

**Report**  
**On**  
**Environmental Audit**  
**At**  
**Nashik Gramin Shikshan Prasarak Mandals**  
**Brahma Valley Institute of Management, Anjneri, Nashik**  
**(Year 2020-21)**



Prepared by

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## **Acknowledgement**

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

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## 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.

Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik 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<sub>2</sub> on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

### 2. Present Level of CO<sub>2</sub> Emissions:

| Sr no | Parameter | Energy consumed, (Units) | CO <sub>2</sub> Emission (MT) |
|-------|-----------|--------------------------|-------------------------------|
| 1     | Maximum   | 19,146                   | 15.32                         |
| 2     | Minimum   | 944                      | 0.76                          |
| 3     | Average   | 8,450                    | 6.76                          |
| 4     | Total     | 1,01,395                 | 1.12                          |

### 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<sub>2</sub>** into atmosphere
2. 1 kWp Solar PV plant generates 5 kWh/day Electrical Energy for 300 days in an year.

## 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 | Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik      |
| 2  | Address             | Brahma Valley Institute of Management, Nashik, Anjaneri, Trimbak Road, Nashik, Maharashtra 422 213. |
| 3  | Affiliation         | Savitribai Phule Pune University  |

## 2. Study of Consumption of Various Resources

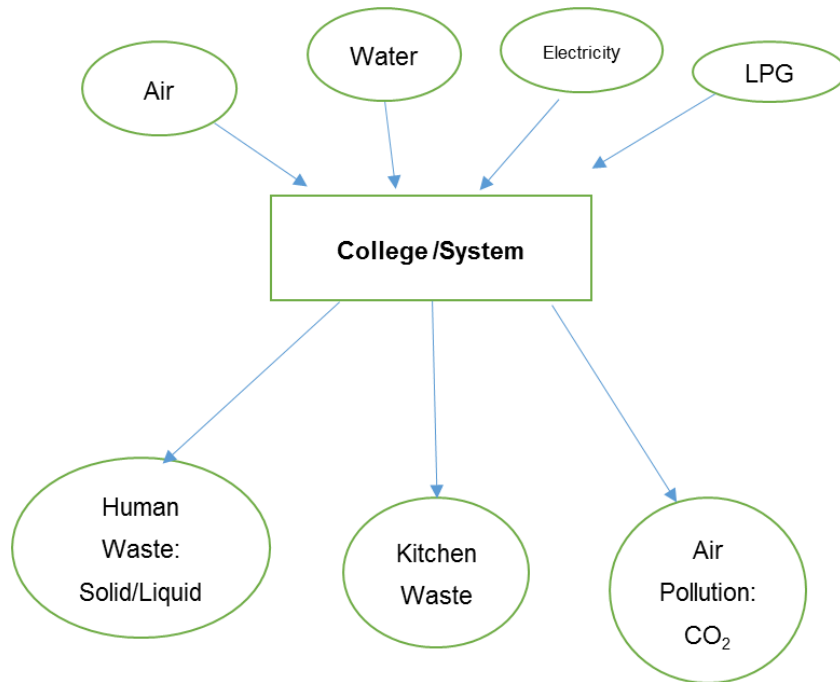
The Institute consumes following basic/derived Resources:

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 CO<sub>2</sub> on account of consumption of Electrical Energy & LPG as under.

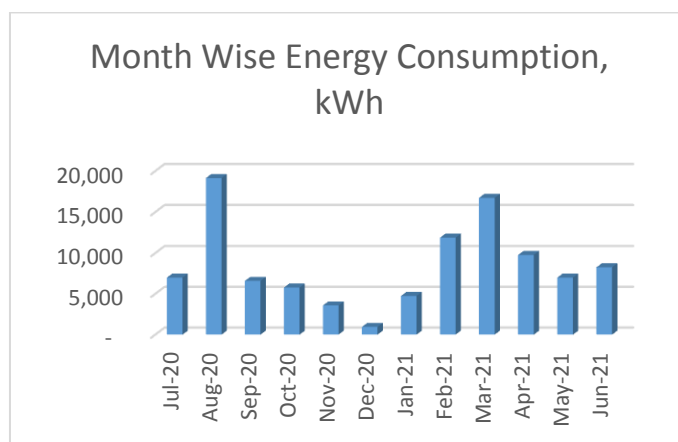
The calculation of electrical energy consumption by college can be given as,



