Nature Solutions

Innovative technologies for sustainable Development

Date: 24 /06 / 2021

CERTIFICATE OF GREEN AUDIT

This is to certify that the SSP Nature Solution Environment Consultant Pvt. Ltd. Has conducted "**Green Audit**" of "**D. Y. Patil Education Society, Kolhapur**" (Institution deemed to be University) declared u/s3 of UGC Act, 1956, 869, E, kasabaBavada, Kolhapur-416006during the academic year **2020-21**. The green audit was conducted in accordance with the applicable standards prescribed by Central Pollution Control Board, New Dehli and Ministry of Environment, Forest & Climate change, New Dehli. The audit involves water, waste water, energy, air, green inventory, solid waste, etc and gives an 'Environmental Management Plan', which the institute can follow to minimize impact on institutional working framework. In an opinion and to the best our information and according to the information given to us, said green audit gives a true and fair view in conformity with environmental auditing principles accepted in India.

Thanking you,

SSP NATURE SOLUTION ENVIRONMENT CONSULTANT PVT. LTD. (OPC) U 156366

Director

S. S. Patane.

D. Y. Patil Education Society
(Institution Deemed to be University) Kolhapur
Inward No. A136
Date: 28/6/2021
Sign

401 and 402, 4th floor, Mahadkar Chambers, Karve Road, Kothrud, Pune 411038

24/6/21

D. Y. PATIL EDUCATION SOCIETY
INSTITUTION DEEMED TO BE UNIVERSITY KOLHAPUR

Reaccredited by NAAC with 'A' Grade

ज्ञानाधिनम् जगत् सर्वम्

Green Audit

(2020-21)

Introduction

a. Green Audit for Environmental Protection:

- Green audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. The purpose of Green auditing is to assess periodically the compliance of completed or on-going activities with the requirements of legislation, measures proposed in environmental policies, environmental management systems and environmental schemes or the provisions of standards and contracts.

b. Benefits of Green Audit:

- Ensuring legislative compliance.
- Reducing environmental impacts.
- Reducing waste, water and energy costs.
- To safeguard the environment and natural resources.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and Environmentcampus.
- Finally, it will help to built positive impression for the upcoming NAAC visit.

c. NAAC criteria VII Environmental Consciousness :

Green audit is assigned to the criterion VII of NAAC. National Assessment and Accreditation Council which is a self governing organization that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation of the institution. The intention of Green audit is to upgrade the environmental condition in and around the institution. It is performed by considering some environmental parameters like water and wastewater management, energy conservation, waste management, air monitoring, etc. for making the institution more eco-friendly.

Students are the major strength of any academic institution. Practicing Environmentactions in any educational institution will inculcate the good habit of caring nature in students. Many environmental activities like plantation and nurturing saplings and trees, cleanliness drives, bird watching camp, no vehicle day,rain water harvesting visits to ecologically important places through Environmentclubs will make the student a good citizen of country.

Need of 'Green and Environmental Audit' is a management tool which comprises systematic assessment of the different components of the ecosystem in which the establishments have been made. It is the process of identifying and determining whether the institution's practices are eco-friendly and sustainable. With modernization, use of resources and chemicals have increased which have negatively impacted the environment creating an imbalance in nature. This is now a great matter of concern. Green and Environmental audit is a way to ensure that such negative impacts on the campus environment, due to the development and other activities, are kept at a minimum. Realising the importance of Green and Environmental audit, the Internal Quality Assurance Cell (IQAC) of the University has constituted a team to work towards such environment-related assessments on the Campus. An Eco-Friendly University agenda for Assam Don Bosco University is its road map for building and operating a healthy and self-renewing vibrant Campus community. With an idea to create an environment where youth can be educated to live a sustainable life in harmony with nature, the University has formulated the eco-friendly policy with the following objectives:

- Creating a collaborative effort among the University fraternity in fostering an eco-friendly learning and working environment.

- Ensuring the sustenance of biodiversity by maintenance of the natural environment in addition to conservation, restoration, and remediation of existing land and water.

. - Managing waste generated in the Campus through proper disposal and treatment.

- Commitment to sustainable management of land through agroforestry and kitchen gardening for meeting the food requirements in the Campus.

- Raising awareness of real-world issues affecting the rural communities living adjacent to the University Campus and working towards addressing these issues in partnership with the communities through teaching, research and extension activities.

- Encouraging students to participate in outreach education programmes as a part of Service Learning.

- Protecting, monitoring, and conserving flora and fauna of the Campus and preservation of their natural habitat.

- Identifying existing invasive species to reduce their negative impact on the indigenous flora and fauna.

- Involving local communities in the custodianship of natural resources and utilizing local resources for infrastructure construction purposes.

The Green and Environmental audit report consists of five components- Land, Energy, Air, Waste and Water.

Objectives: The major objectives of the Green auditing are:

1. To document the land use patterns in the Campus

2. To estimate the energy requirements of the Campus

3. To estimate the water quality of the Campus

4. To in ventorize the biodiversity of the Campus

5. To document the waste disposal system of the Campus

d. Profile of,D.Y. Patil Education Society (InstitutionDeemed to be University) Kolhapur:

Dr.D.Y.Patil,

Padma Shri Awardee

Founder President
Former Governor of States of Tripura, Bihar and West Bengal

Dr. Sanjay D. Patil

President

'D.Y. Patil Education Society (Institution Deemed to be University), Kolhapur'

D.Y. Patil Education Society (Institution Deemed to be University), Kolhapur

The "DY Patil Group" was established in 1983 by Dr. Dnyandeo Yashwantrao Patil, Padma Shri Awardee, former Governor of States of Tripura, Bihar and West Bengal. Affectionately known to all as "Dada", Dr. D. Y. Patil is a well known social worker, philanthropist & an educationist of international repute. The Group has focused on education and health care in the last four decades and is one of the largest private education providers in Maharashtra with over 150 educational institutions with programs in diverse fields.

The Group is actively engaged in Education and Health Care. Today, the movement started by 'Dada' has educated more than 300000 students from primary to doctoral level through the continuous leadership of the second generation of his family and the dedicated efforts of over 11000 staff working in these institutions. The group has three Deemed to be Universities at Kolhapur, Navi Mumbai and Pune and three Private State Universities. In addition the D. Y. Patil Group has diverse interests that are in truth investments in the progress of society and the nation. The group is also engaged electricity generation, Sports, Culture, Hospitality and Agribusinesses.

Vision

- To become a world class dynamic institution of education research & training to develop globally competitive, professional and socially responsible human resource.

Mission

- To ensure globally relevant quality higher education and skill enhancement for providing required trained manpower to the nation & the world.
- To promote symbiotic relations with industry, academic and research institutions and community to meet the expectations of various stakeholders.
- To engage in interdisciplinary research and innovate for furtherance of knowledge, technology and growth.
- To put in place dynamic technocracy for effective use of emerging trends in curriculum development, and radogy, evaluation and system management.
- To provide an environment for holistic evolution of the learners as human, socially responsible and conscious of sustainable ecosystem.

Goal

- University to be recognized as one of the top institutions of higher learning in the next decade and achieve global recognition.

