Shri Marutrao Ghule Patil Shikshan Santha's

Jijamata College of Science and Arts

Dnyaneshwarnagar, Po. Bhende BK, Tal : Newasa, Dist : Ahmednagar, PIN-414605,
Affiliated to Savitribai Phule Pune University, Pune
www.jijamatacollage.ac.in

Self Study Report (SSR) (4th Cycle)

Criterion 7:
Institutional Values and Best Practices

7.1. Institutional Values and Social Responsibilities

7.1.2 (QnM) The Institution has facilities and initiatives for

1. Alternate sources of energy and energy conservation measures
2. Management of the various types of degradable and nondegradable waste
3. Water conservation
4. Green campus initiatives
5. Disabled-friendly, barrier free environment

Submitted to
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL
Bengaluru

7.1. Institutional Values and Social Responsibilities

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Table of Conents

1. Energy conservation measures

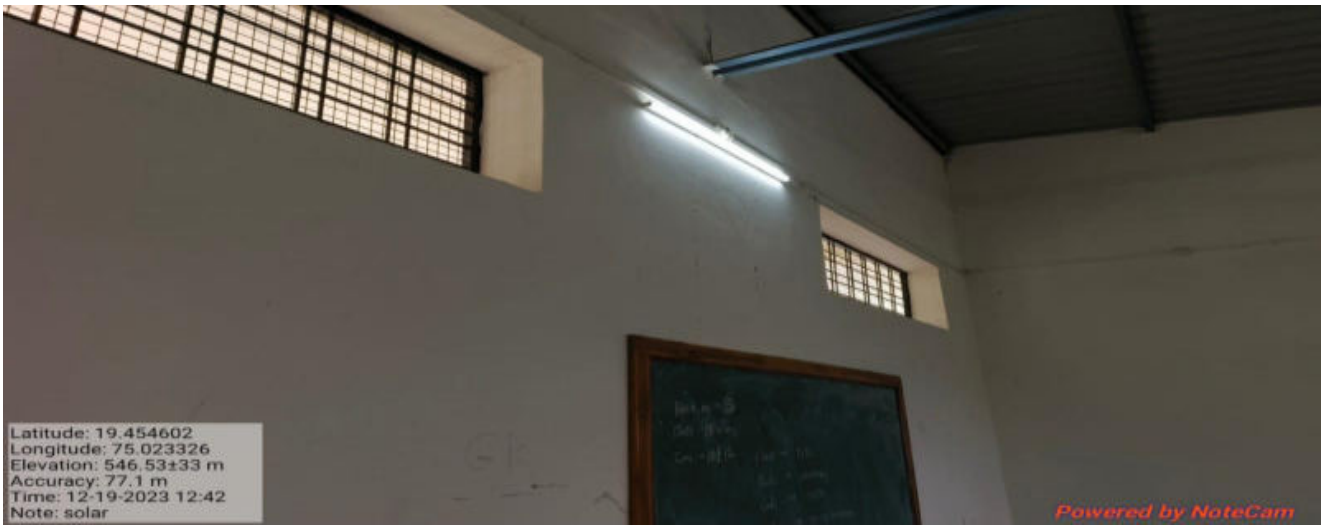
*Solar Energy Plant for Hot Water System in Ladies Hostel


Latitude: 19.456066
Longitude: 75.023597
Elevation: 268.12±31 m
Accuracy: 8.9 m
Time: 12-19-2023 12:29
Note: solar
Powered by NoteCam


Latitude: 19.456155
Longitude: 75.023979
Elevation: 268.12±6 m
Accuracy: 306.3 m
Time: 12-19-2023 12:27
Note: solar
Powered by NoteCam


Latitude: 19.456052
Longitude: 75.023323
Elevation: 268.12±31 m
Accuracy: 25.7 m
Time: 12-19-2023 12:28
Note: solar
Powered by NoteCam

- Solar System for Ellecrical use



Replace LED tubes

NON GRANT 2021-2022 - (from 1-Apr-2021)

Payment Voucher

No. Dated :

Particulars	Amount
Account :	
Contractor Adv. to Cleanteam (Solar Plant Sys)	8,53,500.00

Through :

Bank Saving A/C 7759

On Account of :

Being Contracter Advance to Cleanteam for Installation of 80kw Capaciti Solar Plant system. Amount paid by cheque no. 001977.

Bank Transaction Details:

Cheque	001977	18-Apr-2023	8,53,500.00

Amount (In words) :

INR Eight Lakh Fifty Three Thousand Five Hundred Only

₹ 8,53,500.00

Recei e:

PRINCIPAL
Authorised Signatory
Dist. Ahmednagar

Checked by

Verified by

जिजामाता शास्त्र व कला महाविद्यालय

मागणी अर्ज

दिनांक : १८/०४/२०२३

प्रति,
मा. प्राचार्य साहेब,
जिजामाता शास्त्र व कला महाविद्यालय,
ज्ञानेश्वरनगर भेंडे ता. नेवासा जि. अ.नगर.

महोदय,

महाविद्यालयाचे पुढील कामासाठी खालीलप्रमाणे खर्च आवश्यक असून खर्चाचा तपशील पुढील प्रमाणे

खर्चाचे कारण :— Cleanteam Advance ला देणेस मंजूरी बाबत..

अ.क	खर्चाचा तपशील	अंदाजे रक्कम
१.	आपले महाविद्यालयात Solar Plant Capacity 100KW करावयाचे असुन त्यांना बिलापोट अॅडव्हान्स रक्कम देणेस मंजुरी मिळावी.	
	एकूण बिलाची रक्कम	३७,,५०,०००/—
	अॅडव्हान्स देय रक्कम	८,५३,५००/—
	सोबत बिल जोडले आहे.	
	रक्कम ₹	८,५३,५००/—

वरील प्रमाणे सदरचे कामासाठी अंदाजे खर्च रक्कम ₹ ८,५३,५००/— (आठ लाख त्रेपन्न हजार पाचशे मात्र) होणार आहे. तरी सदरचा खर्च महाविद्यालया मार्फत / ~~मी स्वत: मी केलेला असुन~~ मिळणेस विनंती.

आपला विश्वासू

विभाग प्रमुख

सही
नांव :—

खर्चासाठी रक्कम ₹ ८,५३,५००/— अक्षरी रक्कम ₹ (आठ लाख त्रेपन्न हजार पाचशे मात्र) मंजूरी आहे / नाही.

प्राचार्य
जिजामाता शास्त्र व कला महाविद्यालय
ज्ञानेश्वरनगर, ता. नेवासा, जि. अ.नगर

सदरचा खर्च अनुदान प्राप्त आहे. / ~~नाही~~.
खर्चाचे बजेट हेड :— Contracter Advance to Cleanteam
रक्कम रू. :— ८,५३,५००/—
खर्च ~~अनुदानित~~ / विनाअनुदानित विभाग

लेखा विभाग 18/04/2023

सदरचे साहित्य घेणेसाठी ₹ ८,५३,५००/— अचक्षरी ₹ (आठ लाख त्रेपन्न हजार पाचशे मात्र) मंजूर करणेत येत आहे, सदरचे खर्चासाठी मंजूरी आहे / ~~नाही~~.

सेक्रेटरी
श्री. ज्ञानेश्वर शिक्षण संस्था,
ज्ञानेश्वरनगर भेंडे

Tax Invoice

CLEANTEAM -23-24
331, 2nd Floor,
Matrix Business Center
KALDA Corner, Ch. Sambhaji Nagar
GSTIN/UIN: 27AFOPG9500L2Z2
State Name : Maharashtra, Code : 27
E-Mail : pritam@cleanteam.co.in

Invoice No. **2324/0026**	Dated **6-Oct-23**
Delivery Note	Mode/Terms of Payment
Reference No. & Date.	Other References
Buyer's Order No.	Dated
Dispatch Doc No.	Delivery Note Date
Dispatched through	Destination
Terms of Delivery	

Buyer (Bill to)
Jijamata College of Science and Arts
At Dnyaneshwar Nagar,
PO Bhenda(Bk)
Taluka Newasa
Dist Ahmednagar
State Name : Maharashtra, Code : 27

Sl No.	Description of Goods and Services	HSN/SAC	Quantity	Rate	per	Amount
1	**Sale of Solar Rooftop System**	85414300	**79.92 kwp**	32,845.35	kwp	**26,25,000.37**
2	**I & C Solar Rooftop System**	995461	**79.92 kwp**	14,076.57	kwp	**11,24,999.47**
						37,49,999.84
	CGST					**2,58,749.97**
	SGST					**2,58,749.97**
	Round Off					**0.22**
	Total		**159.84 kwp**			**₹ 42,67,500.00**

Amount Chargeable (in words) *E. & O.E*
INR Forty Two Lakh Sixty Seven Thousand Five Hundred Only

HSN/SAC	Taxable Value	Central Tax		State Tax		Total Tax Amount
		Rate	Amount	Rate	Amount	
85414300	26,25,000.37	6%	1,57,500.02	6%	1,57,500.02	3,15,000.04
995461	11,24,999.47	9%	1,01,249.95	9%	1,01,249.95	2,02,499.90
Total	**37,49,999.84**		**2,58,749.97**		**2,58,749.97**	**5,17,499.94**

Tax Amount (in words) : **INR Five Lakh Seventeen Thousand Four Hundred Ninety Nine and Ninety Four paise Only**

Company's Bank Details
Bank Name : **ICICI BANK**
A/c No. : **145505003823**
Branch & IFS Code : ICIC0001453

Declaration
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

for **CLEANTEAM -23-24**

Authorised Signatory

This is a Computer Generated Invoice

Sr. No.	Energy Saving Areas	Estimated Investment (Rs. Lakhs)	Estimated Energy Saving Potential (Rs.)	Simple Payback Period (Months)	Remark
1	Electricity Bill Analysis	0.027	0.311	1.0	Short term
2	Replacement of 20 Watt FTL with New 15 Watt Led Tube Light	1.35	0.451	36.0	Long term
3	Solar PV System for Fan and Computer	22.5	9.89	27.3	Long Term
4	Replacement of Old AC with New Inverter Air Conditioner AC	0.35	0.423	9.9	Short Term
5	Replacement of Fan with New Energy Efficient Fan	4.56	2.91	18.8	Mid Term
	Total	**28.78**	**13.98**	**24.0**	--

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd

Maharashtra State Electricity Distribution Company Limited

Welcome MADHUKAR E NAVGIRE Logout

Web Self Service Home > View History

Web Self Service

- My Account
- Change Password
- Update Profile
- Consumption Calculator
- Energy Bill Calculator
- New Connection Request
- Track Status,Upload Documents and Pay Charges
- *Online Payment of Other Charges
- *Register / Update Mobile number, Email,Aadhar number, TDS and PAN No

View History

Connection Information

Consumer Number	148389003228	Circle Code	570 A-NAGAR CIRCLE
Name	M/S SECT SHRI MARUTRAO GHULE PATIL S S	Connection Type	HT
Connection Status	P.D.		

