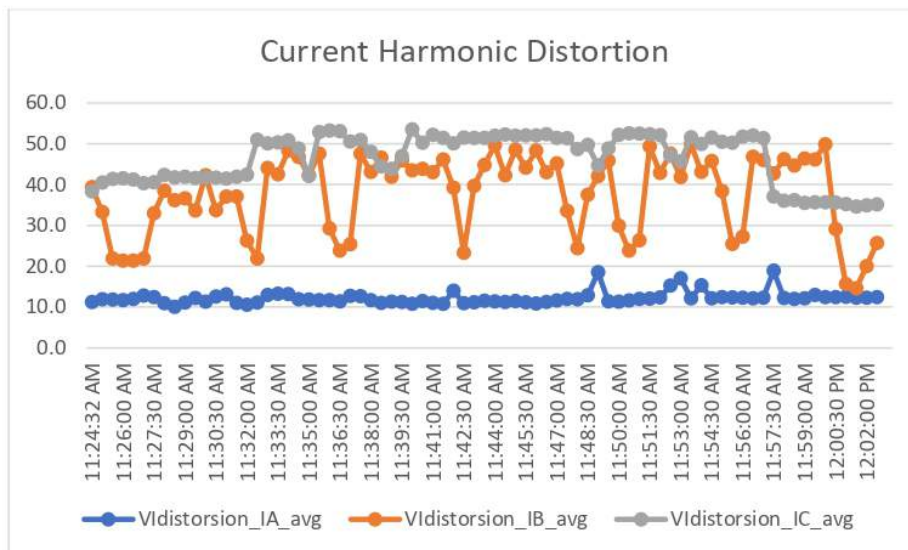
Graph 4. Power Variation at Main Feeder



Graph 5. Voltage Harmonic Distortion at Main Feeder



Graph 6. Current Harmonic Distortion at Main Feeder



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The following table gives the results of Voltage and Current data logging for main Feeder.

	Voltage			Current			Power Factor	Active Power
	Volts			Amperes				
	R	Y	B	R	Y	B		kW
Minimum	246.0	246.4	256.4	10.7	6.0	3.6	0.8	6.74
Average	247.0	247.8	257.5	11.6	8.5	4.6	0.9	7.44
Maximum	248.2	249.3	258.9	13.2	18.3	8.4	0.9	8.39

Observations for Main Feeder Logging:

- Power requirement of the complete facility varies between 10 kW to 20 kW during day time maximum power requirement went to about 19.55 kW.
- The Voltage Variation is between prescribed tolerance limits. However the voltage is on higher end. The average measured voltage is 247 Volts. The voltage is balanced through the all phases. The voltage can be reduced to 230 volts using a voltage stabilizer. As voltage is function of power. Reduction in voltage can help in reducing power/energy consumption. Although the savings are less but this will lead to good number over long period. Also life of equipment's is not hampered.
- There is unbalance in current distribution. The unbalance in 3 phases is around 10 – 15 % which is on higher end. The unbalance in network was recorded due to improper distribution of load. It is recommend that the single phase loads on each phase to be distributed properly so that the current in each phase will be balanced. Unbalanced network can cause three-phase motors and other three-phase loads to experience poor performance or premature failure because of the following: Mechanical stresses in motors due to lower than normal torque output. Higher than normal current in motors and three-phase rectifiers.
- The facility has poor power factor levels having an average power factor maintained at 0.9. Installation of Automatic Power Factor Corrector, will maintain the power factor at unity. There is huge variation in power factor due to switching loads.

Energy Billing Saving Opportunity by Improving Power Factor:

- The present power factor maintained on average is **0.9**. There is penalty imposed by MSEDCL for not maintaining power factor above 0.90. There is also incentive provide by MSEDCL for maintaining power factor to unity i.e. 1. Previously MSEDCL used to charge consumer based on kWh whereas on they'll be charging based on KVAh i.e. (Active Power (kWh) + Reactive Power (kVARh)). The reactive power occupies the capacity of electricity network and reduces the useful capacity of the system for generation and distribution. The source of the most reactive currents is the poor power factor loads (equipment) connected at the consumer premises. As these loads are not compensated by appropriate capacitor installations by consumers,

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utilities are burdened for installation of capacitors. It is thus imperative that every section of consumers has to shoulder their responsibility to maintain the system PF within permissible limits only.

