

GREEN AUDIT REPORT



(2019-20 to 2022-23)



Government of Maharashtra

GOVERNMENT COLLEGE OF ARTS AND SCIENCE

Aurangabad - 431001 (Maharashtra) India.



Prepared By

Department of Botany and IQAC

Evaluated by External Experts

- 1. Dr.J.S.Ambhore, Asso. Professor & Head, Dept. of Botany, Indraraj College, Sillod, Aurangabad
- 2. Dr.R.M.Biradar, Research Guide & Asst. Professor, Dept. of Botany, Indraraj College, Sillod, Aurangabad

Acknowledgement

Green Audit Assessment Team thanks the Government College of Arts and Science, Aurangabad Administration for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process. Our special thanks are due to:

- ❖ Principal Dr. Rajendra H. Satpute
- * IQAC Coordinator- Dr. Smt. Yugandhara S. Topare
- Evaluators- 1. Dr. Jalindar S. Ambhore2. Dr. Smt. Rupali M. Biradar
- * Chairman, Energy Audit Committee- Dr. Jalidar S. Lad
- * Chairman, Water Harvesting Committee- Dr. Akbar I. Khan
- Chairman, Clean Campus and Vermicomposting Committee- Dr. Surekha A. Saraf
- * NSS Coordinator- Dr. Parmeshwar A. Puri
- ❖ Incharge NCC (Boys)- Dr. Bharat R. Usare
- ❖ Team of colleagues for giving us necessary inputs to carry out this very vital exercise of Green Audit.

We are also thankful to Shri. Balnath Kuldhar, Shri. Ankush Jadhav, Shri. Shaikh Naim and otherstaff members who were actively involved while collecting the data and conducting field measurements and survey.



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Government of Maharashtra

GOVERNMENT COLLEGE OF ARTS AND SCIENCE

Aurangabad - 431001 (Maharashtra) India.

Internal Quality Assurance Cell (IQAC)

Introduction and Purpose:

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practices within the concerned place. It will have an impact on the eco-friendly atmosphere in the campus. It provides staff and students better understanding of Green impact on campus.

The rapid urbanization and economic development at local, regional and global level hasled to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO2 from the environment. The National Assessment and Accreditation Council (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through various practices adopted to reduce pollution. Keeping this in mind it becomes essential to adopt sustainable methods in our day to day activities. Government College of Arts and Science, Aurangabad believes in the same and is striving to address issues related to environmental problems.

It works on several methods like Water conservation, tree plantation, and Waste management, Alternative energy etc. The objectives of the audit are to evaluate as to which degree the departments comply with the same.



About the College

The history of higher education in Marathwada region is the history of the Government College of Arts & Science, Aurangabad. The college was founded as a small beginning & has grown into an education movement with a conviction to provide education to all at minimum fees and best possible facilities. The college scaled higher peaks of excellence due to the persistent efforts taken by the former Principals who took keen interest in the development of the college. They were great scholars in theirown fields and reputed teachers as well.

The college was established in 1923 at Aurangabad and since then it has been playing pioneering role in providing quality education in this society

The forty eight acres of college campus, known as Kile-Ark is surrounded by a huge rampart constructed in the seventeenth century which is worth mentioning. The college campus comprises few buildings of medieval architecture namely, Zenana Mahal, Mardana Mahal and Palmer Kothi where the music, Sanskrit, Geography and Home Science departments are located.



Image- Google Maps Image indicating green Campus of College

Vision

"Pursuing educational excellence, character building, overall development of personality andcreating responsible citizens with secular outlook".

Missions

- To increase an intellectual and ethical wealth of learners.
- To promote the growth of secular, democratic and positive attitude of the students
- To promote the advancement of knowledge through teaching, research and dissemination.
- To increase leadership qualities amongst the learners in order to provide devoted and dedicateddemocratic citizen and human resources.
- To shape desirable and favorable attitudes and develop skills of students for equipping them to face the challenges in all walks of life.
- To imbibe values of equality, unity and justice.

Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out GreenAudit are:

- To introduce and make students aware of real concerns of environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzingthe pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections require high cost.