Billing | Payments History

Bill Month	Consumption (Units)	Status	Bill Amount	Prompt Payment Date	Due Date	View/Download
Feb 2024	0		0.00			
Jan 2024	0		0.00			
Dec 2023	0		0.00			
Nov 2023	0		0.00			
Oct 2023	0		0.00			
Sep 2023	0		0.00			
Aug 2023	0		0.00			
Jul 2023	5,373		87,620.00	17 Aug 2023	25 Aug 2023	
Jun 2023	14,444		207,280.00	13 Jul 2023	21 Jul 2023	
May 2023	16,052		225,640.00	20 Jun 2023	29 Jun 2023	
Apr 2023	14,906		208,030.00	16 May 2023	24 May 2023	
Mar 2023	14,833		231,560.00	12 Apr 2023	20 Apr 2023	

View Consumption Graph View Billing Graph

Shri.Marutrao Ghule Patil Shikshan Santha'

Jijamata College of Science and Arts,

Dnyaneshwarnagar, Bhende Bk, Tal Newasa, Dist Ahmednagar

Report of

- **Solid Waste Management**
- **Liquid Waste Management**
- **Hazardous waste management**
- **E-Waste management**
- **Liquid Waste Management**

Audit done by

Department of Chemistry,

Jijamata College of Science and Arts, Bhende Bk, Ahmednagar,

March – 2020

ACKNOWLEDGEMENT

We are very grateful for **Principal Dr. R.R. Saswade,** Jijamata college of Science and Arts Dnyneshwarnagar, Bhende (BK), Tal- Newasa, Dist- Ahmednagar for having given opportunity to conduct **Solid Waste Management, Liquid Waste Management, Hazardous waste management, E-Waste management, Liquid Waste Management** audit of various facilities in college campus. We are also thankful for various respected Head of Department, Lecturers, Physical director, Hostel Rectors & their respective subordinate staffs who have given their valuable contribution for guiding & supporting us during campus round for data collection, network study & measurement for accomplishing successful thisaudit.

We are grateful thank for support information about audit team group. And sincerely acknowledges the co-operation extended by staff members of the institution for extending their help throughout the study. This report made with sincere efforts gives details of the relevant data collected during this audit study, observation, analysis & recommendations made pertaining to different facilities in campus.

We are pleased to submit this detailed Audit Report to **Principal Dr. R.R. Saswade,** Jijamata college of Science and Arts, Dnyneshwarnagar, Bhende (BK), Tal- Newasa, Dist-Ahmednagar representing on behalf of management of Shri. Marutrao Ghule Patil Shikshan Santha's Dnyneshwarnager Bhende (BK) and wishes him all the best for implementation of identified these various Waste management report & cost-effective benefits.

(Dr. R. M. Naval)

Head,

Department of Chemistry

Date: 10/03/2020

Solid Waste Management in the College Campus

1. The Background

Waste materials are substances that are no longer required by one or a group of individuals. Solid waste means garbage and refuse coming out of consumption and production activities. Municipal solid waste is a waste type consisting of everyday items that are discarded by the public. Unscientific disposal of solid waste leads to air, water, soil or solid waste pollution thereby causing damage to the environment and hazards to life. There are major health impacts of improper disposal of solid waste. Therefore, it is essential to have efficient waste management systems in order to control solid waste pollution in communities where waste generation is significantly large on a daily basis. Proper recycling of solid waste may also be perceived as a resource yielding recyclable value for the economy.

2. Objectives

2.1 The Sustainable Development Goals

The Sustainable Development Goals (United Nations Development Program, 2015) form a universal call to act towards attaining a good quality of life, protecting the planet and ensuring a sustainable common future for all by 2030. Goal 3 focuses on healthy life and well-being for all, thereby painting the canvass for a host of targeted areas of development. Goals 11 and 12 focus on the safe, resilient and sustainable living through sustainable consumption and production. Goals 13 through 15 call for necessary action to combat climate change as well as to conserve terrestrial, marine and forest ecosystems.

The above-mentioned goals have sustainable waste management embedded in them. While sustainable production and consumption imply reduction in waste generation, the safe and resilient safe life requires efficient management of waste through reuse and recycling. Unscientific disposal of waste causes threat to all forms of life in the biosphere. Thus, waste management and clean environment are necessary conditions for our common sustainable future. Waste management has been identified as a matter of immediate concern all over the world. Among all forms of solid waste, plastic waste has become the greatest menace. The United Nations announced 'beat plastic pollution' as the theme of the World Environment Day in 2018.

2.2 The Solid Waste Management Rules, 2016

As a necessary action towards solid waste management, the Government of India introduced the Solid Waste Management Rules, 2016. These rules provide procedures to be followed for segregation, collection, removal and disposal of solid waste.

- Operationalize segregation at source;
  - ➢ organic or bio-degradable waste (wet waste)
  - ➢ recyclable or non-bio-degradable waste (dry waste)
  - ➢ domestic hazardous waste, if any
- Every commercial/residential/institutional unit to maintain two types of dustbins with lid, namely, green for wet waste and blue for dry waste;
- Local authorities to strengthen systems of collection, transportation and processing of the segregated waste;
- Local authorities to train the collectors (formal and informal);
- Developing decentralized/ semi-decentralized systems for processing and disposal;
- Imposing user fees and penalties.

2.3 The College as a Sustainable Unit

Jijamata College is an academic institution with a large campus that comprises of academic area, sports area, hostels and Working woman hostel for students and residential area for teachers and non- teaching staff. It is an archetype of a self-sufficient social community with self-sustaining practices, the solid waste management program for campus is an initiative on campus that is visualized as an all-inclusive and participatory project for the entire college community. All members of the community are stakeholders and thus are perceived as contributors to the overall action plan. The ultimate aim of the project is to make a waste-neutral campus. Since the major part of waste management is associated with environmental behaviour of people, the project aims to follow the fundamental approach of sensitization and awareness generation. The current practice of unorganized waste generation, collection and disposal does not allow effective segregation of waste at both source and sink. While the institution is committed to provide full infrastructural and logistical support, the role of the community lies in generating awareness and following sustainable practices.

The College will run the project through active participation of all members of the College community. It will function through the principle of participative waste management with the target that no waste will leave the campus. While some forms of waste will be recycled

in house, some others will be channelized through partner organizations. Actions will establish sustainable practices for waste collection, segregation at source and scientific disposal with a commitment to work towards the stated Sustainable Development Goals. It will further extend to community outreach and fulfill an institutional social responsibility.

3. The Action Plan

Project of solid waste management action plan is a consolidated program aimed to reduce, reuse and recycle the waste generated on campus. The project is aimed to achieve the target that 'no waste leaves the campus. It rests on the leadership of the relevant components of the College and active participation of the entire community. While there are some waste management systems already in practice that will have to be streamlined for greater efficiency, there are some more to be introduced. The College will be divided into smaller working units to implement the waste management systems.

4.1 Core areas of waste management

- Plastic
- Paper
- E-waste
- Laboratory glass wear
- Food/kitchen waste
- Garden waste
- Domestic hazardous waste

4.2 Mode of operation

- Reduction of waste through control over waste generation
- Recycling of waste through segregation at source and scientific disposal

4.3 Targeted locations

- **Canteen**
  - Pet cold drinks bottles to be replaced with glass bottles
  - Sale of water in single use plastic bottles to be restricted
  - Usage of disposable plastic or thermocol/Styrofoam tableware (cup, plates and spoons) to be discontinued
  - Usage of plastic straw to be restricted (except where it is attached with tetra pack)

- Use of paper napkins to be minimized Water /Tea / Coffee to be served in paper /ceramic/ glass cups instead of plastic /thermocol
- Segregated waste to be disposed in color-coded dustbins

- ***Hostels***
  - Waste segregation in the residential floors and rooms
  - Segregation of waste at every possible source
  - Color coded dustbins to be installed in every floor
  - Specific locations of color-coded dustbins for the visually challenged
  - Red dustbins to be installed in the toilets
  - Incinerators for sanitary disposal
  - Proper use of waste paper baskets in rooms
  - Waste segregation in the kitchen and mess
  - All disposable cutlery to be banned
  - Color coded dustbins to be installed in the mess, kitchen, cooking area and washing area
  - Food waste to be disposed along with wet waste
  - Use of biodegradable disposal bags instead of black polythene bags
- ***Academic Area***
  - Color-coded dustbins (green for wet and blue for dry waste) to be installed uniformly all over the campus
  - Dustbins (in pairs of blue and green) to be installed only at one place in every floor of the academic blocks, department blocks and office area
  - Red dustbins to be installed in the toilet blocks for disposal of sanitary and other medical waste
  - Incinerators to be installed for scientific disposal of sanitary napkins
  - Separate carts (colored blue and green) to be used for unloading of waste from the blue and green dustbins respectively
  - Segregated wet/organic waste collected from the green dustbins to be transported and dumped into the compost pits
  - Segregated non-biodegradable waste collected from the blue dustbins to be dumped

in the plastic collection room

- Representatives student to be contacted for collection of the dry waste including plastic, glass, tetra pack, metal cans etc.
- Compost pits to clear off the accumulated pile of garbage immediately and to be continued in tandem with automatic composter
- Waste paper recycling to continue with Green-O-Bin
- Plastic and e-waste management with student representatives to continue as initiated
- Domestic hazardous wastes like tube lights, bulbs etc. are to be segregated for disposal through student representatives and local authority
- Food/kitchen waste management through canteen manager
- Used marker pens to be collected centrally and refilled with ink for reuse in the classrooms

- ***Residential Area***
  - Separate dustbins to be used at home for waste segregation at source
  - Polythene bags for waste disposal to be banned
  - Segregated waste to be disposed in the green and blue dustbins installed in the residential area or elsewhere on campus
  - Segregated waste to be transported to the demarcated collection centers
  - Domestic hazardous waste to be segregated for disposal through student representatives

4.4 Operational Practices in College Events

- Water not to be served in single use plastic bottles
- Water dispensers and paper cups to be kept in the venue for large gatherings
- Water to be served in glass during small events
- Reusable plates to be used instead of disposable plates and cutlery
- Water/Tea/Coffee to be served in paper /ceramic /glass cups instead of plastic /thermocol
- Societies/departments/units to keep set of glass bottles and serving glasses

4. Community Participation

Jijamata College of Science & Arts ★ ID/No.PU/AN/S/043/1992 ★ Bhende-414605 ★

The solid waste management project includes all members of the College. Student volunteers under the mentorship of the faculty advisors/conveners/coordinators will work for the appropriate implementation of the waste management protocol. The student volunteers will spearhead the drive through various teams with duly specified targets, timelines and tasks.

