

GREEN AUDIT REPORT
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MAHAVIDYALAYA, AUNDH
TALUKA-KHATAV DIST-SATARA.

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SUMMARY

If self-inquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-inquiry is a natural and necessary outgrowth of a quality educational institution. Concern about global environmental degradation and resource depletion is a logical consequence of the scholarly research, teaching, and learning that takes place on campuses every day. Because universities & colleges are by nature inquisitive institutions, it is only natural for the colleges to examine itself. The current Green audit represents the first stage in our effort to build environmental sustainability on the campus. Green Auditing is one contribution that attempts to prevent the destruction of the world in which we live. Stresses that it is everyone's responsibility - that of both individuals and the organizations in which they operate.

Green auditing is a systematic, documented, periodic and objective process in assessing an organization's activities and services in relation to:

- Assessing compliance with relevant statutory and internal requirements.

- Facilitating management control of environmental practices

- Promoting good environmental management

- Maintaining credibility with the public

- Raising staff awareness & enforcing commitment to departmental environmental policy

- Exploring improvement opportunities

The audit was conducted by **Adya Environmental services**, with a team of **RSBM** faculty and students & gathered all the necessary information about baseline environment of the college. That covered soil quality, water quality assessment of the campus. Noise and air pollution levels of the campus falls within the permissible limits given by CPCB. Water quality of the campus follows the parameters of potable water given by IS 10500:2012. As a responsible institution it understands

Green Audit

the importance of its Carbon footprint & developed a plan to reduce greenhouse gas emissions and other waste in all its activities. College has also planned to promote campus and local biodiversity through detailed action plan and awareness programmes. Along with future action plans College has already undertaken several steps like 'No vehicle day' to move towards becoming environmentally sensitive & a more sustainable campus.

AUDITS 1. SOLID WASTE AUDIT

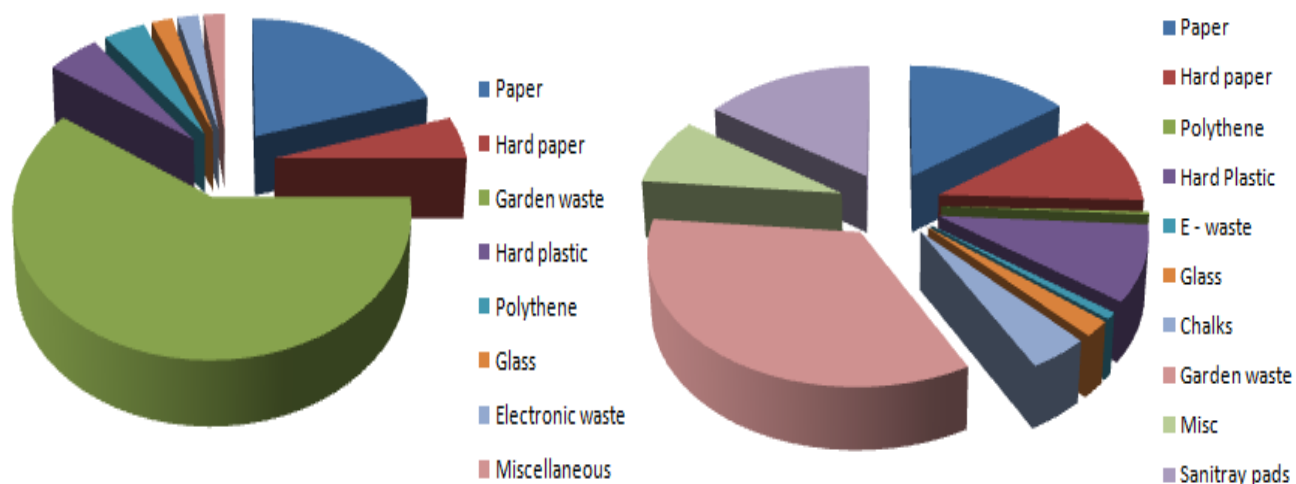
INTRODUCTION

Urbanization and industrialization have resulted in increasing amounts of municipal, industrial and health care waste in the country. Central pollution control board (CPCB) has estimated current quantum of solid waste generation in India to the tune of 48 million tons per annum. Each year everyone in India throws away more than 0.4 tons of waste. Management of such high quantum of waste puts enormous pressure on solid waste management system. Throwing thing away is waste of natural resources and energy which have been used to make the product. Waste has to put somewhere. Most of it is sent to landfill sites or incinerated (burnt), using up land and releasing greenhouse gasses. On an average in India 12% of waste is recycled/composted, 79% is sent to landfill site and 9% is incinerated (burnt)

SOLID WASTE GENERATION

VISUAL ANALYSIS OF MONTHLY SOLID WASTE GENERATION

Garden waste is the main contributor of campus solid waste by volume. Every week near about 1245 gm of Garden waste is removed from college campus. Variation in Garden waste quantity is also found due to the seasonal variation. Paper waste also contributes a lot to the solid waste volume.



As an educational institute, college's paper and hard paper waste like cardboard, paper covering, printing paper is also high. It accounts for 25% by volume. RSBM converts some quantity of its garden waste to manure by vermicomposting. Food waste is not included in visual analysis of solid waste for college building.

SOLID WASTE ACCOUNTING BY WEIGHT

TABLE 1 WEEKLY WASTE OF OFFICES, CLASSROOMS & LIBRARY IN GM APX

| Place | Paper | Hard paper | Polythene | Hard Plastic | Glass | Chalks | Biomass + other | E-waste |
|--------------------|-------|------------|-----------|--------------|-------|--------|-----------------|---------|
| Library | 40 | 60 | 2 | 20 | 5 | NEG | NEG | 7 |
| Main office | 100 | 70 | 1 | 15 | 2 | NEG | 10 | 7 |
| Classrooms | 50 | 20 | 3 | 70 | 10 | 300 | 15 | NEG |
| Total | 190 | 150 | 6 | 105 | 17 | 300 | 25 | 14 |

TABLE 2 WEEKLY DPT WISE SOLID WASTE GENERATION OF COLLEGE IN GM APX

| Departments | Paper | Hard paper | Polythene | Hard Plastic | Glass | Chalks | Garden | E - waste |
|------------------|-------|------------|-----------|--------------|-------|--------|--------|-----------|
| Chemistry | 100 | 200 | 2 | 10 | 30 | 20 | 5 | 2 |
| Physics | 15 | 10 | 1 | 7 | 8 | 20 | 10 | 2 |
| Zoology | 15 | 10 | 1 | 10 | 5 | 20 | 5 | 1 |
| Botany | 10 | 10 | 1 | 5 | 5 | 20 | 200 | 1 |
| Total | 140 | 230 | 5 | 32 | 48 | 80 | 220 | 6 |

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| Main office | 100 | 70 | 1 | 15 | 2 | NEG | 10 | 7 |
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| Botany | 10 | 10 | 1 | 5 | 5 | 20 | 200 | 1 |
| Total | 140 | 230 | 5 | 32 | 48 | 80 | 220 | 6 |

TABLE 2 WEEKLY NON BUILDING AREA SOLID WASTE GENERATION OF COLLEGE IN GM APX

| Place | Paper | Hard paper | Polythene | Hard Plastic | Glass | Chalks | Biomass + other | E-waste |
|---|-------|------------|-----------|--------------|-------|--------|---------------------------------|---------|
| Solid Waste of non built-up area areaup area | 200 | 100 | 2 | 200 | 5 | NEG | 1000 (depends on the season) | 10 |

TOTAL WEEKLY WASTE GENERATION OF CAMPUS

Here we can see that Garden waste is the main contributor of campus solid waste by weight. Paper comes after that. Hard Paper and Sanitary pads are the third and fourth main contributors. If we differentiate between degradable and biodegradable waste biodegradable waste shows a very large figure compare to Non – degradable waste (glass, electronic, waste, and plastic).

Weekly Biodegradable waste of college is 2.5 kg while non biodegradable waste of campus comparatively small and is approx 1 kg. But these are non-biodegradable substances and disturb natural processes. So College should take steps towards waste reduction, reuse and recycling to make its campus more Eco-friendly.

| | Waste Type | Percentage |
|---|------------------|------------|
| 1 | Paper | 20 % |
| 2 | Hard paper | 5 % |
| 3 | Garden waste | 60 % |
| 4 | Hard plastic | 5 % |
| 5 | Polythene | 4 % |
| 6 | Glass | 2 % |
| 7 | Electronic waste | 2% |
| 8 | Miscellaneous | 2% |

Table 5 Visual analysis of Waste

| | Waste Type | Weight (gm) |
|----|--------------------------------|-------------|
| 1 | Paper | 530 |
| 2 | Hard paper | 400 |
| 3 | Polythene | 13 |
| 4 | Hard Plastic | 337 |
| 5 | E - waste | 30 |
| 6 | Glass | 70 |
| 7 | Chalks | 150 |
| 8 | Garden waste | 1245 |
| 9 | Miscellaneous Organic waste | 300 |
| 10 | Sanitray pads | 550 |

Table 5 Visual analysis of Waste

KEY CONTRIBUTORS OF CAMPUS SOLID WASTE

CHALK WASTE

Chalk waste is an important contributor of College's Solid waste. Chalk dust is also an allergic irritant for many students and teachers. Chalk is mostly made up of limestone or gypsum. It can be reused or recycled.

RECYCLING OF CHALK

We can use chalk dust, small chalk stubs to create new, bigger, pieces of chalk. We can do so by crushing the small pieces of



chalk into powder & then mixing the resulting powder with a bit of water, so that it gets the consistency of a modeling paste. Then, we can proceed to modeling it into chalk bars. After you finish shaping it, put it somewhere to dry and harden, so that you can use it just like you use regular chalk when it's dry.

GLASS, PAPER AND HARD PLASTIC

On an average 337 g of hard plastic and plastic is weekly disposed of by campus. Approx 930gm of paper and hard paper waste goes to dustbin every week. On an average 70 gm of glass goes to waste. There should be a separate storage bin for these waste types. Separate storage bins should be provided for three categories of waste (at one place). And it should be given to waste recycler after possible reuse of waste. Currently Aundh Grampanchayat collects this waste from College



ORGANIC WASTE

Organic waste of this college mainly includes garden waste. Weekly on an average approx 200 gm of garden waste (depending on season) is removed from college premises (other than gardening area) which further goes to vermicompost treatment. Garden maintenance is done once in two months. And this waste also goes to vermicompost unit.

Biological technique is most appropriate technique for organic and high-moisture wastes. It includes two main processing mechanisms – composting and anaerobic digestion/ bio-methanation.

USE AND THROW TYPE PENS

Nowadays many people use 'use and throw' type pens. Nobody goes to refill the pen with ink. This adds more plastic to our dustbin. Same picture can be found at this College campus. 98% of students of RSBM use 'use and throw' type pens. This adds near about 20kg hard plastic to solid waste per year.



College is thinking of creating awareness among students to stop the use of such pens. College will make guidelines about good alternatives i.e the use of Ink-pens. This awareness is needed to


be done at every faculty level of college. ^{Green Audit} This can be done by arranging workshops on ‘waste minimization’ and personal observation of students by staff of the college

ELECTRONIC WASTE

Colleges gives its E-waste to a vendor company – A system and technology

SANITARY PADS:

Menstrual Hygiene Management (MHM) is an integral part of the Swachh Bharat Mission Guidelines (SBM-G). The MHM Guideline (Dec 2015) is issued by the Ministry of Drinking Water and Sanitation to support all adolescent girls and women. It outlines what needs to be done by state governments, district administrations, engineers and technical experts in line departments; and school head teachers and teachers.

| | |
|--|--|
| Unsafe  Safe | <i>Common practices</i> |
| | Throw them unwrapped into fields, rooftops, etc. |
| | Wrap them in paper/ plastic bag and throwing them outside |
| | Drying, wrap in paper/plastic bag and throw in dustbins (mostly non-rural) |
| | Burry them for de-composting |
| | Throw them in latrine / toilets |
| | Burn it (rural areas and peri-urban areas) |
| | Use small scale incinerators (community or school level) |
| | Municipal waste management / burning in health clinics (more urban) |

As the usage of sanitary napkins is increasing, the amount of sanitary waste generated every day is also increasing. It is equally important to address the issue of efficient disposal of this infectious waste. Currently as we see, a major part of this waste is dumped into landfills leading to tremendous land pollution. Sanitary napkins are flushed down the toilet under the name of convenience. All the drains ultimately meet the rivers in the city and thus water pollution increases.

So if we see the chart of UNSAFE to SAFE practices i.e burning and use of small incinerators is comparatively safe option. College has a option to use one of two option to minimize environmental pollution. If college selects the burning option then it should be done at a distant place and under complete observation (till complete burning of the sanitary waste).

RECOMMENDATIONS

Vidya Pratishthan should improve its Waste Management Plan to achieve its goal of Carbon neutral campus.



Waste Management Plan by RSBM

2. WATER AUDIT

INTRODUCTION

A water audit is a systematic review of a site that identifies the quantities and characteristics of all the water uses. The site may vary from a public water utility, facility (institutional or commercial properties like malls, office, schools etc.) or a household. The overall objective of conducting a water audit is to identify opportunities to make system or building water use more efficient.

Current Water Status of Khatav region:

The study area is spanning over 1358 sq.km. Geologically, the area is occupied by Basalt and the stage of ground water development is 89.17 %. The area has witnessed ground water depletion and over exploitation over a period of time. In Aquifer-I, the deeper water levels of more than 10 m bgl are observed in the central part of the study area covering north to south elongated patch adjacent to the water divide of Yerala river and Nani nadi, while in Aquifer –II, in eastern and southern parts of the taluka. Declining water level trend > 0.20 m/yr (2007 to 2016). has been observed in about 1142 Sq.km. (84% area of the total area) during pre-monsoon. Declining water level trend of more than 0.2 m/year has been observed in 812 Sq.km. (60% area of the total area) in the post-monsoon. This has been due to cultivation of water intensive cash crop like sugarcane (35.4 sq.km), which is completely dependent on ground water irrigation.

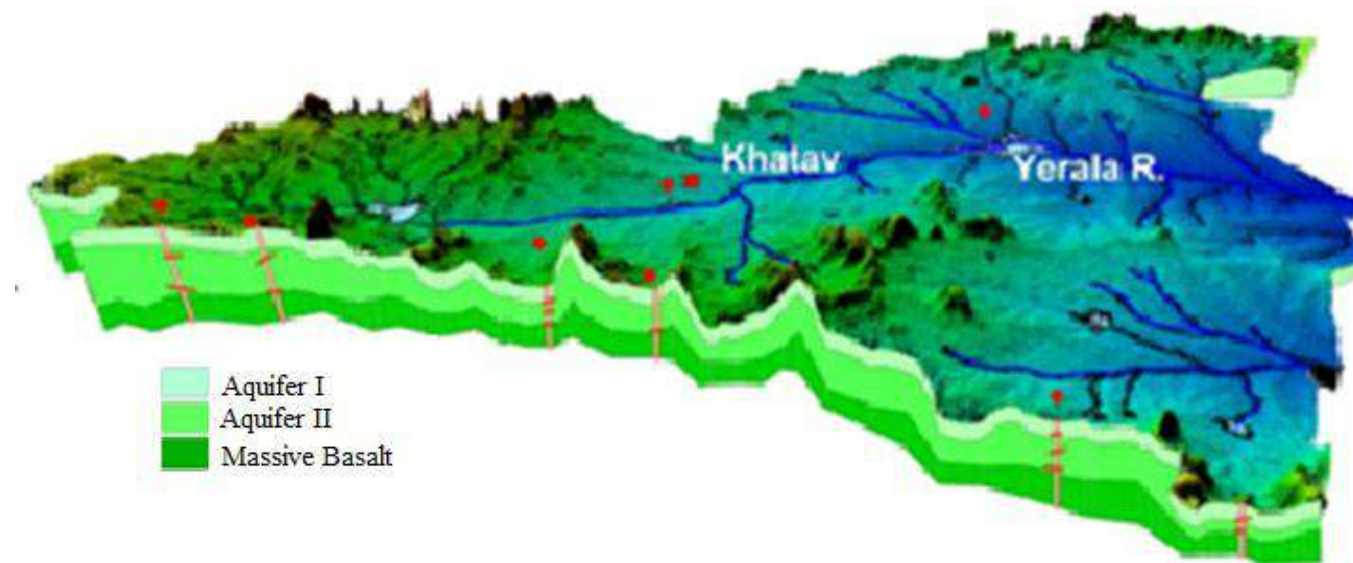


Figure 1 Map: Aquifer levels of Khatav taluka (CGWD report 2017)

WATER SUPPLY OF RSBM CAMPUS

The Primary source of RSBM potabler and Non-potable watwater is Borewell water. The College receives its borewell water from borewell located near RSBM Gymkhana building. The college treats this borewell water before using it as potable water. College has three water filters with attached cooler system.

The pipe from the borewell located near the Gymkhana building is connected to a underground storage tank of capacity 10,000 litres. The Underground water storage tank for storing borewell water is located within campus itself. This is Main storage tank of incoming borewell water.