INSTITUTION PROFILE IN BRIEF

NAME OF THE COLLEGE : D.Y. Patil Education Society (Institution Deemed to be University), Kolhapur

ESTABLISHMENT : 1983

PIONEERS : **Padmashri Dr. D. Y. Patil**

Institution, consist of G+4 and G+5 buildings, is situated at kasaba bawada in the city with necessary infrastructure for the departments of all the faculties. A proper care is taken to provide basic amenities for the students & the staff members. The facilities are as follows….

DYP Medical College Infrastructure

- **Classroom :** 8 spacious classrooms with necessary furniture & blackboards in all buildings of the college.
- **Library:** The library of the college is big stored independent building with qualified staff and more than 17 thousand books.
- **Laboratory:** 14 spacious laboratories with Computers with Battery backup, Printer, Scanner, LCD projectors &equipments& furniture etc.
- **Demo Room:** 7 spacious demo rooms with proper infrastructure.
- **Administrative Office:** The spacious LAN computerized administrative office with 19 cabins and modern technology & with necessary facilities.
- **Open Air Theatre:** An open air theatre of 4000 sq. ft. with paving blocks & stage is used for the big functions.
- **Covered Auditorium:** 2400 sq. ft. Covered Auditorium with a proper sitting capacity.
- **Conference Hall:** Independent conference hall with necessary facilities for different activities of the departments.
- **Study Room**: In the library building one study room for students & one study room for boys & girls students. Both the study rooms are spacious & necessary furniture & facilities, drinking water, toilet etc.
- **Reading Room:** 2 study rooms, 1 for PG and 1 for UG.
- **Ladies room: 1** **BoysRoom: 1**
- **Museum:** Developed 3 number of museums for medical study.
- **Animal House:** 1 animal house is developed by pharmacology department as per requirement.
- **Canteen:**One canteen in the campus providing tea & snacks with the size of 2000 sq. ft.
- **Hostel:**Boys and Girls' hostel with facility of rooms with beds, canteen, T.V., Study Room with newspapers. With proper capacity as per requirement.
- **Toilets:**Total number of toilets are 67 including college, office, hostels, etc.
- **Botanical Garden:**We have developed 11500 sq. ft. garden for trees & plants with many types of species.

DYP Hospital Infrastructure

- **Classroom :** 1 spacious classrooms with necessary furniture & blackboards in all buildings of the college.
- **Demo Room:** 12 spacious demo rooms with proper infrastructure.
- **Cabins:** 48 spacious cabins with proper infrastructure for 48 faculties.
- **OPD:** Different departments for number of opd's as follows.

1	Surgery	2	Radiology
3	Audiometry	4	Medicine
5	Pediatrician	6	Pathology
7	Ortho	8	Radiology & MRI
9	Sonography	10	Gynecology
11	Dermatology	12	Dentist
13	Psychiatrics	14	Pulmonary
15	ENT	16	Ophthalmology
17	Pharmacy	18	ECG Room
19	Blood Bank	20	Store

- **Central research Lab:** 1
- **Molecular Lab:** 1
- **Cybillation& skills:** 1
- **Operation Theater:** 14
- **I C U:** 2
- **Canteen:** 1
- **Toilet:** 250

Methodology

The college has conducted Green audit in the year 2017-18, on a yearly basis. The audit was carried out in three phases.

a. Questionnaire survey:

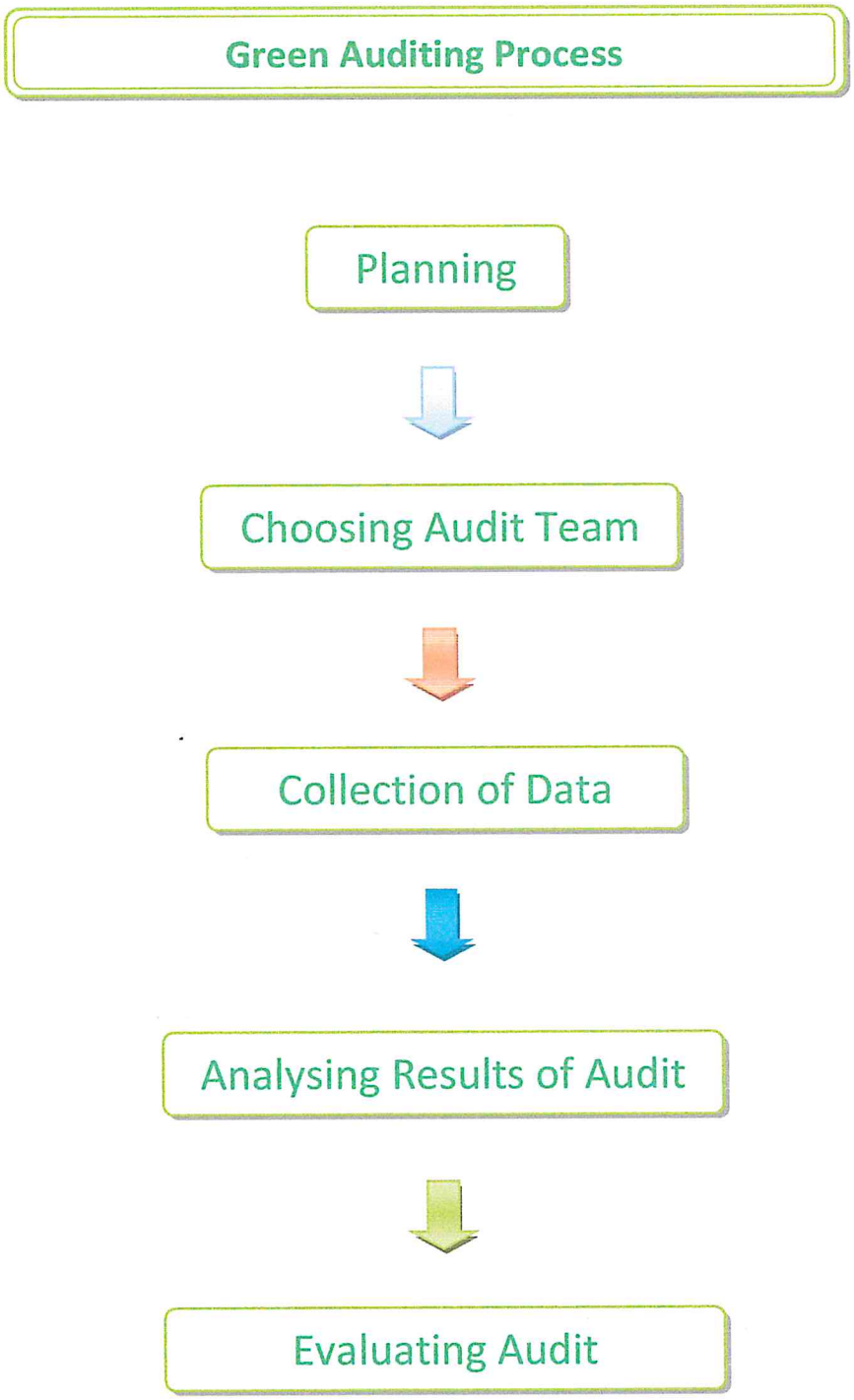
It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to Water and Wastewater management, Energy conservation, green belt, Carbon inventory, Solid waste management, Hazardous waste management, Air and noise quality status, activities of nature club, etc. should be gathered for the audit purpose.For collecting data related to these different areas, specific questionnaires were prepared.

b. Onsite visit and observations:

The data related to above mentioned areas was collected by visiting each and every facility of college campus. The questionnaires were filled up according to the present situation. Photographic documentation was also done with the help of sophisticated camera.

c. Data analysis:

After collection of secondary data, the reviews related to each environmental factor were taken by the Green audit team. The data was tabulated, analyzed and graphs were prepared using computer. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. The Environmental Management Plan (EMP) was prepared for the next academic year in order to have better environmental sensitization. Finally, all the information was compiled in the form of Green audit Report.