Table 1. Plan of Action

Operating Unit	Designated Task
• Nursing College committee	• Awareness campaign and sensitization
• Hostel Union	• Waste management in hostels
• Department of B.C.S and National ServiceScheme (NSS)	• Periodic e-waste collection drives
• Department of Geography	• Monitoring waste reduction and segregation in canteen
• Department of B.C.S	• Social media campaign
• Garden Committee and Department of ENVS	• Organic composting (compost pits and automatic composters)
• Sports Committee	• Sports field and other sports facilities
• Science Society	• Refilling and reuse of marker pens
• Resident Faculty	• Segregation and proper disposal of domestic Waste & maintain clean area
• Nursing College committee	• Training the volunteer team from among the children of the non-teaching staff

5. Manpower Requirement

- Students from all societies/committees/units
- Faculty advisors/coordinators/conveners for mentorship
- *Safai karamcharis* for waste collection, transportation and disposal
- *Malis* for natural composting and automatic composting
- Dedicated *malis* in charge of running the automatic composter
- Dedicated persons to supervise the running of the incinerators
- Caretakers for overall physical supervision of infrastructure and logistics

6. Budget Heads

- Purchase
  - ➢ Dustbins in required numbers
  - ➢ Labels for all dustbins

- Transportation carts
- Automatic composter
- Incinerators

- Electricity bill as a running cost
- Printing of certificates, badges, posters and banners

7. Expected Outcomes

The Solid Waste Management action plan for Jijamata College of Science and Arts bhende is visualized as a comprehensive action plan for sustainable living in the campus of an educational institution. Widespread awareness and sensitization about waste management are the necessary conditions for creating a society that exhibits environmentally conscious behaviour. The project has the potential to succeed in reducing the waste generation and in efficiently organizing scientific disposal of the waste for recycling through significant behavioural changes. The project aims at meeting the recent national agenda as well as achieving multiple of the global developmental goals.

8. Target Beneficiaries

The entire college community is expected to benefit out of the project. Students, teachers and staff form a large body who will have a safer and more resilient living condition. While the resident members will have a cleaner environment at their residential areas, the non-resident members are going to enjoy a cleaner environment at workplace. Moreover, it is expected that the benefits thus generated will extend to communities through the members who will spread awareness outside College and help forming the necessary habits. Thus, the sustainable waste management practices of Jijamata College will go beyond the campus and create a larger environment for sustainable living.

9. Scope for Further Work

The project rests entirely on the active involvement of all members of the College community. The major thrust is on generating awareness, sensitization and bringing in changes in behavioral patterns. The project is expected to result in a significant reduction in the generation of solid waste and recycling of the waste.

Once the first phase of the project is carried out successfully with solid waste, it has the scope to be extended to waste water management in the campus in the second phase and make the campus truly waste-neutral.

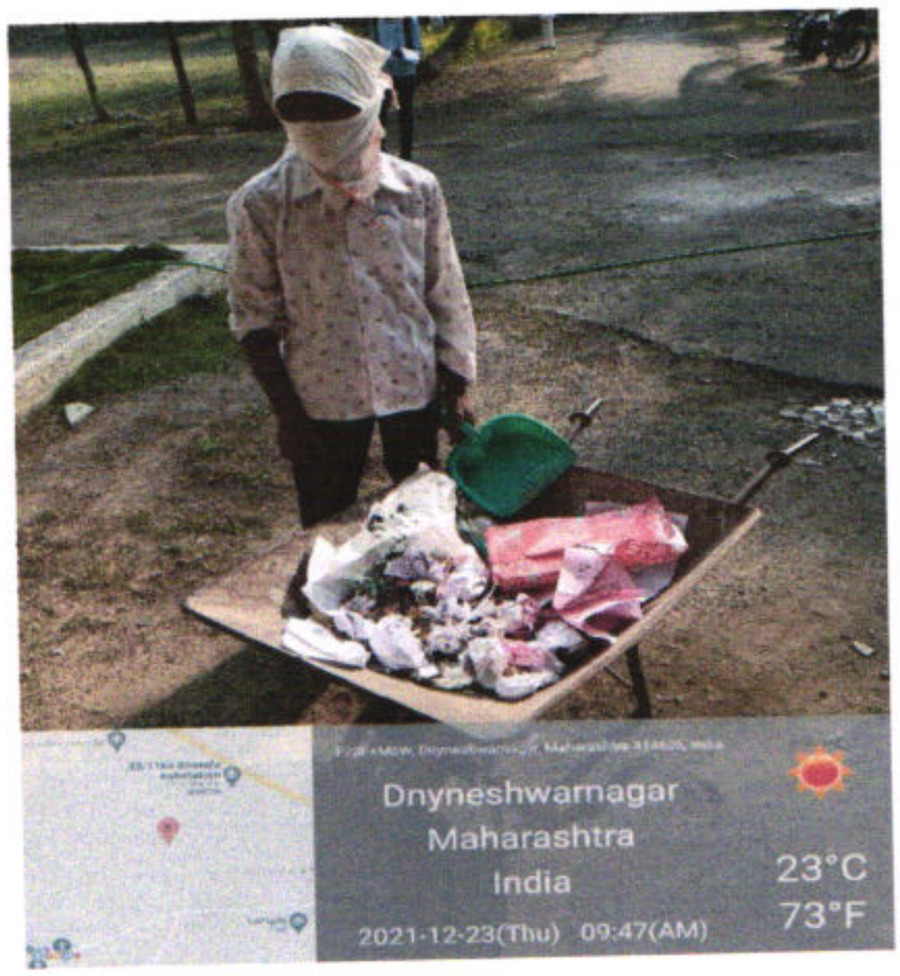
Appendix I: Improvement Targets

Collection of biodegradable and non-biodegradable solid waste from college campus

cleaning and collection college campus

Waste collection box

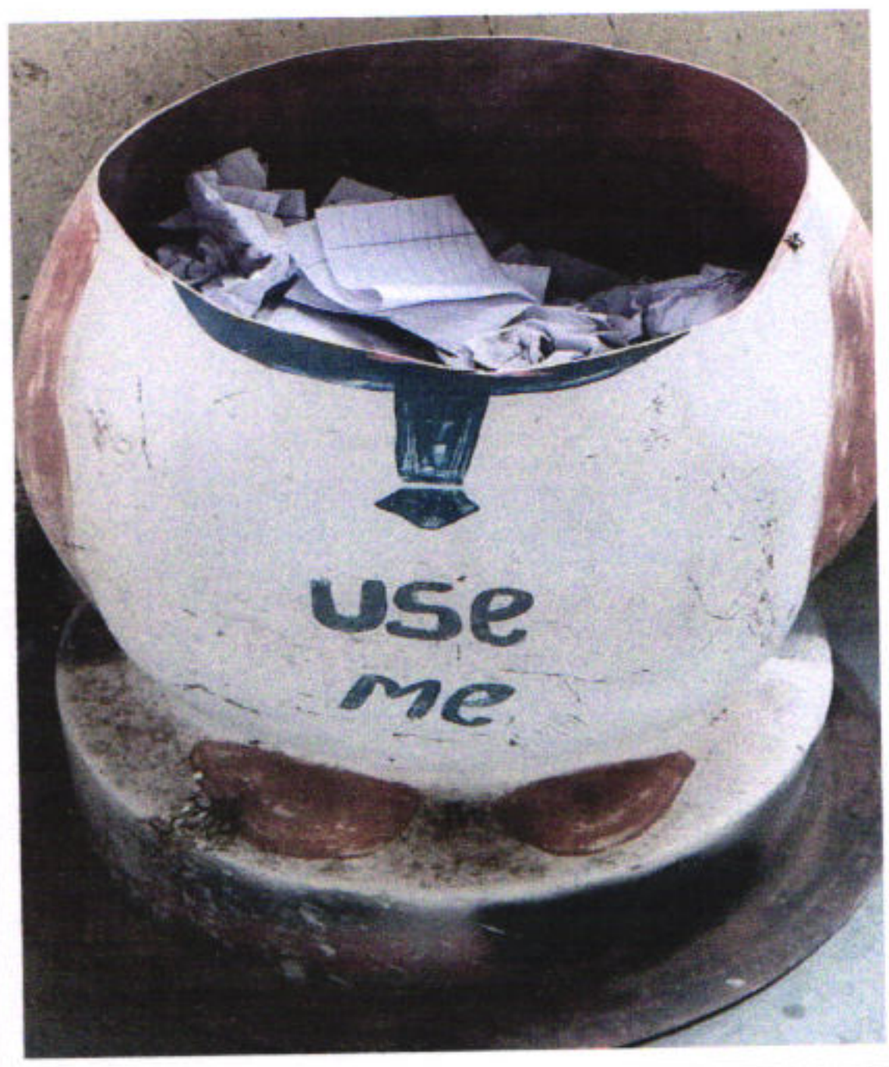
Cleaning Worker



Biodegradable (wormicompost Plant)

Appendix II: Collection Targets

Collection of waste at designated sites

Dustbin in college Campus	Dustbin in college Campus
	
Target site collection	
	

Liquid Waste Management in the College Campus

At our campus in Jijamata College Bhende, we do not get much rainfall either from the South-West or the North-East monsoons, because we are located in the rain-shadow area of the Western Ghats. Average annual rainfall is only 120 mm. During the past twenty-five years, we have planted thousands of trees. Water was needed to grow all these trees. Since water was scarce, we relied on careful and sustainable water use practices since the early days. In our campus, we have both liquid waste management as well as solid waste management. This time, is confined to mainly liquid waste management. As you know, water is very precious for all. Demand for fresh water is increasing due to growing population. Rapid industrialization and urbanization has led to pollution of water bodies. More water is being used and wasted to.

