

7.1.2 THE INSTITUTION HAS FACILITIES AND INITIATIVES FOR

Implementation of the Environmental Policy:

VPIMSR is aimed at balancing environmental protection and the conservation of natural resources with other policy goals, such as affordable energy, air and drinking water quality monitoring, rainwater harvesting. Green Campus Committee of the Institute has established clean and green campus with awareness and protection and in fulfilling environmental goals and sustainable development goals set forth to implement environmental policies given by the Government from time to time. NSS students are frontiers and other students and staff members are supporting the implementation of the environmental policy.

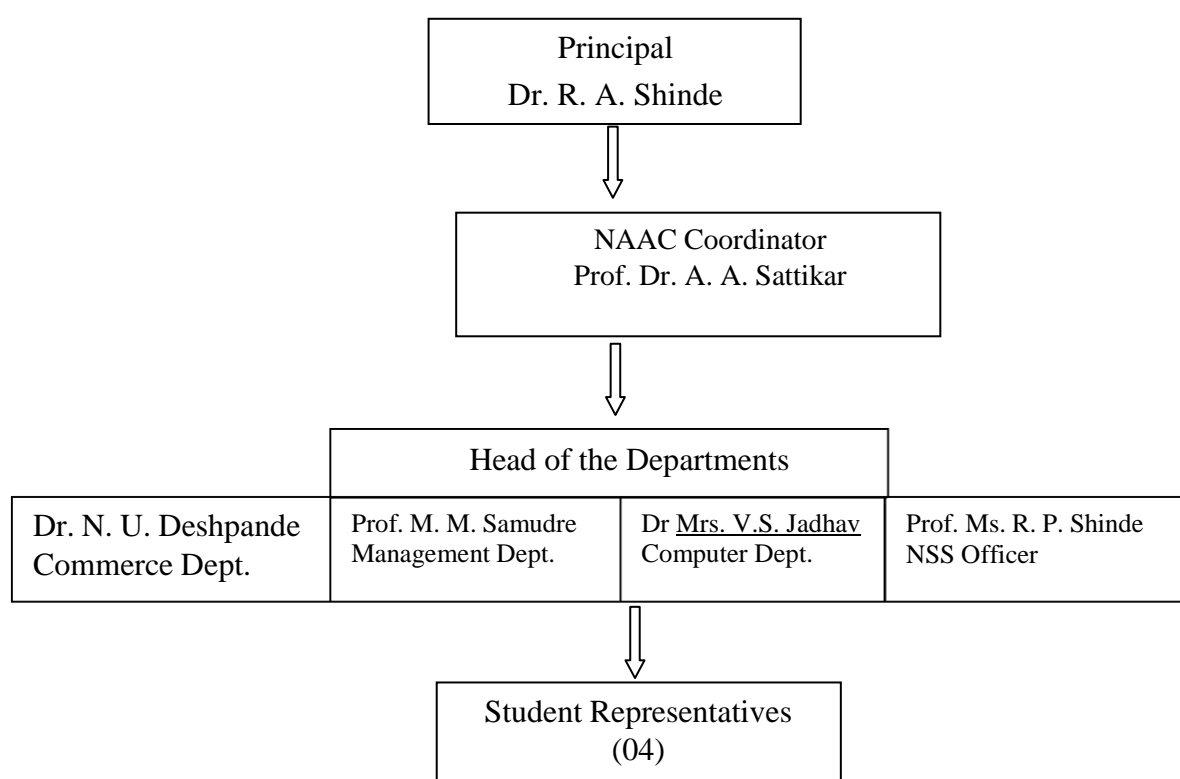


Fig. No. 1 : Environmental Management Cell of VPIMSR




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For effective implementation of the Environmental Policy, VPIMSR has constituted Environmental Management Cell (fig. 1) under the Chairmanship of Vice Principal.

Environmental Policy:

“CLEAN CAMPUS AND GREEN CAMPUS”

Vasantaodada Patil Institute of Management Studies and Research (VPIMSR), Sangli is committed to achieve sustainable development goals set forth by directive principles of Indian Constitution for improving social, economic and environmental wellbeing of the society with the conservation of biodiversity, encouraging students for keeping clean and green campus through sustainable approach in Environment Management. VPIMSR is dedicated to environmental developments that foster a sustainable future.