Methodology

The methodology includes tools such as physical inspection, observation and review of documentation. The study covered the following areas-

- Water harvesting
- Vermicompost
- Energy conservation and Alternative energy
- Green area management

*** For Water harvesting, Vermicompost, Energy conservation and Alternative energy separate annexures have attached.

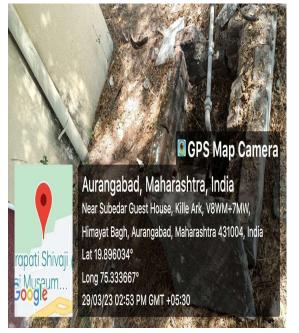
***** Water harvesting:

Government College of Arts and Science having total 12.5 hectors i. e. 4500 sq.m of land area; hence if there is average rainfall of 600mm, the total amount of harvested rainwater in groundwater is 25 million liter. In campus, we have divided rainwater harvesting scheme into two divisions. In first method roof water is collected through in horizontal pipes & all the pipes are connected to a large pipe (10inch) that carries water directly to dug well. Second method of harvesting is surface rainwater recharge. For this purpose we have divided total campus area into three parts depending upon slope of surface. According to this method, three recharge pits are constructed having size of 1.5x2x5 feet. They are filled with boulder at the bottom, metal up to 2 feet above and then large size of sand 2 feet making a filter bed. First pit is constructed near Dug well in NW corner of campus in which surface water of college and library area is accumulated through subsurface drainage line.

Due to this harvesting during hot summer every year bore well were continuously yielding water from dug well.

Rain water harvesting project resulted in saving of 25 million liters of water per year. A project of recycling water with capacity of 15,000 liter water through artificial recharge of dug well and bore wells.





Rain water conduit pipelines on Library building

Recharge of bore well through conduit pipelines.



Rainwater conduit pipelines on college building



* Vermicompost

Introduction:

Vermicomposting is an efficient and environmentally friendly way to manage organic waste. It is the process of using earthworms and microorganisms to convert organic waste into nutrient-rich compost. The Government College of Arts and Science has implemented a vermicomposting bed to manage its organic waste and produce compost.

Vermicomposting Bed:

The vermicomposting bed at the Government College of Arts and Science is located in the backyard of the college. The bed is made up of layers of organic waste and soil, which provide an ideal environment for earthworms to thrive. The bed is covered with a layer of straw to keep it moist and to prevent flies from breeding in it.

Compost Output:

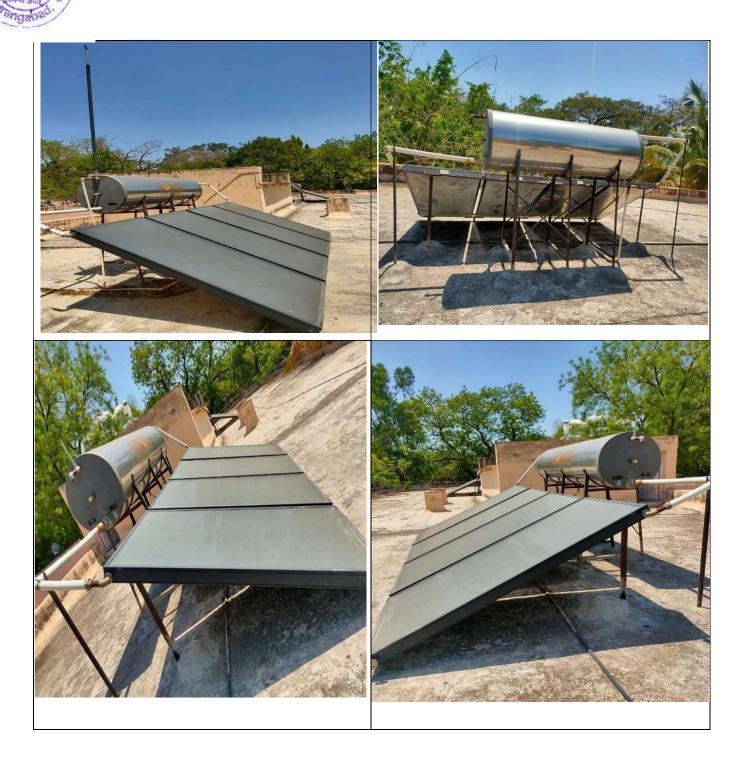
The vermicomposting bed at the Government College of Arts and Science produces 10 kgof compost in a year. The compost is rich in nutrients and is used as a fertilizer for the college's gardens. The compost is also used to improve the soil quality in the surroundingareas.