That water which is adversely affected in quality due to human activity and contains urine, faeces, food materials, oil, dissolved soap, chemicals and other contaminants is waste water. In 2020, over 75 billion litres of untreated wastewater flowed into India's rivers and coastal waters every day. Existing treatment capacity is only able to treat less than 30% of the wastewater generated.

Sustainable waste water treatment involves processing waste water, ridding it of all contaminants, so that it can be used again. It also helps prevent pollution of our water bodies. Wastewater is typically treated using physical, chemical and biological means. Sedimentation is the most common physical method used in most parts in India. Chlorination, ozonisation and other such methods constitute chemical wastewater treatment. Biological methods such as bioremediation involve the use of microorganism metabolism to remove pollutants.

At our Jijamata College campus, we treat wastewater through bioremediation. Over the past twenty years we mainly use this water for gardening. We have planted over 1646 trees in the campus. Our College campus extends over 27 acres of land. We are still planting to this day. This is possible only because of the recycled waste water. Our campus is spectacularly clean and green and I am proud to say that it is considered as one of the best campuses Maharashtra.

Reduction in generation of Effluents, Emissions and Hazardous/Solid waste: The institution does not produce any effluents, emissions or solid waste which violates the environmental ethics. Our institution provides best academic environment which sensitizes

everyone associated regarding the need to maintain a healthy ecological balance in their respective regions.

Runoff rainwater is properly managed through under-ground soak-pits and one small tank.

Waste Water Tank	Under ground Soak Pit
	

Hazardous waste management

Plastic bags have already been banned in the state by the Government of Maharashtra and the ban is properly enforced within the college premises. Plastic waste is collected in the dustbins and disposed separately through the Municipal authorities. The College is trying to minimize the use of hazardous and toxic chemicals. The college is encouraging the use of safer alternatives. Dilute solutions are being used in quantitative analysis, which again minimises the use of chemicals. In Science laboratories, experiments are carried out with all precautions. Biological waste from life sciences laboratories are made harmless through autoclaving and then disposed. In chemistry laboratory practical carried out in less toxic chemical and use alternative chemical to toxic chemical. Practical liquid west dispose in special soak pit.

All glassware and microbial cultures used are first sterilised by autoclaving and then the cultures are discarded properly.

Liquid Waste Hazardous transfer in to pit	Hazardous Solid waste collection
	

Water Over head Tank

Institute provides 24 hours water for drinking as well as other uses. It has constructed 1,00,000 litre capacity elevated service reservoirs tank in hostel campus. Water is pumped into the tank from filter unit and then supplied to consumers. This tank is made up of R.C.C. steel concrete.

This special activity is done by Department of Chemistry

Mr.P.D. Ghare	**Dr.KA. Lande**	**Dr.ME. Navgire** **Co-Ordinator** **IQAC** **Jijamata College of Science & Art's,Bhende Bk.**	**Dr. R. R. Saswade** PRINCIPAL Jijamata College of Science & Arts Bhende, Tal. Newasa, Dist. A'Nagar
Co-ordinator, Energy audit	Head Criteria VI		

E-Waste management:

- The College maintains all its computer peripherals, all old systems are stored in safe place within the campus and are sold to the recycling agencies after fulfilling local formalities.
- Defective systems are upgraded by replacing their parts.
- Most of the defective computer and other e-material repair in our B.C.S. department.
- Awareness is also generated among the students by B.C.S. department organizing the exhibitions and programs on waste management.
- The Institution as undertaken a number of E-waste Management initiatives with the objective of creating an eco-friendly environment in the campus. E-waste such as computers and its peripherals are upgraded regularly to continue usage and to avoid its wastage.
- Reuse is the most eco-friendly and cost effective method for e-waste disposal.
- E-wastes such as electronic components (plastic/metallic) are handed over to agencies which help recycle these materials.
- By recycling the electronic components, we have recovered valuable materials from old electronics components which can be used to make new products.
- E-Waste disposal process through solution providers like "ENVIRONMENTAL & RECYCLING SOLUTIONS INDIA" has been initiated.
- The awareness programs have been undertaken in the institution where the students are made aware of the E-waste management techniques.

This special activity is done by Department of Chemistry

Mr.P.D. Ghare	**Dr.K.A. Lande**	**Dr.M.E. Navgire**	**Dr. R.R. Saswade**
Co-ordinator	Head Criteria VII	Co-Ordinator IQAC Jijamata College of Science & Art's,Bhende Bk.	PRINCIPAL Jijamata College of Science & Arts Bhende, Tal. Newasa, Dist. A'Nagar

Date: 10/03/2020

Shri.Marutrao Ghule Patil Shikshan Santha'

Jijamata College of Science and Arts,

Dnyaneshwarnagar, Bhende Bk, Tal Newasa, Dist Ahmednagar

Report of

Rain Water Harvesting

Audit done by

Department of Chemistry,

Jijamata College of Science and Arts, Bhende Bk, Ahmednagar,

March – 2020

ACKNOWLEDGEMENT

We are very grateful for **Principal Dr. R.R. Saswade,** Jijamata college of Science and Arts Dnyneshwarnagar, Bhende (BK), Tal- Newasa, Dist- Ahmednagar for having given opportunity to conduct **Rain Water Harvesting** audit of various facilities in college campus. We are also thankful for various respected Head of Department, Lecturers, Physical director, Hostel Rectors & their respective subordinate staffs who have given their valuable contribution for guiding & supporting us during campus round for data collection, network study & measurement for accomplishing successful audit.

We are grateful thank for support information about audit team group. And sincerely acknowledges the co-operation extended by staff members of the institution for extending their help throughout the study. This report made with sincere efforts gives details of the relevant data collected during this audit study, observation, analysis & recommendations made pertaining to different facilities in campus.

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(Dr. R. M. Naval)
Head
Department of Chemistry

Date: 10/03/2020

Jijamata College of Science & Arts ★ Bhende-414605 ★ ID/No.PU/AN/S/043/1992

Rain Water Harvesting in the Campus

Due to rapid increase in day-to-day demand for water among fast growing human population, there lies a great opportunity of harvesting rainwater to meet the scarcity of water and avoid destruction of the normal groundwater level. The boon of rainwater harvesting is that the unused or extra water can be sent down the aquifer to charge the groundwater level. Rainwater harvesting is an important environment friendly approach. It is a Green Practice having double benefit of keeping the groundwater level undisturbed and charging the aquifer. This green practice can be encouraged in the form of Community Development Program. Rainwater and run-off water, stored in a planned way, can save the earth from soil erosion and flood and recharge the aquifers to increase the groundwater level. The extensive and unplanned use of groundwater has not only disturbed the natural water level but also has made the ground water contaminated and unfit for use.

Objectives

- To increase recharge of groundwater by capturing and storing rainwater, by rainwater harvesting from rooftop run-offs.
- To store the water for gardening & washing purpose.
- Most use of rain water is it use as distil water in various laboratory such as chemistry Botany Zoology to make practical solution. Because rain water free from any salt.

Need for rainwater harvesting

Increasing water demand

- The rapid rise in human population has made optimum use of fresh water imperative.
- Urban water supply systems in particular are under tremendous pressure to meet the needs of the population as well as industry and large-scale construction.
- The increased need for water results in lower groundwater levels and depleted reservoirs.
- Consumption of polluted water creates health hazards.
- The use of rainwater is a useful alternative.

Variations in water availability

- The availability of water from sources such as lakes, rivers and shallow groundwater can fluctuate strongly
- Unchecked rainwater runoff is causing soil erosion
- Collecting and storing rainwater can provide water for domestic use.

- Rainwater may also provide a solution when the water quality is low or varies during the rainy season in rivers and other surface water resources.

Responsibilities towards protecting Nature.

- Using more rainwater helps to conserve & augment the storage of ground water.
- It helps to arrest sea water intrusion in coastal areas.
- It helps to avoid flood & water stagnation in urban areas.
- Reduces water and electricity bills

Quality of water supplies.

- Water supplies can become polluted either through industrial or human wastes or by intrusion of minerals such as arsenic, salt or fluoride.
- Rainwater is the ultimate fresh water.
- Rainwater is generally of good quality.

Practice

In the Jijamata college campus rainwater harvesting system has been installed in roof of college. The roof runoff water is collected through network of pipe lines and stored in the tank. There are two wells in the campus where the roof runoff water is stored. The total capacity of storage is 10,000 litres. The remaining roof runoff water is allowed to infiltrate in the ground for recharge. The stored water is used for gardening and laboratory as distilled water.

