



ASHOKRAO MANE COLLEGE OF PHARMACY, PETH VADGAON

Tal – Hatkanangale, Dist – Kolhapur

Green Campus Initiatives



Prepared by

Department of Environmental Science,

Shivaji University, Kolhapur- 416004

2024- 25

Ashokrao Mane College of Pharmacy, Peth-Vadgaon



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Date: 29/03/2025

Certificate

This is to certify that the Department of Environmental Science, Shivaji University, Kolhapur, has assessed the detailed "Green Campus Initiatives" of "Ashokrao Mane College of Pharmacy" during the academic year 2024-2025. This report was evaluated in accordance with the applicable standards prescribed by the Indian Institute of Remote Sensing, Dehradun, India, the Ministry of Environment, Forest and Climate Change, New Delhi, the Intergovernmental Panel on Climate Change (IPCC), and the Central Pollution Control Board (CPCB), New Delhi. The report involves Solid waste generation, safe waste disposal practices, green inventory, biomass estimation, and carbon sequestration potential of the campus. 'Environmental Management Plan' is also included in the report, which can be followed to minimize environmental impacts. The performance of the college was found to have good quality with respect to sustainable Green Practices.

The opportunities of sustainable green practices and careful consideration of the suggested Environmental Management Plan can make the college a role model to other institutions as well. In our opinion and to the best of our information and according to the information given to us, Green Initiatives gives a true and fair view in conformity with environmental auditing principles accepted in India.



Aasawari

Head
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Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap
ASHOKRAO MANE COLLEGE OF PHARMACY

Approved by PCI, New Delhi, Government of Maharashtra, DTE, Mumbai

Affiliated to Shivaji University, Kolhapur & MSBTE, Mumbai

Estd. 2006 | Accredited 'A' Grade by NAAC (CGPA: 3.18)

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Date: 29-03-2025

Principal's Message:



As we stand at the crossroads of a rapidly evolving world, it is imperative that we, as future healthcare professionals, recognize the profound connection between the environment, energy, and health.

The need for sustainable practices and green energy solutions is no longer just a global challenge—it is a responsibility that we must embrace for the sake of future generations.

Pharmacy professionals play a vital role in not only advancing medical knowledge but also in shaping healthier communities through the promotion of sustainability. The role of green chemistry, eco-friendly practices in pharmaceutical production, and energy-efficient healthcare systems cannot be overstated. It is our duty to incorporate these principles into our daily practices, research, and the way we educate our students.

Let us champion the use of renewable resources, reduce waste, and ensure that our methods of dispensing care are aligned with the preservation of the environment. By doing so, we will contribute to a healthier, greener planet, where both people and the environment thrive in harmony.

I am very thankful to the audit committee of Shivaji University, Kolhapur who Visited to our institute and produced a systematic Green, Energy and Environment report. This will help us in producing and encourage all members of our college and community to continue innovating and thinking sustainably, for it is through collective efforts that we will pave the way for a brighter, greener future.

Thanking You

Place: Peth-Vadgaon

Dr. A. P Gadad



Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap
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Chairman's Message



It is with great pride and a deep sense of responsibility that I address you through this souvenir. As we continue to navigate the complexities of the modern world, the role of pharmacy professionals has never been more crucial—not only in advancing healthcare but also in safeguarding the future of our planet.

In today's age, we must recognize that the health of individuals and the health of our environment are deeply interconnected. As a pharmacy college, we have the unique opportunity to integrate sustainable practices into our academic programs, research, and community outreach. By focusing on eco-friendly pharmaceutical practices, promoting green chemistry, and exploring energy-efficient healthcare solutions, we can contribute to a healthier and more sustainable world.

I urge all our students, faculty, and staff to remain committed to fostering a culture of innovation that supports both human health and environmental well-being. Together, we can lead the charge in developing solutions that reduce our ecological footprint while enhancing the quality of life for all. Let us embrace sustainability, not as a challenge, but as an opportunity to make a lasting impact. May we continue to inspire each other to think green, act responsibly, and build a future where both health and the environment flourish.

I encourage everyone to continue supporting and engaging in sustainable practices, for the environment is not just a subject of study but a legacy we must protect for future generations. Let us use this report as both a reflection of our progress and an inspiration to continue our green journey.