ENVIRONMENTAL MISSION

Creating Awareness amongst students, teachers and all other stakeholders in terms of:

- i) Plastic free campus
- ii) Energy conservation
- iii) Rain water Harvesting
- iv) Environmental and Social Outreach Programmes




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7.1.3 IJ ALTERNATIVE SOURCES OF ENERGY AND ENERGY CONSERVATION MEASURES

Energy management includes planning and operation of energy production and energy consumption units as well as energy distribution and storage. Objectives of energy audit are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need. Energy management is the process of tracking and optimizing energy consumption to conserve usage in a building. The process of energy management includes, collecting and analyzing continuous data, identifying optimizations in equipment schedules, setting points and flow rates to improve energy efficiency, calculating return on investment. Units of energy saved can be metered and calculated just like units of energy delivered. Execute energy optimization as a solutions, to continue energy efficiency.

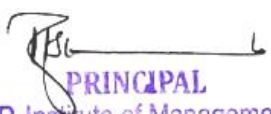
Energy management is the means to control and reduce a building's energy consumption, which enables owners and operators to,

- i) Reduce costs – energy represents 25% of all operating costs in an office building.
- ii) Reduce carbon emissions in order to meet internal sustainability goals and regulatory requirements.
- iii) Reduce risk – the more energy you consume the greater the risk that energy price increases or supply shortages could seriously affect your profitability.

With energy management solutions the risk can be minimized by reducing demand for energy and by controlling it so as to make it more predictable.

Energy is an important parameter which needs to study while




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going through green audit. Different forms of energy such as electricity, LPG, petrol, diesel, wood etc. are used to carry out day to day activities. On the background of climate change and Paris Agreement, India has intended to reduce its carbon emission by various ways. Reject, Reduce and Replace are the three R's for efficient use of energy.

As per the Energy Conservation Act, 2001, Energy Audit is defined as “ the verification , monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. Electricity and LPG are the forms of energy majorly used in higher educational institutes. Use of LED lights instead of incandescent lamp and tube lights is one of the important green practices followed by VPIMSR. Along with the use of LED lamps, use of natural ventilation, natural light are useful practices carried out in the college to reduce the use of electricity.

At VPIMSR, energy conservation measures are taken up by means of replacing conventional bulbs by low energy consuming bulbs in a phase manner and the target is to replace all conventional bulbs within a couple of years. Following are few energy conservation measures adopted by VPIMSR-.

- i) Use of Compact fluorescent lamp (CFL)
- ii) Use of Light Emitting Diode (LED) lamps
- iii) Encouragement to use e-mail instead of sending notices and faxing documents
- iv) Use of electrical appliances carrying three to five stars rating
- v) Use of flat-screen LCD monitors rather than CRT monitors
- vi) Creating awareness amongst students through sign




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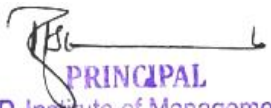
boards displayed at strategic locations for conservation of energy.

A. Energy Consumption (in Units):

Table No. 06: Energy utilized in five year at VPIMSR, Sangli

Month	2016	2017	2018	2019	2020	2021
Jan	0	2800	3429	720	401	474
Feb	0	3727	2977	803	412	485
March	0	3260	4405	660	924	577
April	5057	4985	3242	321	0	454
May	3547	3214	2602	366	0	408
June	2639	2526	2635	496	292	80
July	3236	2380	2657	527	367	80
August	3580	3515	175	443	357	971
September	3693	3429	72	1684	410	80
October	2846	3448	3521	348	442	473
November	2539	5455	1142	348	449	-
December	2509	3069	546	353	482	-