Green Auditing Process
Planning
Choosing Audit Team
Collection of Data
Analysing Results of Audit
Evaluating Audit

Overview of Green audit

a.Profile of D.Y. Patil Education Society (Institution Deemed to be University), Kolhapur:

D.Y. Patil Education Society (Institution Deemed to be University), Kolhapuris situated in Maharashtra at **16°72'943"N**and **72°24'409"E**, in the Kolhapur District and it is at altitude of 760 fts above mean sea level.

Satellite image of D.Y. Patil Education Society (Institution Deemed to be University), KolhapurCampus

Source: Google Earth

a) Entrance

b) College Main Building

c) Parking

d) Library

e) Lecture Building

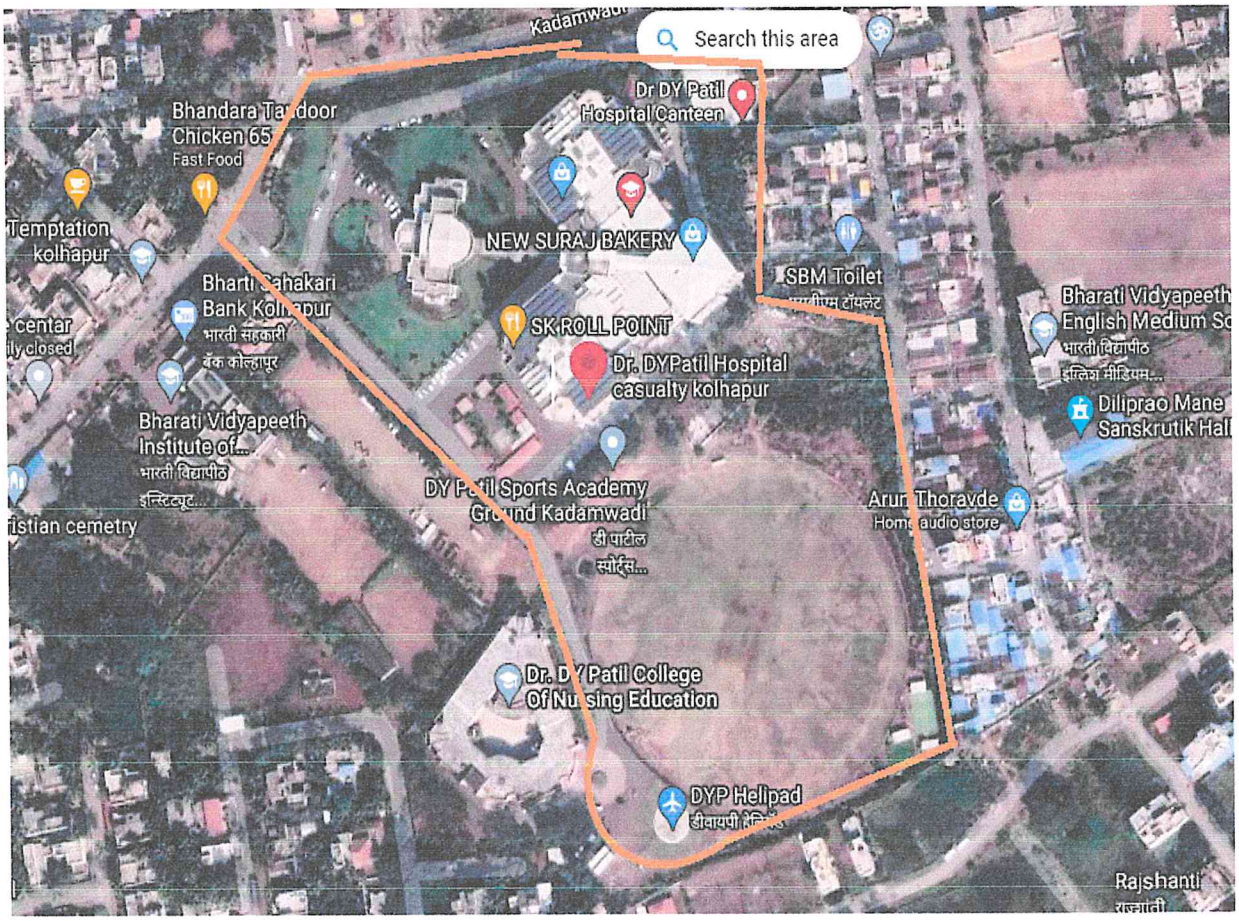
f) Botanical Garden

g) Sanstha Office

h) Labs

Dr. D. Y. Patil Hospital casualty Kolhapur is situated in Maharashtra at **16°71'459" N** and **74°25'655" E**, in the Kolhapur District and it is at altitude of 760 fts above mean sea level.

Dr. D.Y.Patil Hospital casualty KolhapurCampus



a) Entrance

b) College Main Building

c) Parking

d) Playground

e) Lecture Building

f) Botanical Garden

g) Canteen

h) Helipad

In its effort towards creating an eco-friendly campus, the University encourages its Faculty and Students to engage in conserving the Campus environment, its flora and fauna, through activities that include individual and collaborative research, conservation practices, activities and initiatives of the Eco Club and the University as a whole.

Sr.	Particular	Content			
1.	**Name of the project**	**"D.Y. Patil Education Society, KOLHAPUR"**			
2.	**Name, contact number & address of Proponent**	Name	**D.Y. Patil Education Society, Kolhapur**		
		Address	869, E, D. Y. PatilVidyanagar, Kasba Bawada, Kolhapur.		
		Telephone	(0231) 2601235/36		
		Email ID	info@dypatilkolhapur.org		
3.	**Name, contact number & address of Consultant**	Name	**SSP Nature Solution Environment Consultant Pvt. Ltd.(OPC)**		
		Address	Pune, Kolhapur		
		Telephone			
		Mobile	**9881981112**		
		Email ID	**ssp.naturesolutions@gmail.com**		
4.	**Type of project:**	Educational			
5.	**Location of the project**	KasbaBawada, Kolhapur.			
6.	**Whether in Corporation/ Municipal / other area**	Kolhapur Municipal Corporation			
7.	**Total Plot Area (sq.m.)**	**Sr. No. 869**		**1,20,000**	**Sq. ft.**
		Total		**1,20,000**	**Sq. ft.**
8.	**Permissible FSI (including TDR etc.)**	**As per local body**			
9.	**Built-up Area (FSI & Non-FSI)**	FSI =	1,20,000	**Sq. ft.**	
		Non FSI=	22,500	**Sq. ft.**	
		Open Space= **Total=**	11500 **154000**	**Sq. ft.**	
10.	**Ground-coverage percentage (%)** ***(Note: Percentage of plot not open to sky)***	**13516.87 Sq. ft.**			
11.	**Height of the building**	**G+5** **18 to 22 meter**			