- Apart from this, the prime objective of the kVAh billing is to encourage the consumers to maintain near unity Power factor to achieve loss reduction, improve system stability, power quality and improve voltage profile. At the national level, emphasis is being given on energy conservation, energy efficiency and Demand Side Management (DSM) and green energy solutions to optimize the energy usage. By kVAh billing, the consumers will be encouraged to adopt energy efficiency programs and will be benefited by reduced electricity bills.
- Capacitor required for maintaining power factor near unity- 3.45 kVAr. Install 5kVAr capacity into two steps for maintaining power factor near unity.
- Approximate cost of capacitor with installation = Rs. 5000.00

Harmonic Analysis

What is harmonics?

- In an ideal power system, the voltage supplied to customer equipment, and the resulting load current are perfect sine waves. In practice, however, conditions are never ideal, so these waveforms are often quite distorted. This deviation from perfect sinusoids is usually expressed in terms of harmonic distortion of the voltage and current waveforms.
- Power system harmonic distortion is not a new phenomenon - efforts to limit it to acceptable proportions have been a concern of power engineers from the early days of utility systems. At that time, the distortion was typically caused by the magnetic saturation of transformers or by certain industrial loads, such as arc furnaces or arc welders. The major concerns were the effects of harmonics on synchronous and induction machines, telephone interference, and power capacitor failures. In the past, harmonic problems could often be tolerated because equipment was of conservative design and grounded wye-delta transformer connections were used judiciously.
- Distortions of the fundamental sinusoid generally occur in multiples of the fundamental frequency. Thus on a 50 Hz power system, a harmonic wave is a sinusoid having a frequency expressed by the following formula, where n is an integer:
 $f_{\text{harmonics}} = n * 50\text{Hz}$.

What are Sources of Harmonics?

- Harmonics are caused by nonlinear loads attached to the power system. Nonlinear loads draw non-sinusoidal current. Resistors, inductors, and capacitors are linear devices. When a resistive load is applied to an AC power system, it draws sinusoidal current. When an inductive or capacitive load is applied, it too draws sinusoidal current although it is phase shifted compared to the resistive load. There are many types of nonlinear loads which cause harmonics. The largest sources of harmonics are converters. Converters range from a huge 1000 MW inverter station for an HVDC line to a 75 W rectifier found in a television. Other nonlinear sources of harmonics include arcing devices such as arc furnaces, transformer magnetizing impedance, fluorescent and high intensity discharge lights. The harmonic current caused by the nonlinear sources can cause harmonic distortion in the system voltage which may cause problems for other devices.

Effects of Harmonics?

The effects of harmonics are divided into four general categories:

- effects on the power system itself
- effects on consumer load
- effects on communication circuits
- effects on revenue billing

- On the power system, harmonic currents are the main culprit, causing equipment overheating and thermal loss-of-life. This may be a concern for motors or transformers. The impact is worse when network resonances amplify harmonic currents. Harmonics may also interfere with relaying and metering to some degree.
- Harmonics can also cause thyristors firing errors in converter and SVC installations, metering inaccuracies, and false tripping of protective devices. The performance of consumer equipment, such as motor drives and computer power supplies, can be adversely affected by harmonics. In addition, harmonic currents flowing on power lines can induce noise on nearby communication lines.
- Harmonic voltage distortion may cause equipment insulation stress, particularly in capacitors. When harmonics cause the voltage impressed on the capacitor bank to be distorted, the peak voltage may be high enough to cause a partial discharge, or corona, within the capacitor dielectric. This may eventually result in a short circuit at the edges of the foil and failure of the capacitor bank.
- High harmonic currents cause fuse blowing in capacitor banks. This results in a loss of reactive power supply to the system which may cause other problems.
- Harmonic voltage distortion can effect revenue billing by introducing error into kilowatt hour metering systems that rely upon accurate discernment of the voltage zero. And, of course harmonic current sums with fundamental current demanded by facility loads to directly increase net billable kilowatt demand and kilowatt hour consumption charges.

System Problem	Common Causes	Possible Effects	Solutions
Harmonics (non sinusoidal voltages and /or current wave forms)	Office – Electronics, UPSs, variable frequency drives, high intensity discharge lighting and electronic and core coil ballasts.	Over- heating of neutral conductors, motors .transformers, switch gear. Voltage drop, low power factors, reduced capacity.	Take care with equipment selection and isolate sensitive electronics from noisy circuits.

