Report

On

Environmental Audit

At

Shri Brahmanand Swami Shikshan Prasarak Mandal's

ARTS AND COMMERCE COLLEGE DODI (Bk)

Tal - Sinnar, Dist - Nashik

(Year 2021-22)

Prepared by

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S.B.S.S.P.M. Arts & Com. College DODI BK.II Tal. Sinnar, Dist. Nashik

PRINCIPAL
Arts & Commerce College
Dodi BK.II Tal.Sinnar. Dist. Nashik

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Acknowledgement

We at Aarchit Venture , Pune wish to express our sincere gratitude to the management of **Shri Brahmanand Swami Shikshan Prasarak Mandal's** ARTS AND COMMERCE COLLEGE DODI (Bk) Pune for assigning the work of Environmental Audit of college campus.

We appreciate the co-operation and support extended to our team members during the entire tenure of field study.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We are also thankful to all other staff members who helped us during the Measurements at the field and for giving us the necessary inputs to carry out this vital exercise.

About College

The higher education challenge for rural area in the Maharashtra is three fold, namely necessary infrastructure, permanant qualified teaching faculty and appropriate job oriented courses. Shri Brahamanand Swami Shikshan Prasark Mandal's is a leading educational institution in Maharashtra. It was founded and named after the grant. Sant Shri Bramhanand Swami . Let dada patil kedar was the founder of the institution. All his life he remained a revolutionary and was fully devoted to social cause. The present institution Shri Bramhanand Swami Shikshan Prasarak Mandal was established in 1979 to provided education to the under privileged and socially and economically weaker section of society. The college is committed to promote innovation in learning processes and to emerge as a center of academic excellence.

College Vision

Shri Brahamanand Swami Shikshan Prasarak Mandal's ARTS AND COMMERCE College is a premier institution of higher education with the vision statement "vidya vinayen shobhate" viz. The knowledge benifits with humility.

College Mission

To provide education to socially and economically under privilleged students of the society.

Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the dependency on Natural resources & reduce the pollution.

ARTS AND COMMERCE COLLEGE DODI (Bk) consumes various resources for day to day operations, namely: Air, Water, Electrical Energy & LPG.

1. Various Pollution due to College Activities:

- Air pollution: Mainly CO_2 on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

2. Present Level of CO_2 Emissions:

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	25,433	20.35
2	Minimum	9,382	7.51
3	Average	17,967	14.37
4	Total	215,609	172.49

3. The various projects already implemented for Environmental Conservation:

- Usage of Energy Efficient BEE STAR Rated ACs
- Usage of Natural Day light in corridors
- Implementation of Bio Composting pit for disposal of Bio degradable waste
- Implementation of Rain Water Harvesting
- Installation of Solar Thermal Hot Water System.
- Installation of Biogas Generation Plant.

4. Notes & Assumptions:

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
2. 1 kWp Solar PV plant generates 5 kWh/day Electrical Energy for 300 days in an year.

S.B.S.S.P.M. Arts & Com. College DODI BK.II Tal. Sinnar, Dist. Nashik

Abbreviations

AC	:	Air conditioner
PES	:	Progressive Education Society
CFL	:	Compact Fluorescent Lamp
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PF	:	Power Factor
M D	:	Maximum Demand
PC	:	Personal Computer
MSEDCL	:	Maharashtra State Electricity Distribution Company Ltd

1. Introduction

1.1 Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules

2011	E-waste (Management and Handling) Rules
2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Objectives

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To suggest the various measures to reduce the pollution: Air, Water, Noise

1.3 Audit Methodology:

1. Study of College as System
2. Study of Electrical Energy Consumption
3. Study of CO2 emissions
4. Suggestions on usage of Renewable Energy

1.4 General Details of College

No	Head	Particulars
1	Name of Institution	Shri Brahmanand Swami Shikshan Prasarak Mandal's ARTS AND COMMERCE COLLEGE DODI (Bk)
2	Address	Tal - Sinnar, Dist – Nashik
3	Affiliation	Savitribai Phule Pune University