Thanking You

Place: Peth-Vadgaon

Shri Vijaysinh Mane Saheb

President,

Ashokrao Mane Group of Institutions (AMGOI)

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1.1 Green Campus Initiatives of Ashokrao Mane College of Pharmacy

The campus, though limited in size, supports a diverse range of tree species serving multiple purposes. Many of these trees have become an essential part of the campus landscape, having been planted at different periods through various initiatives implemented by the authorities. These trees have significantly improved the quality of life for both the college community and nearby residents by enhancing air quality, contributing to climate change mitigation, conserving water, preventing soil erosion, supporting wildlife, and regulating the local climate by reducing the impact of rainfall and wind.

In addition, the tree foliage plays a crucial role in maintaining a cooler environment during summer by absorbing and filtering solar radiation. The trees also provide habitat and food for a wide variety of birds and other organisms. Birds and insects feed on flower nectar, while the dense branches and leaves offer shelter to creatures such as birds and squirrels, protecting them from predators. The wide variety of tree species on campus displays diverse forms, textures, and vibrant colours, with each tree undergoing seasonal changes in appearance.

Furthermore, the long-lasting, stable, and majestic presence of these trees gives the campus a monument-like character, reflecting the institution's distinguished heritage. Studies suggest that belts of shaded trees within and around college premises help reduce noise, dust, and storm impacts. Consequently, the institution has played a vital role in conserving and enhancing the overall environment of Ashokrao Mane College of Pharmacy and its surrounding area.

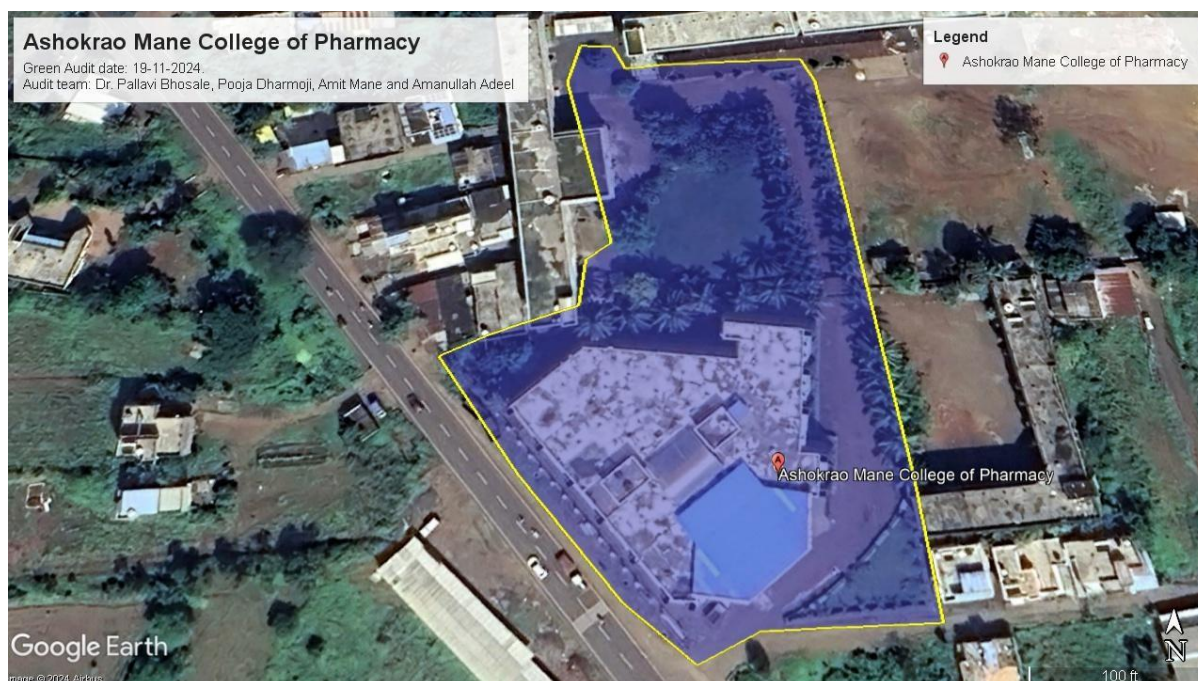


Figure 2.1. Google Earth map of the Ashokrao Mane College of Pharmacy

The college is located at longitude $74^{\circ} 05' 82''$ E and latitude $17^{\circ} 24' 73''$ N. The climate in the area is ideal for the cultivation of a wide variety of plants.

In the case of green inventory, a total of 86 trees were counted, each having a girth of more than 10cm and a height of more than 4 ft. Based on data provided by the Institution, a total of

16 species of woody trees were recognised during the visit. The campus has a higher concentration of native woody tree species, which is a sign of rich biodiversity.