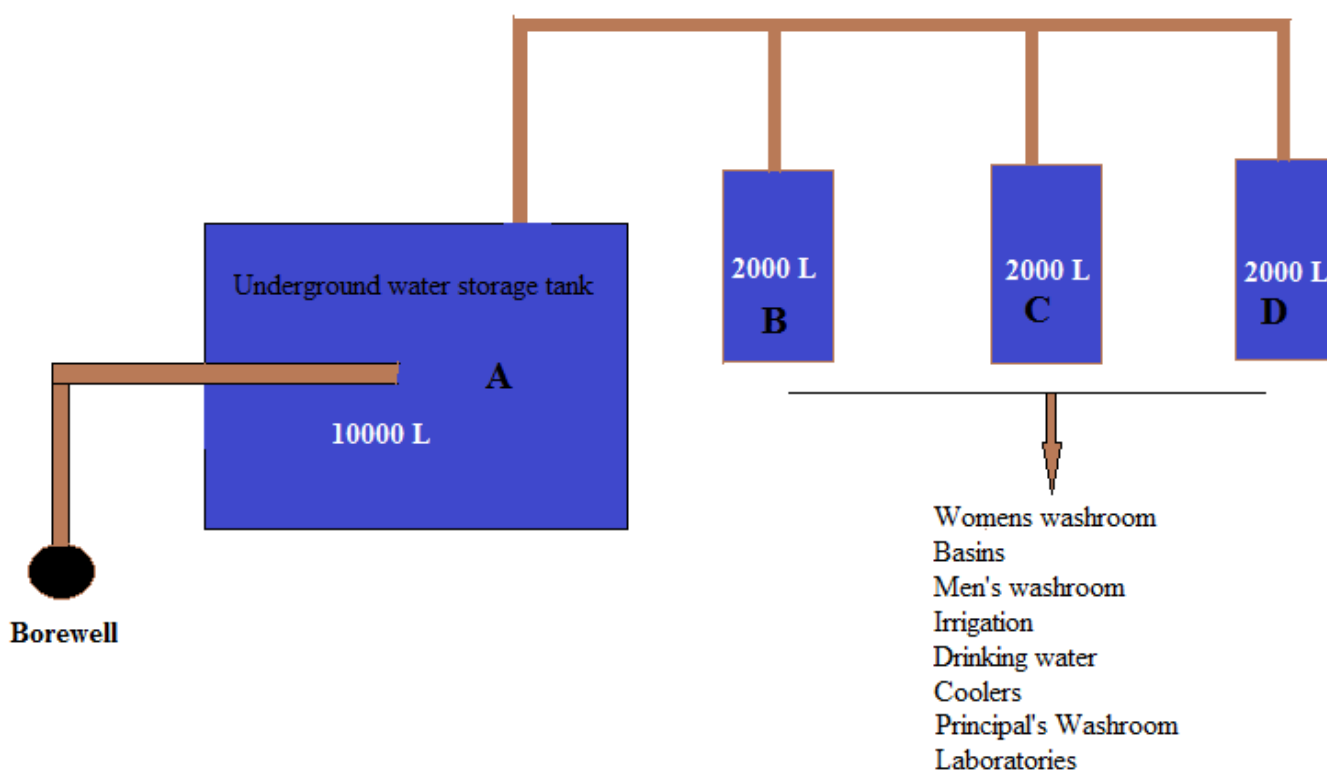


Figure 2 Schematic diagram of RSBM's water supply system

As per the daily pumping observations to overhead three water tanks RSBM senior College daily uses about 3000 liters of potable and non potable water.

Based on flow rate measurement the average amount of potable water that is pumped from underground borewell water storage tank i.e. Tank A to the overhead tanks (B, C, and D) is about 3000 liters per day. Although on certain days there is a sudden jump & increase in the amount of water which is generally attribute to increase in certain water uses like gardening, different events etc.

The current borewell which supplies to RSBM's daily water requirement of drinking and non potable uses is the second in the series of borewell. It is located in Gymkhana premises and was installed in 2014 after the earlier one became dry. The total depth of the borewell is about 320 feet and during the time of drilling water was found at a depth of (feet). The submersible pump of 3.2 Horse Power (HP) was installed at a depth of around 122 mbgl. Of the two borewells, the first is located within senior college campus and was installed around 2011-12. At present, the bore is used for recharging groundwater within the RSBM's rainwater harvesting system.



WATER USAGE

RSBM building has three floors. To conduct a building water audit water consumption data for all the users were required to be monitored and recorded. Toilet water use including flushing and face/hand washing along with drinking was clubbed under personal water use. In order to collect primary data and to ensure accuracy, a brief questionnaire format was prepared and survey conducted for students.

| Water users | Number |
|---------------------------------------|------------|
| Students Senior college | 722 |
| Teaching – Regular Senior college | 29 |
| Teaching – on Contract Senior college | 5 |
| Non teaching– Regular | 12 |
| Non teaching – Contract | 1 |
| Total | 769 |

Table 8 Total water users of the RSBM campus

The total personal water use was calculated from flow rates, questionnaire and total water users (occupancy of the building). We measured the flow rates of taps and pumping lines

There are three drinking lines in college. In total there are 4 Toilet blocks in the building, which includes 1 for principle and 1 for students (2 for boys and 1 for girls).Out of these one ladies toilet block is located on ground floor. All of these are provided with basins

| | Use | Flow rate |
|---|----------|-----------|
| 1 | Drinking | 18s/liter |
| 2 | Toilet | 14s/liter |
| 3 | Basin | 16s/liter |

WATER CONSUMPTION CALCULATION

Total daily water Intake of water,

Tank B + Tank C + Tank D = 3000 lit/day

*Calculated from flow rate and daily water pumping operation to overhead tanks

I. POTABLE WATER CONSUMPTION (DAILY)

College uses filtered borewell water use for potable water use

CALCULATION ON THE BASIS OF QUESTIONNAIRES AND FLOW RATES

i. Daily potable water consumption by staff and students: $1.5 \times 769 = 1153$ liters/day

Total water use of drinking water is = 1153 liters/day

2. NON POTABLE WATER CONSUMPTION FROM NAKSHATRA WELL (DAILY)

College uses borewell water for non potable water use

CALCULATION ON THE BASIS OF QUESTIONNAIRES AND FLOW RATES

i. Water used for flushing by students 769×2 liters = 1538 liters/day

ii. Water use for mopping of Main office area = Water per washing of wiper \times Number

of washing = 100 liter \times 1 = 100 liters/day

- iii. Water used for hand and face washing = Average time the tap left open \times Number of times the hand and face washed) \times Average flow rate of taps per second
 = 10 seconds \times 2 times \times 0.12 = 2.4 liters per capita

So, Total non potable water use by students and staff for hand and face washing = 3.6 liters \times 769 = 1845 liters.

So, the total water use for flushing and washing = 1538 + 100 + 1845 = 3483 liters/day

* The daily water requirement for Science lab is not included here.

OVERALL WATER CONSUMPTION

Therefore based on the above recordings, monitoring and calculation, the total potable water consumption for RSBM College is 1153 lit/day and non potable water consumption is 3483 liters/day. Overall water consumption is 1153 + 3483 = 4636 liters per day. If gardening is excluded, then the per capita use for non potable water is around 6 liters day.

| | Heads | Water use (in liters) |
|---|--|-----------------------|
| 1 | Average daily water supply, to the overhead tanks from the underground tank | 3000 |
| 2 | Total calculated water consumption from the water audit | 4636 |
| 3 | Difference between water consumption from overhead tanks and actual water use for various purposes | 1636 |

Table 10 Total water supply and use at RSBM College

DATA COMPARISON AND ANALYSIS

There is a wide variation in the average amount of water that is pumped to the overhead tanks every day for various purposes and the average water consumption calculation. The average water supply (quantity) was based on time taken to overhead the tanks, flow rates and monitoring. The amount of water based on questionnaire, flow rate and water users is 4636 liters per day while the daily water

need to overhead all the tanks is 3000. The calculated water amount is 1.5 times greater than the amount of water which is used pumped in the tanks.

THIS DIFFERENCE COULD BE ATTRIBUTED TO THE FOLLOWING FACTS

- The staff and students present per day in the college were assumed to be 100 % present. In real this percentage varies.
- The observations from questionnaire for personal water use were a representative observations and not a complete study.
- Along with this staff and students living in nearby areas, they also don't use the college washrooms. Some of them bring drinking water from home.

WASTE WATER GENERATION BY RSBM

Every building generates waste water amounting to almost 80% of total water consumed. The major source of RSBM waste water includes grey water from wash basins, lab basins, and black water from toilets. Out of that Black water of RSBM toilets goes to soak pits. So RSBM doesn't discharge any Black water in Grampanchyayat sewer lines

ESTIMATION OF WASTE WATER GENERATED BY RSBM

Waste water generated = 80% of water used

So, waste water generated by RSBM based on water audit

$$= 80\% \text{ of } 4636 \text{ liters per day} = \mathbf{3708 \text{ liters/day}}$$

Waste water generated by RSBM based on pumped quantity

$$= 80\% \text{ of } 3000 \text{ liter per day} = \mathbf{2400 \text{ liters/day}}$$

Out of that Black water of RSBM toilets goes to soak pits. So RSBM doesn't discharge any Black water in Grampanchyayat sewer lines

THE KEY WATER CONSUMING AREAS

SCIENCE LABS

Science Lab is the highest water demanding area of the campus. There are 4 labs which uses high amount of water. Water provided for these labs comes from the well of combined borewell water source. Out of these labs the water demand of chemistry lab is high due to number of students admitted to this subject and the type of practical's they perform. To arrive at total water use/loss of water from the basin taps by staff & students and to get the idea of water losses due to high pressure, flow rate was computed using the 500ml Beaker test by recording the time taken to fill the bottle, which was then used to compute flow at l/s.

| | | |
|------------------------|---------------|--------|
| Zoology | 12-18 s/liter | Normal |
| Botany FY, SY | 10-80 s/liter | Normal |
| Botany TY | 6-12 s/liter | Normal |
| Chemistry FY,SY | 8-56 s/liter | Normal |
| Chemistry TY | 6-30 s/liter | Normal |
| Physics | - | |

Table 11 Flow rate of the basin taps of campus

TOILETS: Water consumption is more for flushing application in any building. College has single flushing system in Toilets and press type flushing system in urinals.

IRRIGATION/WATERING OF CAMPUS PLANTS

Plants in the garden are watered in between 11am to 5pm in the evening to reduce evaporation losses.

CONCLUSION AND RECOMMENDATIONS

1. The water meter should be installed for RSBM's senior college at the inlet of borewell water and other colleges coming under it. This installation will give correct amount of borewell water used by RSBM's Senior College, Junior College and Gymkhana.

This will give correct information about amount of wastewater produced by the college. Along with this characteristics of waste water will help to decide selection of treatment process. The use of best available waste water technique will improve the quality of treated water and it can be

2. **LOW FLOW FLUSHING SYSTEMS** Water consumption is more for Flushing applications in any building. Use of more efficient water saving toilets having dual flush system can result in a saving of at least 50% of water. Dual flush systems can be installed in order to allow different volume of water for flushing liquids and solids. To facilitate efficient cleaning at low volume, it is possible to install suitable water closets.
3. **WATER TAPS** College taps works 6-80 seconds per litre. Use of low flow faucets along with other water saving devices such as auto control valves, pressure reducing devices, aerators.

Rain water harvesting

To overcome the problem of water logging along with the aim of water harvesting, RSBM College is designing Rainwater harvesting system in its campus. The college has sufficient surface area to adopt this system. For that RSBM preparing rainwater harvesting plan locating available catchments and identify location for siting the rainwater harvesting structures. We calculated the quantity of rain water available for harvesting & recharging With the help

3. NOISE AUDIT

Actual noise monitoring is carried out with the help of sound level meter on various locations shown in figure . We have taken the samples within the free field. The comprehensive study was done inside the campus to calculate the noise level at various important locations such as class room areas, playground, parking area, library location and the data is interpreted for solutions.

Noise level readings (dB) was taken using noise meter and the readings were given in table 1 to table.6

The readings were taken in certain period of interval and specific timings such as mornings, evenings, afternoon.

NOISE MONITORING LOCATIONS



Figure 3 Noise monitoring locations

DISCUSSIONS

Out of 30 average noise recordings at SITE I near college entrance, 17 noise level recordings exceeds noise standard. The laid down noise monitoring standard for commercial zone is 50 dB (A) for a day time. The highest noise levels near entrance were seen in the evening. This site is very close to main road of the Aundh village. So it shows the impact of Road traffic. The visual observations was high rush during evening time on nearby road.

Site II is the back side of the college campus. 13 observation exceed the noise standard. This site is near to the parking area of college. Almost all noise levels observations falls within standards, though it is near parking area of campus.

SITE III location is on the ground of the college. Only 12 observations exceeds the silence zone standard of CPCB.

At some places we can find that the noise levels exceed the standard of CPCB for silence zone i.e. 50 db. But we have taken the samples in free field where there are no reflected sound waves. So this satisfies that the high Noise level (up to 90 db) decreases towards classroom areas.

COMMENTS

- Silence is an important factor in education. RSBM campus is an ideal place for education as it nearly follows the standards of CPCB.
- As per CPCB guidelines silence zone is referred as areas up to 100 meters around such premises as hospitals, educational institutions and courts. The campus is at a distance of from crowdie and noisy a r e a .
- The survey shows that, the plantation of trees and hedge of *Bouganvella* Climber in campus do acoustic buffering of outside noise and acts as noise barriers for road traffic.

4. BIODIVERSITY AUDIT

A TREE CENSUS AND INVENTORY

The present Tree census and inventory study was done to quantify, to create an inventory and to understand phyto-ecological structure of RSBM's Senior college and Gymkhana campus.

Location

Latitude: 17 °32'16''N

Longitude:

74°19'42''E

Average mean sea level: 2659 feet..... Senior college RSBM

Latitude: 17 °32'16''N

Longitude:

74°19'42''E

Average mean sea level: 2659 feet Gymkhana RSBM

OBJECTIVES

1. To make an inventory of tree individuals and tree species in the campus.
2. To undertake phyto-ecological analysis with the help of
 - a. Species composition
 - b. Abundance, Relative abundance, density
 - c. Diameter class and height of the trees

SAMPLING

Since the purpose of the study was to create a detailed inventory of Tree individuals and species, the "Census" was used as a sampling technique. In total, 0 acre of the campus was surveyed and each tree was counted.

Within each plot all individual trees were identified, measured, and recorded. The diameters at breast height of the species were measured using a measuring tape. Trees were grouped into the following diameter classes: medium-sized trees (16–29.9cm), and large trees (>29.9cm).

These species were further grouped into classes according to their height - treelets (small trees) (<10m), understory (10–20m), canopy (20–30m), and emergent (>30m).

RESULTS

SPECIES COMPOSITION OF TREES

Table of species composition (see Annexure) shows the different tree species found in the study area. A total of 27 species were recorded belonging to 15 families and 25 genera. Annexures of tree inventory shows the different plant species, their families found in the RSBM senior college campus. A total of 125 tree individuals (height above 3 meters) species were recorded in the study site. Out of 125 tree individuals 85 were evergreen trees while rests were deciduous.

Dominant families recorded in the study area according to descending order (based on number of species type in each family) are Fabaceae (9), Bignoniaceae (4), Apocynaceae (2) and in remaining other families only one species is recorded (see Tree inventory annexures).

ABUNDANCE From the 15 families recorded in the study sites, the Fabaceae had the highest number of species (9) which belongs to 9 genera followed by the Apocynaceae with 4 species and 3 genera. A total of 25 genera were recorded in the study site. *Cascabela thevetia* (Apocynaceae) having 18 individuals were the most abundant Tree species. This was followed by the species *Polyalthia longifolia* (Annonaceae), *Azadirachta indica* (Meliaceae) and *Tecoma stans* (Bignoniaceae) having 17, 15 and 13 species respectively.

There were 12 species recorded in this site having only one individual. Out of which 8 species were native. The native species of this site having only one individual included *Bombax ceiba*, *Ficus benghalensis*, *Hibiscus rosa-sinensis*, *Alstonia scholaris*, *Mangifera indica*, *Lagerstroemia speciosa*, *Bauhinia*, *Cassia fistula*.

RELATIVE ABUNDANCE

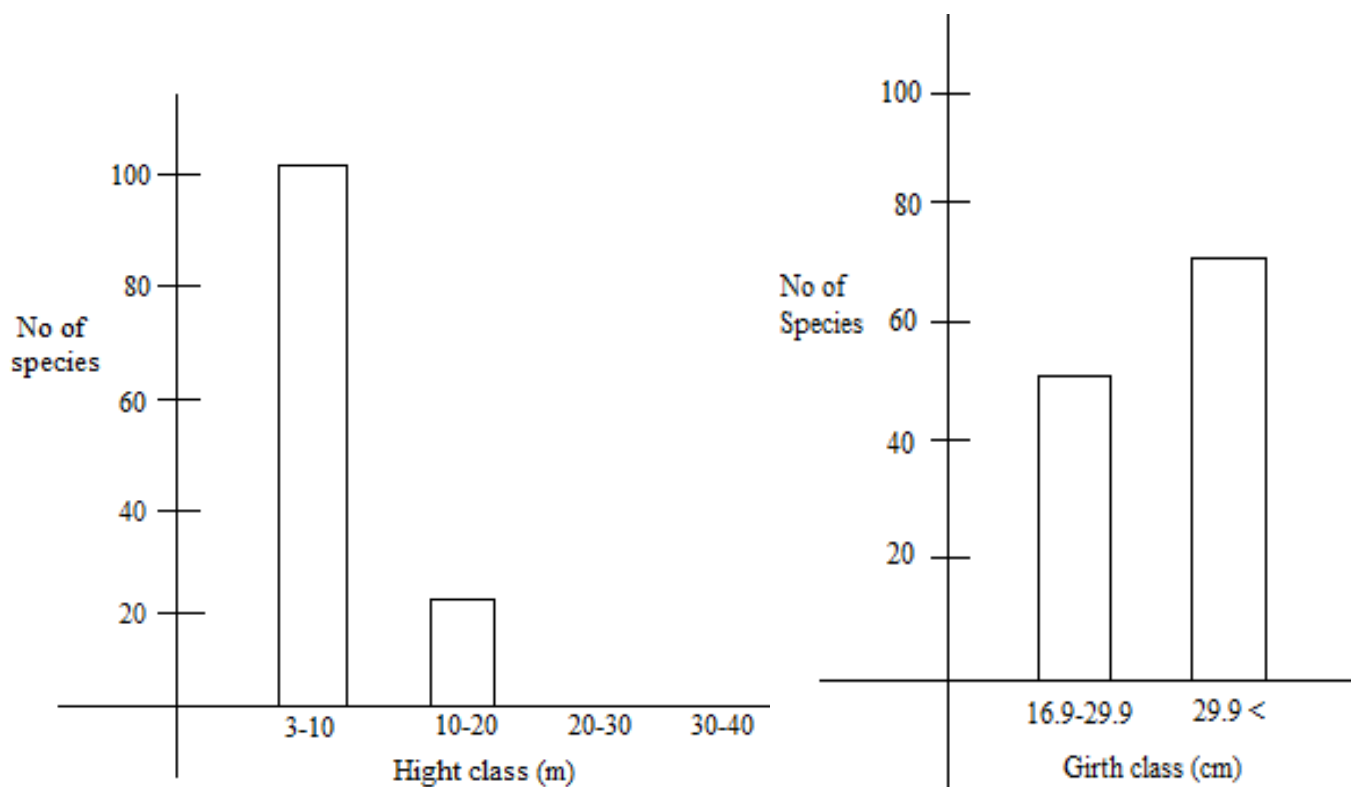
Species composition table shows the different trees species found in the study sites and their relative abundance. In this site, 125 individuals were sampled. The species with the highest number of individual was *Cascabela thevetia* with a relative abundance of 14.4%. It was followed by *Polyalthia longifolia* individuals and relative abundance of 13.6%, *Azadirachta indica* and *Tecoma stans* with

relative abundance of 12 % and 10.4% respectively.