Sr.	Particular	Content			
12.	**Name of the project**	**"D.Y. PatilHospital, KOLHAPUR"**			
13.	**Name, contact number & address of Proponent**	Name	**D.Y. PatilHospital, Kolhapur**		
		Address	507, E, D. Y.Patil Hospital, Kadamwadi, Kolhapur.		
		Telephone	(0231) 2657781		
		Email ID	hospital.dypatilmedicalkop.org		
14.	**Name, contact number & address of Consultant**	Name	**SSP Nature Solution Environment Consultant Pvt. Ltd.(OPC)**		
		Address	Pune, Kolhapur		
		Telephone			
		Mobile	**9881981112**		
		Email ID	ssp.naturesolutions@gmail.com		
15.	**Type of project:**	Educational and medical			
16.	**Location of the project**	Kadamwadi, Kolhapur.			
17.	**Whether in Corporation/ Municipal / other area**	Kolhapur Municipal Corporation			
18.	**Total Plot Area (sq.m.)**	**Sr. No. 507**		**6,50,000**	**Sq. ft**
		Total		**6,50,000**	**Sq. ft**
19.	**Permissible FSI (including TDR etc.)**	**As per local body**			
20.	**Built-up Area (FSI & Non-FSI)**	FSI =	3,50,000		**Sq. ft**
		Non FSI=	1,50,000		**Sq. ft**
		Open Space=	1,10,000		**Sq. ft**
		Gymkhana=	600		**Sq.ft.**
		Total=	**6,10,600**		**Sq.ft.**
21.	**Ground-coverage percentage (%)** ***(Note: Percentage of plot not open to sky)***	**101516.87 Sq. m** **Play Ground 1,30,000 sq. ft. with green lawn.**			
22.	**Height of the building**	**G+4** **15 to 18 meter**			

i. Details of tree census in College campus:

The beginning of the 21st century brought growing concern about global warming, climate change, food security, poverty, and population growth. CO_2 is a principle component causing global warming. Atmospheric carbon dioxide levels have increased to 40% from preindustrial levels to more than 390 parts per million CO_2. On this background it is a need of time to cover the educational campuses with Environmentcover interrelated with climate change.

The current is a present status of tree cover, vegetation and carbon storage assessment of area under D.Y. Patil Education Society (Institution Deemed to be University), KolhapurCampus. In an era of global warming and climate change; carbon emission, carbon sequestration, mitigation, adaptation are the keywords in academia. Carbon sequestration is a phenomenon of converting atmospheric carbon i.e. CO_2 in to other pools of carbon such as vegetation, soil, ocean etc. in various forms to mitigate global warming. It is one of the important clauses of Kyoto Protocol. Current tree census methodology has been adopted from the guidelines set by Indian Institute of Remote Sensing, Dheharadoon, Govt. of India.

- **Total biomass :**

Biomass, in ecology, is the mass of living biological organisms in a given area or ecosystem at a given time. Biomass can refer to *species biomass*, which is the mass of one or more species, or to *community biomass*, which is the mass of all species in the community. It can include microorganisms, plants or animals. The mass can be expressed as the average mass per unit area, or as the total mass in the community. 0.378 tonsof total biomass of woody vegetation have been recorded inThe New College Kolhapurcampus during the current tree census.

- **Carbon stock:**

Forests and trees act as natural carbon stores, but this carbon is released when the trees are felled and the area deforested. The amount of carbon stored within an area of land varies according to the type of vegetation cover. 0.1891 tonsoftotalcarbonstocks are presenton thecampus.

- **Carbon Sequestration:**

Carbon sequestration describes long-term storage of carbon dioxide or other forms of carbon to either mitigate or defer global warmingand avoid dangerous climate change. It has been proposed as a

way to slow the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels. Vegetation carbon pool having the potential of 560 Pg (Pg: Petagram= billion ton) of carbon storage globally. In the current study the focus is given on the assessment of existing carbon stock stored The New College Kolhapurcampus in the form of woody vegetation by enumerating every tree species. Overall 0.694 tons of CO_2has captured and stored by the woody plants present in the college campus. A single tree consumes 0.0218 tonsof CO_2 approximately annually consequently, as the campus possess 69 mature woody plants 1.5042 tonesof CO_2 is consumed yearly by all woody vegetation on the college campus.

- **Oxygen released :**

Woody vegetation on The New College Kolhapurcampus has released 1.85 tonsof oxygen in their lifetime till date. Released oxygen is directly proportional to CO_2 sequestrate in the ratio of 32/12. Thus, it is supposed to release of oxygen annually. It is assumed that a single tree supports oxygen demand of two people for their life.

- **Total number of trees enumerated onD.Y. Patil Education Society (Institution Deemed to be University), Kolhapurcampus:**

All the collected data was tabulated and analyzed with the help of MS- Excel spreadsheets and objected findings were extracted by using various factors given by Inter governmental Panel on Climate Change (IPCC).

- **Total number of trees enumerated onD.Y. Patil Education Society (Institution Deemed to be University), Kolhapur campus:** Total 717 numbers of trees with more than 10 cm girth and height more than 4 ft have been enumerated. Girth and height of every tree has been measured.
- Total 591 numbers of potted plants.
- Total 71 numbers types of shrubs species.

- **Total No. of species identified inD.Y. Patil Education Society (Institution Deemed to be University), Kolhapur campus**

Tree Species chart with Names

Sr. No.	Common Name	Botanical Name	Medical College	Hospital	Nursing	Total
1	Phoenix palm	Phoenix palm		03	03	06
2	Saptipami	Alostonia Scholaris	01	23		24
3	Latania Palm	Latania lontaroides		02		02
4	Cycas Palm	Cycas revolute		07		07
5	Umber	Ficus Racemosa		04	01	05
6	Peltophorum	Peltophorum pterocarpum	01	56	08	65
7	Royal plam	Roystonea regia		01		01
8	Almond	Prunus dulcis	01	04	02	07
9	Terminalia	Terminalia Mentaly	06	05		12
10	Fishtail Plam	Caryota		15		15
11	Ficus Nuda	Ficus benjamina nuda		14		14
12	Golden Cyprus	Golden cypress	13	06		19
13	Tabobuia	Tabobuia impetiginosa		28		28
14	Ficus	Ficus benjamina	04	11		15
15	Bottal Brush	Golden bottal brush		06		06
16	Kanchan	Bahunia Variegata	01	09		10
17	Rain Tree	Samanea saman	02	01		03
18	Tabal Palm	Livistona Rotundi folia	02	05		07
19	Spathodea	Spathodea Campanulata		08	05	13
20	India bael	Aegle marmelos	01			01
21	Conocarpus	Conocarpus erectus		330		330
22	Kadam	Neolamarckia Codamba		03		03
23	Ficus	Ficus Black		11	18	29
24	Ficus	Ficus Microcrappa	08			08
25	Areca Palm	Areaca Catechu	02	16	05	23
26	Sindur plant	Bixa Orellana	02		02	02
27	Golmohar	Royal Poinciana			02	02
28	Buddha Bombu	Buddha belli bombu	01	01		02
29	Vad	Ficus Benghalansis	02	01		03