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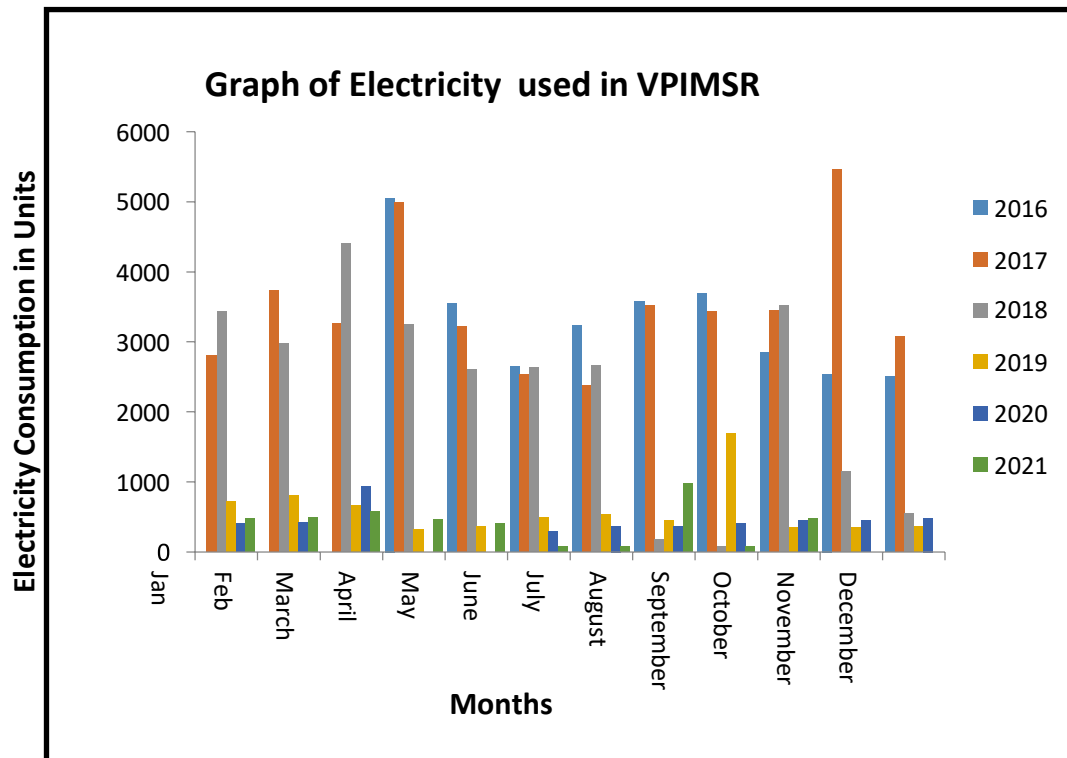
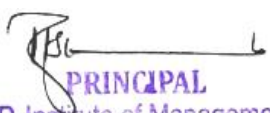


Fig. No.02 : Graph of Electricity used in VPIMSR, Sangli

Electricity supplied from the Maharashtra State Electricity Board (Mahavitaran) is the main source of energy for the activities on the campus like illuminating rooms, operating fans, computers, instruments, motor and for water coolers. It is depicted from the above table and graph that electricity consumption is decreased from year December 2018 because of adopting the solar system in the Institute campus. VPIMSR also has power Exide batteries backup having capacity 1.5 hour.

Green Power Generator operated on Diesel at VPIMSR.

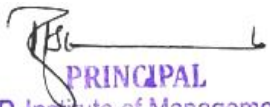



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Set of Batteries used for Power backup at VPIMSR.




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B Energy Conservation and Efforts for Carbon Neutrality

Use of LED bulbs:

Carbon footprints are a simple way to reduce environmental pollution. By reducing our carbon footprints, each one of us can contribute in making the earth a safer and a better place to live. It is found that almost half of our carbon footprint is due to electricity and 17% is due to lighting alone.

Carbon footprint is the amount of Green-house gases like carbon dioxide, methane, nitrous oxide emissions emitted by a building, organization, etc. It relates to the amount of greenhouse gases we are producing in our day-to-day lives through burning fossil fuels for electricity, heating, transportation, etc.

At VPIMSR carbon footprint for indoor lighting in office building is considered. The performance of the building has been increased by using LED lights which reduces the building carbon foot print. The carbon foot print is for –

Incandescent Light

Compact Fluorescent Light

LED Lights

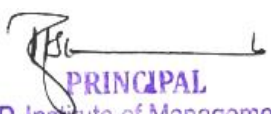
Incandescent Lamp :

Incandescent lamp is a source of light that produces light when the tungsten filament is being heated. It is a device which can convert less than 20% electrical energy consumed into light energy. This results in 80% loss of electrical Energy in the form of heat energy. One can calculate the amount of CO₂ emitted by 40 watt incandescent bulb. It shows that a single 40 watts incandescent bulb will generate 90.3 kilograms of CO₂ for every year.

Compact Fluorescent Lamp :

CFL produce less heat and more visible light as compared to incandescent lamp. Literature shows that a single 14 watts CFL lamp will generate 31.6 kilograms of CO₂ for every year. CFL contains harmful mercury which creates




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environmental consequences of mercury contamination if not properly disposed off.

LED Lamp :

LED lights have less electrical power consumption and more efficiency over other lamps. We can calculate the CO₂ emitted and reduction in carbon footprints by 8 watt LED lamp.

Comparison of Lamps used in VPIMSR, Sangli

Criteria	Incandescent Bulb	CFL	LED light
Power Consumption(watt)	40	14	8
Electricity(kwh)	0.04	0.014	8.008
Hours of Operation Per Day	10	10	10
Carbon Emissions (tons) per year/lamp	0.903	0.316	0.18
Reduction in Carbon Footprint (tons) / y /lamp	--	--	0.12

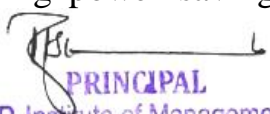
LED lamp can reduce carbon footprint by 0.12 tons per year, and does not contain mercury; it is a big benefit for this lamp.

