

## Green-cum-Energy Audit Summary Audit Report

Name of Higher Education Institution: Goa University

Addresses: Talegao , Plateau, Goa -403206

Telephone no. +91-8669609048

Email.ID: registrar@unigoa.ac.in

Name of coordinator: Prof. (Dr.) Rajendra S. Gad

Telephone No: 8669609217

Date commenced: 02.12.2019

Date completed: 15.12.2020

Total strength of student and teachers: 3000

The major components of campus in context to water utilization and sewage disposal.

- |   |  |
|---|--|
| 1) Garden area with Lawn  | <input checked="" type="checkbox"/>          |
| 2) Play Ground  | <input checked="" type="checkbox"/>          |
| 3) Kitchen  | <input checked="" type="checkbox"/> .....02  |
| 4) Toilets (number)   | <input checked="" type="checkbox"/> .....125 |
| 5) Garbage dumps (number)   | <input checked="" type="checkbox"/> .....02  |
| 6) Laboratory   | <input checked="" type="checkbox"/> .....85  |
| 7) Canteen  | <input checked="" type="checkbox"/> .....10  |
| 8) Rain water Harvesting,   | <input checked="" type="checkbox"/> .....02  |
| 9) Underground percolation tank, Farm pond, Raw water storage pond) |  |

Ground Water tank .04



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The level of disturbance for the HEI in a scale of 1 to 9

|   |    |
|---|----|
| 1) Municipal dump yard                      | 00 |
| 2) Garbage head                             | 01 |
| 3) Public convenience                       | 00 |
| 4) Sewer line                               | 02 |
| 5) Stagnant water                           | 00 |
| 6) Open drainage (River)                    | 01 |
| 7) Industry – (Sugar Industry )             | 00 |
| 8) Bus / Railway Station                    | 02 |
| 9) Market / Shopping complex / Public halls | 01 |

I – WASTE

1) The waste generated by HEI.

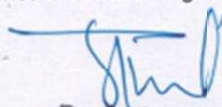
Garden waste,  
Papers, box  
Canteen waste etc.

2) The approximate amount of waste generated per day?  
(In Kilograms) (Approx)

| Approx    | Bio<br>degradable                       | Non-Bio<br>degradable                   | Hazardous                               | Others                                  |
|-----------|---|---|---|---|
| < 1 kg.   |   |   | Yes <input checked="" type="checkbox"/> |   |
| 2- 10 kg. |   |   |   |   |
| >10 kg.   | Yes <input checked="" type="checkbox"/> | Yes <input checked="" type="checkbox"/> |   | Yes <input checked="" type="checkbox"/> |

3) The waste management strategy.

- 1) Composting  Transformed to Agency
- 2) Recycling  Like papers used on both sides
- 3) Reusing  Handed over to agency
- 4) Food waste from mess given to pig farm
- 5) Hazardous material generated in chemistry lab and Life Sciences labs:  
Hazardous waste is generated by working with small quantities of reagents and solvents are collected back instead of allowing them to go into common sewage.

  
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## II – GREENING THE CAMPUS

- 4) There is a garden in HEI and habitants spend time in the garden.  
5) Number of plants on campus: 1000+  
6) The list of the species planted by the students, with numbers.

|                                 |         |     |
|---------------------------------|---------|-----|
| 1. Bottle Palm                  |         | 120 |
| 2. Neem                         | 15      |     |
| 3. Coconut                      | 30      |     |
| 4. Umber                        | 01      |     |
| 5. Gulmohor and similar species |         | 50  |
| 6. Rubber (small leaf)          |         | 01  |
| 7. Pipal                        |         | 15  |
| 8. Morpankhi                    | 15      |     |
| 9. Babul                        |         | 10  |
| 10. Rose                        |         | 30  |
| 11. Badam                       | 50      |     |
| 12. Ahsoka                      | 10      |     |
| 13. Mango                       | 200     |     |
| 14. Assorted plants             | 40      |     |
| 15. Lawns                       | 01 acre |     |

## III – ENERGY

- 7) The energy is utilized by the following products/machinery and equipment.

1. Light& fans
2. Heating, Refrigeration & Air conditioning system
3. Internet & computer
4. Practical equipment
5. Pumping

(Electricity, Diesel Generators, LPG, Solar, Biogas).