Sr. No.	Common Name	Botanical Name	Medical College	Hospital	Nursing	Total
30	Parijatak	Nyctanthes arbor			01	01
31	Sonchafa	Michelia Champa			01	01
32	Trangal plam	Revenala Madagas Coriensis		02		02
33	I. Christmas Tree	Araucaria Calummaris	02	04		04
34	Coconut	Cocos nucifera		04		04
35	Plumeria Alba	Plumeria alba		09		09
36	Foxtail plam	Wodyetia bifuracata	03			03
37	Peepal (Sacred fig)	Ficus religiosa		01		01
38	Date palm	Phonenix dectylifera	04	15		19
39	Pisunia alba	Pisonia alba	03			03
40	Silver ok	Grevillea robusta	02			02
41	Neem Tree	Azadirachara India	01			01
42	Cassia	Cassia Fistula			03	03
43	Mango Tree	Mangifera indica				
44	Mejesty palm					
45	Jack fruit	Jack fruit	01	01		02
	Total					**717**

Potted Plant Species with Names

Sr. No.	Plant Name	Medical College	Hospital	Total
1	Areca Palm	118	23	141
2	Rapies Palm	03	08	11
3	Sheflora	02	03	05
4	Tabel Palm	04		04
5	Dresena Mahatma	01		01
6	Aglonema	14		14
7	Aspragus	01		01
8	Pendanuns	02	02	04
9	Brassia	04		04
10	Golden Ficus	02		02
11	Rabber Merchera	03		03
12	Cptrus Lemen	01		01
13	Difen Becia	06	06	12
14	Marranta	02		02
15	Green Cyprus	01		01
16	Croton	03	01	04
17	Caner	01		01
18	Exora	01		01
19	Rose	01	02	03
20	Morya exotica	01	07	08
21	Mogra	01	01	02
22	Alvera	02	01	03
23	Pedilanthus	01	0	01
24	Cana		04	04
25	Baby croton		21	21
26	Krishna Kamal		02	02
27	Sontakka		01	01
28	Heleconla		01	01
29	Golden Bobu		03	03
30	Lotus		03	03
31	Gokharn		01	01
32	Yukka Green		01	01
33	Bramha Kamal		08	08
34	Arelia		02	02
35	Songs of India		03	03
36	Pudica Chafa		02	02
37	Spider lily		02	02

Medicine Plant in Potted

Sr. No.	Common Name	Medical College Botanical Name	
1	Lasun Vel	Allium Sativum Linn	01
2	Corfad	Aleo Vera	01
3	Vekhand	Acours Calamus	01
4	Adulsa	Adhatoda Vasica	01
5	Arjun	Terminalia Arjuna	01
6	Citrus Lemon	Cirtus Lemon	01
7	Insulin	Costus Ingeneus	01
8	Satavri	Asparagus Affieina lis	01
9	Dalchini	Cinnamon	01
10	Nagarmotha	Cuperus Rotundus	01
11	Parijatak	Nyctanthes arbor Tristis	01
12	Bahava	Cassia Fishula	01
13	Gulvel	Traspord Cardifilia	01
14	Lemon	Paper Lemon	01
15	Vatvruksh	Banyan	01
16	Kailaspati	Caupita Guianensis	01
17	Kanchan	Bauhinia purpurea	01
18	Bakul	Mimusops Santalinus	01
19	Pimpal	Ficus religiosa	01
20	Cadulimb	Azadirachta indica	01
21	Sadafully	Vinca rosea	01
22	Satvin	Alstonia Scholaric	01
23	Taman	Lagerstroemia Flos regineae	01
24	Umber	Ficus rocemosa	01
25	Ractchandan	Pterocarpus santalinus	01
		Total	**591**

Shrub Plant Species with Names

Sr. No.	Medical College	Hospital	Nursing
1	Khupia	Vadeliya	Vedeliya
2	Musanda	Panda Ficus	Panda Ficus
3	Exora	Pudica Chafa	Pudica Chafa
4	Plumbago	Yaforbia	Yuforbia
5	Arelia	Plumbago	Plambago
6	Spider Lily	Cana	Cana
7	Dressena	Heloconia	Heloconia
8	Songsof India	Black Codia	Black codia
9	Jatrofa	Rohia	Ruhia
10	Tagar	Bamboo Grass	Bamboo grass
11	Ticoma	Druranta	Druranta
12	Jai	Almenda	Almenda
13	Jaswand (Hibiscus)	Boganvelia	Boganvedilia
14	Eranthimum Yellow	Morya Exotica	
15	Almenda	Songs of India	
16	Pendanuns	Tagar	
17	Amar Lily	Jatrofa	
18	Aster	Rabber Lily green	
19	Thima Acalifa	Black lily	
20	Rui	Rubra lily green	
21	Costus	Rappies palm	
22	Heloconia	Jiranium	
23	Sadafully	Ticoma Rosia	
24	Hemelia	Ticoma New Red	
25	Monthihut	Pentas	
26	Temerjiay Execta	Pendanus	
27	Limuneca Speataca	Ribben Grass	
28	Adulsa	Lily green Grass	
29	Ficus Golden	Presena Merigenta	
	Total		71

Gardening Photo Gallery



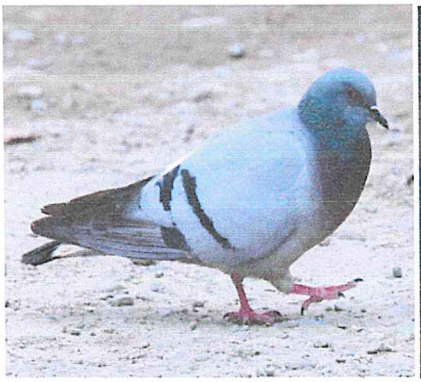



- **Bird's diversity:**

The diversity among birds is striking. ... Birds live in a variety of different habitats. Birds that live in different habitats will encounter different foods and different predators. Birds can be carnivores (feeding on other animals), herbivores (feeding on plants), or generalists (feeding on a variety of foods).

Sparrow, crow, bulbuls, Eagle, Pigeon, Cuckoo, Bat, Butterfly, etc these species are seen regularly around the campus.





1.1 *1. What is Hospital Sewage and why to treat it?*

Generally, wastewater is defined as the composition of physical, chemical and biological waste present in wastewater. Hospital sewage is a wastewater generated relatively in larger quantities from all the units of the hospitals such as emergency and first aid, operating rooms, drug treatment, ICU, chemical and biological laboratories, radiology, canteen and laundry activities, etc.

Since, hospital sewage/wastewater consists of various potentially hazardous components that will cause many risks on human and environment by polluting surface and ground water. Hence, hospital sewage treatment is very much required.

The major objective of hospital wastewater treatment plant is to treat the influent (untreated wastewater) generated by the hospitals and healthcare sectors before its direct release into natural environment. Hospital wastewater may have an adverse impact on environments and human health. Therefore, proper wastewater management in each and every hospital is prerequisite.

.2 *2. Hospital Sewage Characteristics:*

Wastewater from various hospitals consists of:

1. Microbial pathogens and harmful bacteria and virus
2. Pharmaceuticals and its metabolites
3. Radioactive isotopes
4. Hazardous chemicals, heavy metals
5. Drug residues

ı.3 *3. Hospital sewage or wastewater treatment plant process:*

Compact or packaged sewage treatment plant for hospitals is done in series of steps. Conventional treatment processes involved to remove impurities from the influent are listed below.

1. Preliminary Stage or Pretreatment: As a first stage, preliminary treatment process is essential in most of the sewage treatment plant (STP). It removes items such as sticks, rags and other large debris and heavy inorganic solids contained in the hotel influent through bar screens. Removal of these materials protects plant's equipments from damage. The inorganic settled is called as grit which is removed using grit chamber.