Water Harvesting Capacity of Jijamata College Campus

- Organic chemistry lab =450 m^2 , Physical chemistry lab =450 m^2 ,
- Inorganic chemistry lab =550 m^2, Chemistry HOD cabin = 60 m^2

Total Area= 1510 m^2

Rain fall calculate with following formula = Annual rain fall in mm X Area in mm X Run Off factor

= 120 X 1510 X 1

Area m^2	Average Depth of Rainfall (mm)	Expected Volume of water (Litre)	30 % losses Total	Total Quantity (Litre)
1510 m^2	120 mm	181200	54360	126840

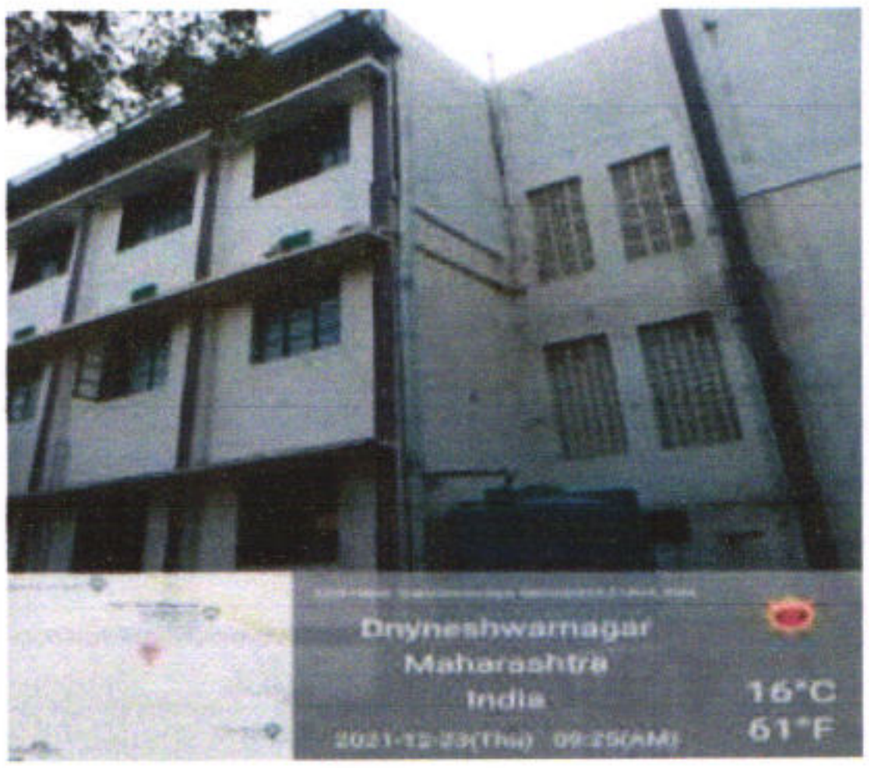
Total Quantity of Water = 1,26,840 litre

The available total capacity of harvesting in Jijamata campus = 10,000 litre

Jijamata College of Science & Arts ID/No.PU/AN/S/043/1992 Bhende-414605

Side view rain harvesters building

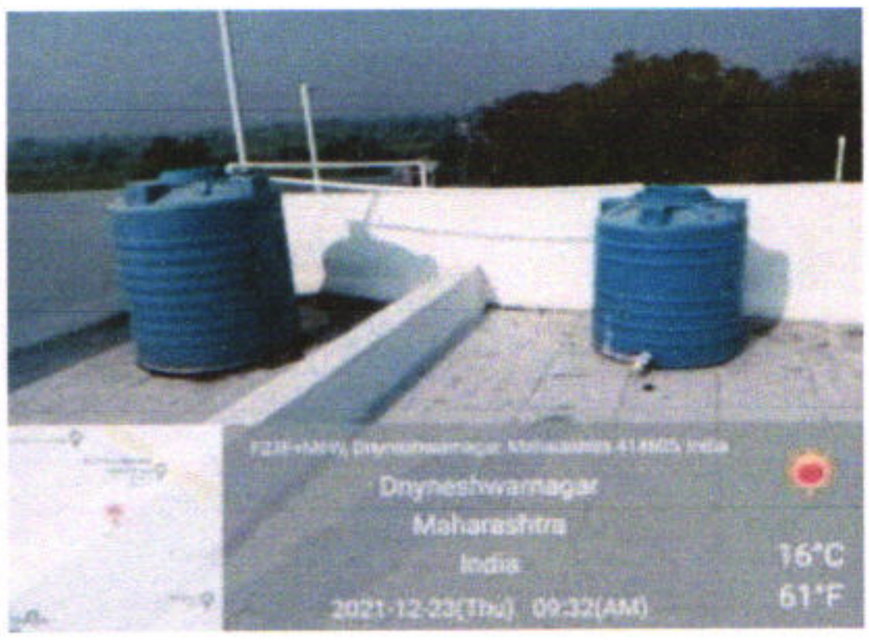
Side view rain harvesters building



Collection Storage tank 10,000 lit .

Storage tank on Building

Storage tank supply to chemistry lab.



Bore Well and Tanks

Jijamata College of Science & Arts
ID/No.PU/AN/S/043/1992
Bhende-414605

Borewells and tubewells, are very similar. Both are basically **vertical drilled wells**, bored into an underground aquifer in the earth's surface, to extract water for various purposes. The difference in the two lies in the type of casing used the depth of this casing and the type of soil where they are drilled.

Total area of the college campus is about nearly 37 acre, on that only area of i.e. 33% on total area was developed as academic zones and the balance area is about i.e. 77% on total area was earmarked for greenery. The college campus depends on ground water for all its needs and the daily need of water in the campus is around 10,000 liters (approx.,). To compensate the mentioned daily need. We had total 2 borewell with different depths as per the sub soil water position and all are recharge regularly with of harvesting ponds.

1. Near to Main building
2. Near to chemistry lab

Near to Main building

Near to chemistry lab

Regularly recharge tank

Transfer water to plant

Water Over head Tank

Institute provides 24 hours water for drinking as well as other uses. It has constructed 1,00,000 litre capacity elevated service reservoirs tank in hostel campus. Water is pumped into the tank from filter unit and then supplied to consumers. This tank is made up of R.C.C. steel concrete.

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Mr. P.D. Ghare	**Dr. K.A. Lande**	**Dr. M.E. Navgire**	**Dr. R.R. Saswade**
Co-ordinator	Head Criteria VII	**Co-Ordinator** **IQAC** **Jijamata College of Science & Arts**	PRINCIPAL Jijamata College of Science & Arts Bhende, Tal. Newasa, Dist. A'Nagar

Date: 10/03/2020

Jijamata College of Science & Arts ★ Bhende-414605 ★ ID/No.PU/AN/S/043/1992

3. Water Conservation

Water Day Lecture & oath

सार्वमत

महाविद्यालयीन विद्यार्थ्यांनी जलसाक्षरता चळवळीत सामील व्हावे

जागतिक जलदिनानिमित्त जिजामाता महाविद्यालयात जलमित्र फुलारी यांचे व्याख्यान

Sarwamat Edition
Mar 24, 2023 Page No. 7
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Roof Water Collection

Collected Water

Bore well Recharge System

ENVIRONMENT POLICY STATEMENT

2018-2023

ENVIRONMENT POLICY STATEMENT

I. Preamble

The Shri Marutrao Ghule Patil Shikshan Sanstha's (MGPSS) **JIJAMATA COLLEGE OF SCIENCE AND ARTS** (JCS&A) is very keen to protect environment and any of the activities practiced in the institution are not causing any harm to its stakeholders or to the society in general. Specific action would be taken to prevent that. The primary goal of environmental policy is to protect natural systems. It is, therefore, a core value of the institute to preserve and protect the environment. As we advance, scientific understanding regarding the fundamental interrelationship between human health and the environment, we will proactively demonstrate our commitment to environmental stewardship and sustainable development.

Through implementation of this policy, MGPSS's JCS&A College, will serve as a leader by advancing environmental conservation commitment within our own programs and facilities, and in the broader community.

II. Aims and Objectives of the Policy:

i. Develop and maintain environmental management programs with objectives and targets to minimize adverse environmental impacts.

ii. Comply with all applicable environmental, health, and safety laws, regulations, and other requirements.

iii. Implement effective pollution prevention and waste minimization programs to reduce, reuse, and recycle materials.

iv. Ensure that energy and water are used responsibly and conserved through innovative practices and procedures.

v. Provide all institute staff with the knowledge and tools needed to meet the goals of this policy and to actively participate in efforts to prevent negative environmental impacts.

vi. Measure progress toward our environmental goals.

III. The Policy

Accordingly, it is resolved that the MGPSS's JCS&A College will:

1. **Provide facilities for alternate sources of energy and energy conservation measures like:**
   - Solar energy

- Biogas plant
- Wheeling to the Grid
- Sensor-based energy conservation
- Use of LED bulbs/ power efficient equipment etc.

2. Create facilities for the management of the following types of degradable and non-degradable wastes:

- Solid waste management
- Liquid waste management
- E-waste management
- Waste recycling system
- Hazardous chemicals and radioactive waste management.

3. Provide Water Management and Water conservation facilities like:

- Rain water harvesting
- Bore well /Open well recharge
- Construction of tanks and bunds
- Waste water recycling
- Maintenance of water bodies and distribution system in the campus

4. **Take Green campus initiatives like:**

- Restricted entry of automobiles
- Use of Bicycles/ Battery powered vehicles
- Pedestrian Friendly pathways
- Ban on use of Plastic
- landscaping with trees and plants

5. Regularly conduct quality audits on environment and energy, which include:

- Green audit
- Energy audit
- Environment audit
- Clean and green campus recognitions/awards
- Beyond the campus environmental promotional activities

6. Implement Carbon Management Strategy, which include:

- To implement a carbon management strategy, including the efficient use of energy.
- To reduce greenhouse gas emissions in the college campus.
- To ensure the uptake of low carbon technologies in buildings and equipment.

7. Provide Awareness and Training:

- To communicate internally and externally, the college's environmental objectives and

performance.

- To raise awareness of staff and students about the college's environmental impact, activities and performance and good practices.
- To provide appropriate environmental educational programmes for staff and students.
- To encourage and facilitate feedback and suggestions on ensuring good practices.
- Evaluation of Environmental Policy.
- To undertake a regular review of environmental management procedures and activities to ensure suitability, adequacy and effectiveness.