What standards are applicable for Harmonic Measurement? What is the acceptable limit of harmonics?

- American standards regarding harmonics have been laid out by the IEEE in the 519 Standard: IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems. There is a combined effect of all nonlinear loads on utility systems that have a limited capability to absorb harmonic current. Further, utilities are charged with the responsibility to provide a high quality supply in terms of voltage level and waveform. IEEE 519 recognizes not only the absolute level of harmonics produced by an individual source but also their size relative to the supply network.

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The permissible harmonic limit for different current (I_{sc}/I_L) as per IEEE standard is given in below table

IEEE 519 Standard - Maximum Harmonics Current /distortion in Percentage of I_L						
Maximum Harmonics Current Distortion in Percent of I_L						
I_{sc}/I_L	<11	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h$	Total Demand Distortion
<20	4	2	1.5	0.6	0.3	5
20<50	7	3.5	2.5	1	0.5	8
50<100	10	4.5	4	1.5	0.7	12
100<1000	12	5.5	5	2	1	15
>1000	15	7	6	2.5	1.4	20

Where,

I_{sc} = Maximum short circuit current at point of common coupling and

I_L = Maximum demand load current (fundamental frequency component) at PCC

TDD = Total Demand Distortion

	Voltage Harmonic Distortion			Current Harmonic Distortion		
	%			%		
	R	Y	B	R	Y	B
Minimum	1.8	1.9	1.6	10.1	14.6	34.6
Average	2.0	2.1	1.8	12.2	37.7	46.4
Maximum	2.3	2.4	1.9	18.9	50.0	53.5

Observation Table: Harmonics Measured

The Voltage Harmonics are within permissible limit. However the current harmonics are much higher side than the permissible limits. It is recommend to use harmonic filters to reduce the current harmonics within permissible limit and to avoid any further future penalty.

The penalty for harmonics is still under proposal stage. However the suggested harmonics penalty is 5% additional energy charges (Wheeling charges plus Energy charges) for consumers who do not maintain the harmonics levels specified in IEEE STD 519-2014.

1. Grid Tied Solar PV

1.1 Background

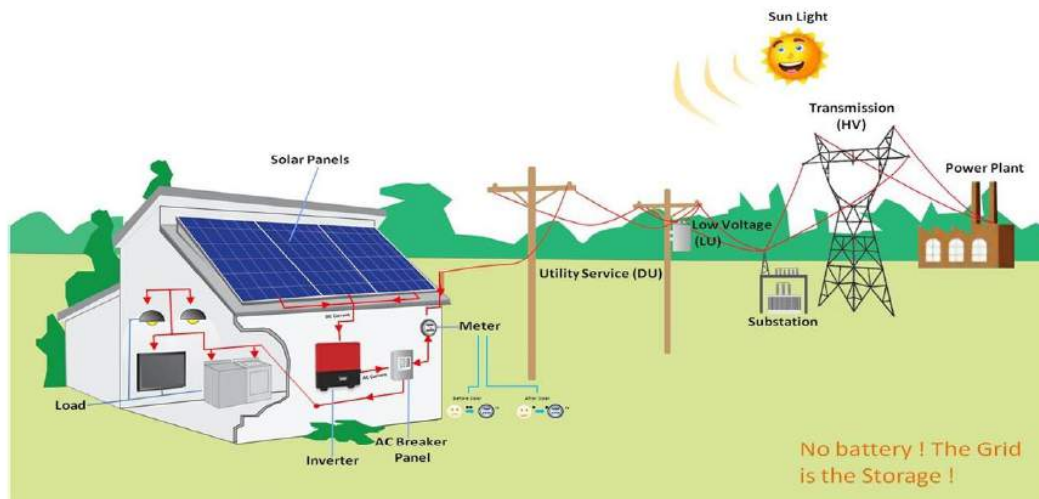
A 25 kWp rooftop Solar Photo Voltaic System is proposed to be installed at your college premises at DBCOE, Nagpur.

This proposal is based on following points discussed during our meeting/conversation.

- You have a three phase LT connection from Mahavitaran with sanctioned load of 10kW.
- Average electricity consumption is about 3000 units per month.
- Present average electricity tariff is Rs. 9 /kWh.
- Space required is 3000 sq. ft. facing south direction with clear rooftop available.