Based on above comparisons, LED emerges as the BEST option to reduce carbon footprint. A building's carbon footprints can be reduced by 68% when LED lamps are used. Considering the need of the time and cost, the conventional lamps from five rooms of administrative wing are totally replaced with LED bulbs.

In addition, effective energy conservation measures are taken up by VPIMSR, Sangli and these are.

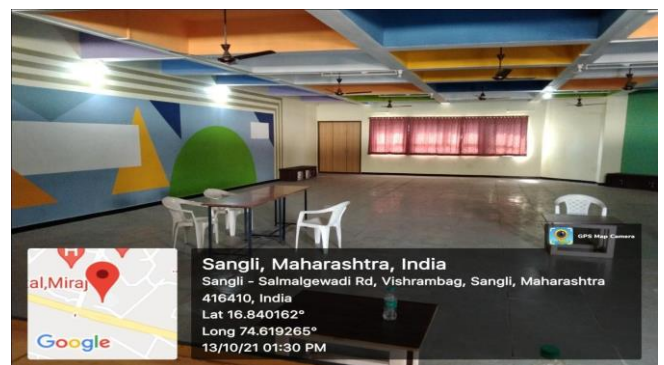
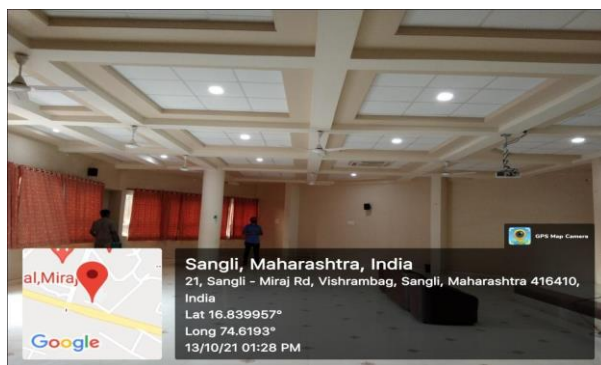
1. Increased use of LED bulbs which consume less electrical energy against incandescent lamps.
2. Use of renewable energy like solar energy through Solar Photovoltaic Systems which converts light energy into electricity, solar street lamps.
3. Creating awareness among students and staffs regarding power saving




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(Avoiding unnecessary use by displaying sign boards at convenient location)

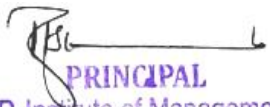
At VPIMSR Carbon footprints for indoor lighting in office building and in other rooms are taken into account. Use of LED and LCD lights reduce carbon footprints. Energy conversion efficiency of normal incandescent lamp is very low. LED lamps consume low power and are more efficient in conversion of electrical energy into light energy. LED lamps do not contain chemicals like mercury and hazardous gases. They do not generate any hazardous waste. Thus an LED lamp emerges as the best option to reduce carbon footprints.



Replacement of incandescent bulbs by LED bulbs.

- Replacement of old incandescent bulb and tube lights by LED lamps has been followed by VPIMSR as a response towards green practices of energy conservation.

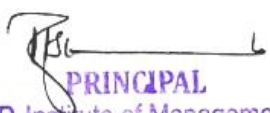



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Display of Sign Boards at convenient points for creating awareness among staff and students regarding Energy Conservation.




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C Harnessing Solar Energy through Solar Photovoltaic Applications (PVC)

VPIMSR, Sangli has installed Roof Top Solar Photovoltaic Panel for harnessing solar energy. Electricity generated by solar panels is used in the Institute premises.



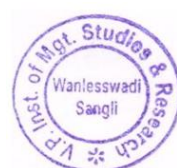
Solar Photovoltaic Application at VPIMSR, Sangli

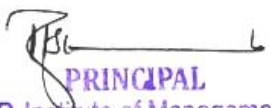
Photovoltaic (PV) is the conversion of light into electricity using the photovoltaic effect and is commercially utilized for electricity generation.

Fixed PV installations rooftop-mounted systems are employed at VPIMSR, with the capacity 30 KW. These solar panels are working in full capacity. It is depicted from Mahavitaran electricity bills of VPIMSR that the bill is reduced by 70%. Thus solar photovoltaic panels installed on rooftop of library building are efficient in harnessing solar energy throughout the year.