DIAMETER CLASSES AND HEIGHT OF THE TREES

Trees with different diameter classes were found in the campus. The diameter range was grouped as medium-sized trees (16.9–29.9cm), and large trees (<29.9cm). The site was dominated by trees species having diameters (<29.9cm (large trees). 75 trees of the campus are large sized trees. 53 trees of the campus are small trees having medium diameters (16.9–26.9cm).

Out of the 125 species identified in the study site, 103 species were treelets, mostly <10m tall, and 22 species were understory trees <20m tall. No canopy species (20-30m) is found in the campus. Emergent species (>30m) were not found in the RSBM campus. The understory species of the campus are *Peltophorum pterocarpum*(1), *Polyalthia longifolia*(1), *Leucaena leucocephala*(2), *Dalbergia sissoo*(1), *Cassia Siamea*(1), *Delonix regia*(1), *Azadirachta indica* (3) *Acacia auriculiformis* (1),



DISCUSSION

The canopy of the campus is characterized by mixed species i.e. evergreen as well as deciduous. The most dominant trees in this campus are *Cascabela thevetia*, *Polyalthia longifolia*, *Azadirachta indica* and *Tecoma stans*.

The Fabaceae were observed to be the most prevalent family. This may be due their massive plantation, good survival rate and adaptability. Fabaceae is the largest family of the campus. Along with this highest number of *Cascabela thevetia* individuals were recorded, which also belongs to Fabaceae family having relative abundance of 14.4.

Out of first four abundant species of the campus three were exotic species while one is native to India i.e. , *Azadirachta indica*. The three exotic species alone makes up 38.4 % of total tree number. If we differentiate between exotic and native species of the campus 64.8% of tree individuals are exotic tree species while only 35.2 % of trees are native to India. This underlines that 64.8 % tree cover of the campus is under cultivation of exotic species and which is not good for biodiversity of the study area and nearby area.

The campus does not contain tallest layer of vegetation. No emergent and canopy 10 trees found. This site has more individuals of medium height (3m-10m). The higher number of individuals have diameter above 30cm. This indicates that less plantation is taken place in recent years. This may be due to availability of open space for tree plantation.

CONCLUSION

1. Fabaceae is the dominant family and *Cascabela thevetia* is the dominant species of this area.
2. It does not includes Trees of a rare, vulnerable or endangered species
3. This site does not contain tallest layer of vegetation
4. Large population of single species i.e. plantation of Bitti, Kaduning, Ashoka, *Tecoma stans* is one of the reasons for low value of evenness.

BIRD DIVERSITY

In nature birds occur in a variety of habitats – from deserts to the tropical rain forests; the short dry to the tall wet grasslands and on the alpine meadows in the high altitudes; from sea level to above 4000 meters above sea level; on rocks, cliffs in caves and mud banks; along fresh water estuaries, seas and shores. They also occur on man modified lands such as agricultural fields, airfields, along roadsides and hedgerows and gardens, among human habitations and dwellings.

RSBM College comes under habitat of man modified lands. 14 bird species were recorded from the campus.

C DAY AND TIME OF BIRD CENSUS

Date 18th February 2019, Time of the observations – 7.30 am to 10.30am

D BEHAVIORAL OBSERVATIONS

- a) Communal roosting of Rose ringed parakeet (*Psittacula krameri*) was seen on tall tree of *Peltophorum pterocarpum* and *Polyalthia longifolia*
- b) Communal roosting of large grey babbler (*Turdoides malcolmi*) was seen on *Dalbergia sissoo* hedge on College Gymkhana boundary line.
- c) House Swifts (*Apus affinis*) do roosts on the top floors of College building.
- d) Roosting Blue rock pigeons (10-20 in numbers) were seen on college buildings
- e) Sunbirds both purple and purple rumped enjoys the nectar of *Bauhinia* flowers.

METHODOLOGY

Direct count method was used to count the birds of campus.. The area was divided to record the number of birds in each part. The divisions were clearly demarcated by landmarks so they can be used subsequently for the same purpose. The observations included the species/common name of the bird, number of individuals observed.

Table 19 List of birds reported at RSBM campus & Nakshatra garden

| Family | Common Name | Scientific Name | ASC College and Gymkhana |
|---------------------|-------------------------|----------------------------------|--------------------------------|
| Accipitridae | Pariah Kite | <i>Milvus migrans</i> | 1 |
| Columbidae | Blue Rock Pigeon | <i>Columba livia</i> | 5 |
| | Little Brown Dove | <i>Streptopelia senegalensis</i> | 3 |
| Cuculidae | Asian Koel | <i>Eudynamys scolopaceus</i> | 2 |
| | Crow Pheasant | <i>Centropus sinensis</i> | 1 |
| Psittacidae | Rose ringed Parakeet | <i>Psittacula krameri</i> | 4 |
| Muscicapidae | Indian Robin | <i>Copsychus fulicatus</i> | 2 |
| | Tailor Bird | <i>Orthotomus sutorius</i> | 1 |
| Nectarinidae | Purple Sunbird | <i>Cinnyris asiaticus</i> | 3 |
| Meropidae | Small Green Bee- eater | <i>Merops orientalis</i> | 3 |
| Megalaimidae | Coppersmith Barbet | <i>Megalaima haemacephala</i> | 2 |
| Dicruridae | House Crow | <i>Corvus splendens</i> | 2 |
| | Common Myna | <i>Acridotheres tristis</i> | 3 |
| Strigidae | Spotted owlet | <i>Athene brama</i> | 1 |

BUTTERFLY DIVERSITY

India hosts 1501 species of butterflies (Gaonkar 1996), of which peninsular India hosts 350 and the Western Ghats, 331. The literature on biogeographic distribution and habitat preference indicates that the Satara district may harbor about 153 species. Remaining species are mostly forest dwellers and may not be found in the urban area. Koregaon taluka falls in the relatively species drier region of the Northern Western Ghats. There is no literature available on Korgaon butterflies and butterflies in Aundh.

OBSERVATIONS

| Common grass yellow | <i>Eurema hecabe</i> | Pieridae | Abundant | In front of college B.ED |
|---------------------|--------------------------|--------------|----------|--|
| Common Mormon | <i>Papilio polytes</i> | Papilionidae | Common | ASC, Nakshatra |
| Plain Tiger | <i>Danaus chrysippus</i> | Nymphalidae | Rare | Nakshatra garden |
| Blue Tiger | <i>Tirumala limniace</i> | Nymphalidae | Common | Entrance to Main Office |
| Common mime | <i>Papilio clytia</i> | Papilionidae | Common | On <i>Dalbergia sissoo</i> trees of ASC campus |

Table 20 Butterflies reported at RSBM college campus

MAMMAL DIVERSITY

In satara Districts animals like the Gray Langur *Semnopithecus hypoleucos*, Indian Hare *Lepus nigricollis*, Indian Grey Mongoose *Herpestes edwardsi* were sighted abundantly all over the district (covering both the northern Western Ghats and Deccan Plateau) followed by Wild Boar *Sus scrofa*, Asian Palm Civet *Paradoxurus hermaphroditus* and Indian Jackal *Canis aureus*. Mammals like Sahayadri Forest Rat *Rattus satarae*, Sloth Bear *Melurus ursinus* and Four-horned Antelope *Tetracerus quadricornis* were more or less restricted to Western Ghats mountain province of the district. Leopard *Panthera pardus* and Jungle Cat *Felis chaus* were noticed frequently to certain extent in the Western and middle part of the district. The Tiger *Panthera tigris tigris* was seen occasionally at Vasota Fort and Koyna area.

The mammals commonly seen on campus - Bandicoot Rat (*Bandicota indica*), House Rat (*Rattus rattus*), and Black footed gray langur

Black footed langur

The species is listed as Vulnerable based on a predicted decline of at least 30% over the next three generations (approximately 30 years) as a result of over-hunting.

This black-footed gray langur is distributed throughout south-western India, but is centred on the Western Ghats. In the past, expanding timber plantations were threats; in the present and future, threats include agriculture, human settlement, fragmentation, habitat loss, mining, deforestation, hunting, deliberate fires, and local trade for live animals and meat for food and traditional medicine. Hunting is considered the most serious threat to the taxon.



These black footed langurs are the regular visitors of the Aundh village. Their numbers go on a peak in summer season. They also prefer RSBM college campus for rest and they use to feed on roadside Tamarind trees. As human nuisance for them is almost zero, mother monkeys feel safe in this RSBM campus.

HONEY BEES OF THE CAMPUS

Bees and plants have co-existed since time immemorial. Bees depend for their food on plants; nectar provides them with carbohydrate, while pollen supplies protein. Most bees also depend on plants for shelter. In return, bees help with the vital process of plant reproduction. They cross-pollinate flowers, diversify the genetic background of seed, and help plant species reproduce and survive.

Bees need a clean and healthy environment. The existence of natural bee colonies is a good indicator of a healthy environment. Individual bees can also be useful in detecting air pollution. India can boast of being a centre of origin of the world's honeybee species. Out of the five honey-producing bee species, four have occurred in India since ancient times.



Three types of Honey bees were listed in campus

i) *Apis dorsata*-the rock bee or giant bee

This wild bee constructs single, huge, vertical wax comb exposed to light. The nest hangs on tall tree branches or towers, or underneath bridges or on rock cliffs. It contributes nearly 75% of total honey production of India. It migrates with the season to seek



Apis dorsata

ii) *Apis cerana-indica the Indian hive bee*

This hive bee constructs several vertical parallel combs in dark enclosures like hollows in tree trunks or in the ground. It is relatively stationary and can be kept in wooden hives for commercial production of honey and pollination services.



Apis cerana - indica

i) *Apis florea-the garden bee or little bee*



This wild bee constructs a single, small, vertical comb in bushes exposed to light. It produces small quantities of honey. It also migrates depending upon the availability of food

is florea-indica

COMMENTS

1. RSBM has attractive green cover and landscape. The noise monitoring studies indicates that this greenery proved beneficial for the betterment of campus environment.
2. The tree cover of campus acts as filter to air pollution. Noise monitoring analysis shows that the campus trees do acoustic buffering of outside noise and acts as noise barriers. Pure environment and silence zone are prime necessities of any educational institute.
3. Along with maintenance of greenery more focus should be given for mixed plantation. Planting should include a diverse array of species, genera, and families, of different herbs shrubs and trees. This will provide protected habitat for different faunal species of nearby area.
4. We can replace some ornamental shrubs or herbs with native and useful one. Some areas should be reserved for plantations which attracts local butterfly species. Vines and bushes with long leaves attract birds.
5. An integrated landscape approach can help to reconcile the sometimes-competing objectives of development and environmental sustainability.

Introduction

Increasing levels of carbon dioxide in the atmosphere are of growing concern globally and locally, and urban forests have a role to play in the battle against climate change. Urban forests can reduce atmospheric carbon directly and indirectly. As long as trees are growing, they remove CO₂ from the air in a process called carbon sequestration, transforming CO₂ into carbon and making use of it to build living matter - leaves, stems, trunk, roots, etc. The Biomass carbon sequestration potential was measured for RSBM campus.

Tree canopy of the campus

The canopy of the campus is characterized by mixed species i.e. evergreen as well as deciduous. The most dominant trees in this campus are *Casabela thevetia*, *Polyalthia longifolia*, *Azadirachta indica* and *Tecoma stans*.

A total of 27 species were recorded belonging to 15 families and 25 genera. Annexures of tree inventory shows the different plant species, their families found in the RSBM senior college campus. A total of 125 tree individuals (height above 3 meters) species were recorded in the study site. Out of 125 tree individuals 85 were evergreen trees while rests were deciduous.

The canopy of the campus is characterized by mixed species i.e. evergreen as well as deciduous.

A total of 25 species were recorded belonging to 12 families and 23 genera. Annexure of tree inventory shows the different plant species, their families found in the RSBM campus. A total of 412 tree individuals (height above 10 meters) species were recorded in the study site.

Distribution of dominant tree species and its relevance to carbon sequestration

In any carbon inventory project on above ground biomass, the main focus is paid to the dominant.

Species of living trees in the project areas. RSBM campus has heterogeneous tree diversity. From the 15 families recorded in the study sites, the Fabaceae had the highest number of species (9) which belongs to 9 genera followed by the Apocynaceae with 4 species and 3 genera. A total of 25 genera were recorded in the study site. *Cascabela thevetia* (Apocynaceae) having 18 individuals were the most abundant Tree species. This was followed by the species *Polyalthia longifolia* (Annonaceae), *Azadirachta indica* (Meliaceae) and *Tecoma stans* (Bignoniaceae) having 17, 15 and 13 species respectively.

Height and Girth distribution of trees

Assessment of height apart from being one of the most important parameters for calculation in carbon inventory projects along with DBH was considered as a reliable parameter to find out the maturity of a natural or man-made forest for terrestrial sequestration projects.

Out of the 125 species identified in the study site, 103 species were treelets, mostly <10m tall, and 22 species were understory trees <20m tall. No canopy species (20-30m) is found in the campus. Emergent species (>30m) were not found in the RSBM campus. The understory species of the campus are *Peltophorum pterocarpum*(1), *Polyalthia longifolia*(1), *Leucaena leucocephala*(2), *Dalbergia sissoo*(1), *Cassia Siamea*(1), *Delonix regia*(1), *Azadirachta indica* (3) *Acacia auriculiformis* (1),

Total biomass assessment

The assessment of above ground and belowground biomass of RSBM campus was carried out within 15 acres.

$$\text{Biomass carbon} = (\text{aboveground biomass carbon} + \text{belowground biomass carbon})$$

The total biomass has been summarised below in table

| Carbon pool | Estimated Quantity (Tones) |
|---------------------|----------------------------|
| Aboveground Biomass | 0.32009 |
| Belowground Biomass | 0.08322 |
| Total Biomass | 0.403310 |
| Total carbon | 0.201655 |

Table Total biomass carbon sequestration in RSBM campus

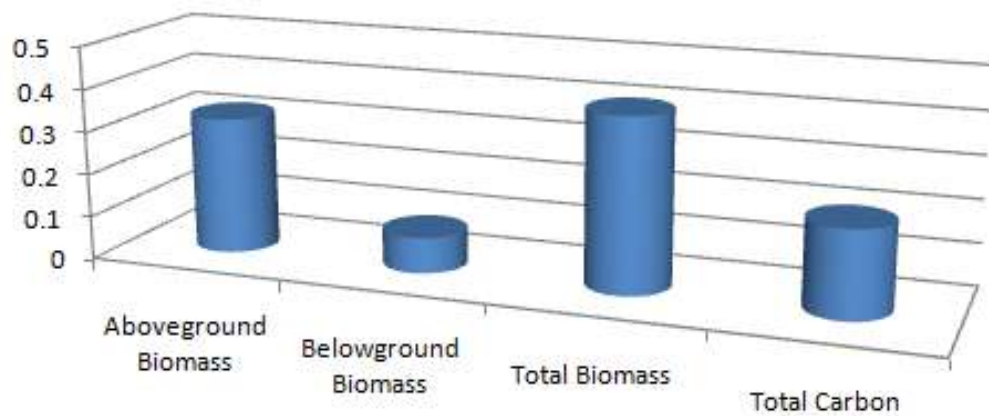


Figure AGB, BGB, TB and TC in study area

Conclusion

Total 0.2 tons of carbon is locked in the study area of RSBM campus by trees.

9. Vehicular emissions

The emissions inventory is the foundation upon which the regulatory strategy can be formulated. There are many emission sources that contribute to the urban air pollution such as point sources, non-point or area sources, motor vehicles, non-road mobile and natural. Magnitude of contribution from each of the sources depends upon the individual emission rates and the activity level.

The on-road motor vehicle emission inventory can be summarized as the product of an emission rate (e.g., gram/km) and an associated vehicle activity (e.g., km/day).