1.2 Proposed System

Based on your requirement, a grid tied three phase solar system is proposed to be installed on your space available.



A grid tied solar system generates output in synchronization with the electricity supplied from the utility (Mahadiscom).

1.3 Operation Details of proposed system

- The generated solar power is used for local consumption decreasing the demand of electricity from the grid.
- As long as the captive power requirement is more than the output of solar, the excess power required is feed by the grid.
- If the captive power requirement is lower than the output of solar, the electricity is exported to grid.
- Whenever there is no power supply from the grid, the solar PV system goes in standby mode and its output cannot be used.

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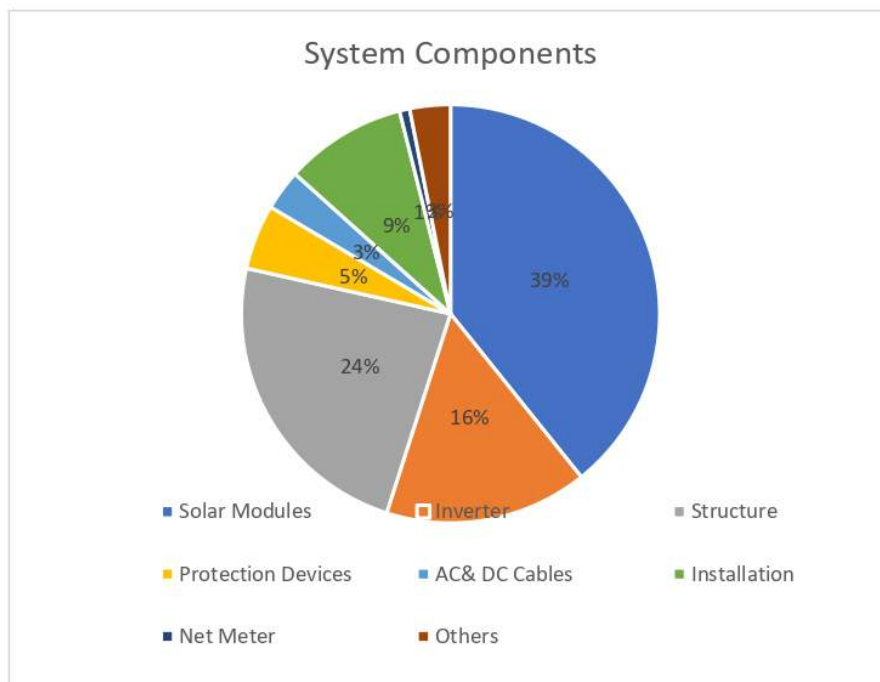
of Pharmacy (DBCOP), Besa, Nagpur

1.4 Advantages and benefits

- The life of solar system is 25 years with 25 years' linear power output warranty from the manufacturer of solar module.
- Dynamic system with no moving parts, hence no wear and tear of systems.
- With no batteries connected, maintenance is limited to cleaning of solar modules once in 15 days.
- Inverter output and grid power are on same bus, there is no effect of load fluctuations on the system.
- Generation of renewable energy results in reduction of carbon footprints.
- The effective cost of power generated from solar energy is as lower as Rs. 3/kWh. Thus any investment in solar system now gives healthy returns over next 25 years.

1.5 Technical Details

SR.NO	DESCRIPTION	DETAILS	MAKE / MODEL
1	Solar PV Module	25 kWp	Trina/Canadian/Renesys/others
2	Grid Tied Inverter	25 KVA	Growatt/Delta/Polycab /Other
3	Module Structures	M S Galvanized	Own
4	DC Distribution Box	As required	Own
5	AC Distribution Box	As required	Own
	Surge Protection	Type 2 for AC and DC	Mersen/Dehn/Equivalent
6	DC Cables	As required	Polycab / Siechem/ others
7	AC Cables	As required	Polycab / Siechem/ others
8	Lightning Arrestor	As required	ISI Complaint
9	Earthing	As required	ISI Complaint
10	Net Meter	Approved by Mahadiscom	Secure



Scope of Work

Scope of work includes Supply Design, Engineering, Procurement, Supervision, Installation, Testing & Commissioning and one-year warranty on installed Solar PV system.