Energy conservation and Alternative energyThis includes use of alternate energy production tools like Solar Water heaters.

This helps in Energy conservation and reduce electricity consumptions. The Solar Water heaters are installed bothhostels.



❖ Green area management:

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

***** Objectives of Activity-

- 1. To encourage students for plantation.
- 2. To encourage students for identifying the plants to be conserved/cultivated.
- 3. To develop cultivation techniques (agro-techniques) among students.
- **4.** To create optimum awareness and interest amongst students o increase public awareness about the efficacies of various useful plants.
- **5.** This program helps in encouraging eco-friendly environment which provides pure oxygenwithin the Campus and awareness among students.
- **6.** The plantation program includes various type of indigenous species of ornamental andmedicinal wild plant species.

Observations:

Campus is located in the vicinity of many trees (species) to maintain the biodiversity. Various tree plantation programs are being organized at college

College Map:





The campus attempts to maintain eco-friendly atmosphere on the campus; the number and variety of plant species helps to maintain eco-friendly ambience. There are several perennial plant species in the campus. College has undertaken various activities like plantation and beautification of campus through various drives.

List of Plants:

The greenery and eco-friendly ambience of campus is mostly maintained by shrubs and trees. The college campus has total 44 species of trees and shrubs. In all they are 401 in number. Apart from it campus has rich flora of herbs and pot plants.

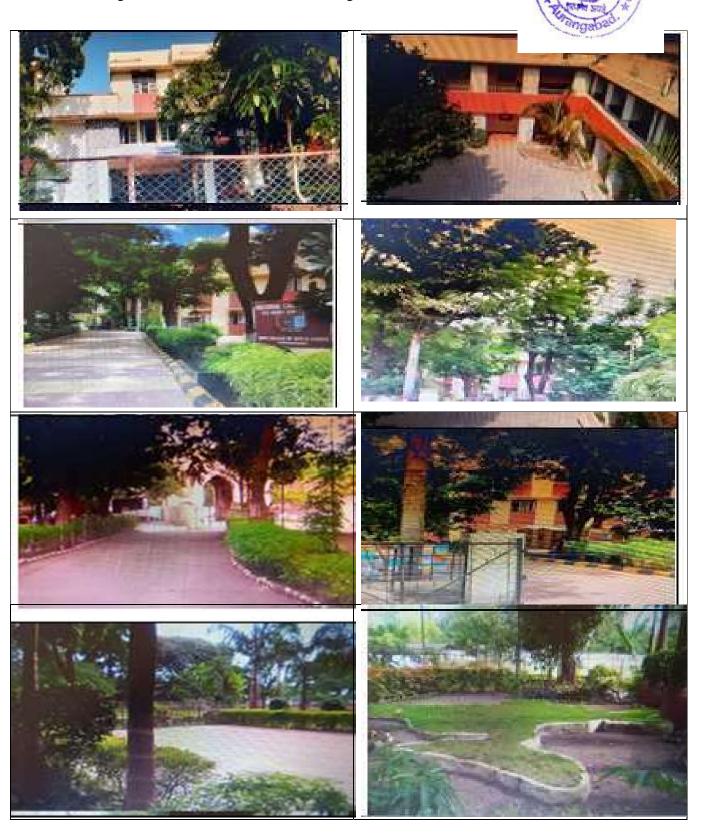
Sr.no	Name of plant	Local name	Number
1.	Aegle marmelos	Bel	1
2.	Alstonia scholaris	Sapthparni	6
3.	Annona reticulata	Ramfal	9
4.	Annona squamosa	Sitaphal	10
5.	Artocarpus hetrophyllus	Fanas	3
6.	Azadirachta indica	Neem	48
7.	Dendrocalamus strictus	Bambu	40
8.	Bogenvelia spectabelis	Boganvel	8
9.	Citrus auruntifolia	Nimbu/Limbu	7
10.	Cocos nucifera	Naral	26
11.	Cordia dichotoma	Bhokar	5
12.	Cycas revoluta	Cycas	3
13.	Dalbergia sissoo	shisham	14
14.	Delonix regia	Gulmohar	1
15	Eucalyptus maculata	Nilgiri	9
16.	Ficus benghalensis	Vad	2
17.	Ficus racemosa	Umbar	6
18.	Ficus religosa	Pimpal	4
19.	Hibiscus rosa-sinesis	Jaswandi	15