Survey was conducted to count the vehicles used by RSBC 'ians . Survey was done for one week in morning and afternoon sessions. It is assumed that the vehicles present at 7.40am are not present in afternoon session.

| Day & Date | Vehicle type | Morning 7.40 am |
|------------------------|---------------------|------------------------|
| Monday 15/7/2019 | Bicycles | 37 |
| | Two wheeler | 23 |
| | Four wheelers | 3 |
| Tuesday 16/7/2019 | Bicycles | 44 |
| | Two wheeler | 25 |
| | Four wheelers | 5 |
| Wednesday 17/7/2019 | Bicycles | 35 |
| | Two wheeler | 23 |
| | Four wheelers | 4 |
| Thursdays 18/7/2019 | Bicycles | 54 |
| | Two wheeler | 23 |
| | Four wheelers | 4 |
| Friday | Bicycles | 44 |

| | | |
|-----------------------|---------------|----|
| 19/7/2019 | Two wheeler | 22 |
| | Four wheelers | 5 |
| Saturday 20/7/2019 | Bicycles | 46 |
| | Two wheeler | 28 |
| | Four wheelers | 3 |

Table Vehicles of the campus

Vehicle count was done for Six days in the month of July 2019. To get the more correct number, vehicle count was done at two different times i.e. 7.40 am and 3.00 pm.

On an average 43 number of bicycles were counted per day. Around 24 two wheelers are used daily by RSBM students and staff. While 4 four wheelers daily come to the campus.

Based on the vehicle count and with the help of emission factors given by the ARAI (Automotive Research Association of India) for Indian vehicles (2010) total emissions by RSBM campus are calculated here.

| Pollutants | Emissions Factor | Avg Number of Vehicle/ day | Emissions (gm/km) | Average Travel (km) | Total Emissions per day |
|------------|------------------|----------------------------|-------------------|---------------------|-------------------------|
| CO | 1.4 | 24 | 33.6 | 15 | 504 |
| HC | 0.7 | 24 | 16.8 | 15 | 252 |
| NOx | 0.3 | 24 | 7.2 | 15 | 108 |
| PM | 0.05 | 24 | 1.2 | 15 | 18 |
| CO2 | 33.83 | 24 | 811.92 | 15 | 12178 |

Table Total emissions by two wheelers

If we consider CO2 emissions only, we can see that 12178 gm/day of CO2 is emitted by two wheelers of RSBM campus. So the CO2 emitted by two wheelers per year is,

$$12178 * 185 = 2252930 \text{ gm/year} = 2.48 \text{ tones/year}$$

| Pollutants | Emissions Factor | Avg Number of Vehicle day | Emissions (gm/km) | Average Travel (km) | Total Emission per day |
|------------|------------------|---------------------------|-------------------|---------------------|------------------------|
| CO | 4.3 | 4 | 43.0 | 15 | 645 |

| | | | | | |
|------------|-------|---|------|----|-------|
| HC | 2.05 | 4 | 20.5 | 15 | 307.5 |
| NOx | 0.11 | 4 | 1.11 | 15 | 16.65 |
| PM | 0.08 | 4 | 0.8 | 15 | 12 |
| CO2 | 72.50 | 4 | 725 | 15 | 10875 |

Table Total emissions by Four wheelers

Emission factors by four wheelers are higher than two wheelers. So the emissions per vehicles are also high as compared to two wheelers. If we consider CO2 emissions only, we can see that 10875gm of CO2 is emitted by two wheelers of RSBM campus. So the CO2 emitted by four wheelers per year is,

$$10875 * 240 = 2011875\text{gm/year} = \mathbf{2.21 \text{ tones/year}}$$

Total Emissions by RSBM vehicles per year = 2W + 4W = 2.48 + 2.21 = 2.41 tones/year

From above figure it can be analyzed that though the number of 4W are less as compared to 2W, they do major contribution in total CO2 emissions of the campus

CARBON DIOXIDE EMISSIONS AND ITS ASSIMILATION BY CAMPUS TREES

In green audit college has also assessed carbon sequestration by campus trees. Study shows that 0.2 tones of carbon is sequestered by campus plants. And carbon flux shows that campus plants have capacity to absorb/sequester around 0.03 tones of carbon this year. This capacity gets increased by every year.

If we quantify CO2 flux to carbon dioxide,

$$0.2 \text{ tones of Carbon} = 181.437 \text{ kg of carbon}$$

To determine the amount of CO₂ that the trees removed from the atmosphere, we have to multiply the carbon value by 3.67. This value is the mass conversion factor for carbon to carbon dioxide.

$$182.437 \text{ kg of carbon} * 3.67 = 669.54 \text{ kg of CO}_2 = 0.737 \text{ tones}$$

CO₂ per year So it can be concluded that campus trees has capacity to 0.737 CO₂ per year.

While the vehicular emissions study showed that total emissions of RSBM vehicles is 2.41 tones/year. This value is 3.44 times greater than Carbon dioxide assimilation capacity of campus trees.

CONCLUSION AND RECOMMENDATIONS

Total 0.2 tons of carbon is locked in the study area of campus by trees. Carbon flux calculations show that carbon sequestration capacity of trees will get increased by their age.

The Value of CO₂ emissions of RSBM campus vehicles is 3.44 times greater than carbon dioxide assimilation capacity of campus trees. Plantation is needed to assimilate the CO₂ emissions. As well as reduction in the use of four wheeler by college staff will also do major impact on CO₂ reduction. Because though the number of 4W are less as compared to 2W, they do major contribution in total CO₂ emissions of the campus

RSBM staff and students must use public transport. Use of Bicycle is an eco-friendly transport option to lower the CO₂ emissions of campus. College has already started awareness activities like 'No vehicle day' (at least once in a month).

Introduction

Knowledge of chemical and physical properties of soils has been assessed to understand the capacity of campus soil to support existing green cover. The concept of soil quality includes assessment of soil properties of campus as they relate to ability of soil to function effectively as a component of a Plant health at RSBM campus. In present study soil quality was assessed to know the capacity of a soil to produce biomass. As front campus is physically locked due to fencing of cement wall, so movement from **outside – campus – outside** is significantly restricted.

Status of soil in Maharashtra

The state of Maharashtra represents a mixed landscape with hill ranges, thick forest cover and coastline. The soils of Maharashtra are residual, derived from the underlying basalts. The land in the river basins of Godavari, Bhima, Krishna and Tapi has a deep layer of fertile black basalt soil rich in humus. The rest of the semi-dry plateau has a medium layer black regur soil which is clayey with high moisture retention capacity, rich in iron but poor in nitrogen and organic matter. The peaks of Sahayadri Mountains, the districts of Ratnagiri and the western regions of Kolhapur and Satara are composed of laterite soil. The Konkan coast has sandy loam soil. A variety of red soil and sandy soil is found in the Vidarbha region. Maharashtra's soils are highly deficient in nutrients when compared with the soils of other Indian states. They are lacking in Nitrogen (N), Phosphorous (P) and Potassium (K) and mainly because farmers in rain-fed areas use very little fertilizers. Further, excessive use of water for irrigation also leads to increasing salinity of soils.

Soil characteristics

In order to assess the soil quality RSBM educational campus, a collective soil samples were taken from different sites. Soil samples between 0-20 cm depths were collected. Collected soil samples are analyzed by using water soluble extract of soil samples.

Physical characteristics

Physical characteristics of soil are delineated through specific parameters, viz, particle size distribution in terms of percentage of sand, slit, clay is presented in table. It is observed that texture of original landscape of RSBM educational complex Sandy Clay Loam.

The bulk density of soil sample in the campus area found to be 1.4 gm/cm^3 , which is suitable for plant growth. It is generally desirable to have soil with a low BD ($<1.5 \text{ g/cm}^3$) (Hunt and Gilkes, 1992) for optimum movement of air and water through the soil. Soil porosity is a measure of air filled pore spaces and gives information about movement of gases, inherent moisture, and development of root system and strength of soil. Variation in soil porosity is presented in table. The porosity of soil sample is 43%, which shows moderate water holding capacity.

| Sample | %sand | % silt | %clay | Texture | % OM ¹ | CEC ² | BD | Porosity ³ | pH |
|--------|-------|--------|-------|-----------------|-------------------|------------------|-----|-----------------------|-----|
| 4 | 60 | 15 | 25 | Sandy clay loam | 4 | 36 | 1.4 | 43 | 7.7 |

Table Physico-chemical analysis of soil samples collected from Campus

Chemical characteristics

pH is an important parameter indicative of the alkaline or acidic nature of the soil. It greatly affects the microbial population as well as the solubility of metal ions and regulates nutrient availability. The pH of original soil of the campus is 7.7 and so is conducive for the growth of plants.

Cation exchange capacity (CEC) determines the storage capacity of nutrients as supplied to plant in exchangeable forms. CEC of the campus soil is 36 meq/100 in the study area is given in table. Very high level of CEC i.e. more than 40 meq/100 normally found in very heavy soils with a high clay content or soils with a high organic matter level. Nutrients can be bound very tightly to the soil particles and availability can be restricted.

Fertility status of the soil

Organic matter present in the soil influences its physical and chemical properties. It commonly accounts for as much as one third or more of the cation exchange capacity of the surface soils and is responsible for soil aggregates. Organic matter of the campus soil is 3%, which is good for landscaping and gardening.

Recommendations and conclusions

- Soil at different location of the campus is varying in texture and having mixture of native and exotic soil. So soil sample is selected from original landscape area of the campus. It shows that campus terrain has good fertility status and can be used for landscaping and gardening.
- Though the campus soil has enough quantity of Organic matter, improved quantity will help for better Plant growth.

6. Water quality

Drinking water supply in RSBM College campus

The Primary source of RSBM potable and Non-potable water is Borewell water. The College receives its borewell water from borewell located near RSBM Gymkhana building. The college treats this borewell water before using it as potable water. College has three water filters with attached cooler system.

Water sampling and analysis

Two drinking water samples were collected from campus premises to assess water quality. One sample was taken from direct borewell supply and other one was taken from filters. Water before filtration is also sampled to check the quality of non-potable water. This water is used for Laboratories, wash basins, toilets, mopping and irrigation of campus plants.

| Source | Sample No. |
|-------------------|------------|
| Before filtration | D1 |
| After filtration | D2 |
| | |

Table Water samples of RSBM campus

Collected water samples are immediately brought in analytical laboratory at Department of Chemistry of and preserved under 4⁰C to analyze physico-chemical parameter on priority list provided by APHA (2010).

Physical parameters such as pH, E.C., TDS, were determined at first in college. And others are determined by titrimetric methods, AAS technique and spectrophotometer method was sampled in water quality testing lab.

| Sample No. | pH | Total hardness | TDS | DO |
|------------|------|----------------|-----|----|
| D1 | 7.08 | 250 | 190 | 5 |
| D2 | 7.50 | 70 | 78 | 6 |

Table Physical parameters

This table shows the results of physical parameters viz. pH, TH, TDS and DO are in the range of 7.08 -7.50, 70-250mg/l, 78-190mg/l, 5-6.3mg/l.

| Sample No. | Ca | Na | K | Cl | SO ₄ | PO ₄ | NO ₃ |
|------------|----|----|-----|-----|-----------------|-----------------|-----------------|
| D1 | 33 | 20 | 0.1 | 300 | 42 | 0.02 | 9.20 |
| D2 | 31 | 26 | 0.1 | 111 | 34 | 0.01 | 9.17 |

Table Chemical parameters

Inorganic parameters viz. Calcium, Sodium, Chlorides and Sulphates are found within the permissible limits given by IS 10500:2012 under drinking water specifications. Physical parameters are also within the permissible limits. Nutrient parameters – phosphates and Nitrates are within permissible limits too.

Conclusion and Recommendations

The overall drinking water (after filtration) quality of the RSBM campus is found to be within the specifications for drinking water standards IS 10500:2012. The regular water quality analysis is needed to check the potability of drinking water.

This bore well water supply can also be used for Gardening purpose.

Energy Audit

ENERGY SCENE

Primary source of energy at RSBM is electricity. Electricity is used for all electrical appliances like lighting, fan, pumps, computer and lab instruments. Also water is used for drinking, domestic & gardening purpose.

ENERGY: SOURCES & UTILIZATION

Primary energy / natural resources utilized at the service center are electricity & water. These sources are consumed for the generation of motive power and water for drinking, washing & domestic usage, gardening respectively. The source of electrical power for the service center is from MSEDCL grid

Objectives

- Collect historical data to analyze background activities
- Collect & analyze monthly billing data & energy consumption data for the period of one year.
- Review on billing demand, load factor, etc. and suggest method to reduce maximum demand

Monthly Electricity Consumption of College building

| Sr. No. | Months | Contract Demand (kVA) | Billed Demand (kVA) | Units Consumed (kWh) | Total Bill, (Rs.) | Rs./kWh |
|----------------|---------------|------------------------------|----------------------------|-----------------------------|--------------------------|----------------|
| 1 | Dec 2018 | 9 | 0 | 523 | 6,551.93 | 12.52 |
| 2 | Nov 2018 | 9 | 0 | 412 | 5,397.13 | 13 |
| 3 | Oct 2018 | 9 | 0 | 456 | 5,661.14 | 12.41 |
| 4 | Sep 2018 | 9 | 0 | 498 | 6,022.81 | 12.093 |
| 5 | Aug 2018 | 9 | 0 | 343 | 3,936.55 | 11.476 |
| 6 | Jul 2018 | 9 | 0 | 349 | 4,175.26 | 11.96 |

| | | | | | | |
|----|----------|---|---|-------|-----------|-------|
| 7 | Jun 2018 | 9 | 0 | 803 | 10,091.44 | 12.56 |
| 8 | May 2018 | 9 | 4 | 1,013 | 12,687.52 | 12.52 |
| 9 | Apr 2018 | 9 | 4 | 941 | 11,566.15 | 12.29 |
| 10 | Mar 2018 | | 4 | 456 | 5,461.01 | 11.97 |
| 11 | Feb 2018 | | 4 | 443 | 5,260.16 | 11.87 |
| 12 | Jan 2018 | | 4 | 483 | 5,570.25 | 11.53 |

Electricity bill analysis

| Sr. No. | Parameter | Value | Unit |
|---------|---|--------|------------|
| 1 | Contract Demand | 9 | kVA |
| 2 | Average recorded Maximum demand | 4 | kVA |
| 3 | Demand charges | 270 | Rs./kVA |
| 4 | Avg. Unit Consumption (Electricity bill) | 560 | kWh/Months |
| 5 | Avg. Unit Consumption (Electricity audit) | 475.71 | kWh/Months |

Average monthly MSEDCL unit's consumption is 560 units and average monthly consumption by electricity audit about 475 unit.

WATER

For water quantification there is no any metering system available at building section.

Water flow meter has to install at all major water line for recording consumption of water.

LEVEL OF AWARENESS

The level of awareness for energy conservation in top management is high since they are using star rated lighting, fan & other electrical appliances. College should organize different training programs for general awareness. Trainings on energy conservation are not found on records. It should be ensured that everyone knows the operating energy conservation parameters

The electricity bill consists of following parts

- Demand charges
- Unit charges•

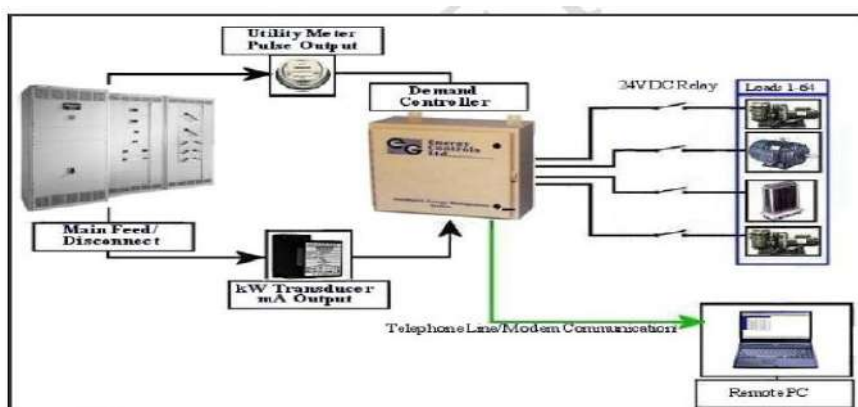
- Time of Day Charges
- Other charges, which cannot be controlled
- Load factor is an indicator to assess if the billed maximum demand charges can be reduced. The monthly load factor is calculated as follows:

| | |
|---------------|---|
| Load Factor = | Actual units consumed |
| | Maximum demand X No of hours per month X Average power Factor |

Maximum demand should be monitored regularly so as to reduce non-critical loads when set maximum demand is reached. And also need to reduce contract demand in such way that to avoid excess demand charge by considering future load.

Maximum Demand Controller

- High-tension (HT) consumers have to pay a maximum demand charge in addition to the usual charge for the number of units consumed. This charge is usually based on the highest amount of power used during some period (say 30 minutes) during the metering month.
- The maximum demand charge often represents a large proportion of the total bill and may be based on only one isolated 30 minute episode of high power use. Considerable savings can be realized by monitoring power use and turning off or reducing non-essential loads during such periods of high power use.



Power Factor Incentive & Penalty

- Whenever the average power factor over a billing cycle or a month, whichever is lower, of a High Tension consumer is below 90%, Penal charges shall be levied to the consumer at the rate of 2 % (two %) of the amount of monthly energy bill (excluding of Demand Charges, FOCA, Electricity Duty and Regulatory Liability Charge etc.) for first 1 % (one percentage point) fall in the power factor below 90%, beyond which the penal charges shall be levied at the rate of 1 % (one %) for each percentage point fall in the power factor below 89%. Such penalty will however not be applicable to Railways for Power Factor up to 72%.
- Whenever the average power factor is more than 0.95, an incentive will be given to High Tension industrial (HTP-I, HTP-II & HT- SEASONAL), and HTP-III & HTP-IV consumers, irrespective of status of TOD meter installation.
- The said incentive will be at the rate of 1% of the amount of the monthly energy bill (excluding Regulatory Liability Charges, Demand Charges, FOCA, Electricity Duty) for every 1% improvement in the average power factor above 0.95.
- For power factor of 0.99, the effective incentive will amount to 5% reduction in the energy bill and for unity power factor; the effective incentive will amount to 7% reduction in the energy bill.
- Power factor will be computed, by the method of kWh / KVAh & rounded off to two decimal points as per the existing practice.