- Documentations and approvals
 - a. Application to increase the sanctioned load from **present 10 kW to 30 kW** for the purpose of installing 25 kWp solar. (As per MAHAVITRAN Commercial Circular No: 258 dated 25th January 2016, we can install only 80% of the sanctioned load as maximum capacity for solar PV System.)
 - b. Application and approval from MSEDCL for Net metering/Gross Metering purpose.
- Design & Engineering.
 - a. System design.
 - b. Engineering drawings.
 - c. Detailed Bill of Materials & Project Report.
- Procurement and supply of material.
 - a. Solar PV Modules
 - b. Solar Grid Inverter
 - c. Solar Module Mounting Structure
 - d. Solar Grade, UV protected DC Cable
 - e. AC Cable
 - f. DC and AC Distribution Box
 - g. Earthing & Lightning Arrestor
 - h. All other related accessories.
 - i. Net Meter
- Civil Installation Work.
 - a. Module mounting structure installation.
 - i. The structure will be installed on pillars above terrace and on available terrace space will elevation such that a person can easily walk and use terrace.
 - b. Civil work for module mounting structure.
- Electrical Works.
 - a. Wiring of Modules.
 - b. Cabling from modules to DC distribution box.
 - c. Cabling from DC distribution box to Inverter.
 - d. Cabling from Inverter to AC Distribution box.
 - e. Earthing and Lightning Protection.
- Testing & Commissioning.
- Net Metering.

Exclusion

- Construction Power and Water.
- All other activities, documentation, services, etc. which are not specifically mentioned in this offer.

2. Estimated Output & Returns

Detailed estimation of output of solar PV system is done considering location of installation, proposed direction of solar panels, data of solar irradiance at the location, system losses, and other related data.

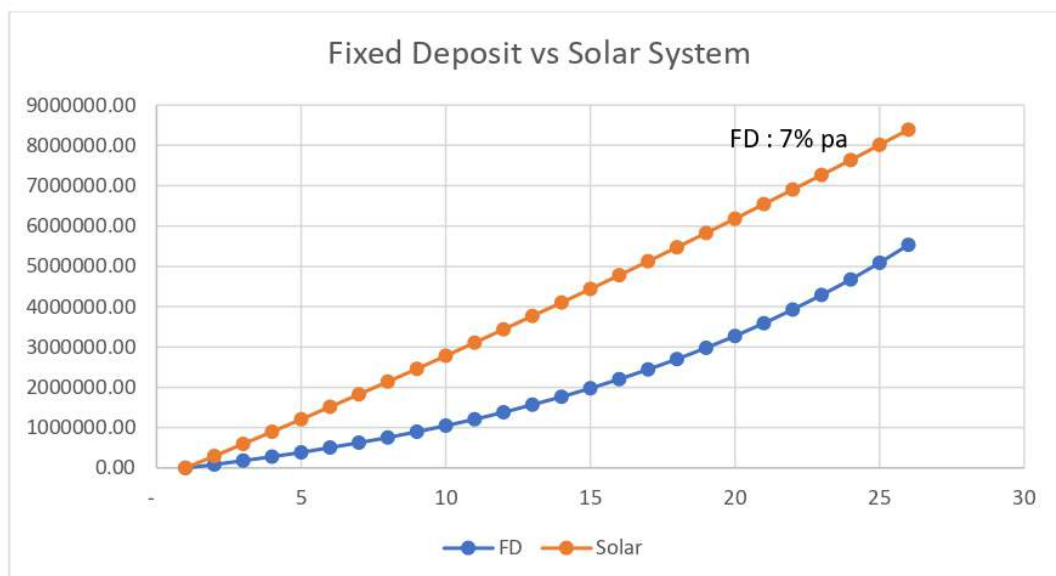
2.1 Basis of estimation

- Solar PV Capacity: 25kWp
- Location: DBCOE, Nagpur, Maharashtra
- The solar panels are expected to be free of shadow.
- Generation is based on radiation of 1000W/m² and grid availability.
- Assumed clear sunny 330 days/year.
- Space required is 3000 sq. ft. facing south direction with clear rooftop available.