IV. Responsibilities:

- The main responsibility for implementation of this policy lies with the Students, Teaching and non-teaching staff and Principal of College.
- The Heads of departments are responsible for ensuring compliance with Environment Policy within their area of control.
- The committee will actively monitor the performance of Colleges and Divisions in the implementation of the aims and objectives of this Policy in the activities under their control.
- Whilst the college accepts the main responsibility for implementation of this policy, individuals have a very important role in co-operating with those responsible for safeguarding the environment. Individuals are required to abide by rules and requirements made under the authority of this policy.

Waste Reduction and Recycling:

- To set and achieve targets for reducing resource use.
- To minimize the adverse environmental impacts of the decommissioning and disposal of college assets.
- To increase the rate of recycling of all appropriate materials, based on life-cycle principles.
- To implement sustainable resource management practices, based on reduce, reuse and recycle principles.

Photographs of Activities taken for Green campus




Plantation in Campus

Shri.Marutrao Ghule Patil Shikshan Santha'

Jijamata College of Science and Arts,

Dnyaneshwarnagar, Bhende Bk, Tal Newasa, Dist Ahmednagar

Report of

Carbon Footprint & Carbon Sequestration

Audit done by

Department of Chemistry,

Jijamata College of Science and Arts, Bhende Bk, Ahmednagar,

February – 2020

ACKNOWLEDGEMENT

We are very grateful for **Principal Dr. R.R. Saswade,** Jijamata college of Science and Arts Dnyneshwarnagar, Bhende (BK), Tal- Newasa, Dist- Ahmednagar for having given opportunity to conduct **Carbon Sequestration** audit of various facilities in college campus. We are also thankful for various respected Head of Department, Lecturers, Physical director, Hostel Rectors & their respective subordinate staffs who have given their valuable contribution for guiding & supporting us during campus round for data collection, network study & measurement for accomplishing successful this audit.

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(Dr. R. M. Naval)

Head,

Department of Chemistry

INTRODUCTION

Climate change is the hottest issue all over the globe. The four major greenhouse gases (NO_2, CH_4, CFC and CO_2) are responsible for capturing heat energy in the atmosphere and in turn increase in global temperature. The contribution of carbon dioxide in this process is as high as 60%. Therefore carbon sequestration has been considered to be the best possible solution for avoiding the disaster due to climate change. This kind of externalities has been internalize wisely by continuous efforts done by Jijamata College campus. The college has very good carbon pool in the form of luxuriant growth of forest in a dedicated area of **15.24 hector (38.10 acres)**, along with presence of tall trees within the campus. In addition to this the soil layer covered with grasses and bushes is also far more than the areas covered by roads, buildings and platforms. Thus qualitatively best practices in the college offer extraordinary scope for carbon sequestration. This report attempts to quantify the amount of carbon emission due to consumption of electricity and fossil fuels. This is compared with the carbon pool observed in the college. This report also highlights the measures taken by the college and its importance in the context of externalities of climate change. Hopefully college management would appreciate the competitive work and continue to document related activities in future so that success stories can be built which can be followed by other educational institutes.

Table No 1: Jijamata College Campus

Name of institute	Staff	Student	Total
Jijamata college of Science & Arts	**100**	**1500**	**1800**
Jijamata public School	**42**	**934**	**976**
Jijamata nursing college	**10**	**60**	**70**
Industrial training institute (ITI) College	**25**	**150**	**175**
TOTAL			**3021**

Jijamata College of Science & Arts ★ ID/No.PU/AN/S/043/1992 ★ Bhende-414605

CARBON FOOTPRINT

The term "carbon footprint" refers to a person or organization's carbon consumption, or the CO_2 or GHG emitted directly or indirectly during the life cycle of an activity or a product [*TERI,* 2008]. Therefore, carbon footprint can be used to evaluate an object's (including a region, an organization, or a product) impact on environment. According to the original footprint calculations, energy consumption of human activities is generally converted to bio-productive area so as to evaluate the sustainability of consumption from an ecological point of view.

Carbon Sequestration:

The term "carbon sequestration" is used to describe both natural and deliberate processes through which CO_2 is either removed from the atmosphere or diverted from emission sources and stored in the ocean, terrestrial environments (vegetation, soils, and sediment), and geologic formations. This carbon is stored stable solid form by direct and indirect fixation of atmospheric CO_2. Direct soil carbon sequestration occurs by inorganic chemical reactions that convert CO_2 into soil inorganic carbon compounds such as **calcium and magnesium carbonates**. Direct plant carbon sequestration occurs as plants photosynthesize atmospheric CO_2 into plant biomass. Subsequently, some of this plant biomass is indirectly sequestered as **soil organic carbon** (SOC) during decomposition processes. The amount of carbon sequestered at a site reflects the long-term balance between carbon uptake and release mechanisms. Many agronomic, forestry, and conservation practices, including best management practices, leads to a beneficial net gain in fixation of carbon in soil.

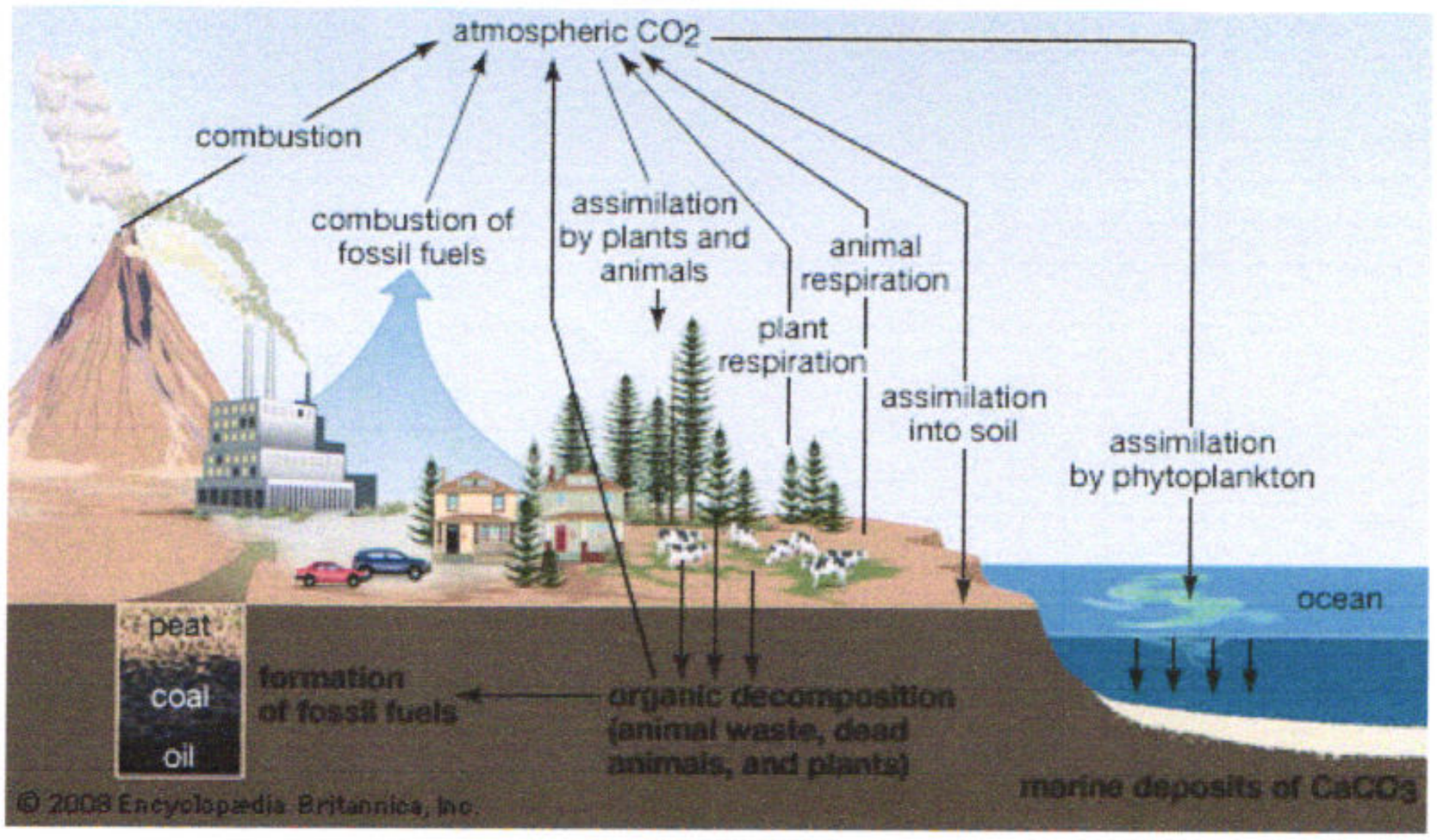


Fig. of Carbon sequestration cycle

Unlike many plants and most crops, which have short lives or release much of their carbon at the end of each season, forest biomass accumulates carbon over decades and centuries. Furthermore, carbon accumulation potential in forests is large enough that forests offer the possibility of sequestering significant amounts of additional carbon in relatively short periods – decades. Terrestrially, carbon is stored in vegetation and in the soil. Plants store carbon for as long as they live, in terms of live biomass. Once they die, the biomass becomes a part of the food chain and eventually enters the soil as soil carbon. If the biomass is incinerated, the carbon is re-emitted into the atmosphere and is free to move in the carbon cycle.

TYPES OF SEQUSTRATION

There are number of technologies under investigation for sequestering carbon from the atmosphere. These can be discussed under three main categories:

- **Ocean Sequestration:** Carbon stored in oceans through direct injection or fertilization.
- **Geologic Sequestration:** Natural pore spaces in geologic formations serve as reservoirs for long-term carbon dioxide storage.

- **Terrestrial Sequestration:** A large amount of carbon is stored in soils and vegetation, which is natural carbon sinks. Increasing carbon fixation through photosynthesis, slowing down or reducing decomposition of organic matter, and changing land use practices can enhance carbon uptake in these natural sinks.

Benefits of Soil Carbon Sequestration:

Removing CO_2 from the atmosphere is only one significant benefit of enhanced carbon storage in soils. Improved soil and water quality, decreased nutrient loss, reduced soil erosion, increased water conservation, and greater crop production may result from increasing the amount of carbon stored in agricultural soils.