20.	Lawsonia inermis	Mehendi	1
21.	Leucalna leucocephala	Subabhul	1
22.	Limonia acidissima	Kavath	1
23.	Livistona chinensis	Fan palm	9
24.	Mangifera indica	Amba/aam	18
25.	Manilkara zapota	Chiku	4
26.	Michelia champaca	Sonchafa	4
27.	Milintonia hortensis	Buch/Akashnimb	16
28.	Moringa oleifera	Shevga	11
29.	Murraya koenigii	Curry tree (leaves)	3
30.	Nyactanthes arbortristis	Parijatak	5
31.	Peltophorum pterocarpum	Pivla Gulmohar	2
32.	Phylanthus officnalis	Awla	6
33.	Plumeria alba	Chafa	7
34.	Pongamia pinnata	Karanj	3
35.	Terminalia catappa	Desi Badam	11
36.	Psidium guayava	Peru	15
37.	Punica granatum	Dalimb	8
38.	Quisqalis indica	Madhumalti	20
39.	Roystonea regia	Royal Palm	18
40.	Santalum album	Chandan	1
41.	Spathodea companulata	Pichkari	2
42.	Syzygium cumini	Jambhul	6
43.	Tamarindus indicus	Chinch/Imli	7
44.	Thuja occidentalis	Thuja	5



Photos of plants and facilities in campus



Tree Plantation – Initiatives by Institution towards Green Management

















Committee Photos during Evaluation:



Conclusions:

There is significant environmental awareness amongst the faculty and students and initiatives taken by them are substantial. The installation of solar panels, composting, rain water harvesting, ample number of shrubs and trees shows how the campus is going to be a green. Few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques.

As part of green audit of campus, we carried out the environmental monitoring of campus which includes Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light andair velocity present. Noise level in the campus is well within the limit



Evaluation Report:

Evaluation Report:

Green Audit Committee:

Sr. No.	Name	Signature
I.	Dr. Vikas S. Gambhire, Chairman	المناهدة
2.	Dr. Smt. Sulochana R. Rathod, Member	Rathod
3.	Dr. Syed Abrar Ahmed, Member	(A)
4.	Dr. Ajaykumar C. Gandhi, Member	Hawlin
5.	Dr. Naziruddin F. Shaikh, Member	م المنه
6.	Dr. Yogesh P. Malche, Member	0

Remarks- Campus are very esecutent + appreciable. Specially the Dept. of Botany have been contineously engaged to impriment water havesting & Biodiversity Lewed of college campus, which helps to maintain ecopsiendly, healthy & natural clean environment of the college.

1.	Dr. Jalindar S. Ambhore-	
	Professor and Head,	Shubhore
	Dept. of Botany,	1
	Indraraj Arts, Commerce and Science	Dr. J. S. AMBHORE

H.O.D. Of. Botany Indraraj College Sillod Dist : Aurangabad (M.S.)

 Dr. Rupali. M. Biradar-Assistant Professor.
 Dept. of Botany.
 Indraraj Arts. Commerce and Science College, Sillod, Dist. Aurangabad

College, Sillod, Dist. Aurangabad

Dr. R. M. Birader

Joan Guide and Assistant Professor
Dept. of Botany

Joan Grand Arts Commerce and Science Collect
Sillod, Dist. Aurangabad

Dr. Smt. Yugandhara S. Topare
IQAC Coordinator

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Dr. Rajendra H. Satpute Principal Principal Govt. College of Arts & Science

Aurangabad.

Annexure I

Water Harvesting



Government of Maharashtra's Government College of Arts and Science, Aurangabad



Report of Rain water Harvesting



INDEX

1. Geo-tagged Photos – Rain Water Harvesting Systems

RAIN WATER HARVESTING

Geology of the area:



The basaltic lava flow belonging to the Deccan trap is the only major geological Formation occurring in Aurangabad. Deccan basaltic flows mainly compact

Amygdaloidal basalt flows occurs mainly in college campus and the surface layer

Consists of vesicular and amygdaloidal Zoolitic basalt while the bottom layer consists of massive basalt. The lava flows are individually different in their ability to receive as well as hold water in storage and to transmit it. The Difference in the productivity of groundwater in various flows arises as a result Of their inherent physical properties such as porosity, permeability &Transitivity. The groundwater occurs under water table condition and is mainly Controlled by the extent of its secondary

porosity i.e. thickness of weathered Rock and spacing of joint and fractures. In college campus the central part is unsuitable for groundwater artificial Recharge due to its hard and compact nature.