2.2 Estimated output

- Daily generation from solar: 100 kWh/day
- Monthly generation: 3000 kWh/month
- Total Annual output: 33000 kWh/annum
- Specific Production: 1320kWh/kWp/annum

2.3 Comparison with Bank Fixed Deposit:



3. Commercial Offer

4.1 Cost of System

Description	Amount (INR)
Supply, Design, Installation, Testing and Commissioning of 25 kWp Grid Tied Solar PV System	Rs.12,50,000.00
Transportation	Included
GST	Extra at Actual
Any other taxes and duties	Nil at present

4.2 Returns

The Solar system gives excellent result as shown below

- Estimated savings of **Rs.290000** from first year.
- Return on investment: **23 %pa.**
- **Breakeven time of 4.5 years out of operating life of 25 years.**

No	Capital Cost	Savings in Electricity bills	Net Cash Flow	Cumulative cash flow
Year 1	12,50,000.00	297000.00	-953000.00	-953000.00
Year 2		299970.00	299970.00	-653030.00
Year 3		302969.70	302969.70	-350060.30
Year 4		305999.40	3,05,999.40	-44060.90
Year 5		309059.39	3,09,059.39	264998.49
Year 5-25	Savings in Electricity of Rs. 3,00,000.00/Annum			

Assumptions:

- Increase in MSEB tariff assumed at 1%pa.

Annexure –XVII: Patents Registered by College

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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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— with international search report (Art. 21(3))

(54) Title: HERBAL BASED MOSQUITO REPELLENT

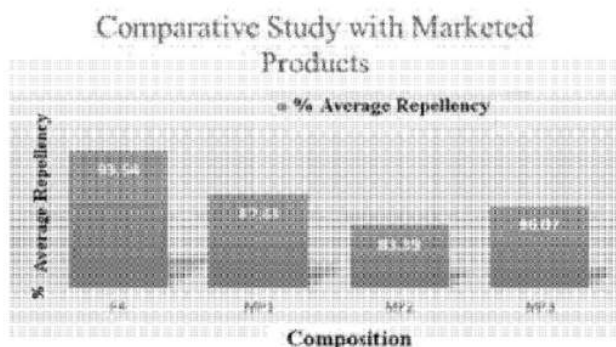


Figure 3

(57) Abstract: This invention comprises a herbal composition for repellency of at least Anopheles, Aedes and Culex mosquitoes for at least eight hours when applied to the body. In one embodiment of this invention, the herbal composition comprises three or more than three essential oils. The herbal composition of this invention has been illustrated 5 with use of a cream containing three essential oils: Citronella oil, Catnip oil and Kaffir lime oil. However, the invention also includes within its scope any other composition that comprises more than three or other combination of three essential oils.

WO 2017/168449 A1

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

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(19) INDIA
(22) Date of filing of Application :30/01/2018 (43) Publication Date : 02/08/2019

(54) Title of the invention : A PH-DEPENDENT TABLET

(51) International classification	:A61K 1/00	(71)Name of Applicant :
(31) Priority Document No	:NA	1)Chetak Gulabrao Panchbhai
(32) Priority Date	:NA	Address of Applicant :302/20, Purushottam Vista Apartment,
(33) Name of priority country	:NA	Empress Mill Colony, Shrinagar, Nagpur 440015, Maharashtra
(86) International Application No	:NA	India
Filing Date	:NA	(72)Name of Inventor :
(87) International Publication No	: NA	1)Chetak Gulabrao Panchbhai
(61) Patent of Addition to Application Number	:NA	2)Narayan Purushottam Dakshinkar
Filing Date	:NA	3)Nilesh Mahadevrao Mahajan
(62) Divisional to Application Number	:NA	4)Gautam Ramkrishna Bhojne
Filing Date	:NA	5)Shirish Vinayak Upadhye

(57) Abstract :

The present disclosure relates to a pH dependent tablet composition. Particularly, the present disclosure relates to a pH dependent tablet composition for goats where said tablet, is safe, easy to administer and target specific. A pH-dependent tablet of the present invention comprises an extract consisting of Artemisia maritima, Holarrhena antidysentrica, Vernonia anthelmintica and Butea frondosa; at least one pharmaceutically acceptable excipient; and a pH dependent polymer.