1.2 Species with the highest population

Table No. 2.1.2- Species with the highest population

No.	Botanical name	common name	Number of trees
1	<i>Sabal palmetto</i>	Palms	28
2	<i>Polyalthia Longifolia</i>	Ashok	25
3	<i>Cocos nucifera</i>	Coconut	17

During the inventory, Sabal palmetto was discovered with the highest population on campus (Table 2.1 and Fig. 2.1). The college has planted trees that have a better capability for carbon sequestration. The Institute took the initiative to grow native plants, which is the best way to protect the area's biodiversity. The trend is followed by *Polyalthia Longifoli* and *Cocos nucifera*.

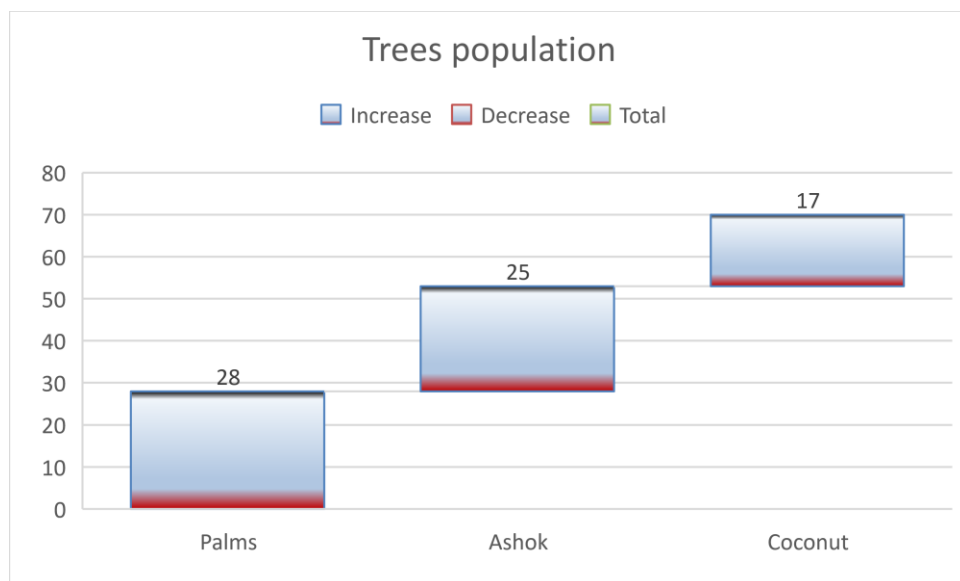


Figure 2.1.2. Trees with highest population in the campus.

1.2.1 Total biomass

In the field of ecology, biomass refers to the amount of living organisms present in a specific location or ecosystem at a given time. The term "species biomass" is used to indicate the combined mass of one or more species, while "community biomass" encompasses the total mass of all species within a community, including animals, plants, and microorganisms. This measurement of mass can be expressed as either the overall mass of the community or the average mass per unit area. The biomass of an individual tree includes its branches, stem, fruits, roots, and flowers. The latest tree census conducted on the Ashokrao Mane College of Pharmacy campus reports a total biomass of woody vegetation at 30.43 tones.

Table No. 2.1.3- Total Biomass of trees in tons on the campus

Botanical Name	Common Name	Total Biomass (Tones)
Cocos nucifera	Coconut	17.83088
Ficus religiosa	Pimpal	3.198947
Eucalyptus obliqua	Nilgiri	2.661205
Ficus racemosa	Umbar	1.666749
Elaeis guineensis	Oil Palm	1.426534
Tamarindus indica	Chinch	1.074841

Palms recorded highest biomass on the campus. Followed *Ficus religiosa* and *Eucalyptus obliqua* (Table 2.2. and Fig. 2.2).