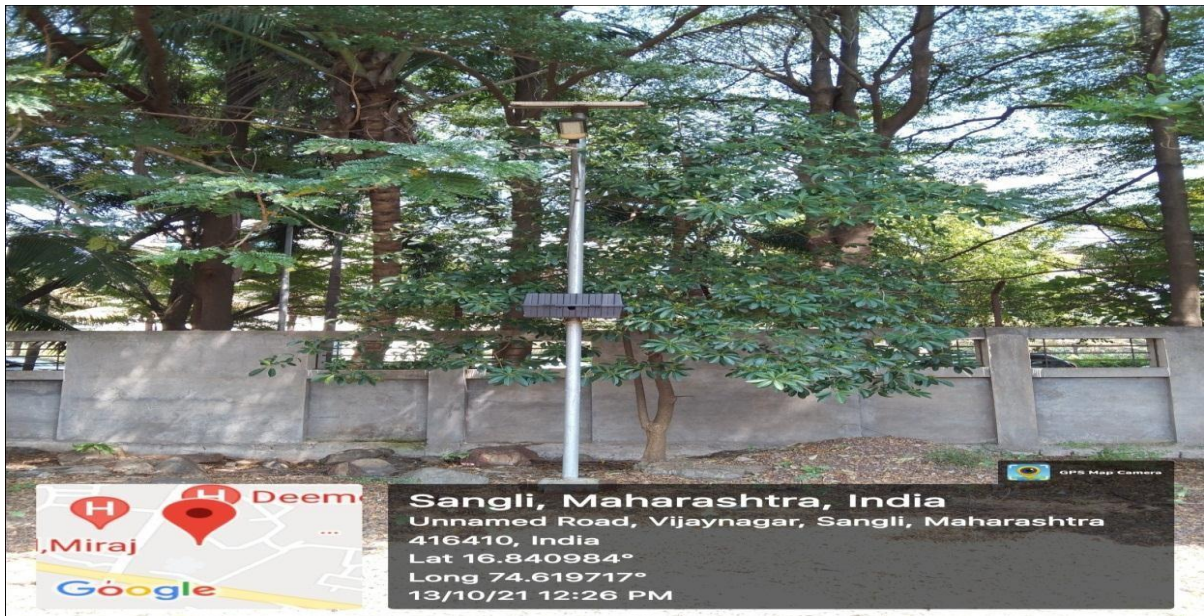
Such kind of installations for harnessing renewable energy resources has a potential to mitigate the global warming by CO₂ reduction. Solar PV has specific advantages as an energy source- once installed, its operation generates no pollution and no greenhouse gas emissions. It shows simple scalability in respect of power needs and silicon has large availability in the Earth's crust, although other materials required in PV system manufacture such as silver will eventually constrain further growth in the technology. The use of PV as a main source requires energy storage systems or distribution.

Solar power is pollution-free during use, which enables it to cut down pollution when it is substituted for other energy sources. PV installations could ideally operate for 100 years or even more, with little maintenance or intervention after their initial set-up, so after the initial capital cost of building any solar power




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plant, operating costs are extremely low compared to existing power technologies. Grid-connected solar electricity can be used locally thus reducing transmission/distribution losses.

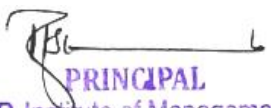


Solar Photovoltaic street lamps at VPIMSR, Sangli

Use of Renewable Energy Through Solar Photovoltaic Street Lamps :

Solar Photovoltaic street lamps are also installed at VPIMSR, Sangli, which are efficiently working. Institute has used solar street lights with 9W LED outdoor luminary solar photovoltaic panel in open spaces. This has considerably reduced energy consumption. Nevertheless, experimental highefficiency solar cells already have efficiencies of over 40% in case of concentrating photovoltaiccells and efficiencies are rapidly rising while mass-production costs are rapidly falling.




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7.1.2. II MANAGEMENT OF VARIOUS TYPES OF GRADABLE AND NON-DEGRADABLE WASTE

Solid Waste Management:

Proper solid waste management is an essential part of society's public and environmental health. Solid waste generation and its management is a burning issue in current days. The rate of generation of solid waste is very high and yet we do not have adequate system to manage the generated waste. Unscientific handling of solid waste can create threats to public health, unintended environmental safety issues. So, it is necessary to manage solid waste properly to reduce the load on waste management system. The purpose of the audit done was to find out the quantity, volume, type and current management practices of solid waste generated in the VPIMSR campus. The Institute follows the practice of segregation of waste at source by placing different coloured collection bins in the Institute campus. Plastic waste, Paper waste, food waste helps for further solid waste management and to go for green campus development.