**Table 2.1: Electrical Energy Consumption**

| No | Month          | Energy (kWh)    |
|----|----------------|-----------------|
| 1  | Jun-21         | 8,252           |
| 2  | May-21         | 6,994           |
| 3  | Apr-21         | 9,775           |
| 4  | Mar-21         | 16,727          |
| 5  | Feb-21         | 11,874          |
| 6  | Jan-21         | 4,739           |
| 7  | Dec-20         | 944             |
| 8  | Nov-20         | 3,578           |
| 9  | Oct-20         | 5,780           |
| 10 | Sep-20         | 6,592           |
| 11 | Aug-20         | 19,146          |
| 12 | Jul-20         | 6,994           |
|    | <b>Total</b>   | <b>1,01,395</b> |
|    | <b>Maximum</b> | 19,146          |
|    | <b>Minimum</b> | 944             |
|    | <b>Average</b> | 8,450           |

**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/<br>Value | Energy<br>Consumed, kWh |
|----|---------------------|-------------------------|
| 1  | Maximum             | 19,146                  |
| 2  | Minimum             | 944                     |
| 3  | Average             | 8,450                   |
| 4  | Total               | 1,01,395                |

### 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.

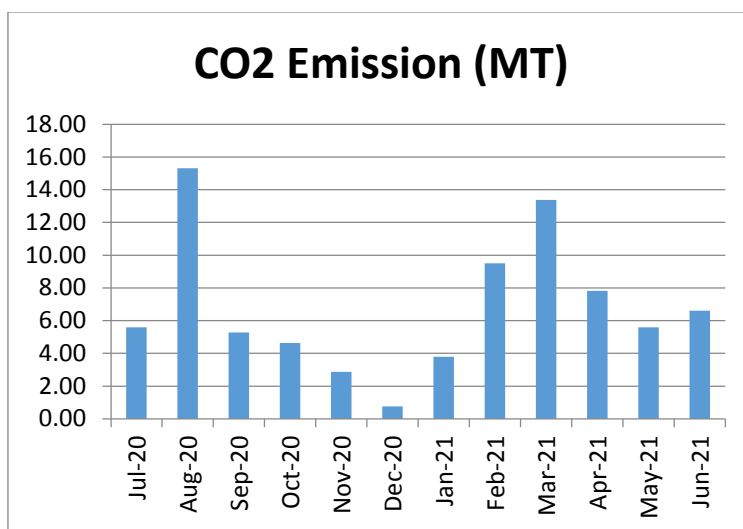
- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO<sub>2</sub> in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO<sub>2</sub> in the atmosphere

In the following Table, we present the CO<sub>2</sub> emissions.

**Table 3.1: Month wise Consumption of Electrical Energy & CO<sub>2</sub> Emissions:**

| No | Month          | Energy Consumed,<br>kWh | CO2<br>Emissions, MT |
|----|----------------|-------------------------|----------------------|
| 1  | Jun-21         | 8,252                   | 6.60                 |
| 2  | May-21         | 6,994                   | 5.60                 |
| 3  | Apr-21         | 9,775                   | 7.82                 |
| 4  | Mar-21         | 16,727                  | 13.38                |
| 5  | Feb-21         | 11,874                  | 9.50                 |
| 6  | Jan-21         | 4,739                   | 3.79                 |
| 7  | Dec-20         | 944                     | 0.76                 |
| 8  | Nov-20         | 3,578                   | 2.86                 |
| 9  | Oct-20         | 5,780                   | 4.62                 |
| 10 | Sep-20         | 6,592                   | 5.27                 |
| 11 | Aug-20         | 19,146                  | 15.32                |
| 12 | Jul-20         | 6,994                   | 5.60                 |
|    | <b>Total</b>   | <b>1,01,395</b>         | <b>81.12</b>         |
|    | <b>Maximum</b> | 19,146                  | 15.32                |
|    | <b>Minimum</b> | 944                     | 0.76                 |
|    | <b>Average</b> | 8,450                   | 6.76                 |

In the following Chart we present the CO<sub>2</sub> emissions due to usage of Electrical Energy.



**Figure 2.1: CO<sub>2</sub> emission due to usage of electrical energy.**

### 3.2 Study of Solid Waste Generation

The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

For canteen waste, college has installed biogas plant. Kitchen and other wastes (leftover cooked food (veg and non-veg), vegetable wastes are fed to biogas plant. The biogas generated is then used for cooking. Total capacity of biogas plant is 500 liters by volume. The college has more potential to for such biogas plant. The college is recommended to install more such plants with higher capacity.

#### Photograph of Biogas Plant



### 3.3 Study of Liquid Waste Generation

The waste water generated in college campus is treated in Sewage Water Treatment Plant. This plant aims to remove contaminants from sewage to produce an effluent that is suitable for reuse application.

### **3.4 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**

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to underground Water Storage tank. This stored water is then reused for domestic purpose.

#### **Photograph of Rain Water Harvesting pipe**



## **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.

- Installation of Sewage treatment Plant to make campus a Zero Discharge campus