2. Primary Treatment Stage: This is the second step in sewage treatment system. Physical separation of solids and greases from wastewater is done in this stage. Now, water flows into primary filter or

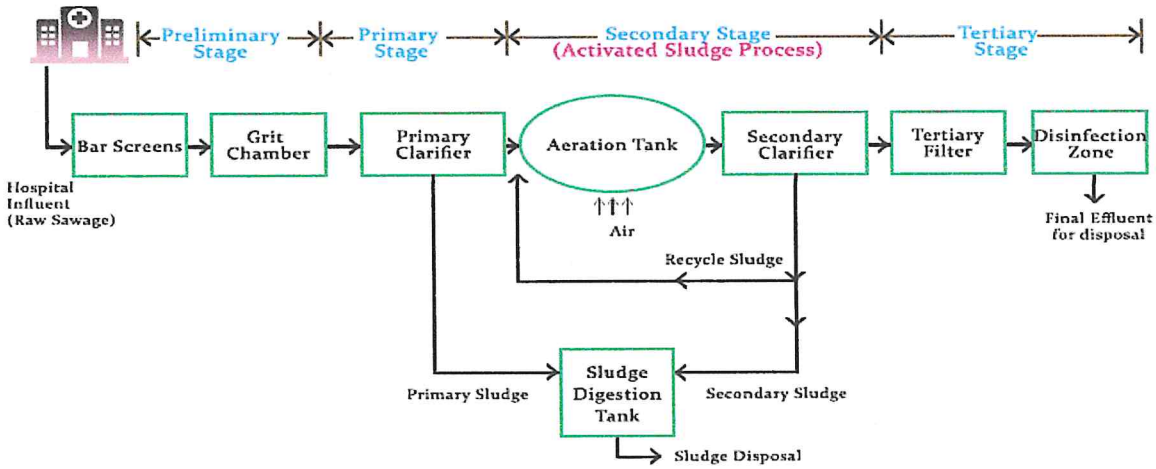
clarifiers for few hours to allow solid particles to settle down and lighter particles will float to the top will be skimmed off from the tank. The settled solid is called as primary sludge or primary effluent contains about 60-70% of solids. Partly treated wastewater is now subjected to next treatment level.

3. Secondary Treatment Stage: It is a biological treatment process removes dissolved inorganic materials present in soluble and colloidal form from the wastewater. Here, bacteria are used convert the colloidal and dissolved organic matter. Now the partially treated wastewater from primary tank flows into the aeration tank and air is supplied through air blower to provide oxygen for microbes. When wastewater flows into secondary clarifier, where solids settle down which is called as secondary sludge and part of it is recycled for activated sludge process and remaining is mixed with primary sludge which will be send to sludge digestion tank and then disposes off. This stage removes about 90% of inorganic solids.

4. Tertiary or Advanced Treatment Stage: This is the last stage in most of the STP's. This stage removes the suspended solids and organic matter which was not removed in secondary treatment. The pathogenic microorganisms which were not removed during biological treatment process will get removed by the process called disinfection. Several disinfection agents can be used depending on wastewater condition (pH, clarity etc). It is achieved by means of physical or chemical disinfectants like chlorine, UV light, ozone etc. Now, disinfected wastewater is suitable for disposal or reuse.

If the water is not treated adequately, the harmful contaminants in the sewage is hazardous to human health and natural environment. So, Sewage treatment Plant in hospitals is always necessary to reduce harmful impact on the environment.

Conventional processes involved in Sewage Treatment Plant (STP) for Hospitals is shown below:



Water management Practices:

• Rain Water Harvesting (RWH) is practiced by means of recharge wells, recharge bore, and water tanks (for storage of rainwater). The institution Campus is independent of the city water supply system as it relies on three bore wells and four natural ponds, present in the Campus, to cater to the water requirements. Bore wells were made to help with the construction as well as to ensure drinking water for the campus. Three Bore Wells and Four natural ponds which helps with the construction as well as to ensure drinking water for the campus.

What is RWH?

Rain water harvesting is collection and storage of rain water that runs off from roof tops, parks, roads, open grounds, etc. This water run off can be either stored or recharged into the ground water. A rainwater harvesting systems consists of the following components:

1. catchment from where water is captured and stored or recharged,
2. conveyance system that carries the water harvested from the catchment to the storage/recharge zone,
3. first flush that is used to flush out the first spell of rain,
4. filter used to remove pollutants,
5. storage tanks and/or various recharge structures.

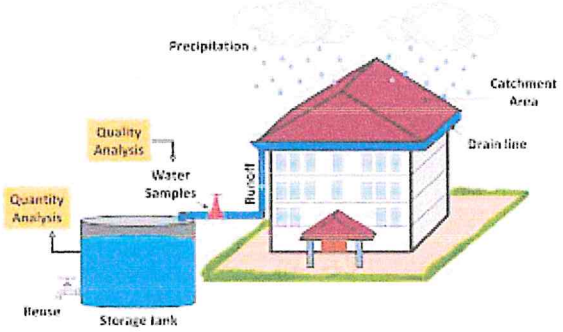
Why do RWH?

Rain may soon be the only source of clean water. Rainwater harvesting systems use the principle of conserving rainwater where it falls and have the following benefits:

- Helps meet ever increasing demand of water.
- Improves quality and quantity of groundwater.
- Reduces flooding.

How?

Setting up a rainwater harvesting is not difficult but requires some sort of understanding of hydrology and architecture and as a result most people find it too complicated to do it themselves. In order to make it simple and convenient for everyone to set up a rainwater harvesting system suitable for their needs, we have prepared a set of guidelines which will help you to set up your own rainwater harvesting system quickly and efficiently.



Solar Water Heating System

Solar water heating system is a device that helps in heating water by using the energy from the SUN. This energy is totally free. Solar energy (sun rays) is used for heating water. Water is easily heated to a temperature of 60-80o C. Solar water heater of Solar water heaters (SWHs) of 100-300 liters capacity are suited for domestic use. Larger systems can be used in restaurants, canteens, guest houses, hotels, hospitals etc. A 100 liters capacity SWH can replace an electric geyser for residential use and may save approximately 1500 units of electricity annually. The use of 1000 SWHs of 100 liters capacity each can contribute to a peak load saving of approximately 1 MW. A SWH of 100 liters capacity can prevent emission of 1.5 tones of carbon dioxide per year.

Working Of a Solar Water Heater

The Sun's rays fall on the collector panel (a component of solar water heating system). A black absorbing surface (absorber) inside the collectors absorbs solar radiation and transfers the heat energy to water flowing through it. Heated water is collected in a tank which is insulated to prevent heat loss. Circulation of water from the tank through the collectors and back to the tank continues automatically due to thermo siphon system. Based on the collector system, solar water heaters can be of two types: A solar water heater consists of a collector to collect solar energy and an insulated storage tank to store hot water. The stored hot water can be used later any time.