A. Biodegradable Waste:

The main source of biodegradable waste in educational institute is generally from student's tiffin and eatables. Another source is garden waste generated from pruning of trees, fallen leaves, etc. which is also an important source of biodegradable waste at VPIMSR Campus. The Institute has taken good initiatives to treat biodegradable waste by implementing vermicomposting facility for the treatment of biodegradable waste. The garden waste is collected and kept for prefabricated vermicomposting site. The transformed waste after completion of process is utilized as manure for gardening purpose.

Vermicomposting reduces waste sent to our dump sites, reduces environmental pollution. When organic waste decomposes at dump sites in the absence of oxygen, a hazardous liquid known as leachate (the liquid that runs from a dump) and odor are produced. Vermicomposting helps to improve soil's physical properties like soil structure, texture, porosity, water holding capacity, drainage, and aeration and reduce erosion in addition to plant nutrient supply. It improves soil nutrient availability by providing buffering and improving nutrient retention capacity. It improves overall plant growth by enhancing the growth of new shoots and leaves,




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thereby increasing productivity. It also helps to buffer the pH and temperature of the soil

B. Paper Waste:

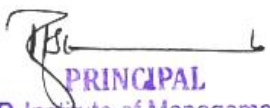
Major part of the solid waste generated at VPIMSR is paper waste. Though paper is biodegradable material, it is having good potential for recycling thus helps in conserving the resources and trees indirectly. VPIMSR follows the green practice by processing the paper waste to recycling purpose. The waste paper is sold to specific vendor. Other green practices like use of one sided paper, paperless activities like e-mailing all notices instead of printing it on paper, putting the information on WhatsApp groups are also practiced in the college to reduce the use of paper. Thus, Reduce, Reuse and Recycle these three - R principles of solid waste management are followed in the VPIMSR campus for waste management.

C. Hazardous Waste Management:

VPIMSR being a management institute has very less amount of hazardous waste generated on the campus. Some of the action taken for cleaning campus is given below:

- i) The campus has been declared as plastic free zone.
- ii) VPIMSR aims to make the campus plastic free by avoiding non-biodegradable persistent products such as plastic cups, plates, straws in the Institute canteen and instructing students to avoid bringing plastic material.
- iii) Bins are placed in different parts of the campus for the segregation of plastic paper & food waste.
- iv) The Institute aims for an ecofriendly campus and to make this reality, the use of ecofriendly bags and files are encouraged.
- v) The campus is also declared tobacco free and smoking free zone.
- vi) Students are trained to use paper bags and a promotion of the same is held.



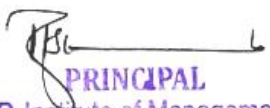

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Other Waste:

Damaged computers and their parts are the only source of electronic waste on the campus. As on date there are about 500 computers under use for practical and office work. Every effort is made to repair and use electronic and electrical devices. Piling up of e-waste is discouraged in the campus. Institute follows the principle of reusing of old computers by donating them to others schools under the trust and other needy schools and orphanages.

Other kinds of waste like plastic waste, metal waste generated in the campus may lead to serious unintended environmental consequences, if not properly handled. In VPIMSR such waste is collected, stored and properly disposed off periodically to vendors. Plastic and metal waste is sent for the recycling and recovery practices.




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7.1.2. III Water Conservation:

Water plays a key role in every environmental system. Water is an amazing material with unique properties that affect life on earth. The earth holds the same water in the same quantity as it did when it was formed. The earth's water continuously circulates from the ocean to the atmosphere, then to the land and back. The atmospheric water cycle helps us to get a regular supply of fresh water every year. Thus fortunately the world's freshwater supply is continually collected, purified, recycled and distributed in the earth's hydrological cycle.

Water is so integral to life that we frequently take it for granted. Freshwater is an irreplaceable resource that we are managing poorly. Despite its importance, water is one of our most poorly managed resources. Hence water conservation measures should be adopted. Water requirement per person is assumed to be 3 lit / per person during their stay on the campus. Hence, water requirement for per day would be $820 \times 3 \text{ lit} = 2400 \text{ lit}$. Water requirement is met through the supply made by the Miraj- Kupwad Corporation. Water billing is done at the rate of Rs. 12 per 1000 lit of water. Total billed amount for a period of six months is Rs. 2520 /. Total quantity of water used over a period of six months is 25,20,000 lit. and per month is 4,20,000 lit and per day is around 15,000 lit. Out of this about 2400 to 3000 lit is used for internal consumption and balance of 11000 to 12600 lit for gardening purpose.

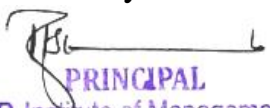
In addition to the Corporation water supply bore well water is used for gardening purpose as and when required. Source of water supply for VPIMSR is from Corporation and through bore well and rain water harvesting.