The area in which Aurangabad is situated suffers from drought conditions frequently. As this region comes under shadow zone, it faces the problems of low rainfall. Its average rainfall is only 700mm. The frequent conditions of scarcity of water compels for best management of available water. As a result, Rain Water Harvesting unit is established in the college.

The Rainwater Harvesting & Water Management program in Government College Campus is one of the ideal projects of Rainwater Harvesting in this region.



Methodology:

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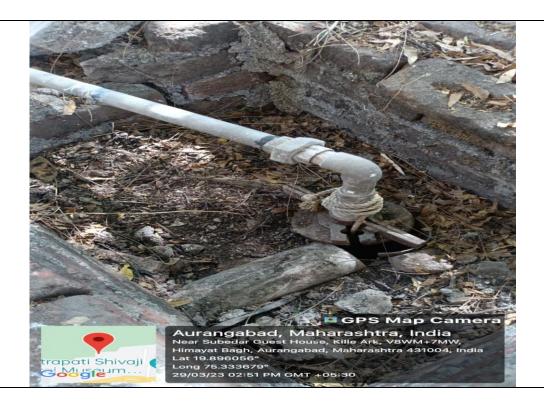






Rainwater conduit pipelines on college building







Rainwater harvesting pit near college Bore well







Annexure II

Vermicompost



Vermicompost report 2017-2018

Introduction:

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Vermicomposting Bed:

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Compost Output:

The vermicomposting bed at the Government College of Arts and Science produces 10 kgof compost in a year. The compost is rich in nutrients and is used as a fertilizer for the college's gardens. The compost is also used to improve the soil quality in the surrounding areas.

Benefits:

The use of a vermicomposting bed at the Government College of Arts and Science has several benefits. Firstly, it helps to manage the organic waste produced by the college in an environmentally friendly way. Secondly, it produces nutrient-rich compost that can be used to improve the soil quality and promote plant growth. Finally, it reduces the need for chemical fertilizers, which can have negative impacts on the environment.

Conclusion:

In conclusion, the vermicomposting bed at the Government College of Arts and Science is an effective way to manage organic waste and produce nutrient-rich compost. The compost produced by the bed is used to promote plant growth and improve the soil quality in the surrounding areas. The implementation of a vermicomposting bed is a step towards a moresustainable and environmentally friendly approach to waste management.

Participated students in Vermicompost Project:

- 1) Al Hymed Ayesha
- 2) Aradwad Tejaswini
- 3) Arke Satkar



- 4) Bankar Praneta
- 5) Chabukswar Karan
- 6) Johar Deepali
- 7) Garole Penaji
- 8) Hage Ajay
- 9) Katke Rohit
- 10) Morelu Bhawna
- 11) Mule Vishal
- 12) Ravte Avinash







Vermicompost report 2018-2019

Introduction:

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Compost Output:

The vermicomposting bed at the Government College of Arts and Science produces 8 kg of compost in a year. The compost is rich in nutrients and is used as a fertilizer for the college's gardens. The compost is also used to improve the soil quality in the surrounding areas.

Benefits:

The use of a vermicomposting bed at the Government College of Arts and Science has several benefits. Firstly, it helps to manage the organic waste produced by the college in an environmentally friendly way. Secondly, it produces nutrient-rich compost that can be used to improve the soil quality and promote plant growth. Finally, it reduces the need for chemical fertilizers, which can have negative impacts on the environment. Conclusion:

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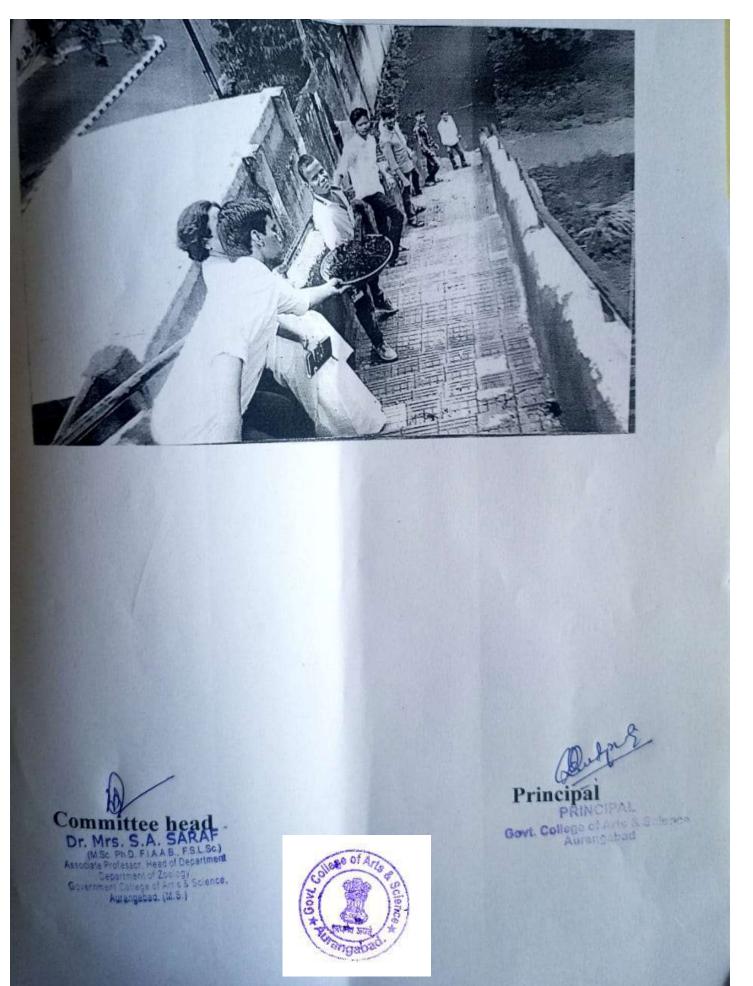


Participated students in Vermicompost Project:

- 1) Gadwe Rohit
- 2) Pargoankar Prajakta
- 3) Yangad Tiwankale
- 4) Vitekar Sneha
- 5) Wahatule Jayshre
- 6) Wagh Bharti
- 7) Thote Tejaswini
- 8) Surashe Deepali
- 9) Shaikh Zabilulha
- 10) Shankala Prerna
- 11) Shinde manisha
- 12) Tadvi Surabh







Vermicompost report 2019-2020

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Compost Output:

The vermicomposting bed at the Government College of Arts and Science produces 12 kgof compost in a year. The compost is rich in nutrients and is used as a fertilizer for the college's gardens. The compost is also used to improve the soil quality in the surrounding areas.

Benefits:

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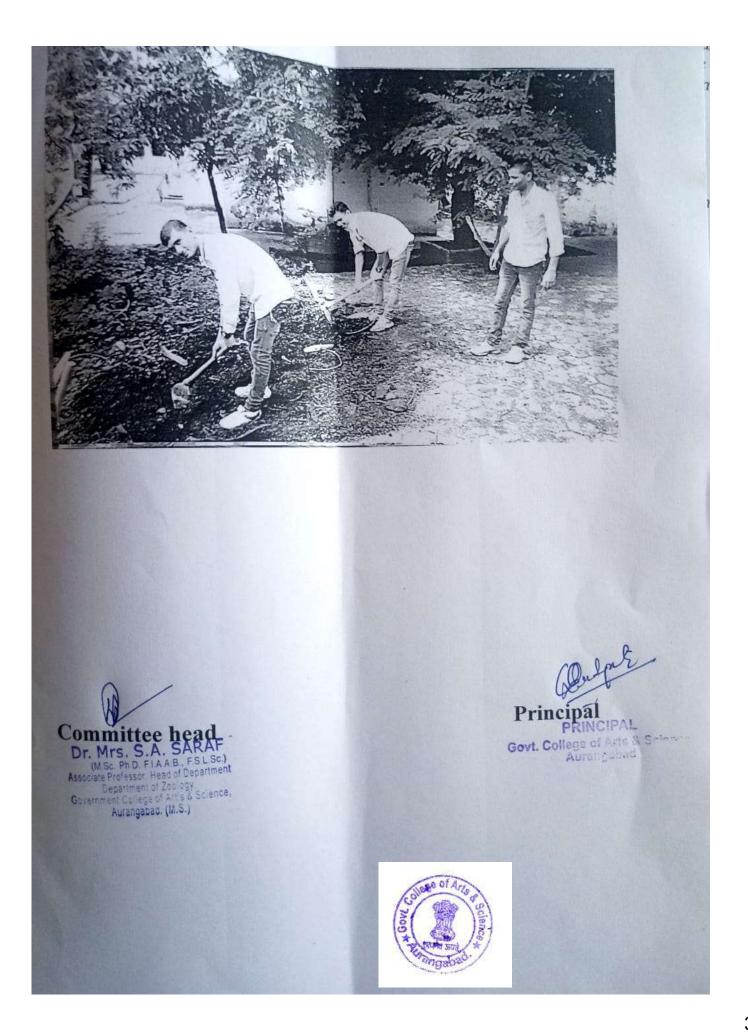
- 1) Suryawanshi Suhas
- 2) Targhale Pooja
- 3) Tyade Dyneswar