No. of Pages : 70 No. of Claims : 47

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
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(19) INDIA
(22) Date of filing of Application :09/05/2020 (43) Publication Date : 03/07/2020

(54) Title of the invention : A MORTUARY CABINET FOR DISINFECTION OF VIRUS INFECTED DEAD BODIES

(51) International classification	:A61G0017060000, A61L0002100000, A01N0001000000, C02F0001320000, A61L0002180000	(71)Name of Applicant : 1)Nilesh M. Mahajan Address of Applicant :Department of Pharmaceutics, Dadasaheb Balpande College of Pharmacy, Nagpur- 440037, MS., India Maharashtra India 2)Nirupama S. Dhoble 3)Sanjay J. Dhoble
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Nilesh M. Mahajan 2)Nirupama S. Dhoble 3)Sanjay J. Dhoble
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
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Filing Date	:NA	
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Filing Date	:NA	

(57) Abstract :

The present invention relates to a mortuary cabinet for disinfection of virus infected dead bodies. The object of the proposed invention is to provide a sanitization cabinet using UV radiation for corona affected dismissal of dead body (3) for protecting the families and relatives from getting infected. The proposed unit has height, width and length as 4—4—7.5 ft3 respectively. All side wall of the cabinet is constructed by thick plastics. UVC lamp i.e. 200 nm to 280 nm wavelength are used for UV exposure purposed. UVC light crushed the NRA of virus and lamps with a radiation peak at around 254 nm for germicidal action for UV sensitization. Following invention is described in detail with the help of Figure 1 of sheet 1 showing the mortuary unit containing dead body (3) for UV radiation exposure, Figure 2 of sheet 1 showing mortuary unit containing dead body (3) wrapped in a plastic.

No. of Pages : 10 No. of Claims : 3

**Integrated Energy and Green Audit: Ambe Durga Education Society's Dadasaheb Balpande College
of Pharmacy (DBCOP), Besa, Nagpur**

Annexure –XVIII: Snapshot of annual rainfall data, Grid Emission Factor

Table : Rainfall data of Nagpur District (2002-2011) In mm

Taluka	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
Nagpur city	1176.1	1431.5	702.3	973.4	975.7	741	952.9	954.4	1395	879.4	1018.2
Nagpur Gramin	966.7	1229	689	1274.7	1205.5	966.3	953.2	947.4	1495	913.8	1064
Kamthi	1035.8	1208.7	707.1	1475.8	1178.2	1205	791.6	1032.6	1099	861.3	1059.5
Hingna	489.2	770	583.3	920.4	814.9	806	683.1	724.7	942.2	814.8	753.9
Ramtek	1101.3	822.5	733.9	1435.5	1133	1370.8	865.3	905.2	1184	885.1	1043.7
Parshiwani	850.1	1056.9	858.4	1239.5	1106.2	878.8	1068.6	983.6	1087	1043.8	1017.3
Maudha	904	1171.6	631.3	1679.1	1114.3	1030.9	814.1	1280.4	1521	1366.2	1151.2
Katol	649.6	920.1	555.1	1092.3	937.4	1271.8	773.2	888.4	1028	801.8	891.8
Narkhed	822.8	778	606.7	914.9	768.6	1281.3	671	954.1	1137	764.9	869.9
Savner	823.6	1063.6	812.6	1497.2	974.1	1209	873.6	941.6	1078	945.8	1022
Kalmeshwar	740	1092.2	808.6	1320.9	916.4	1203.4	675.9	780.5	1181	855.2	957.4
Umrer	846.2	1296.8	747.1	1856.3	1014.2	1464	1060.4	926.2	1551	887.1	1164.9
Bhiwapur	923.3	1146.3	740.4	1431.2	1045.6	1341.8	853.2	993.7	1690	1088.4	1125.4
Kuhi	859.2	1057.2	596.4	1543.8	828.6	1286	817.9	950.3	1292	1024.7	1025.6
Average	869.9	1074.7	698	1332.5	1000.9	1146	846.7	947.4	1263	938	1011.8

Web link: <http://www.agri.mah.nic.in>

CEA Database Version-13

Emission Factors (tCO ₂ /MWh) (incl. Imports)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Weighted Average Emission Rate (2)	0.78	0.83	0.82	0.82	0.82	0.82
Simple Operating Margin (1) (2)	0.97	0.99	1.00	0.99	0.97	0.96
Build Margin (not adjusted for imports)	0.92	0.97	0.95	0.93	0.91	0.87
Combined Margin (1) (2)	0.95	0.98	0.98	0.96	0.94	0.92