VPIMSR campus has huge potential for roof top rainwater harvesting. Institute has utilized this opportunity and water collected is used for recharging bore well water and storing water during rainy season in the underground tanks.

Total roof top area used for rainwater harvesting is 1981.19 sq. m. Sangli has almost 1000mm average annual rainfall. Considering 20% as evaporation loss, actual water available for harvesting would be 800mm or 0.8m. Volume of water that is available for harvesting is $1981.19 \text{m} \times 0.8 \text{m} = 1584.952 \text{ m}^3$. Converting into liters, rainwater available is $1584.952 \text{ m}^3 \times 1000 = 15,84,952 \text{ lit}$. Almost 63 % of total water requirement is made through rainwater harvesting.

The Institute's irrigation system includes a variety of measures to ensure that campus is irrigated appropriately. Sprinkler irrigation has been systematically




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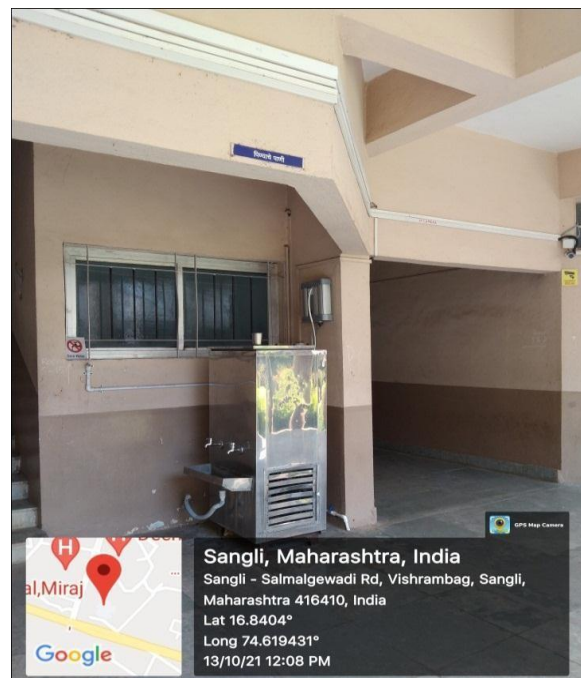
installed, reducing the wastage of water incampus.

The Institute has significantly reduced the watering schedule down to a base for two times per week. Watering occurs more than twice a week when weather or other conditions require it.

A. Water Quality:

In the Institute water is used for domestic and drinking purpose.

Water quality of drinking water from cooler and bore well is periodically monitored by staff and routine water analysis is done from laboratory for necessary parameters. It is evident from the reports of water analysis for portability study that the required parameters are within the limits of BIS standards.



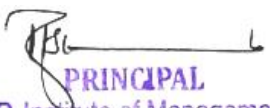
Water filter and Cooler at VPIMSR, Sangli.

B. Water Conservation Practices at Premises followed by VPIMSR:

Clean, fresh water is a limited resource. With all the severe droughts happening in the world, the limited supply of fresh water is becoming one of our most precious resources. Every person on earth needs water to survive. Without it, many of us would get sick and even result in death.

While almost 70% of the Earth is made up of water, many parts of the world suffer from clean water shortage. Conserving water is important because it keeps water pure and clean while protecting the environment.




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Conserving water means using our water supply wisely and be responsible. As every individual depends on water for livelihood, we must learn how to keep our limited supply of water pure and away from pollution. Keeping our water supply safe and pure will protect the water for the generations to come.

Many believe that our water supply is infinite. However, our supply is quite the opposite. It is important that we must not pollute water as many do not realize just how important and scarce water is.

Humans are not the only species on Earth that require water for survival. In fact, every species on this planet needs water to live and survive. Without water, the aquatic life will stand at no chance of survival. It is highly important that we save water that is essential to our sustainability.

Efficient use of water:

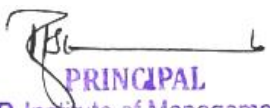
Enormous amount of water is wasted, without reason, through leaking taps and open taps waste. In many cities, more than half the available supply is lost through these leakages and rotting of pipelines. In VPIMSR campus instruction boards are displayed at every washroom to avoid wastage of water. Students are instructed to close the taps when they are not in use. Taps and pipelines are regularly checked for leakages and repaired if needed. Leaking taps are immediately replaced by new handy taps.

Rain Water Harvesting:

Rain water harvesting is done by collecting and storing rain water. This is very effective method for collection of pure water for many cities. The rain water that falls on the roof can be collected, filtered and stored. As Sangli gets assured rainfall surprisingly large amount of water can be collected in this way. Rain Water harvesting is also done at VPIMSR, Sangli.