Important clauses of Kyoto Protocol related to carbon sequestration:

The Kyoto Protocol to the UN Framework Convention on Climate Change (UNFCCC, 1997) has provided a vehicle for considering the effects of carbon sinks and sources, as well as addressing issues related to fossil fuels emissions.

Soil Carbon Sequestration:

Soil carbon sequestration is the process of transferring carbon dioxide from the atmosphere into the soil through crop residues and other organic solids, and in a form that is not immediately remitted. This transfer or "sequestering" of carbon helps off-set emissions from fossil fuel combustion and other carbon-emitting activities while enhancing soil quality and long-term agronomic productivity.

AIM

This study is aimed at measuring carbon footprint and carbon sequestration in the campus area and to compare both the processes in the context of capacity building by the Jijamata college of Science & Arts Bhende Newasa Dist. Ahmednagar Maharashtra.

MAJOR OBJECTIVES OF STUDY CARBON EMISSION AND SEQUESTRATION:

1. To measure carbon emission from power (electrical) consumption
2. To measure carbon emitted from transportation and other activities
3. To estimate Soil organic matter
4. To estimate organic biomass of trees
5. Analysing results for determination of carbon footprint analysis and carbon sequestration

SCOPE

Removing CO_2 from atmosphere is significant benefit of enhanced carbon

Storage in soil. High level of fossil fuel combustion and deforestation have transformed large pools of fossil carbon (coal and oil) into atmospheric CO_2, strategies for reducing CO_2 in atmosphere include soil carbon sequestration, tree planting etc.

Scientists are doing work to understand impact of land use and land management on soil sequestration and ways to increase storage time of carbon in soil. Underline mechanisms controlling soil structure and storage of carbon these include various chemicals, physical, biological, mineralogical and ecological process. They are also doing work to find out relationship between biodiversity, atmospheric CO_2 level, and increase nitrogen deposition in carbon storage.

POSSIBLE OUTCOME OF THESE STUDY

It may be used for following purpose.

- Develop a quantitative analysis to understand carbon emission potential
- Estimation of carbon sequestration in college campus
- Formulation of strategies for plantation and other means for carbon sequestration
- Creation of awareness in the stakeholder regarding carbon emission and its capturing

METHODS FOR ASSESSMENT OF CARBON EMISSION AND CARBON SEQUESTRATION:

1. Carbon Emission

a) Power Consumption activity

The power consumption of individual has been studied by using secondary data of energy audit report done for college campus in 2019. Along with the same average electrical consumption per month was taken from last six months reading from college electricity bill. The energy/power generated through coal or diesel emits certain amount of carbon into atmosphere considering the fact carbon emission is calculated for present study.

The energy consumption at college is particularly for running light, fans and other instruments. Hence to measure the carbon emission from

Electrical consumption $C = \beta E$,

Where C is carbon dioxide emission, β is emission factor which is 0.81 ton/MWh and E is electrical consumption.

b) Consumption of fossil fuels

For the assessment of carbon emission the primary data was collected by survey in the college campus. Firstly for accounting of vehicular emission the no. of vehicles (two wheelers, four wheelers) measured which were visited to college campus every day. An average of six working days had been considered for the same. Parking areas and campus area had monitored from morning 7 am to evening 7 pm also number of students coming from ST buses are counted to determine indirect emission hence to calculate per capita emission.

- Emission factor Bus 0.023 kg CO_2 per passenger per Km
- Two wheeler 0.054 kg CO_2 per vehicle per Km
- Four wheeler 0.175 kg CO_2 per vehicle per Km
- Auto 0.13 kg CO2 per passenger per Km

(The emission factor is based on the percentage of carbon present in the fuel used for the vehicle whereas the present values given above are suitable at India Ref. Cerana Foundation)

2. Carbon Sequestration

a) Estimation of carbon sequestration from Soil Organic matter

- Selection of land use category or project activity strata, sampling method and location of sampling plots.
- Collection of soil samples at two depths (0 to 15 cm and 15 to 30 cm) from each stratum.
- Estimation of bulk density.
- Estimation of organic matter or carbon content in the soil sample in the laboratory using the Walkley and Black methods.
- Calculation of carbon stock in tonnes of carbon per hectare using organic matter content, bulk density and depth of soil.

b) Above ground biomass and carbon estimation of the trees

The biomass from the surrounding areas of college campus was estimated from the Diameter at Breast Height (DBH) and from the total height of the tree. A constant for wood density of about 690 kg/m^3 is taken in consideration for measuring total biomass of the tree. Hence the volume of dry and green biomass (calculated) from the constant values has been considered in estimating the carbon sequestration by the trees.

ESTIMATION OF CARBON EMISSION

1. Carbon emission through power consumption activity
2. Carbon emission from transport activity

Number of vehicles visiting every day to college campus along with the mode of transport used by students, teacher, staff and visitors has been surveyed to understand this activity through which carbon is emitted into atmosphere. As per the weekly survey there are average **580** two wheelers and **25** four wheelers coming in college premises every day. About **3021** **student/ staff/ teacher** are coming to college by using state transport bus service.

Hence for calculating the carbon emission we have considered average 5 Km of distance travelled by each of the person. The emission factor suitable for India terrain had been used in computing the carbon emission.

I. Emission from **3021** no. of individual

3021 X 0.023 X 5 = **347.41** **Kg of CO_2 per day**

II. Emission from two wheelers

580 X 0.054 X 5 = **156.6** **Kg of CO_2 per day**

III. Emission from four wheelers

25 X 0.175 X 11= **48.12** **Kg of CO_2 per day**

a +b + c = **347.41 + 156.6 + 48.12 = 552.13**

Therefore total carbon dioxide emitted from transport activity within and outside college premises is **552.13 Kg of CO_2 per day or 16.54 tons/month**

Overall carbon emission from the college campus is A+B, it means both the activities from which carbon emitted in the surrounding of college campus.

Therefore total carbon emission =

Carbon Emission = 10.99 + 16.54

= 27.53 tons/month

= 329.28 tons/yea

ESTIMATION OF CARBON SEQUESTRATION

1) Carbon Sequestration by soil organic matter

The soil organic carbon is the major of soil organic matter present in the soil layer at the depth of 10 to 30 cm from ground level. The Soil Organic Matter (SOM) concentration differs among climate, soil type and land uses. Depletion of SOM, a widespread problem on croplands and grazing lands is exacerbated by soil degradation. Most soils have extremely low levels of soil organic carbon (SOC) contents, ranging from 8 to 10 g/kg. Depletion of SOC pool is caused by fertility- exploitative practices and soil degradation processes. Low external input of chemical fertilizers and organic amendment causes depletion of SOC pool because nutrients harvested in agricultural products are not replaced, and are made available through minerlization of SOM.

Every tonne of carbon lost from soil adds 3.67 tonnes of carbon dioxide (CO2) gas to the atmosphere. Conversely, every one tonne increase in soil organic carbon represents 3.67 tonnes of CO2 sequestered from the atmosphere and removed from the greenhouse equation

Many factors affect soil organic matter levels:

- **Soil depth** – the organic matter content generally decreases as you dig deeper
- **Soil type** – sandy soils generally have lower soil organic matter than heavier soils such as loams
- **Management practices** – excessive cultivation reduces organic matter levels
- **Temperature** – organic matter breaks down quicker in hot climates compared with cool climates

- **Soil water content** – organic matter breaks down quicker in moist soil (though not permanently saturated) compared with dry soil

Carbon is a key ingredient in soil organic matter. Lands produce organic compounds by using sunlight energy and combining carbon dioxide from the atmosphere with water from the soil.

Well decomposed organic matter forms humus, a dark brown, porous, spongy material that provides a carbon source in soil. Plants assimilate carbon by the process of photosynthesis some of the carbon remains in plant tissue that is either consumed by animals or remain in soil as a litter. When plants die and decompose.

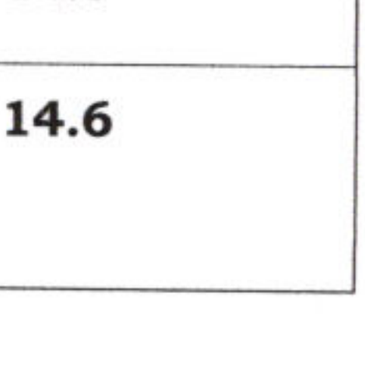
Table no .2 Carbon sequestration in college campus

Sr.no	Place of observation	Result	Carbon in Ton/He
1	Senior College ground	0.71	14.2
2	Botanical garden	0.75	15
3	Nursing college ground	0.73	14.6
4	Public School ground	0.72	14.4
5	ITI college Ground	0.74	14.8
Average carbon sequestration in college campus			**14.6**

Total area 38.10 acres = 15.24 hector

Therefore, total 222.56 ton CO_2 sequestered in college campus

Since the total area of college campus is about **38.10 acres i.e.** 15.24 hectares of land we must require the average carbon sequestered per hectare so that we can estimate the total carbon sequestered in



college campus. Therefore the total carbon sequestered is equal to **222.56 ton in college campus**.

The soil samples for measuring organic matter have been collected from the senior college ground, botanical garden, nursing college ground, public school ground ITI & college ground area of college campus. It was showing **0.71, 0.75, 0.73, 0.72, and 0.74 %** of organic carbon respectively. The carbon equivalent for this is equal to **14.6 ton/ha** in all campus of college. Thus the atmospheric carbon sequestered in college campus is equivalent to **51.38 and 55.05** ton/hectare CO_2.

Further if we treat total **222.56 ton/ha CO_2** then **3** times of atmospheric CO_2 is accounted to be **667.68** tons of carbon sequestration.