Main Components Of Solar Water Heating System

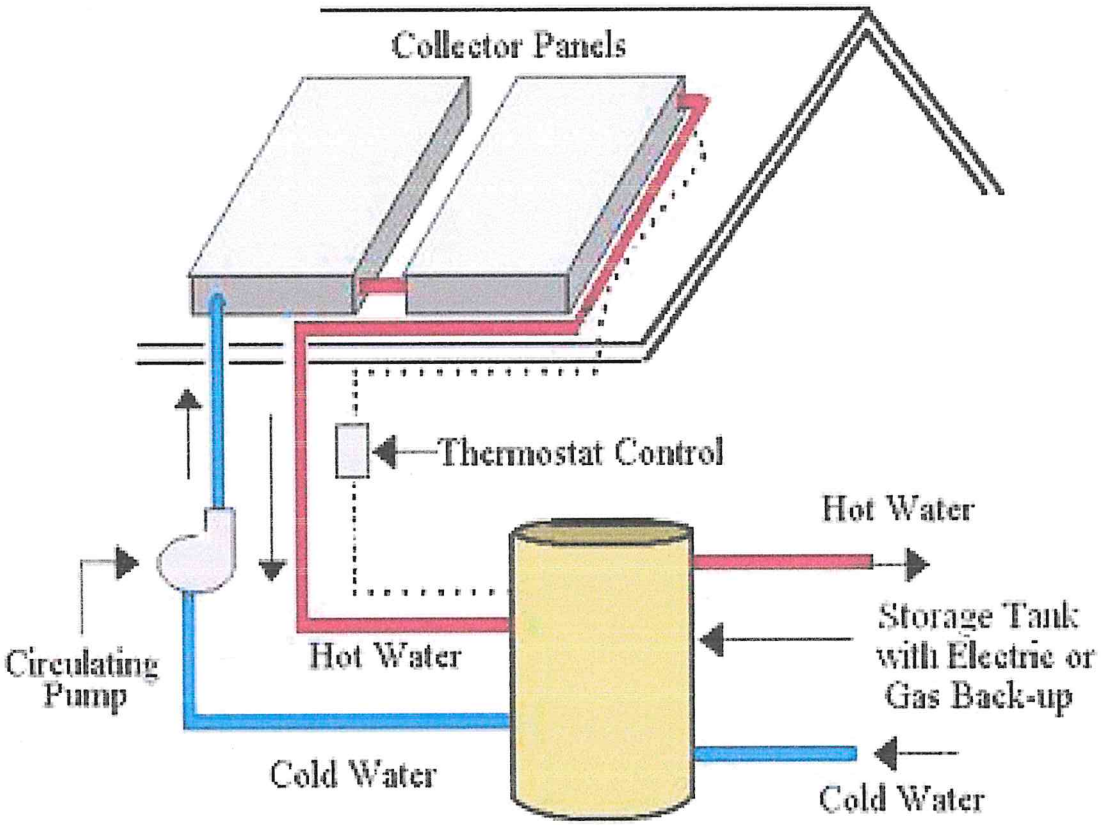
Main components of solar water heater system are

- Solar Collector(to collect solar energy)
- Insulated tank (to store hot water)
- Supporting stand
- Connecting pipes and instrumentation etc.

Applications Of Solar Water Heater

- Water heating is one of the most cost-effective uses of solar energy. Every year, several thousands of new solar water heaters are installed worldwide. Solar water heaters can be used for Homes, Community Centers, Hospitals, Nursing homes, Hotels, Restaurants, Dairy plants, Swimming Pools, Canteens, Ashrams, Hostels, Industry etc. Use of solar water heater can curtail electricity or fuel bills considerably.

- Usage of solar water heater for any application where steam is produced using a boiler or steam generator can save 70-80% of electricity or fuel bills. A residence can save 70-80% on electricity or fuel bills by replacing its conventional water heater with a solar water heating system. Solar water heaters are known to have the fastest repayment of investment in 2 to 4 years depending upon use and fuel replaced.



Active Solar Water Heating System

The solar is installed on institution building of hostels with capacity of 5000 litres/day.

Solar System for Electricity:

Solar power is pollution free and causes no greenhouse gases to be emitted after installation. Reduced dependence on foreign oil and fossil fuels. Renewable clean power that is available every day of the year, even cloudy days produce some power.

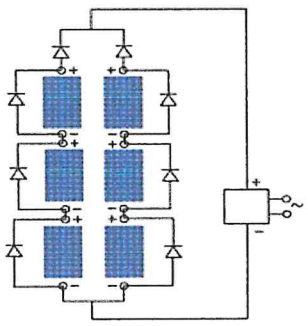
Theory and construction

Photovoltaic modules use light energy (photons) from the Sun to generate electricity through the photovoltaic effect. Most modules use wafer-based crystalline silicon cells or thin-film cells. The structural (load carrying) member of a module can be either the top layer or the back layer. Cells must be protected from mechanical damage and moisture. Most modules are rigid, but semi-flexible ones based on thin-film cells are also available. The cells are usually connected electrically in series, one to another to the desired voltage, and then in parallel to increase current. The power (in watts) of the module is the mathematical product of the voltage (in volts) and the current (in amperes) of the module. The manufacturing specifications on solar panels are obtained under standard condition, which is not the real operating condition the solar panels are exposed to on the installation site.

A PV junction box is attached to the back of the solar panel and functions as its output interface. External connections for most photovoltaic modules use MC4 connectors to facilitate easy weatherproof connections to the rest of the system. A USB power interface can also be used.

Solar panels also use metal frames consisting of racking components, brackets, reflector shapes, and troughs to better support the panel structure.

Module interconnection



A connection example, a blocking diode is placed in series with each module string, whereas bypass diodes are placed in parallel with modules.

Module electrical connections are made with conducting wires that take the current off the modules and are sized according to the current rating and fault conditions.

Panels are typically connected in series of one or more panels to form strings to achieve a desired output voltage, and strings can be connected in parallel to provide the desired current capability (amperes) of the PV system.

Blocking and bypass diodes may be incorporated within the module or used externally, to deal with partial array shading, to maximize output. For series connections, bypass diodes are placed in parallel with modules to allow current to bypass shaded modules which would be high resistance. For paralleled connections, a blocking diode may be placed in series with each module's string to prevent shaded strings' internal impedance from short circuiting other strings.

Concentrator

Some special solar PV modules include concentrators in which light is focused by lenses or mirrors onto smaller cells. This enables the use of cells with a high cost per unit area (such as gallium arsenide) in a cost-effective way.

Inverters

In general with solar panels, if not enough current is taken from PVs, then power isn't maximised. If too much current is taken then the voltage collapses. The optimum current draw depends on the amount of sunlight striking the panel. Solar panel capacity is specified by the MPP (maximum power point) value of solar panels in full sunlight.

Solar inverters convert the DC power to AC power by performing the process of maximum power point tracking (MPPT): solar inverter samples the output Power (I-V curve) from the solar cell and applies the proper resistance (load) to solar cells to obtain maximum power.

MPP (Maximum power point) of the solar panel consists of MPP voltage (V mpp) and MPP current (I mpp): it is a capacity of the solar panel and the higher value can make higher MPP.

Solar panels are wired to inverters in parallel or series (a 'string'). In string connections the voltages of the modules add, but the current is determined by the lowest performing panel. This is known as the "Christmas light effect". In parallel connections the voltages must be the same to work,

but currents add. Arrays are connected up to meet the voltage requirements of the inverters and to not greatly exceed the current limits.

Micro-inverters work independently to enable each panel to contribute its maximum possible output for a given amount of sunlight, but can be more expensive.