Recommendations

1. College should conduct awareness programmes about energy saving
2. College should minimize its contract demand to cut down unnecessary payment towards high contract demand

Green Audit Certificate

IMG-20201218-WA0004 1 .JPG

GREEN AUDIT

Certificate by

ADYA ENVIRONMENTAL SERVICES

Flat No - 1, Wing A, Mukti Park, Yashwantrao Chavan Park, Barrowli, Pune - 411012

Registration number - IS300032846203

This Certificate is presented to: Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh for successfully completing the Green Audit. An Audit was performed in May-July 2019.

Awarded on: 20/7/2019



Adya Environmental Services

Proprietor

24/2020

Plantation At Ambheri In collaboration with Forest Department



Policy on Environment and Energy Use

Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh has specific policy on use of environment and energy.



Policy on Environment:

Environment consist all the animals, plants, reptiles, water bodies, birds, insects, trees, microorganisms, human beings and many more. Environment regulates various cycles daily which help in maintaining natural balance between living things and environment. Human being receives countless benefits from environment every day and all the benefits are free of cost. These benefits are connected with forest, trees, animals, water and air. Trees and plants play important role in the sustenance and development of environment. Trees absorb harmful gases and release lifesaving oxygen which is the biggest benefit to all living things. Social, physical and cultural environment is the matter of consideration from the college and educational environment's point of view. Raja Shripatrao Bhagwantrao Mahavidyalaya is quite aware of environment maintenance and its development. The college decided to run various activities to build environment awareness among the students. Plantation in rainy season is yearly activity of the college. Students of the college are motivated to take initiative in the plantation on the occasion of birth anniversary of the president and chairperson of the institution. Students of the college are motivated to use bicycles to avoid air pollution. The college has provided dust bins to use for waste. Plastic carry bags, pouches, bottles are banned in the college campus. Filtered drinking water is provided to the students. The college has developed botanical garden with rare and endangered and medicinal plants which are taken care of the department of Botany. Environmental Audit of the college has been done by the external agency. Some birds and insects are frequently visiting the campus due to its rich plantation. Plants and trees are regularly watered by the peons of the college. All the faculty members support to maintain and develop healthy environment.

Policy regarding maintaining and developing environment is as follows:

1. As per the directions of state government regarding plantation, the college along with its students organizes plantation programme at the gymkhana ground every year.
2. Birth anniversaries of Hon'ble Prisident and Hon'ble Chairperson of Aundh Shikshan mandal, Aundh is celebrated regularly by organizing plantation programme.
3. The college motivates the students and staff to use bicycles and avoid fuel consuming vehicles to reduce air pollution in the campus.
4. To make environment awareness among the people, the college organizes plantation programme in nearby villages through NSS volunteers.
5. The college has banned tobacco, gutkha chewing and smoking in the campus. Tobacco Free Zone board is displayed in the entrance of the college to aware the students regarding this.
6. To maintain atmosphere clean and healthy, the college has banned plastic bottle, plastic pouches, plastic carry bags, etc., in the campus. Plastic Free Zone board is displayed at the entrance of the college.

Policy on Energy Use:

The college always takes an initiative to use appropriate, essential and required energy i. e. electricity and tries to save energy through its restricted use. The college has thirty eight rooms and almost every room has at least one fan, two tube lights and two plugs for extension randomly where one can connect laptop, mobile and such energy consuming gadgets. Various departments, laboratories, office, staff room, NAAC room, library, seminar hall etc. are more energy consuming centres where requirement of energy is higher than classrooms. As entire building of the college has proper ventilation, the college does not require energy in the form of tube light in day time but regular use of energy in the form of fans, computers, especially in the office, principal's cabin, library, etc. is unavoidable. Energy for battery backup system and for LCDs, computers and tube lights in the departments is also quite essential where more consumption of energy is rampant. The college has three submersible water pumping motors which directly consume high level of energy to fulfil water requirement of the college. Apart from this the college has separate Gym and Indoor Sports Facility Centre/Building equipped with high energy consuming flood lights where the use of energy is higher than usual.

As continuous use of electricity is quite essential thing in day-to-day life, the college also requires certain amount of units every month and recently the college is paying electricity bills around Rs. 15000/- to 17000/- per month. Aundh village and its Gram Panchayat adopted government policy of single phase connection to avoid irregularity in supplying electricity or no electricity for eight to ten hours in a day due to shortage of electricity production in Maharashtra State. Now there is no shortage of electricity supply in the village but there is weekly off on Tuesday for the maintenance of street lights and repairing in the various connections in and around the sub-station. The policy, adopted by Gram Panchayat, Aundh, of single phase connection directly benefitted to the college where regular electricity is supplied by MSEB or Mahavitaran (Maharashtra State Electricity Board). MSEB employees and staff are quite supportive and cooperative in providing essential and required services. Apart from this, the college has appointed an electrician to maintain and repair electric material, energy sources and regular check-up as well as maintenance of the college. To avoid extra energy consumption, especially in the night, the college has fixed six street solar lamps with solar panels fixed on the top of the pole and that do not require direct electricity supply, to provide the light in the night. Recently, the college has taken a step ahead and changed all regular forty watts energy consuming tubes in all the rooms of ground floor in to LED tubes which will help to cut off the use of energy or to save the energy in future.

To save the electricity and its consumption and use the energy, the college has taken following initiatives as its policy:

Initiatives taken by the college to save energy:

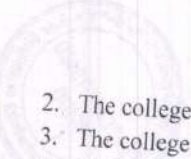
1. The college has fixed six solar street lamps to save direct electricity consumption in the night.



7. College campus and building area is equally distributed among the peons and laboratory attendants for cleaning regularly.
8. Plants and trees of the campus along with botanical garden are watered weekly by the peons and laboratory attendants.
9. Cutting of trees, plants and flowers are strictly prohibited in the campus.
10. One student one plant scheme is implemented.
11. Environment awareness and cleanliness programme is organized for the students in the college and for the people through NSS Special Camping Programme in nearby villages.
12. Dust bins are placed in the departments as well as common area of the campus where waste material can be deposited.
13. Every third Saturday is declared as vehicle free zone.
14. To provide sufficient light at the night, the college has fixed solar lamps in the campus.
15. Clean bore well drinking water is made available at the ground and first floor of the college building.
16. Leakage of water is repaired instantly and wastage is avoided.
17. Rain water harvesting is also developed through which rain water, collected at the terrace of the building in rainy season, is stored in the underground water tank and later this water is used for plants, latrines and toilets.
18. Separate sweeper is appointed to clean lavatory and toilets on daily wages. Cleaning of the toilets is done twice in a week.
19. Health check-up camps are organized for the staff and students.
20. Counsellor is also appointed to maintain mental health of the students.
21. College use to give plants as a gift to resource persons and dignitaries who visit the college in various organized occasions.
22. Vermicomposting unit is developed by the college with four beds where waste leaves of the plants and trees of the campus are deposited. And prepared material by earthworms is used for the plants and trees as fertilizer. Best from the waste is done through this unit.

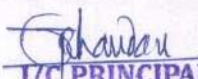
Following are some social activities regarding environment done by the college.

1. Road side plantation from Aundh to Ghatmatha
2. Plantation and spreading seeds on Yamai Hill.
3. Plantation (1000 plants) in collaboration with forest department at Ambheri Hill.
4. Plantation at Yeliv Village through NSS Volunteers.
5. Plantation at Varud through NSS Volunteers.
6. Cleaning and repairing of roads is done by the students of the college at Aundh.
7. Cleaning and building water reservoir is done by NSS Volunteers at Varud, Yeliv, Wanzoli, etc. nearby villages where special camping programme of NSS is organized.
8. Crackers free Dipawali Campaign is organized by Vivek Wahini of the college.
9. Pollution Free Ganesh Festival Awareness programme is also organized.



2. The college has fixed LED tubes in all the rooms of ground floor of the building.
3. The college preferably fixed LED tubes in newly constructed rooms.
4. All the passages area or verandas are covered with LED lamps.
5. The college assures that the electricity supply to the college should be closed for at least fifteen hours in a day.
6. Peons are instructed to check all the buttons of the tube lights and fans and that should be off before lock the doors of the classrooms.
7. Teaching and non-teaching staff are regularly instructed that they should make sure that all the buttons of required fans and tubes are off before leaving the place in the evening.
8. All the faculty members are instructed time to time that they should make sure before leaving the campus that all the computers are closed and shut down properly after the work done on the device.
9. Energy audit is done by the college through which the administration of the college can understand and assess the places where excess energy is used and how it can be avoided.
10. Use of energy is pointed out time to time and the expenses in the form of energy bills are put before the management for approval.
11. Management of the institution is preferably thinking on the use of solar panels to be fixed on the terrace of the building for regular use of energy in future.


COORDINATOR
Internal Quality Assurance Cell
Raja Shri Patrao Bhagwantrao
Mahavidyalaya, Aundh (Satara)


I/C PRINCIPAL
Raja Shri Patrao Bhagwantrao
Mahavidyalaya, Aundh (Satara)

Energy Audit Report

For

Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh
Taluka Khatav, District. Satara



By



Karmaveer Bhaurao Patil
College of Engineering,
Satara-415001.

15 Dec 2020

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Kamnaveer Bhaurao Patil
College of Engineering,
Savara-413001.

12 Dec 2020

Executive Summary

It is the primary energy audit report, for the electrical installations at various buildings of Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh Tal. Khatav, Dist. Satara.

The major and most of energy utilization is in the form of electrical energy and hence Audit of electrical energy is primary consideration.

The objective of this Audit is to assess primarily the electrical installations in the building and suggest energy saving majors. The electrical installations in an institute had not been assessed for its electrical power utilization since establishment and hence this energy audit is proposed.

Electrical equipments, laboratory equipments and lighting systems, reviewed during this primary audit in the month Dec- 2020.

Summary of Recommendations


- The audit conducted is a preliminary audit
- Institute should prepare detailed electrical schematic, from electrical supply point to end load point.
- The total monthly average billed energy consumption of 3820.25 kWh over a span of last five years from financial year 2015-16 to financial year 2019-20. The electrical energy consumption rate is high ranging from Rs. 8/00 to Rs.15/00 per unit. Even distribution of load will reduce energy bill. Taking in to account the power consumption, the recommendation is to consolidate all the meters and have a three, three-phase supply. Distribute the load on all the three phases in balanced manner
- Recommended to get all earth points to be salt treated to improve earthing.
- Replacement of Fluorescent / CFL / filament bulb lighting by LED lighting.
- The alternative source of power available is three phase Diesel Generator. It is necessary to maintain the generator utilization log book registering the period of usage, energy generated and utilized in kWh (units) and fuel consumed during this period.
- Provision of fire extinguisher is necessary and to be done with priority.
- Display first aid charts to improve awareness of first aid support in case of electrical accident.

Ref - KBPCUGS/2020-21/666

Date - 15/12/2020



Dhananjay Devi
Associate Professor
Energy Auditor (EA6470)



Dr. A.C. Attar
Principal

Rayat Shikshan Sanstha's

Karmaveer Bhaurao Patil College of Engineering, Satara-415001.

1. Introduction of the Institute

Aundh is forty five kilometers away towards east from the district place Satara. Nearest railway station (twenty five kilometers away to west) is Rahimatpur, Tal: Koregaon. Nearest airport is Pune one hundred and sixty five kilometers away from Aundh. Aundh is situated in remote rural area of Khatav tehsil which is popularly known as drought prone zone. People of the area are financially backward, poor and basically depend on farming which is under the blessings of sufficient rainfall during the year. Poor industrial development, lowest rainfall, scarcity of underground water and weak farming are some characteristics of the area. So the people are migrated for the job towards the cities like Pune and Mumbai. But now-a-days, situation is changing sustainably. Sugar Industries and some small scale industries are taking initiatives in the progress of the area by offering job opportunities to the youngsters.

Aundh is prominent political and holy place and it has grand historical heritage. Before independence, Aundh was a separate state (Sansthan). Democracy was established in Aundh State first time in India (1939) by the then King Shrimant Bhawanrao alias Balasaheb Pantpratnidi. During the reign of this king Aundh State became prosperous in different walks of life such as drawing, painting, sculpture, carpentry, ivory, etc.

Shri. Chitra Padarth PuranVastu Sangrahalaya, Aundh near Yamai temple on hill is the best evidence. The king Shrimant Balasaheb Pantpratnidi was quite aware of the importance of education, different arts, physical exercise such as Suryanamaskar, cleanliness, plantation, eradication of untouchability and poverty.

In 1898, in the memory of his father Hon'ble King Shrimant Shrinivas Pantpratnidi, he established Shri Yamai Shrinivas High School at Aundh.

Eminent personality's like Shri. Sane Guruji: A famous Litterateur and social reformer, Shri. Appasaheb Pantpratnidi; Barrister and Ambassador to England and Indonesia, Shri. Shantanurao Kirloskar: Famous Industrialist, Shri. G. D. Madgulkar: Famous Litterateur, Film Director, Film Actor and president of "Akhil Bharatiya Marathi Sahitya Sammelan", Shri. Shankarrao Kharat: Dalit Litterateur and president of "Akhil Bharatiya Marathi Sahitya Sammelan", Shri. V. D. Madgulkar: Famous Litterateur, Film Director and president of "Akhil Bharatiya Marathi Sahitya Sammelan", Shri. N. S. Inamdar: Famous Litterateur and president of "Akhil Bharatiya Marathi Sahitya Sammelan", Shri. Madhukar Pathak: Famous Film Director, Shri. Ram Naik: Ex Minister of Petroleum, Govt. of India, Shri. K. N. Watave: Famous Story Writer, Shri. Pandit Satavalekar: Vedantacharya and famous painter, Shri. Anant Buva Joshi: Great Musician, and Shri. M. D. Kulkarni: Ex Principal and Educationist had taken their education from Shri Yamai Shrinivas High School Aundh.

Pandit Jawaharlal Neharu visited the place along with his sister Vijayalkshmi Pandit and praised the work of the King & his democratic approach.

King Shrimant Bhawanrao alias Balasaheb Pantpratnidi had helped financially and donated acres of land for the industrial development to Shri Ogale and Shri Kirloskar at Karad and Kundal respectively. He established Aundh Shikshan Mandal, Aundh on 12th January, 1949 by keeping important objective in his mind about the education.

In the same pedigree, the King Hon'ble Shrimant Shripatrao Bhagwantrao Pantpratnidi had paid attention to educational development. He realized that even though this area is dry, drought and full of poverty, there is a tremendous intelligence amongst these people. So he started educational institutions like Shri. Yamai Shrinivas High School, Raja Bhagwantrao Junior College with agriculture as an important subject for the students of the area, Raja Shripatrao Bhagwantrao Mahavidyalaya at Aundh and Waghjaidevi Vidyalaya at Trimali, six kilometers away from Aundh.

In the same way, present chairperson Hon'ble Shrimant Gayatri Devi Bhagwantrao Pantpratini, Ranisaheb of Aundh has not only motivated the people for higher education but helped by all means in overall development of Aundh. Her Highness founded new branches of Aundh Shikshan Mandal, Aundh entitled Shrimant Harshitaraje English Medium School and Shri. Bhavani Bal-Vidya Mandir at Aundh. As per the motto of the parent institution, *Sheel, Sharir, Adhyayan*, She established advanced Gymkhana with modern equipment in Aundh. More than two hundred youngsters are daily visitors to this Gym. Huge playground for outdoor games, Big hall for indoor games like badminton, wrestling, boxing, judo, table tennis, carom, chess etc., hostel for the girls are the assets of the college. Now Aundh became an important educational centre in the tehsil area. Apart from other branches of Aundh Shikshan Mandal, Aundh, Raja Shripatrao Bhagwantrao Mahavidyalaya is the major stream of higher education. Along with regular under-graduated courses like B. A. and B. Sc., Post-Graduation in Geography, centre of Yashwantrao Chavan Maharashtra Open University, Nashik for B. A., B. Com. and M. A./M. Sc. in Environment Science, Centre for various courses under ISRO, Distance Education Centre of Shivaji University, Kolhapur, Shrimant Charusheelaraje Competitive Examination and Guidance Centre, Centre for Police Pre-recruitment Training for Girls, Centre for various courses under Life Long and Continuous Education of Shivaji University, Kolhapur all these additional educational facilities are provided by the college keeping **vision** in the mind to provide quality education in the drought-stricken rural region and to create social and scientific awareness among students for maintenance of national integrity and overall development. The college, with its motto *Sheel, Sharir, Adhyayan*, is a conscious educational institute that sets up **mission** for imparting value education to every aspect of society as well as motivating students to participate in various activities to develop their personalities, creating awareness of social responsibility and generating leadership qualities through various programs. It is our prime important to maintain quality education and to develop national integration to make our student globally competent with human values. By taking an inspiration from Late Shrimant Shripatrao Pantpratini Maharaj, founder of the college and the then chairman of Aundh Shikshan Mandal Aundh, some faculty members of the college initiatively established Rajesaheb Vichar Manch. This Manch organizes elocution competitions, lectures on its own by collecting fund from the members of the Manch. The Manch also donates educational material to the needy poor students and financial help to the cattle camps in summer season. The college is distinct institution and it has fulfilled almost all the recommendations made by the PEER team in the last accreditation process like-extension of library and laboratories, UGC indoor sport facility oriented badminton hall and ranking in NIRF with band 150 to 200.