- 4) Shital Kale
- 5) Kamble Mrunal
- 6) Adhagale Shivani
- 7) Rane Priti
- 8) Pawar Snehal
- 9) Jadhav Pradhnay







Vermicompost report 2020-2021

Introduction:

Vermicompost is an organic fertilizer produced by the process of decomposition of organic waste by earthworms. The process is an effective method of waste management, and the resulting compost is rich in nutrients, making it a valuable resource for agriculture. In Government College of Arts and Science, Aurangabad, vermicomposting has been a successful initiative for a long time. However, during the lockdown period of 16th March 2020 to 1st Nov2021, there has been a drastic decline in the production of vermicompost.

Reasons for decline:

The lockdown period saw a significant decrease in the amount of organic waste generated in the college due to the closure of the canteen, hostel mess, and reduced activities in the college. Withless waste available for decomposition, the production of vermicompost also decreased.

Additionally, the maintenance and monitoring of the vermicomposting unit were also hampereddue to restrictions on movement and the shortage of staff.

Impact:

The decline in vermicompost production has affected the overall sustainability of the college. Vermicompost was used as a natural fertilizer for the college garden and the nearby fields, which helped to reduce the usage of chemical fertilizers. It also played a crucial role in waste management, reducing the amount of organic waste sent to landfills. The decrease in vermicompost production has led to an increase in the usage of chemical fertilizers, which has an egative impact on the environment.

Steps taken:

To address the issue, the college administration has taken several measures. The college has started collecting food waste from the hostels and staff quarters, and the canteen has resumed

operations, leading to an increase in the organic waste generated. The vermicomposting unit has also started a campaign to create awareness among the students and staff regarding the importance of waste management and vermicomposting.

Conclusion:

The decline in vermicompost production during the lockdown period was a temporary setback for the college. However, the steps taken by the administration to address the issue are commendable. It is essential to continue the efforts to promote sustainable waste management practices and reduce the usage of chemical fertilizers. The initiative taken by the college can serve as a model for other institutions to follow.

Committee head Dr. Mrs. S.A. SAKAF (M.Sc. Ph.D. F.I.A.A.B., F.S.L.Sc.) Associate Professor: Head of Department Department of Zoo ugy. Government College of Art's & Science, Aurangabad. (M.S.) Tool and Arts of Science &