Efficiency

Each module is rated by its DC output power under standard test conditions (STC) and hence the on field output power might vary. Power typically ranges from 100 to 365 Watts (W). The efficiency of a module determines the area of a module given the same rated output – an 8% efficient 230 W module will have twice the area of a 16% efficient 230 W module. Some commercially available solar modules exceed 24% efficiency. Currently, the best achieved sunlight conversion rate (solar module efficiency) is around 21.5% in new commercial products typically lower than the efficiencies of their cells in isolation. The most efficient mass-produced solar modules[disputed – discuss] have power density values of up to 175 W/m2 (16.22 W/ft2).

Scientists from Spectro lab, a subsidiary of Boeing, have reported development of multi-junction solar cells with an efficiency of more than 40%, a new world record for solar photovoltaic cells. The Spectro lab scientists also predict that concentrator solar cells could achieve efficiencies of more than 45% or even 50% in the future, with theoretical efficiencies being about 58% in cells with more than three junctions.

Capacity factor of solar panels is limited primarily by geographic latitude and varies significantly depending on cloud cover, dust, day length and other factors.

Technology

Most solar modules are currently produced from crystalline silicon (c-Si) solar cells made of multicrystalline and monocrystalline silicon. In 2013, crystalline silicon accounted for more than 90 percent of worldwide PV production, while the rest of the overall market is made up of thin-film technologies using cadmium telluride, CIGS and amorphous silicon.

Emerging, third generation solar technologies use advanced thin-film cells. They produce a relatively high-efficiency conversion for a lower cost compared with other solar technologies. Also, high-cost, high-efficiency, and close-packed rectangular multi-junction (MJ) cells are usually used

in solar panels on spacecraft, as they offer the highest ratio of generated power per kilogram lifted into space. MJ-cells are compound semiconductors and made of gallium arsenide (GaAs) and other semiconductor materials. Another emerging PV technology using MJ-cells is concentrator photovoltaics (CPV).

Thin film

In rigid thin-film modules, the cell and the module are manufactured on the same production line. The cell is created on a glass substrate or superstrate, and the electrical connections are created in situ, a so-called "monolithic integration." The substrate or superstrate is laminated with an encapsulant to a front or back sheet, usually another sheet of glass. The main cell technologies in this category are CdTe, or a-Si, or a-Si+uc-Si tandem, or CIGS (or variant). Amorphous silicon has a sunlight conversion rate of 6–12%.[citation needed]

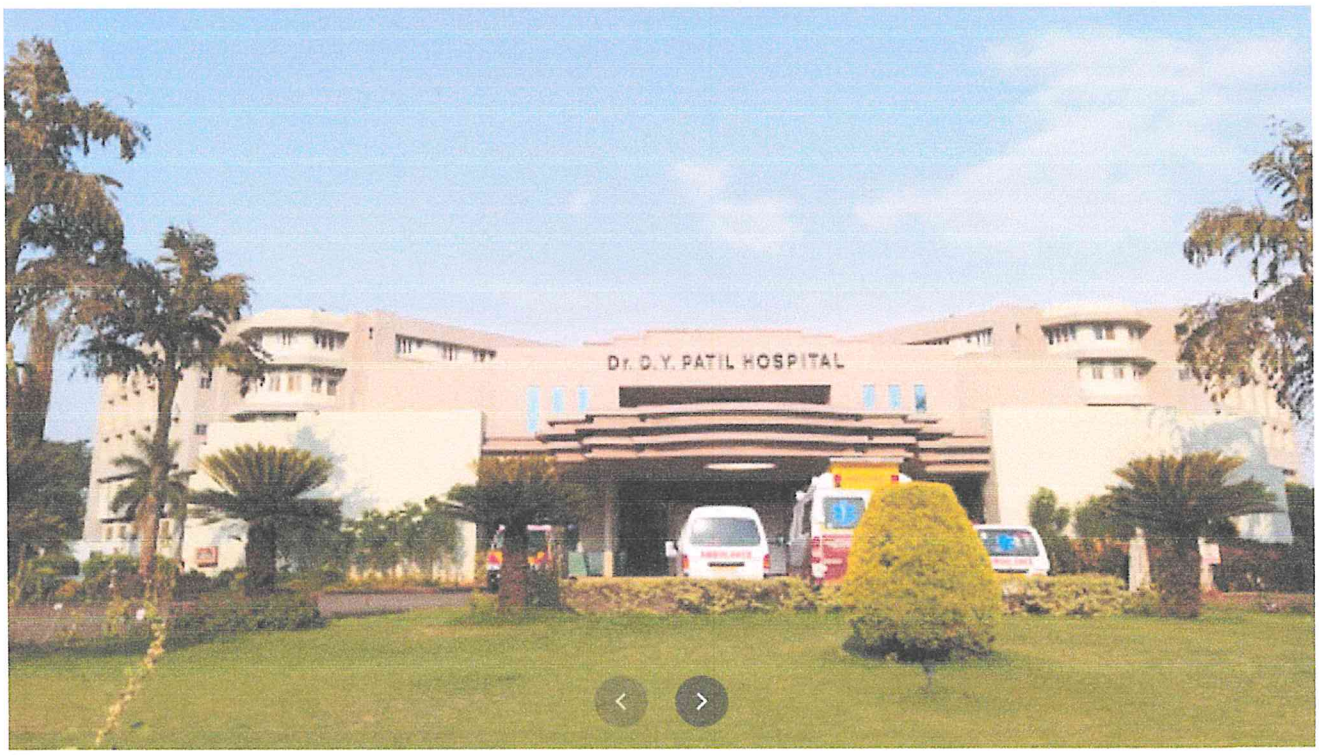
Flexible thin film cells and modules are created on the same production line by depositing the photoactive layer and other necessary layers on a flexible substrate. If the substrate is an insulator (e.g. polyester or polyimide film) then monolithic integration can be used. If it is a conductor then another technique for electrical connection must be used. The cells are assembled into modules by laminating them to a transparent colourless fluoro polymer on the front side (typically ETFE or FEP) and a polymer suitable for bonding to the final substrate on the other side.

The solar is installed on institution building with capacity of 500 kw, and right now only used for single building using only 300 to 350 units per day. Whatever available balance will be reversed to MSEB.

Solar Panel

Environmental protection through activities conducted

Front view of Institution



Front view of Hospital

Institution office

Botanical Garden

Green zone

Biogas Plant

Sewage treatment plant

CONCLUSION AND MANAGEMENT PLAN

The SSP Nature Solutions Environment consultant Pvt. Ltd., Kolhapur has conducted aGreen audit of D.Y. Patil Education Society (Institution Deemed to be University), Kolhapurin the academic year 2018-19. Green auditing is the process of identifying and determining whether institution practices are eco-friendly and sustainable. The main objective of college to carry out Green audit is to check Environment practices followed by college and to conduct a well formulated audit to understand where we stand on a scale of environmental soundness.

Conclusions:

The green audit practically involves:

- energy conservation
- use of renewable sources
- rain water harvesting
- efforts of carbon neutrality
- planting of trees
- hazardous waste management and E-waste management.

All above conclusions are very properly going on in Institution, some recommendations are as follows:

Recommendations:

Following are some of the key recommendation for improving campus environment.

1. College should develop its own Environmental Policy by using guidelines given in Green audit document.
2. Try to increase local tree species like kadulimb to purify air.
3. Wherever possible the waste should be reused or recycled.
4. All street lighting should be changed to solar systems to save electricity.
5. Rain water harvesting must be installed for every building.
6. Drip irrigation for gardens and vegetable cultivation can be initiated.