College achieved B Grade in reaccreditation of NAAC with CGPA 2.33 in 2013. College introduced PG courses in Geography and Environmental Chemistry affiliated to Shivaji University, Kolhapur and Yashwantrao Chavan Maharashtra Open University, Nashik respectively. The college also started Degree Courses under Yashwantrao Chavan Maharashtra Open University, Nashik. The college runs Shrimant Charusheelaraje Competitive Examination and Guidance Center. Police Pre Recruitment Training Program is also run by the college in association with Maan-Deshi Foundation, Mhaswad.

College is also extending infrastructure of Library, Chemistry Laboratory and Public function hall from last year. Well-equipped Badminton hall for enhancement of indoor and outdoor sport facility is also provided to the students.

It is reported that the college has NIRF ranking with rank band 150-200 as per NAAC guidelines. It is reported that institute has successfully completed Gender audit, Environmental/Green audit and Energy Audit in the recent years with some green initiative

like vermi composting beds, tree plantation under green army project of Maharashtra State. Now, college is ready for 3rd cycle Assessment and accreditation process introduced by NAAC, Bengaluru.

In 2019-20, the college has started UGC approved skill based Bachelor of Vocational Degree Course in Horticulture Science, Diploma in Sugar Technology and Certificate course in Library Automation and Networking under NSQF with multiple entries and exit facility for skill development of the students and their better future.

Objective of Audit

Electrical energy is the major source of energy used for operations. It was become necessary to review the electrical installations and equipments from electrical power consumption and efficiency assessment point of view.

The intention of this energy audit is to have primary assessment of electrical installations and energy and to overview the situation this primary audit is executed.

Description of facility, building Audited

The institute is located on the outskirts of a holy town Yamai Temple of Aundha in the district of Satara, over the land area of Three acres. Total built up area occupied is 22587 sq. feet by various academic departments, library, administration etc.

The operations of the institute are run from a three different locations. One a three -storied building. One two storied ladies hostel & one gymkhana.

The details of institute and details of Electrical Load are as annexed in Annexure

Scope of Audit

The scope of Audit is limited to primary audit with the intention to identify possible opportunities for revision and modifications to improve energy efficiency, pertaining to electrical power utilization. Major energy used is electrical energy for lighting, utilities, equipments, etc.

2. Methodology and Instrumentation

The institute had provided the data of available electrical installations.

The energy consumption data of MSEDCL is extracted & supplied by the institute. Accordingly net energy bill is considered for energy audit.

The verification of the data of electrical installations physically by visiting the site.

The verification of the ratings of lighting system, equipment and installations by visiting the site

Confirmation of actual power drawn and rated values with Volt Amp meters and power analyzer wherever necessary.

The analysis of supplied energy data to find out the discrepancies and to suggest the opportunities to improve performance and effective utilization of electrical energy.

3. Observations

- Prof. Er. Dr. EA. Dhananjay Devi visited the institute on 14th December 2020.
- Representative of institute, In charge Principal Dr. Shrikant Bhandare, Prof. Dr. Kharatmal R.M., Prof. Ayub Mulla, Prof. Nanaware J.G., Prof. Bhujbal G.R.,

Shri. Hattigote Sunil, Shri. Sheikh R.Y. and others concerned were present during physical inspection.

- The Institute is an educational institute imparting knowledge in the field of Arts and Commerce faculty. The power utilization is limited to lighting, utilities and computers. Institute does not use any heavy electrical equipment.
- The electrical power is available through various LT connections from MSEDCL through four separate single-phase & two separate three phase electrical supply points and load is distributed randomly as per local need.
- The details of supply points are as listed below.

| Location | Consumer Number | Sanctioned Electrical Load in KW | Date of Connection | Type of phase connection |
|------------------|-----------------|----------------------------------|--------------------|--------------------------|
| Bore well | 201020030653 | 3 Kw | 13/08/1996 | Three |
| Gymkhana | 201021011245 | 0.5Kw | 22/01/1997 | Single |
| College | 201022105119 | 9 Kw | 28/10/2005 | Three |
| Ladies Hostel | 201021017057 | 3 Kw | 02/12/2008 | Single |
| Ground Bore well | 201020003737 | 3.3 Kw | 24/02/2013 | Single |
| Badminton Hall | 201020014186 | 3.3 Kw | 14/09/2016 | Single |

Average monthly power consumption is 3820.25 Units, through two three-phase & four single-phase separate supply points.

Year wise per unit rate as a institute is as under

| Sr. No. | Year | Units consumed | Amount Paid | Per unit rate in Rs/Kwh |
|---------|---------|----------------|-------------|-------------------------|
| 1 | 2015-16 | 9955 | 81612 | 8.19 |
| 2 | 2016-17 | 8835 | 123406 | 13.96 |
| 3 | 2017-18 | 8709 | 133331 | 15.09 |
| 4 | 2018-19 | 9041 | 134599 | 14.89 |
| 5 | 2019-20 | 9303 | 139638 | 15.00 |

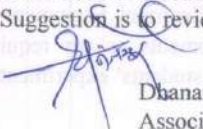
- Power backup is provided through a diesel generator set.
 - Generator set: Cooper make, model no. CD-30-3A-WH, 30 kVA, 415V, three phase 50Hz alternator.
 - Generator is used for Office lighting, fans and computers, printers etc. and during emergency. The load details are not available.
- Institute has installed standalone individual UPS. These UPS provides necessary minimum 10-15 minutes backup for Computers in laboratories and office.
- No measurements are available of Earth resistance at each earth point (measured in summer). However potential difference between neutral and earth point is noted varying between 1 to 2 volts at various points. Earthing at metering unit, water coolers and few electrical outlets is not in good order.
- Majority of Electrical equipment are computers. Students use Laboratory and Library equipments as per requirements and its usage is random. Usage is dependent on students' experimentation and activities.

- Usage of lighting is seasonal, but has scope for more effective utilization. Most of the lighting is used in day time in the institute. During winter vacation and summer vacation, the power utilization is minimum.
- Schematic (Detailed electrical connection diagram / circuit diagram) of Electrical distribution, control, protections and load connections is not available. Diagram showing location of electrical control gears and supply points should be prepared and displayed to enable easy access in case of emergency.
- Computer LAN network cabling is in good order.

Conclusion / Recommendations

The audit conducted is a preliminary audit and noted that some more focus is to be given on following points.

- Distribute the load on all the supply meters equally. Meter consumer number 201021015119 is properly loaded while one meter is under loaded. The same case with the ladies hostel & Gymkhana energy meters. Under loaded meter billing is in minimum slab rate but have to pay extra billing. Even distribution of load will reduce billed amount for same consumption.
- The Average monthly energy utilization is of 3820.25 units per year from two three phase & four single phase, electrical supply points. Taking in to account the power consumption, the recommendation is to consolidate all the meters and have a three, three-phase supply. Distribute the load on all the three phases in balanced manner.
- The alternative source of power available is three phase Diesel Generator. Data about utilization of generated units of energy since installation is not available. Engine is run record and Engine service record is not available. It is necessary to maintain the generator utilization log book registering the period of usage, energy generated and utilized in kWh (units) and fuel consumed during this period.
- Provision of fire extinguisher is necessary and to be done with priority.
- Maintain all the earth points by salting and watering regularly. To maintain earth resistance less than one Ohm is necessary. Provide additional separate earthing at all electrical meter units, water cooler units, and computer laboratory. Lack of proper earthing and increased neutral line voltage is harmful for computer systems.
- Display first aid charts to improve awareness of first aid support in case of electrical accident.
- Replace fluorescent light fittings including CFL by LED lighting, gradually, when need repairs & replacements.
- Diagram showing location of electrical control gears and supply points should be prepared and displayed to enable easy access in case of emergency. Detailed electrical schematic diagram should be prepared with load details. It is to enable further detailed audit.
- It is observed that institute has recently installed six solar street lights of 15W capacity. It is recommended that surface of the solar panels needs to be periodically cleaned for maximum output.
- It is recommended that to reduce the need of electrical lighting in daytime by improving availability of natural light. Suggestion is to review the windows and other light openings and room interiors.


Dhananjay Devi
Associate Professor
Energy Auditor (EA6470)

Annexure

| Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh | | | | | | |
|--|--------------|-------------------|----------------|---------------|--------|---------|
| Electrical Energy Consumption and Electrical Energy bill details | | | | | | |
| Financial Year 2015-16 | | | | | | |
| Sr. No. | Meter No. | Property | Period (Month) | Unit consumed | Amount | Year |
| 1 | 201021015119 | R. S. B. M. Aundh | Apr-15 | 586 | 6243 | 2015-16 |
| 2 | 201021015119 | R. S. B. M. Aundh | May-15 | 602 | 6622 | 2015-16 |
| 3 | 201021015119 | R. S. B. M. Aundh | Jun-15 | 457 | 4800 | 2015-16 |
| 4 | 201021015119 | R. S. B. M. Aundh | Jul-15 | 483 | 5376 | 2015-16 |
| 5 | 201021015119 | R. S. B. M. Aundh | Aug-15 | 503 | 5596 | 2015-16 |
| 6 | 201021015119 | R. S. B. M. Aundh | Sep-15 | 533 | 6161 | 2015-16 |
| 7 | 201021015119 | R. S. B. M. Aundh | Oct-15 | 1411 | 17468 | 2015-16 |
| 8 | 201021015119 | R. S. B. M. Aundh | Nov-15 | 19 | 441 | 2015-16 |
| 9 | 201021015119 | R. S. B. M. Aundh | Dec-15 | 316 | 3803 | 2015-16 |
| 10 | 201021015119 | R. S. B. M. Aundh | Jan-16 | 506 | 6159 | 2015-16 |
| 11 | 201021015119 | R. S. B. M. Aundh | Feb-16 | 518 | 6161 | 2015-16 |
| 12 | 201021015119 | R. S. B. M. Aundh | Mar-16 | 427 | 4840 | 2015-16 |
| 12 | 201020030653 | College Bore Well | Apr-15 | 18 | 352 | 2015-16 |
| 13 | 201020030653 | College Bore Well | May-15 | 16 | 349 | 2015-16 |
| 14 | 201020030653 | College Bore Well | Jun-15 | 13 | 336 | 2015-16 |
| 15 | 201020030653 | College Bore Well | Jul-15 | 13 | 357 | 2015-16 |
| 16 | 201020030653 | College Bore Well | Aug-15 | 24 | 424 | 2015-16 |
| 17 | 201020030653 | College Bore Well | Sep-15 | 22 | 412 | 2015-16 |
| 18 | 201020030653 | College Bore Well | Oct-15 | 8 | 327 | 2015-16 |
| 19 | 201020030653 | College Bore Well | Nov-15 | 2 | 280 | 2015-16 |
| 20 | 201020030653 | College Bore Well | Dec-15 | 3 | 287 | 2015-16 |
| 21 | 201020030653 | College Bore Well | Jan-16 | 1 | 273 | 2015-16 |
| 22 | 201020030653 | College Bore Well | Feb-16 | 2 | 279 | 2015-16 |
| 23 | 201020030653 | College Bore Well | Mar-16 | 12 | 344 | 2015-16 |
| 23 | 201021011245 | Gymkhana | Apr-15 | 100 | 1010 | 2015-16 |
| 24 | 201021011245 | Gymkhana | May-15 | 100 | 982 | 2015-16 |
| 25 | 201021011245 | Gymkhana | Jun-15 | 100 | 1008 | 2015-16 |
| 26 | 201021011245 | Gymkhana | Jul-15 | 100 | 1110 | 2015-16 |
| 27 | 201021011245 | Gymkhana | Aug-15 | 250 | 2641 | 2015-16 |
| 28 | 201021011245 | Gymkhana | Sep-15 | 100 | 1141 | 2015-16 |
| 29 | 201021011245 | Gymkhana | Oct-15 | 900 | 1860 | 2015-16 |
| 30 | 201021011245 | Gymkhana | Nov-15 | 100 | 1200 | 2015-16 |
| 31 | 201021011245 | Gymkhana | Dec-15 | 100 | 1190 | 2015-16 |
| 32 | 201021011245 | Gymkhana | Jan-16 | 100 | 2350 | 2015-16 |
| 33 | 201021011245 | Gymkhana | Feb-16 | 518 | 3252 | 2015-16 |

| | | | | | | |
|--|--------------|------------------|--------|------|-------|---------|
| 34 | 201021011245 | Gymkhana | Mar-16 | 46 | 682 | 2015-16 |
| 34 | 201020003737 | Ground Bore Well | Apr-15 | 35 | -862 | 2015-16 |
| 35 | 201020003737 | Ground Bore Well | May-15 | 6 | -976 | 2015-16 |
| 36 | 201020003737 | Ground Bore Well | Jun-15 | 16 | -633 | 2015-16 |
| 37 | 201020003737 | Ground Bore Well | Jul-15 | 16 | -379 | 2015-16 |
| 38 | 201020003737 | Ground Bore Well | Aug-15 | 250 | 1694 | 2015-16 |
| 39 | 201020003737 | Ground Bore Well | Sep-15 | 16 | 376 | 2015-16 |
| 40 | 201020003737 | Ground Bore Well | Oct-15 | 48 | -925 | 2015-16 |
| 41 | 201020003737 | Ground Bore Well | Nov-15 | 16 | -547 | 2015-16 |
| 42 | 201020003737 | Ground Bore Well | Dec-15 | 16 | -179 | 2015-16 |
| 43 | 201020003737 | Ground Bore Well | Jan-16 | 16 | 191 | 2015-16 |
| 44 | 201020003737 | Ground Bore Well | Feb-16 | 64 | 547 | 2015-16 |
| 45 | 201020003737 | Ground Bore Well | Mar-16 | 16 | 366 | 2015-16 |
| 46 | 201021017057 | Ladies Hostel | Apr-15 | 100 | 1588 | 2015-16 |
| 47 | 201021017057 | Ladies Hostel | May-15 | 100 | 2380 | 2015-16 |
| 48 | 201021017057 | Ladies Hostel | Jun-15 | 100 | 3359 | 2015-16 |
| 49 | 201021017057 | Ladies Hostel | Jul-15 | 50 | -3759 | 2015-16 |
| 50 | 201021017057 | Ladies Hostel | Aug-15 | 1 | -3433 | 2015-16 |
| 51 | 201021017057 | Ladies Hostel | Sep-15 | 3 | -3150 | 2015-16 |
| 52 | 201021017057 | Ladies Hostel | Oct-15 | 3 | -2847 | 2015-16 |
| 53 | 201021017057 | Ladies Hostel | Nov-15 | 3 | -2562 | 2015-16 |
| 54 | 201021017057 | Ladies Hostel | Dec-15 | 3 | -2278 | 2015-16 |
| 55 | 201021017057 | Ladies Hostel | Jan-16 | 3 | -1994 | 2015-16 |
| 56 | 201021017057 | Ladies Hostel | Feb-16 | 3 | -565 | 2015-16 |
| 57 | 201021017057 | Ladies Hostel | Mar-16 | 62 | 89 | 2015-16 |
| TOTAL UNITS CONSUMED AND AMOUNT FOR YEAR 2015-16 | | | | 9955 | 81612 | 2015-16 |

| Raja Shripatrao Bhagwanrao Mahavidyalaya, Aundh | | | | | | |
|--|--------------|-------------------|--------|------|-------|---------|
| Electrical Energy Consumption and Electrical Energy bill details | | | | | | |
| Financial Year 2016-17 | | | | | | |
| 1 | 201021015119 | R. S. B. M. Aundh | Apr-16 | 1057 | 13005 | 2016-17 |
| 2 | 201021015119 | R. S. B. M. Aundh | May-16 | 343 | 3794 | 2016-17 |
| 3 | 201021015119 | R. S. B. M. Aundh | Jun-16 | 607 | 7382 | 2016-17 |
| 4 | 201021015119 | R. S. B. M. Aundh | Jul-16 | 425 | 5052 | 2016-17 |
| 5 | 201021015119 | R. S. B. M. Aundh | Aug-16 | 419 | 4496 | 2016-17 |
| 6 | 201021015119 | R. S. B. M. Aundh | Sep-16 | 764 | 9092 | 2016-17 |
| 7 | 201021015119 | R. S. B. M. Aundh | Oct-16 | 424 | 4807 | 2016-17 |
| 8 | 201021015119 | R. S. B. M. Aundh | Nov-16 | 375 | 3979 | 2016-17 |
| 9 | 201021015119 | R. S. B. M. Aundh | Dec-16 | 462 | 5886 | 2016-17 |
| 10 | 201021015119 | R. S. B. M. Aundh | Jan-17 | 483 | 6788 | 2016-17 |
| 11 | 201021015119 | R. S. B. M. Aundh | Feb-17 | 330 | 3956 | 2016-17 |
| 12 | 201021015119 | R. S. B. M. Aundh | Mar-17 | 654 | 7919 | 2016-17 |
| 12 | 201020030653 | College Bore Well | Apr-16 | 1 | 273 | 2016-17 |
| 13 | 201020030653 | College Bore Well | May-16 | 9 | 327 | 2016-17 |
| 14 | 201020030653 | College Bore Well | Jun-16 | 1 | 273 | 2016-17 |
| 15 | 201020030653 | College Bore Well | Jul-16 | 0 | 222 | 2016-17 |
| 16 | 201020030653 | College Bore Well | Aug-16 | 28 | 445 | 2016-17 |
| 17 | 201020030653 | College Bore Well | Sep-16 | 34 | 487 | 2016-17 |
| 18 | 201020030653 | College Bore Well | Oct-16 | 51 | 580 | 2016-17 |
| 19 | 201020030653 | College Bore Well | Nov-16 | 43 | 535 | 2016-17 |
| 20 | 201020030653 | College Bore Well | Dec-16 | 74 | 781 | 2016-17 |
| 21 | 201020030653 | College Bore Well | Jan-17 | 62 | 716 | 2016-17 |
| 22 | 201020030653 | College Bore Well | Feb-17 | 35 | 519 | 2016-17 |
| 23 | 201020030653 | College Bore Well | Mar-17 | 8 | 338 | 2016-17 |
| 23 | 201021011245 | Gymkhana | Apr-16 | 102 | 1059 | 2016-17 |
| 24 | 201021011245 | Gymkhana | May-16 | 62 | 988 | 2016-17 |
| 25 | 201021011245 | Gymkhana | Jun-16 | 47 | 1856 | 2016-17 |
| 26 | 201021011245 | Gymkhana | Jul-16 | 53 | 2278 | 2016-17 |
| 27 | 201021011245 | Gymkhana | Aug-16 | 54 | 613 | 2016-17 |
| 28 | 201021011245 | Gymkhana | Sep-16 | 39 | 1352 | 2016-17 |
| 29 | 201021011245 | Gymkhana | Oct-16 | 37 | 715 | 2016-17 |
| 30 | 201021011245 | Gymkhana | Nov-16 | 50 | 1430 | 2016-17 |
| 31 | 201021011245 | Gymkhana | Dec-16 | 50 | 2074 | 2016-17 |
| 32 | 201021011245 | Gymkhana | Jan-17 | 47 | 796 | 2016-17 |
| 33 | 201021011245 | Gymkhana | Feb-17 | 48 | 706 | 2016-17 |
| 34 | 201021011245 | Gymkhana | Mar-17 | 48 | 377 | 2016-17 |