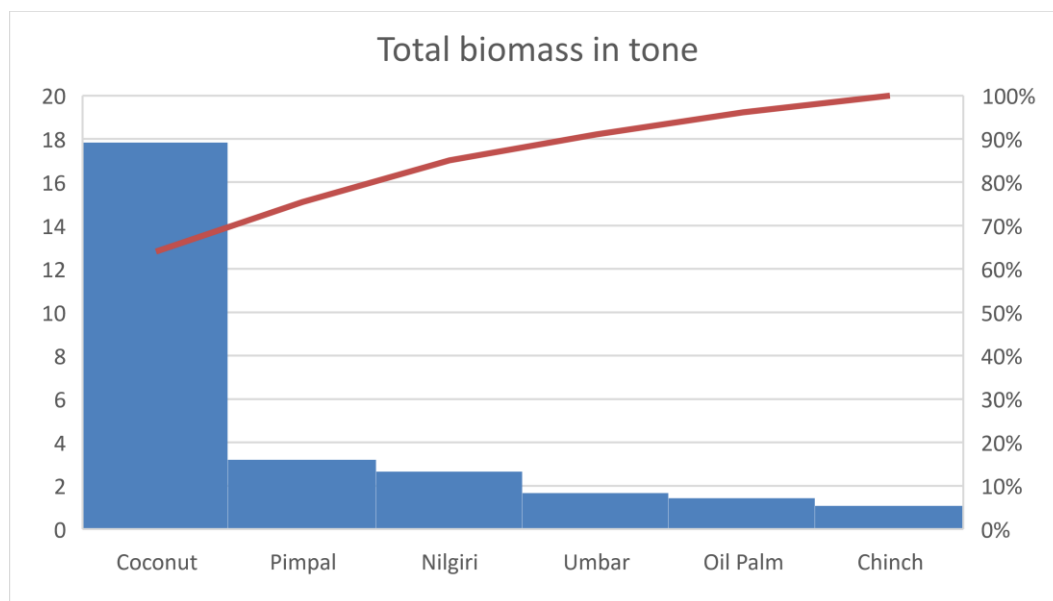


Figure 2.1.3. Highest Total Biomass in tones in the campus.

1.2.2 Carbon stock

Forests and trees serve as natural carbon storage systems, naturally capturing and storing carbon. Consequently, carbon is released when trees are cut down, and areas experience deforestation. The amount of carbon stored in a particular land area is influenced by the extent of plant coverage. The term "carbon sock" signifies the quantity of carbon that accumulates in a tree during the photosynthetic process. The total carbon stock on the campus is recorded at 33.04 tones.

Table No. 2.1.4. Carbon stock of trees in tones on the Campus

Botanical Name	Common Name	Carbon stock (tons)
<i>Cocos nucifera</i>	Coconut	26.74632
<i>Ficus religiosa</i>	Pimpal	1.599473
<i>Eucalyptus obliqua</i>	Nilgiri	1.330603

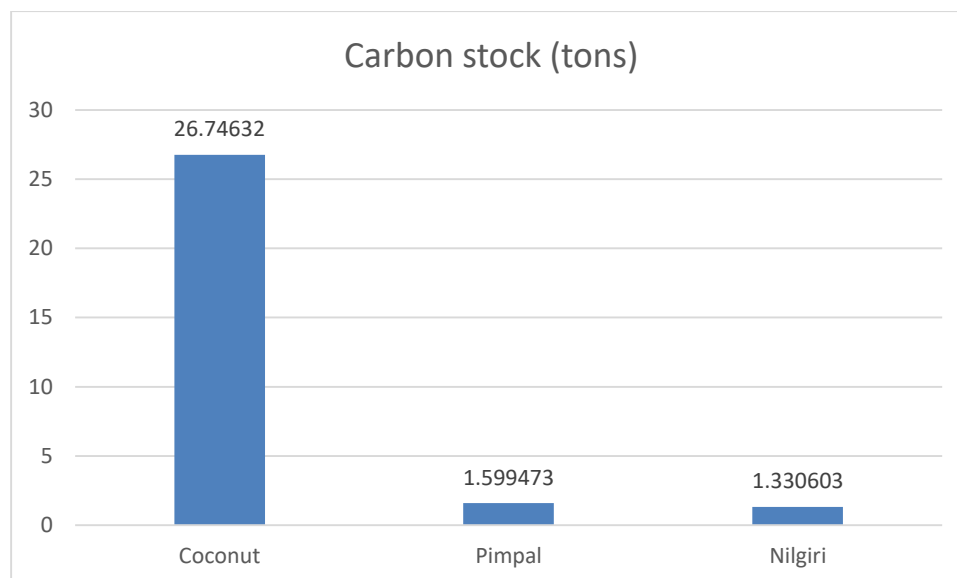


Figure No. 2.1.4. Highest carbon stock in tone

The highest carbon stock is recorded in Coconut followed by *Ficus religiosa* and *Eucalyptus obliqua* respectively on the institute campus.

1.2.3 Carbon Sequestration

Carbon sequestration refers to the long-term storage of carbon dioxide or other forms of carbon with the aim of preventing or slowing climate change. It has been recognized as an effective approach to mitigating the accumulation of greenhouse gases in the atmosphere and oceans arising mainly from fossil fuel combustion. Globally, vegetation has the potential to store about 560 petagrams (Pg; one petagram equals one billion tonnes) of carbon.