2. Study of Consumption of Various Resources

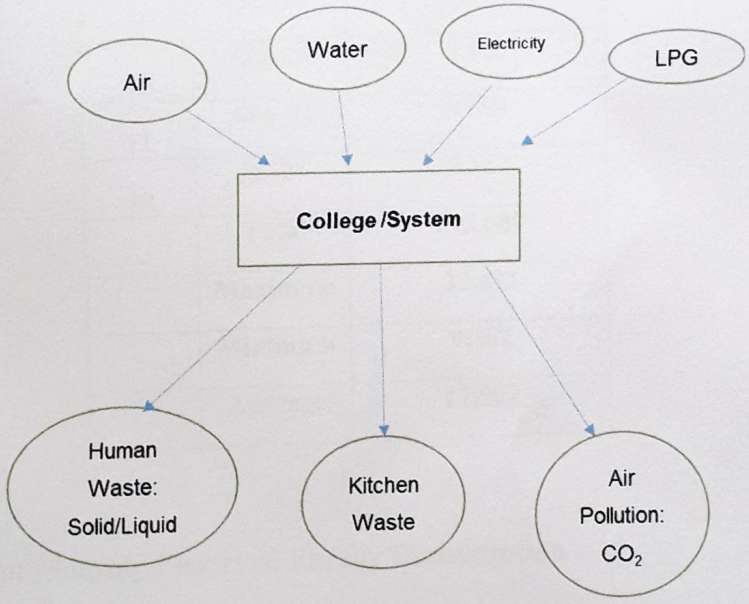
The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy
4. Liquefied Petroleum Gas

Also, college emits following pollutants to environment

1. Human Waste: Solid/ Liquid
2. Kitchen waste
3. Air pollution

We try to draw a schematic diagram for the College System & Environment as under.



Now we compute the Generation of CO2 on account of consumption of Electrical Energy & LPG as under.

The calculation of electrical energy consumption by college can be given as,

Table 2.1: Electrical Energy Consumption

No	Month	Energy (kWh)
1	Jun-22	20,521
2	May-22	17,499
3	Apr-22	20,976
4	Mar-22	25,433
5	Feb-22	22,635
6	Jan-22	22,185
7	Dec-21	23,893
8	Nov-21	14,360
9	Oct-21	19,078
10	Sep-21	9,953
11	Aug-21	9,694
12	Jul-21	9,382
	Total	**215,609**
	Maximum	**25,433**
	Minimum	**9,382**
	Average	**17,967**

2.1 Variation of Monthly Electrical Energy Consumption

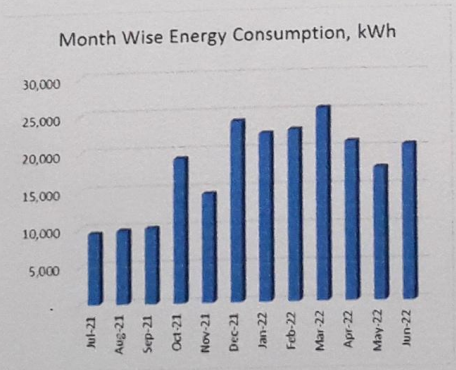


Figure 2.1 : Monthly Electrical Energy Consumption

2.2 Key Inference drawn

From the above analysis, we present following important parameters:

Table 2.2: Variation in Important Parameters

No	Parameter/ Value	Energy Consumed, kWh
1	**Maximum**	25,433
2	**Minimum**	9,382
3	**Average**	17,967
4	**Total**	215,609

3. Study of Environmental Pollution

In this Chapter, we present the various types of Pollution as under:

3.1 Air Pollution

The College is using two forms of Energies, namely: Thermal in the form of LPG and Electrical Energy used for day to day operations of the College. The major pollutant on account of above Energy forms is the Carbon Di Oxide.

- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO_2 in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO_2 in the atmosphere

In the following Table, we present the CO_2 emissions.

Table 3.1: Month wise Consumption of Electrical Energy & CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jun-22	20,521	16.42
2	May-22	17,499	14.00
3	Apr-22	20,976	16.78
4	Mar-22	25,433	20.35
5	Feb-22	22,635	18.11
6	Jan-22	22,185	17.75
7	Dec-21	23,893	19.11
8	Nov-21	14,360	11.49
9	Oct-21	19,078	15.26
10	Sep-21	9,953	7.96
11	Aug-21	9,694	7.76
12	Jul-21	9,382	7.51
	Total	**215,609**	**172.49**
	Maximum	25,433	20.35
	Minimum	9,382	7.51
	Average	17,967	14.37

In the following Chart we present the CO2 emissions due to usage of Electrical Energy.