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|--|--------------|------------------|--------|------|--------|---------|
| 34 | 201020003737 | Ground Bore Well | Apr-16 | 16 | 740 | 2016-17 |
| 35 | 201020003737 | Ground Bore Well | May-16 | 16 | 4 | 2016-17 |
| 36 | 201020003737 | Ground Bore Well | Jun-16 | 64 | 385 | 2016-17 |
| 37 | 201020003737 | Ground Bore Well | Jul-16 | 16 | 765 | 2016-17 |
| 38 | 201020003737 | Ground Bore Well | Aug-16 | 32 | 1144 | 2016-17 |
| 39 | 201020003737 | Ground Bore Well | Sep-16 | 16 | 1516 | 2016-17 |
| 40 | 201020003737 | Ground Bore Well | Oct-16 | 16 | 361 | 2016-17 |
| 41 | 201020003737 | Ground Bore Well | Nov-16 | 16 | 738 | 2016-17 |
| 42 | 201020003737 | Ground Bore Well | Dec-16 | 16 | 1135 | 2016-17 |
| 43 | 201020003737 | Ground Bore Well | Jan-17 | 16 | 391 | 2016-17 |
| 44 | 201020003737 | Ground Bore Well | Feb-17 | 16 | 393 | 2016-17 |
| 45 | 201020003737 | Ground Bore Well | Mar-17 | 16 | 785 | 2016-17 |
| 46 | 201021017057 | Ladies Hostel | Apr-16 | 62 | 786 | 2016-17 |
| 47 | 201021017057 | Ladies Hostel | May-16 | 62 | 1311 | 2016-17 |
| 48 | 201021017057 | Ladies Hostel | Jun-16 | 62 | 2025 | 2016-17 |
| 49 | 201021017057 | Ladies Hostel | Jul-16 | 62 | 674 | 2016-17 |
| 50 | 201021017057 | Ladies Hostel | Aug-16 | 372 | 1320 | 2016-17 |
| 51 | 201021017057 | Ladies Hostel | Sep-16 | 62 | 1992 | 2016-17 |
| 52 | 201021017057 | Ladies Hostel | Oct-16 | 62 | 273 | 2016-17 |
| 53 | 201021017057 | Ladies Hostel | Nov-16 | 41 | 815 | 2016-17 |
| 54 | 201021017057 | Ladies Hostel | Dec-16 | 41 | 1381 | 2016-17 |
| 55 | 201021017057 | Ladies Hostel | Jan-17 | 41 | 559 | 2016-17 |
| 56 | 201021017057 | Ladies Hostel | Feb-17 | 41 | 559 | 2016-17 |
| 57 | 201021017057 | Ladies Hostel | Mar-17 | 41 | 555 | 2016-17 |
| 58 | 201020014186 | Badminton Hall | Sep-16 | 4 | 50 | 2016-17 |
| 59 | 201020014186 | Badminton Hall | Oct-16 | 50 | 654 | 2016-17 |
| 60 | 201020014186 | Badminton Hall | Nov-16 | 50 | 1338 | 2016-17 |
| 61 | 201020014186 | Badminton Hall | Dec-16 | 50 | 2044 | 2016-17 |
| 62 | 201020014186 | Badminton Hall | Jan-17 | 50 | 705 | 2016-17 |
| 63 | 201020014186 | Badminton Hall | Feb-17 | 50 | 1412 | 2016-17 |
| 64 | 201020014186 | Badminton Hall | Mar-17 | 50 | 699 | 2016-17 |
| TOTAL UNITS CONSUMED AND AMOUNT FOR YEAR 2016-17 | | | | 8835 | 123406 | 2016-17 |

| Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh | | | | | | |
|--|--------------|-------------------|--------|-----|------|---------|
| Electrical Energy Consumption and Electrical Energy bill details | | | | | | |
| Financial Year 2017-18 | | | | | | |
| 1 | 201021011245 | Gymkhana | Apr-17 | 50 | 1084 | 2017-18 |
| 2 | 201021011245 | Gymkhana | May-17 | 40 | 1783 | 2017-18 |
| 3 | 201021011245 | Gymkhana | Jun-17 | 16 | 2248 | 2017-18 |
| 4 | 201021011245 | Gymkhana | Jul-17 | 59 | 2928 | 2017-18 |
| 5 | 201021011245 | Gymkhana | Aug-17 | 85 | 989 | 2017-18 |
| 6 | 201021011245 | Gymkhana | Sep-17 | 87 | 2082 | 2017-18 |
| 7 | 201021011245 | Gymkhana | Oct-17 | 88 | 3133 | 2017-18 |
| 8 | 201021011245 | Gymkhana | Nov-17 | 75 | 924 | 2017-18 |
| 9 | 201021011245 | Gymkhana | Dec-17 | 113 | 1539 | 2017-18 |
| 10 | 201021011245 | Gymkhana | Jan-18 | 117 | 2874 | 2017-18 |
| 11 | 201021011245 | Gymkhana | Feb-18 | 118 | 4259 | 2017-18 |
| 12 | 201021011245 | Gymkhana | Mar-18 | 115 | 1330 | 2017-18 |
| 13 | 201020030653 | College Bore Well | Apr-17 | 19 | 412 | 2017-18 |
| 14 | 201020030653 | College Bore Well | May-17 | 16 | 399 | 2017-18 |
| 15 | 201020030653 | College Bore Well | Jun-17 | 22 | 464 | 2017-18 |
| 16 | 201020030653 | College Bore Well | Jul-17 | 28 | 501 | 2017-18 |
| 17 | 201020030653 | College Bore Well | Aug-17 | 60 | 672 | 2017-18 |
| 18 | 201020030653 | College Bore Well | Sep-17 | 6 | 345 | 2017-18 |
| 19 | 201020030653 | College Bore Well | Oct-17 | 2 | 315 | 2017-18 |
| 20 | 201020030653 | College Bore Well | Nov-17 | 0 | 250 | 2017-18 |
| 21 | 201020030653 | College Bore Well | Dec-17 | 0 | 289 | 2017-18 |
| 22 | 201020030653 | College Bore Well | Jan-18 | 0 | 250 | 2017-18 |
| 23 | 201020030653 | College Bore Well | Feb-18 | 0 | 250 | 2017-18 |
| 24 | 201020030653 | College Bore Well | Mar-18 | 0 | 250 | 2017-18 |
| 25 | 201021015119 | R. S. B. M. Aundh | Apr-17 | 665 | 7980 | 2017-18 |
| 26 | 201021015119 | R. S. B. M. Aundh | May-17 | 620 | 6553 | 2017-18 |
| 27 | 201021015119 | R. S. B. M. Aundh | Jun-17 | 337 | 3912 | 2017-18 |
| 28 | 201021015119 | R. S. B. M. Aundh | Jul-17 | 289 | 3437 | 2017-18 |
| 29 | 201021015119 | R. S. B. M. Aundh | Aug-17 | 477 | 5208 | 2017-18 |
| 30 | 201021015119 | R. S. B. M. Aundh | Sep-17 | 509 | 6223 | 2017-18 |
| 31 | 201021015119 | R. S. B. M. Aundh | Oct-17 | 652 | 7349 | 2017-18 |
| 32 | 201021015119 | R. S. B. M. Aundh | Nov-17 | 265 | 2787 | 2017-18 |
| 33 | 201021015119 | R. S. B. M. Aundh | Dec-17 | 353 | 4771 | 2017-18 |
| 34 | 201021015119 | R. S. B. M. Aundh | Jan-18 | 483 | 5570 | 2017-18 |
| 35 | 201021015119 | R. S. B. M. Aundh | Feb-18 | 443 | 5260 | 2017-18 |
| 36 | 201021015119 | R. S. B. M. Aundh | Mar-18 | 456 | 5461 | 2017-18 |

| | | | | | | |
|---|--------------|------------------|--------|-------------|---------------|----------------|
| 37 | 201021017057 | Ladies Hostel | Apr-17 | 41 | 1102 | 2017-18 |
| 38 | 201021017057 | Ladies Hostel | May-17 | 41 | 1714 | 2017-18 |
| 39 | 201021017057 | Ladies Hostel | Jun-17 | 41 | 1882 | 2017-18 |
| 40 | 201021017057 | Ladies Hostel | Jul-17 | 31 | 2155 | 2017-18 |
| 41 | 201021017057 | Ladies Hostel | Aug-17 | 31 | 488 | 2017-18 |
| 42 | 201021017057 | Ladies Hostel | Sep-17 | 31 | 1012 | 2017-18 |
| 43 | 201021017057 | Ladies Hostel | Oct-17 | 31 | 1518 | 2017-18 |
| 44 | 201021017057 | Ladies Hostel | Nov-17 | 31 | 21448 | 2017-18 |
| 45 | 201021017057 | Ladies Hostel | Dec-17 | 545 | 615 | 2017-18 |
| 46 | 201021017057 | Ladies Hostel | Jan-18 | 378 | 1353 | 2017-18 |
| 47 | 201021017057 | Ladies Hostel | Feb-18 | 218 | 2123 | 2017-18 |
| 48 | 201021017057 | Ladies Hostel | Mar-18 | 59 | 792 | 2017-18 |
| 49 | 201020003737 | Ground Bore Well | Apr-17 | 16 | 1180 | 2017-18 |
| 50 | 201020003737 | Ground Bore Well | May-17 | 16 | 1605 | 2017-18 |
| 51 | 201020003737 | Ground Bore Well | Jun-17 | 16 | 2025 | 2017-18 |
| 52 | 201020003737 | Ground Bore Well | Jul-17 | 16 | 1948 | 2017-18 |
| 53 | 201020003737 | Ground Bore Well | Aug-17 | 16 | 400 | 2017-18 |
| 54 | 201020003737 | Ground Bore Well | Sep-17 | 16 | 810 | 2017-18 |
| 55 | 201020003737 | Ground Bore Well | Oct-17 | 16 | 1219 | 2017-18 |
| 56 | 201020003737 | Ground Bore Well | Nov-17 | 16 | 1626 | 2017-18 |
| 57 | 201020003737 | Ground Bore Well | Dec-17 | 16 | -395 | 2017-18 |
| 58 | 201020003737 | Ground Bore Well | Jan-18 | 0 | -1716 | 2017-18 |
| 59 | 201020003737 | Ground Bore Well | Feb-18 | 0 | -1466 | 2017-18 |
| 60 | 201020003737 | Ground Bore Well | Mar-18 | 0 | -1218 | 2017-18 |
| 61 | 201020014186 | Badminton Hall | Apr-17 | 50 | 1372 | 2017-18 |
| 62 | 201020014186 | Badminton Hall | May-17 | 50 | 2135 | 2017-18 |
| 63 | 201020014186 | Badminton Hall | Jun-17 | 50 | 2890 | 2017-18 |
| 64 | 201020014186 | Badminton Hall | Jul-17 | 50 | 3395 | 2017-18 |
| 65 | 201020014186 | Badminton Hall | Aug-17 | 126 | -2950 | 2017-18 |
| 66 | 201020014186 | Badminton Hall | Sep-17 | 18 | -2499 | 2017-18 |
| 67 | 201020014186 | Badminton Hall | Oct-17 | 13 | -2108 | 2017-18 |
| 68 | 201020014186 | Badminton Hall | Nov-17 | 31 | -1683 | 2017-18 |
| 69 | 201020014186 | Badminton Hall | Dec-17 | 17 | -1257 | 2017-18 |
| 70 | 201020014186 | Badminton Hall | Jan-18 | 17 | -829 | 2017-18 |
| 71 | 201020014186 | Badminton Hall | Feb-18 | 0 | -863 | 2017-18 |
| 72 | 201020014186 | Badminton Hall | Mar-18 | 0 | -613 | 2017-18 |
| TOTAL UNITS CONSUMED AND AMOUNT FOR YEAR 2017-18 | | | | 8709 | 133331 | 2017-18 |

| Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh | | | | | | |
|--|--------------|-------------------|--------|------|-------|---------|
| Electrical Energy Consumption and Electrical Energy bill details | | | | | | |
| Financial Year 2018-19 | | | | | | |
| 1 | 201021015119 | R. S. B. M. Aundh | Apr-18 | 941 | 11566 | 2018-19 |
| 2 | 201021015119 | R. S. B. M. Aundh | May-18 | 1013 | 12688 | 2018-19 |
| 3 | 201021015119 | R. S. B. M. Aundh | Jun-18 | 803 | 10091 | 2018-19 |
| 4 | 201021015119 | R. S. B. M. Aundh | Jul-18 | 349 | 4175 | 2018-19 |
| 5 | 201021015119 | R. S. B. M. Aundh | Aug-18 | 343 | 3937 | 2018-19 |
| 6 | 201021015119 | R. S. B. M. Aundh | Sep-18 | 498 | 6023 | 2018-19 |
| 7 | 201021015119 | R. S. B. M. Aundh | Oct-18 | 456 | 5661 | 2018-19 |
| 8 | 201021015119 | R. S. B. M. Aundh | Nov-18 | 412 | 5397 | 2018-19 |
| 9 | 201021015119 | R. S. B. M. Aundh | Dec-18 | 523 | 6652 | 2018-19 |
| 10 | 201021015119 | R. S. B. M. Aundh | Jan-19 | 618 | 8102 | 2018-19 |
| 11 | 201021015119 | R. S. B. M. Aundh | Feb-19 | 468 | 6061 | 2018-19 |
| 12 | 201021015119 | R. S. B. M. Aundh | Mar-19 | 456 | 5764 | 2018-19 |
| 13 | 201020030653 | College Bore Well | Apr-18 | 1 | 309 | 2018-19 |
| 14 | 201020030653 | College Bore Well | May-18 | 15 | 428 | 2018-19 |
| 15 | 201020030653 | College Bore Well | Jun-18 | 2 | 341 | 2018-19 |
| 16 | 201020030653 | College Bore Well | Jul-18 | 1 | 334 | 2018-19 |
| 17 | 201020030653 | College Bore Well | Aug-18 | 2 | 340 | 2018-19 |
| 18 | 201020030653 | College Bore Well | Sep-18 | 1 | 333 | 2018-19 |
| 19 | 201020030653 | College Bore Well | Oct-18 | 0 | 270 | 2018-19 |
| 20 | 201020030653 | College Bore Well | Nov-18 | 0 | 350 | 2018-19 |
| 21 | 201020030653 | College Bore Well | Dec-18 | 0 | 350 | 2018-19 |
| 22 | 201020030653 | College Bore Well | Jan-19 | 0 | 424 | 2018-19 |
| 23 | 201020030653 | College Bore Well | Feb-19 | 2 | 438 | 2018-19 |
| 24 | 201020030653 | College Bore Well | Mar-19 | 0 | 350 | 2018-19 |
| 25 | 201021017057 | Ladies Hostel | Apr-18 | 67 | 1459 | 2018-19 |
| 26 | 201021017057 | Ladies Hostel | May-18 | 63 | 1828 | 2018-19 |
| 27 | 201021017057 | Ladies Hostel | Jun-18 | 52 | 689 | 2018-19 |
| 28 | 201021017057 | Ladies Hostel | Jul-18 | 46 | 1664 | 2018-19 |
| 29 | 201021017057 | Ladies Hostel | Aug-18 | 60 | 2594 | 2018-19 |
| 30 | 201021017057 | Ladies Hostel | Sep-18 | 78 | 3465 | 2018-19 |
| 31 | 201021017057 | Ladies Hostel | Oct-18 | 78 | 4465 | 2018-19 |
| 32 | 201021017057 | Ladies Hostel | Nov-18 | 78 | -2456 | 2018-19 |
| 33 | 201021017057 | Ladies Hostel | Dec-18 | 78 | -804 | 2018-19 |
| 34 | 201021017057 | Ladies Hostel | Jan-19 | 104 | 347 | 2018-19 |
| 35 | 201021017057 | Ladies Hostel | Feb-19 | 104 | 1877 | 2018-19 |
| 36 | 201021017057 | Ladies Hostel | Mar-19 | 118 | 952 | 2018-19 |