3. Above ground biomass and carbon estimation from trees

Sr. No.	Botanical Name	No.of plants in campus	Value of individual plant	Carbon as Biomass
1	*Delonix regia* (Box.ExHook)	15	11.54	173.1
2	*Pithcolombium dulce (Roxb)*	1	17.33	17.33
3	*Eucalyptus lanceolatus*	10	5.55	55.5
4	*Acacia nilotica*	7	6.73	47.11
5	*Milingtonia hortensis*	22	17.25	379.5
6	*Leucaena leucocephala*	16	3.05	48.8
7	*Ficus religiosa*	4	55.7	222.8
8	*Pongania pinnata*	152	5.53	840.56
9	*Azadirachta indica*	121	4.33	523.93
10	*Tectona grandis*	9	1.99	17.91
11	*Saraka Indica*	10	2.15	21.5
12	*Capparis zeylanica*	3	1.01	3.03
13	*Spathodia campanulata*	14	9.2	128.8
14	*Thespesia populnea*	2	8.78	17.56
15	*Mangifera indica*	53	4.06	215.18

16	*Carica papaya*	9	2.03	18.27
17	*Livistona chinensis*	2	1.87	3.74
18	*Ficus benghalensis*	7	25.48	178.36
19	*Ziziphus jujuba*	13	2.03	26.39
20	*Ixora coccinea*	22	2.03	44.66
21	*Dalbergia sisso Roxb.*	59	9.1	536.9
22	*Cuscuta refelxa Roxb.*	2	1.23	2.46
23	*Ficus elastic Roxb ex Hornem*	2	7.62	15.24
24	*Musa paradisiaca L.*	6	2.12	12.72
25	*Mirabilis jalapa L.*	2	1.01	2.02
26	*Ficus benjamina L.*	27	10.45	282.15
27	*Tecoma stans L.*	38	1089	41382
28	*Bombax ceida*	2	5.25	10.5
29	*Plumeria obtuse*	5	2.16	10.8
30	*Artocarpus heterophyllus*	3	7.61	22.83
31	*Murraya koenigii*	5	3.26	16.3
32	*Nephrolepis exaltata L.*	26	1.05	27.3
33	*Cassia siamea Lam.*	75	4.81	360.75
34	*Ricinus communis*	1	1.08	1.08
35	*Adathoda vasica*	5	3.44	17.2
36	*Bauhinia racemosa*	12	3.23	38.76
37	*Tamarindus indica*	49	5.76	282.24
38	*Annona reticulata*	4	4.59	18.36
39	*Limonia acidissima L.*	2	12.84	25.68
40	*Dypsis l utescens H. Wendl*	10	8.15	81.5
41	*Bougainvillea spectabilis*	7	1.56	10.92
42	*Alstonia scolaris*	35	3.1	108.5
43	*Roystone aregia*	2	1.58	3.16
44	*Calotropis giaganthe*	1	2.16	2.16
45	*Cassia fistula*	40	12.14	485.6

46	*Lantana Camera*	10	2.11	21.1
47	*Emblica officinalis*	7	6.52	45.64
48	*Madhuca longifolia*	2	27.26	54.52
49	*Bauhinia variegate*	17	1.66	28.22
50	*Catharanthus roseus L.*	30	1.05	31.5
51	*Araucaria columnarisJ.R.Forst Hook.*	2	1.91	3.82
52	*Cordia dichotomaG.Forst*	1	5.43	5.43
53	*Parkinosonia aculeate L.*	2	2.15	4.3
54	*Callistemon lanceollatus*	7	7.95	55.65
55	*Cassia marginata Roxb.*	2	10.28	20.56
56	*Syzygium cumini L.*	14	15.48	216.72
57	*Annona squmosa L.*	49	3.23	158.27
58	*Terminalia catappa L.*	8	14.56	116.48
59	*Nyctanthes arbor-tristis L.*	3	1.36	4.08
60	*Canna indica L.*	10	2.86	28.6
61	*Tabernaemontana divaricate R.Br.*	4	1.2	4.8
62	*Clitoria ternatea L.*	4	1.54	6.16
63	*Piper betle L.*	4	2.23	8.92
64	*Ficus racemosa*	3	12.74	38.22
65	*Thuja occidentalis*	40	2.56	102.4
66	*Aegle marmelos*	4	5.12	20.48
67	*Polyalthia longifolia*	108	4.59	495.72
68	*Santalum album*	6	13.62	81.72
69	*Cocus nucifera*	46	7.58	348.68
70	*Rauvolfia serpentine*	2	1.56	3.12
71	*Adansonia digitata*	3	2.11	6.33
72	*Neolamarckia cadamba*	3	1.69	5.07
73	*Swetenia mahugani*	4	3.01	12.04

74	*Cycas revolute*	5	2.98	14.9
75	*Terminalia arjuna*	3	9.15	27.45
76	*Thevetia peruviana*	21	4.26	89.46
77	*Psidium guajava*	13	5.87	76.31
78	*Bambusa bamboo*	1	5.25	5.25
79	*Peltophorum pterocarpum*	367	26.81	9839.27
80	*Butea monosperma*	1	2.38	2.38
81	*Albizia julibrissin*	2	7.88	15.76
82	Samniea saman	7	25.75	180.25
	Total	**1727**		**58920.74**

Estimation of above-ground biomass (AGB) is an essential aspect of carbon stocks. Estimated C pools in different forest types can be used to in making decisions about C management within forests. Generally in estimation of biomass from tree the allometric equations are used. Allometric equations describe the relationship of one part of a plant to another part of a plant. Usually some parts of the plat are easier to measure than other parts. Usually it is easy to measure and predict the hard parts i.e. tree trunk or girth and height (e.g. Use diameter to predict tree height for a given species). In present study we had first measured the aboveground biomass for trees. It was calculated using the tree girth at breast height and total height of the tree, similarly the constant variables based on tree species is taken into account for estimating total biomass. This is further used for measuring carbon C stored in the tree species.

Tree survey conducted in college campus was showing more than **2000** nos. of trees present in college premises. We had taken **1726** nos. of trees from which total biomass had been estimated. As per the protocol the trees selected in present assessment need to have tree girth more than 15cm.

Total carbon estimated as biomass from the tree species in present study is **58920.74** tons of carbon

The carbon sequestered can be calculated as soil organic matter plus the carbon estimated from tree biomass i.e. C + D

Carbon Sequestered in college campus is equal to

Carbon sequestered = C+ D

= 667.68 + 58920.74

= 59588.42 tons of CO2

Table 3: The carbon emission and sequestration balance as per study

Total Carbon emission from all measured activity in college campus	Total carbon sequestered from soil organic matter and tree biomass
329.28 tons/year	**59588.42 tons/Year**

EVALUATION OF FINDINGS

The results based on our observations carried out during the survey clearly show that the college campus has much more capacity of carbon pool compared to yearly carbon footprint. In other words it may be stated that carbon sequestration capacity of the campus is so much so that the present rate of carbon emission persists for about

25.9 years to come. Thus, the college has proactively equipped itself by putting efforts continuously for a long period so as to build its capacity for carbon sequestration.

Mr.P.D. Ghare	Dr.KA. Lande	Dr.ME. Navgire	Dr. R. R. Saswade
Co-ordinator	Head Criteria VII	Co-Ordinator IQAC Jijamata College of Science & Art's,Bhende Bk.	PRINCIPAL Jijamata College of Science & Arts Bhende, Tal. Newasa, Dist. A'Nagar

Date: 17/02/2020

Place: Bhende Bk

Policy Document On

DISABLED FRIENDLY

and

BARRIER FREE ENVIRONMENT

2018-2023

Policy Document On

DISABLED FRIENDLY and BARRIER FREE ENVIRONMENT

Preamble

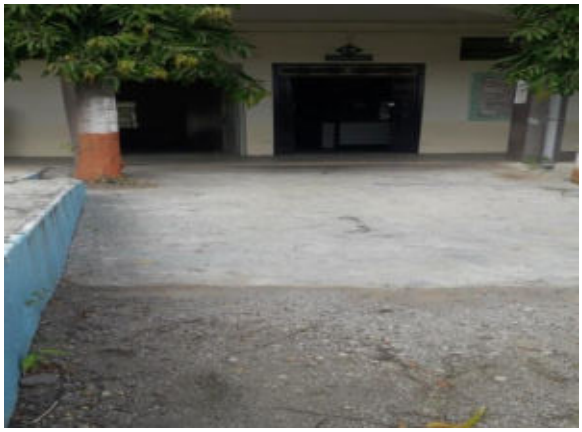
The Government of India has enacted "The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 which came into force on February 7, 1996. The main objectives of the act are to create barrier free environment for persons with disabilities and to make special provisions for the integration of persons with disabilities into the social mainstream. In February 2006, the Government of India formulated the "National Policy for Persons with Disabilities," which deals with educational rehabilitation of persons with disabilities. In 2016, the Government of India has introduced another act known as "Rights of Persons with Disabilities" Act, which prohibits discrimination against individuals with physical and mental disabilities.

The Shri Marutrao Ghule Patil Shikshan Sanstha's (MGPSS) **JIJAMATA COLLEGE OF SCIENCE AND ARTS** (JCS&A), recognizes that persons with disabilities are valuable human resource for the institution and seeks to create an environment that provides equal opportunities, protection of their rights and full participation in the academic environment. With this objective in mind the institution advances the following comprehensive "Disabled Friendly, Barrier Free Environment Policy' in which incapacitated students and employees are not distraught or treated un-favourably. The policy is to be adopted and strictly observed by all stake holders of the institution.

THE POLICY:

1. The institution shall provide adequate space for persons using mobility devices like wheelchairs, crutches and walkers, as well as those walking with the assistance of other persons.
2. The institution shall create barrier free environment for disabled and physically challenged persons in the form of Ramps with railing facility, provision of Lifts in each and every academic building and in Restrooms.
3. Adaptation of toilets for wheel chair users,
4. Construction of slopes (ramps with railing facility) in pavements for the easy access of wheel chair users,
5. It shall also provide necessary signage, lights, display boards and signposts for the easy movement of the disabled persons.
6. To provide scribe facility for the person who required human assistance during the course of examination and academic activities.
7. To augment screen reading software and braille facility for the needy person.
8. To adopt and implement the necessary facilities as per the guidelines of Govt. of India as on when required.
9. If required, allotment of extra time in tutorials, internal and university examinations.
10. The institution shall ensure itself that it has disabled friendly and barrier free environment.

Photographs of Facilities available for Divyangjan in campus




Ramps for Divyangajan

Restricted entry for Vehicles


*Pedestrian-friendly pathways