Using this list, try to think of ways that you could use less energy every day.

| Sr. No | Energy      | Reduction of usage |
|--------|-------------|--------------------|
| 1      | Electricity | 10 %               |



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|   |           |      |
|---|-----------|------|
| 2 | Generator | 20 % |
| 3 | LPG       | 00 % |
| 4 | Solar     | 30%  |

- 8) The energy saving methods employed by adopting the measures like-
- LED Lamps are installed in the HEI (Provision of LED Lamps wherever possible)
  - Solar Water heaters are used in hostel
  - 3KW Solar Power Station installed for electricity supply to Electronics Department
  - Optimum use of electrical equipment.
  - LED monitors are used in computer labs
- 9) The spending on energy such as electricity, gas, firewood, etc. per month.

**Record Monthly**

| Month      | Electric meter reading | LPG Consumption | Fuel for Generator |
|------------|------------------------|-----------------|--------------------|
| Jun.-2016  | 197620                 | Rs.5000         | Rs.50000           |
| Jul.- 2016 | 220180                 | Rs.5000         | Rs.50000           |
| Aug.- 2016 | 208070                 | Rs.5000/-       | Rs.50000           |
| Sept.-2016 | 190260                 | Rs.5000/-       | Rs.50000           |
| Oct.-2019  | 208230                 | Rs.5000         | Rs.50000           |
|            |                        |                 |                    |

- 10) The number of LED\* bulbs installed: 100bulbs and 2070 tube lights  
Electronic tubes are also installed in Campus
- 11) The details of alternative energy sources employed at HEI :

  
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- i. 3KW Solar Power Station installed for electricity supply to Electronics Department,
  - ii. Solar collecting panels are installed for water heating in the hostels
- 12) The "switch off" drills are practiced at HEI and the computers and other equipment put on power saving mode.
- 13) The machinery (TV, AC, Computer, weighing balance, Printers, etc.) run on standby modes for average 2.00 Hours daily.

#### IV – WATER CONSERVATION

14) List four uses of water.

- 1) Drinking
- 2) Washrooms
- 3) Laboratories
- 4) Gardening

The water is stored in overhead tank, ground water Tank

15) The water supply is done by PWD and it is supplied to the habitants from the water pumping station and the output/sewage is released through PWD sewer line joining the treatment plant.

- 16) The water saving is observed by way of-
- a. By using push cock system
  - b. Evaporation of water is minimized
  - c. Glasses are provided for drinking water.
  - d. Awareness in students to save the water

17) The water utilization on the campus.

| Week | Water for toilet (Ltr) | Water for drinking (Ltr) | Water for gardening (Ltr) | Water for laboratory (Ltr) |
|------|------------------------|--------------------------|---------------------------|----------------------------|
|      |                        |                          |                           |                            |

  
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|   |        |        |        |        |
|---|--------|--------|--------|--------|
| 1 | 787500 | 612500 | 87500  | 262500 |
| 2 | 780000 | 600000 | 100000 | 270000 |
| 3 | 790000 | 620000 | 110000 | 230000 |
| 4 | 785000 | 615000 | 105000 | 225000 |

- 18) The rain water harvesting system is installed at 02 locations.

#### V –ANIMAL WELFARE

- 19) The animals (wild and domestic) found on the campus.

Dogs - 25  
Cats - 05  
Squirrels - 100

Birds of various species - Ample.

- 20) The animal birth control practice is performed by the municipal corporation.


- 21) The animal welfare organization is available in the vicinity of HEI (Prayas Charitable Trust, Panaji).

#### VI – GENERAL

- 22) The awareness of environment Laws is found in the habitants. The University undertakes different environment conservation initiatives and program. The University has signed MOU with Goa Biodiversity board.

- 23) The HEI practice the environment conservation rules such as-

- Building is planned to have natural illumination and good air cross ventilation.
- Plant more trees and educate others about the positive aspects of it.
- Choose fuel efficient travel options, travel less and try to pick more direct routes to save on fuel
- Use less Fossil Fuel Based Products
- Conserve Water
- Reduce Use of Harmful Chemicals
- Animal should not be injured or killed.

  
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- Having identifies parking near the entry and exit gates.

#### Action Plan

Utilize the open space and roof-top for generation of solar energy;  
Increase the use of LED bulbs and tubes;  
Employ measures like sub-meter at each building to control the energy utilization;  
The mechanism for collection of surface runoff water;  
Use of sensors at appropriate location;  
Install water meters;  
Use modern practices for efficient watering of plants;

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