| | | | | | | |
|---|--------------|------------------|--------|-------------|---------------|----------------|
| 37 | 201021011245 | Gymkhana | Apr-18 | 117 | 2110 | 2018-19 |
| 38 | 201021011245 | Gymkhana | May-18 | 94 | 2559 | 2018-19 |
| 39 | 201021011245 | Gymkhana | Jun-18 | 63 | 1027 | 2018-19 |
| 40 | 201021011245 | Gymkhana | Jul-18 | 50 | 2037 | 2018-19 |
| 41 | 201021011245 | Gymkhana | Aug-18 | 58 | 1180 | 2018-19 |
| 42 | 201021011245 | Gymkhana | Sep-18 | 81 | 2438 | 2018-19 |
| 43 | 201021011245 | Gymkhana | Oct-18 | 90 | 2677 | 2018-19 |
| 44 | 201021011245 | Gymkhana | Nov-18 | 101 | 1370 | 2018-19 |
| 45 | 201021011245 | Gymkhana | Dec-18 | 101 | 2807 | 2018-19 |
| 46 | 201021011245 | Gymkhana | Jan-19 | 101 | 4209 | 2018-19 |
| 47 | 201021011245 | Gymkhana | Feb-19 | 101 | 2807 | 2018-19 |
| 48 | 201021011245 | Gymkhana | Mar-19 | 101 | -113 | 2018-19 |
| 49 | 201020003737 | Ground Bore Well | Apr-18 | 0 | -961 | 2018-19 |
| 50 | 201020003737 | Ground Bore Well | May-18 | 0 | -1119 | 2018-19 |
| 51 | 201020003737 | Ground Bore Well | Jun-18 | 0 | -852 | 2018-19 |
| 52 | 201020003737 | Ground Bore Well | Jul-18 | 0 | -584 | 2018-19 |
| 53 | 201020003737 | Ground Bore Well | Aug-18 | 0 | -317 | 2018-19 |
| 54 | 201020003737 | Ground Bore Well | Sep-18 | 0 | -50 | 2018-19 |
| 55 | 201020003737 | Ground Bore Well | Oct-18 | 0 | 297 | 2018-19 |
| 56 | 201020003737 | Ground Bore Well | Nov-18 | 0 | 352 | 2018-19 |
| 57 | 201020003737 | Ground Bore Well | Dec-18 | 0 | 706 | 2018-19 |
| 58 | 201020003737 | Ground Bore Well | Jan-19 | 0 | 1061 | 2018-19 |
| 59 | 201020003737 | Ground Bore Well | Feb-19 | 0 | 355 | 2018-19 |
| 60 | 201020003737 | Ground Bore Well | Mar-19 | 0 | 349 | 2018-19 |
| 61 | 201020014186 | Badminton Hall | Apr-18 | 0 | -358 | 2018-19 |
| 62 | 201020014186 | Badminton Hall | May-18 | 0 | -402 | 2018-19 |
| 63 | 201020014186 | Badminton Hall | Jun-18 | 0 | -135 | 2018-19 |
| 64 | 201020014186 | Badminton Hall | Jul-18 | 0 | 133 | 2018-19 |
| 65 | 201020014186 | Badminton Hall | Aug-18 | 29 | 557 | 2018-19 |
| 66 | 201020014186 | Badminton Hall | Sep-18 | 21 | 1059 | 2018-19 |
| 67 | 201020014186 | Badminton Hall | Oct-18 | 2 | 930 | 2018-19 |
| 68 | 201020014186 | Badminton Hall | Nov-18 | 2 | -519 | 2018-19 |
| 69 | 201020014186 | Badminton Hall | Dec-18 | 6 | -5 | 2018-19 |
| 70 | 201020014186 | Badminton Hall | Jan-19 | 5 | 443 | 2018-19 |
| 71 | 201020014186 | Badminton Hall | Feb-19 | 63 | 1446 | 2018-19 |
| 72 | 201020014186 | Badminton Hall | Mar-19 | 25 | 641 | 2018-19 |
| TOTAL UNITS CONSUMED AND AMOUNT FOR YEAR 2018-19 | | | | 9041 | 134599 | 2018-19 |

| Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh | | | | | | |
|--|--------------|-------------------|----------------|---------------|--------|---------|
| Electrical Energy Consumption and Electrical Energy bill details | | | | | | |
| Financial Year 2019-20 | | | | | | |
| Sr. No. | Meter No. | Property | Period (Month) | Unit consumed | Amount | Year |
| 1 | 201021015119 | R. S. B. M. Aundh | Apr-19 | 781 | 10356 | 2018-19 |
| 2 | 201021015119 | R. S. B. M. Aundh | May-19 | 567 | 7531 | 2019-20 |
| 3 | 201021015119 | R. S. B. M. Aundh | Jun-19 | 398 | 5205 | 2019-20 |
| 4 | 201021015119 | R. S. B. M. Aundh | Jul-19 | 379 | 4924 | 2019-20 |
| 5 | 201021015119 | R. S. B. M. Aundh | Aug-19 | 391 | 4940 | 2019-20 |
| 6 | 201021015119 | R. S. B. M. Aundh | Sep-19 | 535 | 5631 | 2019-20 |
| 7 | 201021015119 | R. S. B. M. Aundh | Oct-19 | 527 | 6728 | 2019-20 |
| 8 | 201021015119 | R. S. B. M. Aundh | Nov-19 | 454 | 5893 | 2019-20 |
| 9 | 201021015119 | R. S. B. M. Aundh | Dec-19 | 489 | 6612 | 2019-20 |
| 10 | 201021015119 | R. S. B. M. Aundh | Jan-20 | 693 | 9528 | 2019-20 |
| 11 | 201021015119 | R. S. B. M. Aundh | Feb-20 | 676 | 9080 | 2019-20 |
| 12 | 201021015119 | R. S. B. M. Aundh | Mar-20 | 676 | 9542 | 2019-20 |
| 13 | 201020030653 | College Bore Well | Apr-19 | 1 | 431 | 2019-20 |
| 14 | 201020030653 | College Bore Well | May-19 | 0 | 35 | 2019-20 |
| 15 | 201020030653 | College Bore Well | Jun-19 | 0 | 430 | 2019-20 |
| 16 | 201020030653 | College Bore Well | Jul-19 | 0 | 351 | 2019-20 |
| 17 | 201020030653 | College Bore Well | Aug-19 | 0 | 351 | 2019-20 |
| 18 | 201020030653 | College Bore Well | Sep-19 | 3 | 445 | 2019-20 |
| 19 | 201020030653 | College Bore Well | Oct-19 | 1 | 432 | 2019-20 |
| 20 | 201020030653 | College Bore Well | Nov-19 | 0 | 351 | 2019-20 |
| 21 | 201020030653 | College Bore Well | Dec-19 | 0 | 351 | 2019-20 |
| 22 | 201020030653 | College Bore Well | Jan-20 | 1 | 432 | 2019-20 |
| 23 | 201020030653 | College Bore Well | Feb-20 | 1 | 432 | 2019-20 |
| 24 | 201020030653 | College Bore Well | Mar-20 | 2 | 440 | 2019-20 |
| 25 | 201021017057 | Ladies Hostel | Apr-19 | 90 | 2047 | 2019-20 |
| 26 | 201021017057 | Ladies Hostel | May-19 | 97 | 184 | 2019-20 |
| 27 | 201021017057 | Ladies Hostel | Jun-19 | 68 | -10 | 2019-20 |
| 28 | 201021017057 | Ladies Hostel | Jul-19 | 132 | 1390 | 2019-20 |
| 29 | 201021017057 | Ladies Hostel | Aug-19 | 90 | 1064 | 2019-20 |
| 30 | 201021017057 | Ladies Hostel | Sep-19 | 107 | 1164 | 2019-20 |
| 31 | 201021017057 | Ladies Hostel | Oct-19 | 110 | 1204 | 2019-20 |
| 32 | 201021017057 | Ladies Hostel | Nov-19 | 163 | 837 | 2019-20 |
| 33 | 201021017057 | Ladies Hostel | Dec-19 | 100 | 2031 | 2019-20 |
| 34 | 201021017057 | Ladies Hostel | Jan-20 | 92 | 1138 | 2019-20 |
| 35 | 201021017057 | Ladies Hostel | Feb-20 | 87 | 2245 | 2019-20 |

| | | | | | | |
|--|--------------|------------------|--------|-------|--------|----------|
| 36 | 201021017057 | Ladies Hostel | Mar-20 | 93 | 1138 | 2019-20 |
| 37 | 201021011245 | Gymkhana | Apr-19 | 99 | -1692 | 2019-20 |
| 38 | 201021011245 | Gymkhana | May-19 | 91 | -776 | 2019-20 |
| 39 | 201021011245 | Gymkhana | Jun-19 | 74 | 255 | 2019-20 |
| 40 | 201021011245 | Gymkhana | Jul-19 | 66 | 1872 | 2019-20 |
| 41 | 201021011245 | Gymkhana | Aug-19 | 77 | 1460 | 2019-20 |
| 42 | 201021011245 | Gymkhana | Sep-19 | 96 | 1367 | 2019-20 |
| 43 | 201021011245 | Gymkhana | Oct-19 | 106 | 2857 | 2019-20 |
| 44 | 201021011245 | Gymkhana | Nov-19 | 103 | 1536 | 2019-20 |
| 45 | 201021011245 | Gymkhana | Dec-19 | 105 | 3200 | 2019-20 |
| 46 | 201021011245 | Gymkhana | Jan-20 | 111 | 1981 | 2019-20 |
| 47 | 201021011245 | Gymkhana | Feb-20 | 125 | 4035 | 2019-20 |
| 48 | 201021011245 | Gymkhana | Mar-20 | 139 | 1774 | 2019-20 |
| 49 | 201020014186 | Badminton Hall | Apr-19 | 25 | 1016 | 2019-20 |
| 50 | 201020014186 | Badminton Hall | May-19 | 25 | 1644 | 2019-20 |
| 51 | 201020014186 | Badminton Hall | Jun-19 | 11 | -409 | 2019-20 |
| 52 | 201020014186 | Badminton Hall | Jul-19 | 11 | 144 | 2019-20 |
| 53 | 201020014186 | Badminton Hall | Aug-19 | 11 | 453 | 2019-20 |
| 54 | 201020014186 | Badminton Hall | Sep-19 | 7 | 684 | 2019-20 |
| 55 | 201020014186 | Badminton Hall | Oct-19 | 13 | 501 | 2019-20 |
| 56 | 201020014186 | Badminton Hall | Nov-19 | 13 | 548 | 2019-20 |
| 57 | 201020014186 | Badminton Hall | Dec-19 | 14 | 1067 | 2019-20 |
| 58 | 201020014186 | Badminton Hall | Jan-20 | 7 | 1594 | 2019-20 |
| 59 | 201020014186 | Badminton Hall | Feb-20 | 7 | 2041 | 2019-20 |
| 60 | 201020014186 | Badminton Hall | Mar-20 | 3 | 524 | 2019-20 |
| 61 | 201020003737 | Ground Bore Well | Apr-19 | 0 | 704 | 2019-20 |
| 62 | 201020003737 | Ground Bore Well | May-19 | 0 | 710 | 2019-20 |
| 63 | 201020003737 | Ground Bore Well | Jun-19 | 16 | 115 | 2019-20 |
| 64 | 201020003737 | Ground Bore Well | Jul-19 | 16 | 664 | 2019-20 |
| 65 | 201020003737 | Ground Bore Well | Aug-19 | 16 | 539 | 2019-20 |
| 66 | 201020003737 | Ground Bore Well | Sep-19 | 16 | 534 | 2019-20 |
| 67 | 201020003737 | Ground Bore Well | Oct-19 | 16 | 539 | 2019-20 |
| 68 | 201020003737 | Ground Bore Well | Nov-19 | 16 | 540 | 2019-20 |
| 69 | 201020003737 | Ground Bore Well | Dec-19 | 16 | 543 | 2019-20 |
| 70 | 201020003737 | Ground Bore Well | Jan-20 | 16 | 546 | 2019-20 |
| 71 | 201020003737 | Ground Bore Well | Feb-20 | 16 | 1300 | 2019-20 |
| 72 | 201020003737 | Ground Bore Well | Mar-20 | 16 | 545 | 2019-20 |
| TOTAL UNITS CONSUMED AND AMOUNT FOR YEAR 2019-20 | | | | 9303 | 139638 | 2019-20 |
| TOTAL UNITS CONSUMED AND AMOUNT ACROSS 5 YEARS | | | | 45843 | 612536 | ALL YEAR |

Report on Environmental Promotional Activity

Raja Shripatrao Bhagwantrao Mahavidyalaya, Aundh runs Environmental Promotional Activities. Environment consist all the animals, plants, reptiles, water bodies, birds, insects, trees, microorganisms, human beings and many more. Environment regulates various cycles daily which help in maintaining natural balance between living things and environment. Human being receives countless benefits from environment every day and all the benefits are free of cost. These benefits are connected with forest, trees, animals, water and air. Trees and plants play important role in the sustenance and development of environment. Trees absorb harmful gases and release lifesaving oxygen which is the biggest benefit to all living things. Social, physical and cultural environment is the matter of consideration from the college and educational environment's point of view. Raja Shripatrao Bhagwantrao Mahavidyalaya is quite aware of environment maintenance and its development. The college decided to run various activities to build environment awareness among the students. Plantation in rainy season is yearly activity of the college. Students of the college are motivated to take initiative in the plantation on the occasion of birth anniversary of the president and chairperson of the institution. Students of the college are motivated to use bicycles to avoid air pollution. The college has provided dust bins to use for waste. Plastic carry bags, pouches, bottles are banned in the college campus. Filtered drinking water is provided to the students. The college has developed botanical garden with rare and endangered and medicinal plants which are taken care of the department of Botany. Environmental Audit of the college has been done by the external agency. Some birds and insects are frequently visiting the campus due to its rich plantation. Plants and trees are regularly watered by the peons of the college. All the faculty members support to maintain and develop healthy environment. The college takes effort to maintain paperless work. Only unavoidable work is done with the help of the paper. The solar street lamps are fixed in the college campus to avoid electricity consumption in the night. Four vermicomposting units are developed in the college campus through which organic fertilizers are created and used for the garden and trees. Rain water is reused for the refilling bore well. Separate pipeline is fixed from the terrace of the building to the bore well of the campus. The programmes like exhibition of medicinal plants and flower arrangement competitions are organized by the college to make aware the students about environment.

College maintains and develops environment in a following way:

1. As per the directions of state government regarding plantation, the college along with its students organizes plantation programme at the gymkhana ground every year.
2. Birth anniversaries of Hon'ble President and Hon'ble Chairperson of Aundh Shikshan Mandal, Aundh is celebrated regularly by organizing plantation programme.
3. The college motivates the students and staff to use bicycles and avoid fuel consuming vehicles to reduce air pollution in the campus.
4. To make environment awareness among the people, the college organizes plantation programme in nearby villages through NSS volunteers.

5. The college has banned tobacco, gutkha chewing and smoking in the campus. Tobacco Free Zone board is displayed in the entrance of the college to aware the students regarding this.
6. To maintain atmosphere clean and healthy, the college has banned plastic bottle, plastic pouches, plastic carry bags, etc., in the campus. Plastic Free Zone board is displayed at the entrance of the college.
7. College campus and building area is equally distributed among the peons and laboratory attendants for cleaning regularly.
8. Plants and trees of the campus along with botanical garden are watered weekly by the peons and laboratory attendants.
9. Cutting of trees, plants and flowers are strictly prohibited in the campus.
10. One student one plant scheme is implemented.
11. Environment awareness and cleanliness programme is organized for the students in the college and for the people through NSS Special Camping Programme in nearby villages.
12. Dust bins are placed in the departments as well as common area of the campus where waste material can be deposited.
13. Every third Saturday is declared as vehicle free zone.
14. To provide sufficient light at the night, the college has fixed solar lamps in the campus.
15. Clean bore well drinking water is made available at the ground and first floor of the college building.
16. Leakage of water is repaired instantly and wastage is avoided.
17. Rain water harvesting is also developed through which rain water, collected at the terrace of the building in rainy season, is stored in the underground water tank and later this water is used for plants, latrines and toilets.
18. Separate sweeper is appointed to clean lavatory and toilets on daily wages. Cleaning of the toilets is done twice in a week.
19. Health check-up camps are organized for the staff and students.
20. Counsellor is also appointed to maintain mental health of the students.
21. College use to give plants as a gift to resource persons and dignitaries who visit the college in various organized occasions.
22. Vermicomposting unit is developed by the college with four beds where waste leaves of the plants and trees of the campus are deposited. And prepared material by earthworms is used for the plants and trees as fertilizer. Best from the waste is done through this unit.

Following are some social activities regarding environment awareness organized by the college:

1. Road side plantation from Aundh to Ghatmaha
2. Plantation and spreading seeds on Yamai Hill
3. Plantation (1000 plants) in collaboration with forest department at Ambheri Hill.
4. Plantation at Yeliv Village through NSS Volunteers.

5. Plantation at Varad through NSS Volunteers.
6. Cleaning and repairing of roads is done by the students of the college at Aundh.
7. Cleaning and building water reservoir is done by NSS Volunteers at Varad, Yeliv, Wanzoli, etc. nearby villages where special camping programme of NSS is organized.
8. Crackers free Dipawali Campaign is organized by Vivek Wahini of the college.
9. Pollution Free Gansh Festival Awareness programme is also organized.

In this way, the college organizes various promotional activities to maintain and develop healthy environment of the campus.



COORDINATOR
Internal Quality Assurance Cell
Raja Sirpatrao Bhagwantrao
Mahavidyalaya, Aundh (Satara)

Rajendra
T/C PRINCIPAL
Raja Sirpatrao Bhagwantrao
Mahavidyalaya, Aundh (Satara)

1000 Trees Plantation at Ambheri