Principal
PRINCIPAL
Govt. College of Aria & Science
Aurangus

Vermicompost report 2021-2022



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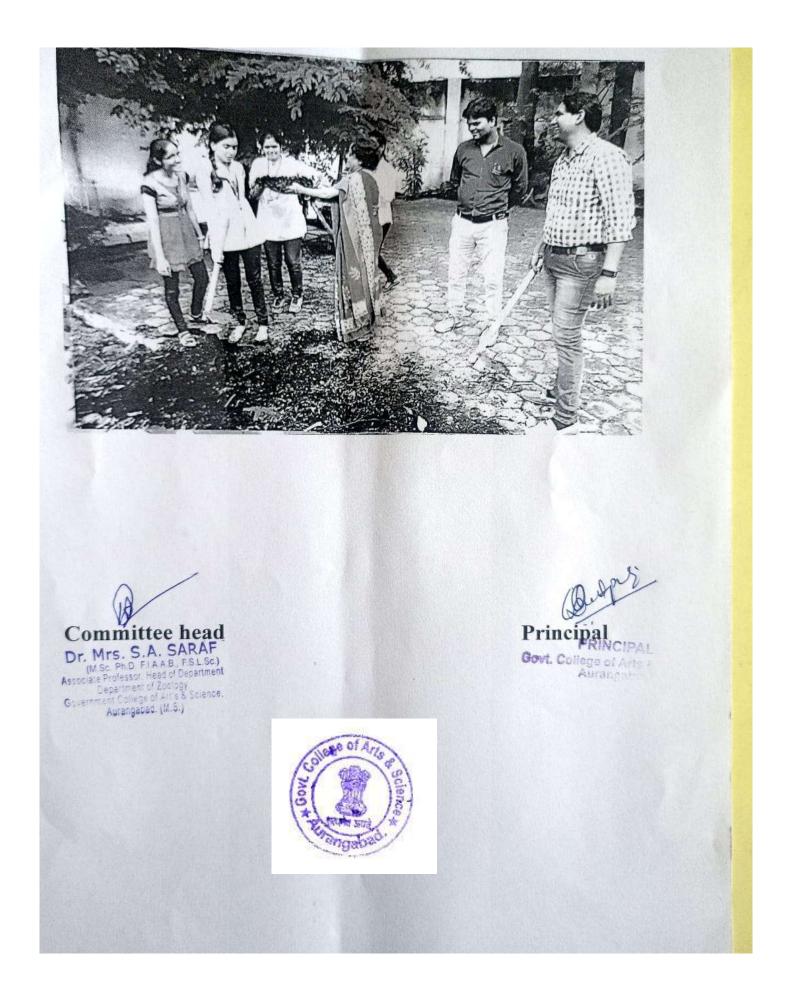
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Participated students in Vermicompost Project:

- 1) Ahire Manjeetrao
- 2) Bankar Praneeta
- 3) Chabukshwar Karan
- 4) Maher Sonali
- 5) Mule Vishal
- 6) Salunkhe Deepali
- 7) Kakade Vinod
- 8) Jadhav Amol
- 9) Karhale Ganesh







Annexure III

Energy
Conservation
and Alternative
Energy

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा) विभागीय कार्यालय,

शॉप न. ३०५, तिसरा मजला साई ट्रेंड सेंटर, रेल्वे स्टेशन रोड, औरंगाबाद

जावक क्र. 60 2

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2017-18. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा) विभागीय कार्यालय, शॉप न. ३०५, तिसरा मजला साई ट्रेंड सेंटर, रेल्वे स्टेशन रोड, औरंगाबाद

जावक क्र6०।

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2018-19. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा) विभागीय कार्यालय,

शॉप न. ३०५, तिसरा मजला साई ट्रेंड सेंटर, रेल्वे स्टेशन रोड, औरंगाबाद

जावक क्र. ७७३

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2019-20. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.





Divisional General Manager Division Office, MEDA Aurangabad

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा) विभागीय कार्यालय,

शॉप न. ३०५, तिसरा मजला साई ट्रेंड सेंटर,रेल्वे स्टेशन रोड,औरंगाबाद

जावक क्र. 604.

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2020-21. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.

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Divisional General Manager Division Office, MEDA Auranoabad

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा) विभागीय कार्यालय,

शॉप न. ३०५ ,तिसरा मजला साई ट्रेंड सेंटर ,रेल्वे स्टेशन रोड ,औरंगाबाद

जावक क्र. ६०५

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2021-22. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.





Divisional General Manager Division Office, MEDA

Divisional General Manager Division Office, MEDA Aurangabad

महाराष्ट्र ऊर्जा विकास अभिकरण (महाऊर्जा)

विभागीय कार्यालय,

शॉप न. ३०५ ,तिसरा मजला साई ट्रेंड सेंटर ,रेल्वे स्टेशन रोड ,औरंगाबाद

जावक क्र. 606

Energy Audit

This is certify that Government College of Arts & Science, Aurangabad underwent Energy audit for the academic year 2022-23. It is certified that the college has successfully implemented systematic approach for efficient use of energy and reduce energy wastage.





Divisional General Manager Division Office, MEDA Aurangabad