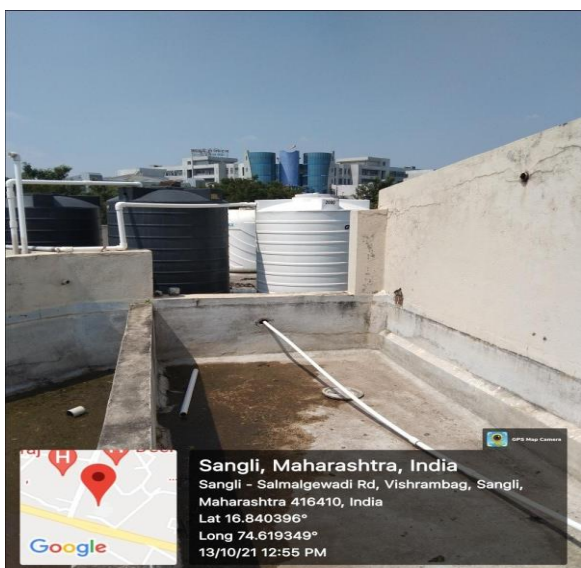
Harvested rooftop rainwater is also used in washrooms and for recharging of ground water in the campus.



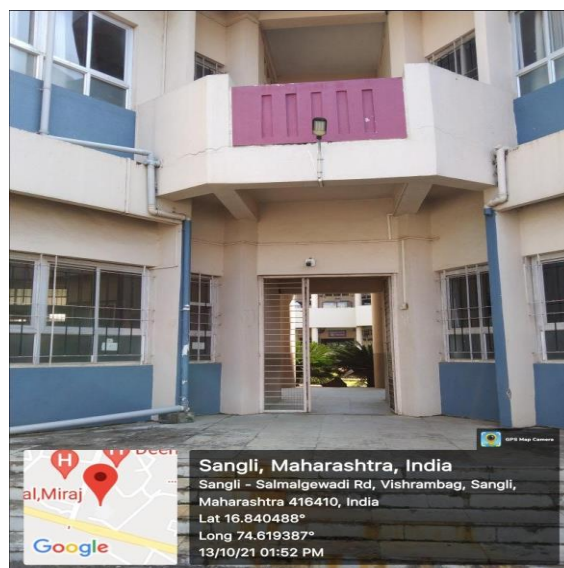

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Water storage tanks for harvested rain water.

Sr. No	Tank Type	Number of Tanks	Capacity (Lit)
1	Sintex tank	2 +2	2000
2	Sintex tank	1	1000
3	Sintex tank	1	500
4	Cement Tank	1	5000



Rain water collection and storage at VPIMSR, Sangli

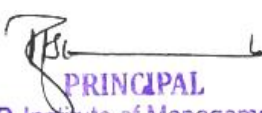


Rain water collection and Ground water recharge at VPIMSR, Sangli

III Air and Noise Quality

Air and noise quality plays an important role in student's concentration and ability to learn. In noisy environment it is difficult to focus on the subject for students and also it is difficult to teaching faculty. Furthermore, noise pollution can cause increase in blood pressure, hypertension, and other stress-related health issues. In many cases, noise pollution can cause a disturbance in a person's state of mind, which further causes disturbance in sleep pattern, stress, aggressiveness, and other related issues. In very noisy environment sometimes the teacher has to talk very loudly resulting in suffering from occupational hazards like pain in throat. As the college location is in the city so there are such sources to create pollution of air and noise. VPIMSR is committed for good working environment on the campus by means of providing good quality of water , quality of air and sound. Periodically the samples are collected and analyzed for pollution parameters. The values of air, water and noise parameters are observed within the prescribed limits. **(Annex-II & III)** These parameters are slightly elevated in the campus but are under the



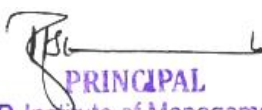

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prescribed limit of CPCB. Noise level inside the college is below the limit and in suitable range. The college has planted some trees and planning to plant some more to screen the noise and to filter the suspended particulate matters.



Air sample collection at College campus



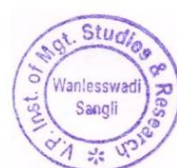

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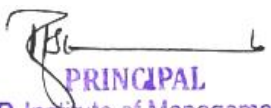
7.1.2 V DISABLED –FRIENDLY BARRIER FREE ENVIRONMENT



Barrier free Environment

We have a language lab on the ground floor which is also used by Divyanjan students. The provision of Ramp is made for free movement of such students.




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