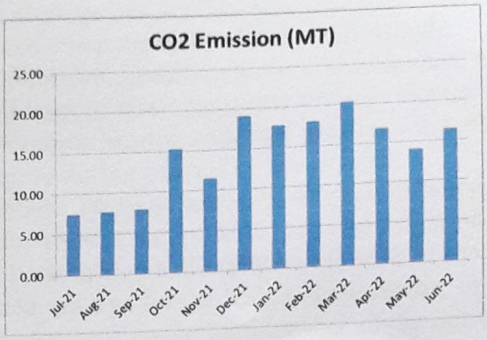


Figure 2.1: CO2 emission due to usage of electrical energy.

3.2 Study of Solid Waste Generation

College Runs various programes for waste management.

- Recycling programs: Implementing a comprehensive recycling program on campus, including separate bins for paper, plastic, glass, and other recyclable materials.
- Waste segregation: Encouraging students and staff to separate waste at the source by providing clearly labeled bins for different types of waste, such as recyclables, organic waste, and non-recyclable items.
- Composting: Setting up composting systems to manage organic waste generated in the college, which can then be used as fertilizer for campus gardens or landscaping.
- Energy-efficient practices: Promoting energy conservation through initiatives such as installing energy-efficient lighting, encouraging the use of natural light, and optimizing heating and cooling systems.
- Water conservation: Encouraging water-saving practices like installing low-flow faucets and toilets, promoting awareness about water conservation, and maintaining efficient irrigation systems.
- Reusable and sustainable alternatives: Encouraging the use of reusable items like water bottles, coffee mugs, and shopping bags to reduce the consumption of single-use plastics.
- Awareness and education: Conducting awareness campaigns, workshops, and educational programs to inform students and staff about waste management practices, recycling guidelines, and the importance of sustainability.

3.3 Study of e-Waste Management:

The internal communication is through emails and there is hardly any generation of e-Waste in the premises.

4. Study of Rain Water Harvesting

Dodi Arts Commerce College has implemented rainwater harvesting measures, some of the common techniques and components involved could include:

1. Rooftop Rainwater Collection: Installing gutters, downspouts, and rainwater collection systems on the rooftops of buildings to direct rainwater towards storage tanks or underground reservoirs.
2. Storage Tanks or Reservoirs: Storing collected rainwater in tanks or underground reservoirs to ensure a sufficient supply during periods of low rainfall.
3. Filtration and Purification: Treating rainwater through filtration systems to remove impurities and make it suitable for various non-potable uses like irrigation or flushing.
4. Distribution System: Establishing a distribution network to channel the harvested rainwater to areas where it is needed, such as for gardening, landscaping, or other purposes.
5. Maintenance and Monitoring: Regular maintenance of the rainwater harvesting infrastructure, including cleaning filters, inspecting storage tanks, and monitoring water quality

5. Recommendations

In order to reduce the dependency on Natural resources and also in order to reduce the various pollutions arising due to the day to day operations of the College we herewith recommend following recommendations.

- Sustainability Initiatives: Encourage and implement sustainable practices throughout the campus, such as promoting recycling, reducing energy consumption, utilizing renewable energy sources, and adopting water conservation measures. This could include installing energy-efficient lighting, implementing waste reduction and recycling programs, and educating the college community about sustainable practices.
- Green Spaces and Gardens: Create and maintain green spaces on campus, including gardens and landscaped areas. These areas can enhance the beauty of the campus, provide opportunities for outdoor activities, and promote environmental awareness.
- Student Involvement: Engage students in sustainability initiatives by establishing student clubs or organizations focused on environmental issues. Encourage student-led projects, such as organizing sustainability events, conducting awareness campaigns, and implementing recycling programs.
- Curriculum Integration: Integrate sustainability topics and principles into the curriculum across various disciplines. Offer courses or modules that focus on environmental studies, sustainable development, or related subjects. This can help foster a culture of sustainability among students and faculty.
- Transportation Alternatives: Promote sustainable transportation options such as carpooling, biking, or using public transportation. Provide bicycle racks, designated carpool parking, and incentives for choosing eco-friendly transportation.
- Community Engagement: Establish partnerships with local organizations or communities to collaborate on sustainability projects. This could involve participating in environmental clean-up campaigns, organizing tree planting drives, or supporting local sustainable initiatives.
- Waste Management: Implement an effective waste management system on campus, including proper waste segregation, recycling facilities, and composting programs. Raise awareness about waste reduction and encourage the use of reusable items among students and staff.
- Green Building Practices: Incorporate environmentally friendly design principles into new construction or renovation projects. Use sustainable materials, energy-efficient systems, and consider incorporating green building certifications such as LEED (Leadership in Energy and Environmental Design).