In the present study conducted at Ashokrao Mane College of Pharmacy, the primary objective is to evaluate the existing carbon stock in woody vegetation through systematic documentation of all tree species on campus. The woody plants within the college premises have collectively sequestered 148.03 tonnes of CO₂. On average, each tree sequesters approximately 0.0218 tonnes of CO₂ annually.

Table No. 2.1.5. Carbon sequestrates of trees in tones on the campus

Botanical Name	Common Name	CO ₂ sequestrate (tonnes)
<i>Cocos nucifera</i>	Coconut	124.9053
<i>Ficus religiosa</i>	Pimpal	5.870068
<i>Eucalyptus obliqua</i>	Nilgiri	4.883312

<i>Ficus racemosa</i>	Umbar	3.058484
<i>Elaeis guineensis</i>	Oil Palm	2.61769
<i>Tamarindus indica</i>	Chinch	1.972333
<i>Polyalthia Longifolia</i>	Ashok	1.82436

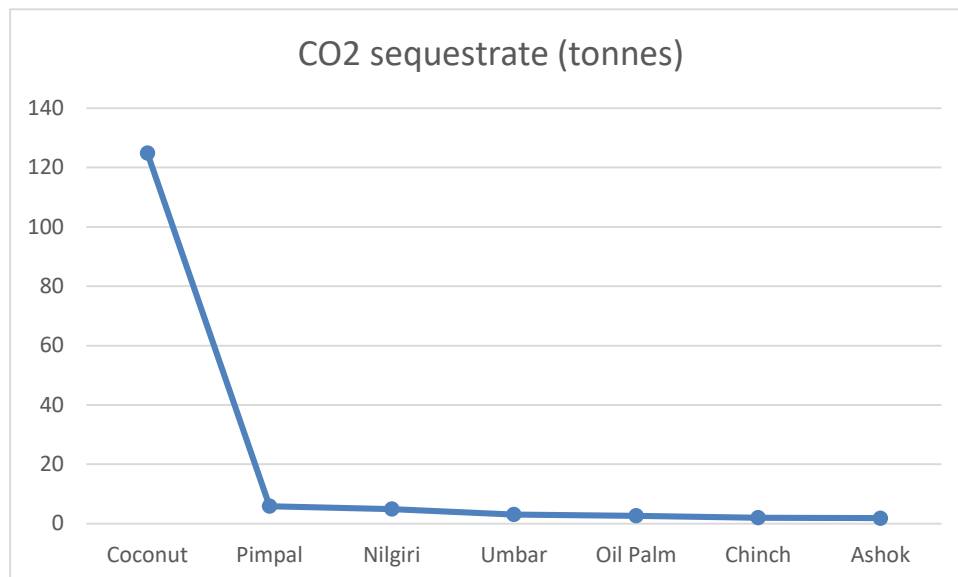


Figure No. 2.1.5. Highest carbon sequestration in tons

Cocos nucifera is the highest tree species in the campus to sequester carbon over 124 tons per year.

1.2.4 Oxygen released

At present, the woody vegetation at Ashokrao Mane College of Pharmacy has generated an estimated total of 394.7 tonnes of oxygen. The amount of oxygen released is directly associated with carbon dioxide sequestration, following a stoichiometric ratio of 32:12. It is widely recognized that a single mature tree has the potential to meet the lifetime oxygen requirements of two human beings.

The spider chart illustrates the comparative oxygen release capacity of different tree species present on the campus of Ashokrao Mane College of Pharmacy. Among all species, *Cocos nucifera* (Coconut) overwhelmingly dominates oxygen production, contributing the highest amount (333.08 tons), which is several orders of magnitude greater than the other species. This indicates that Coconut trees play a disproportionately significant role in sustaining the campus oxygen balance.

The next major contributors are *Ficus religiosa* (Peepal) and *Eucalyptus obliqua* (Nilgiri), with oxygen releases of 15.65 tons and 13.02 tons, respectively. These species are well known for their large canopy size, high biomass, and rapid growth, which explains their relatively higher oxygen output compared to other trees.

Moderate contributions are observed from *Ficus racemosa* (Umbar), *Elaeis guineensis* (Oil Palm), and *Tamarindus indica* (Chinch), suggesting that although individually less productive than Coconut, collectively they play a meaningful role in maintaining ecological balance on the campus.

Species such as *Polyalthia longifolia* (Ashok), *Grevillea robusta* (Silver Oak), *Azadirachta indica* (Neem), and *Terminalia catappa* (Wild Badam) show comparatively lower oxygen release. However, their ecological importance remains high, as they provide additional benefits such as medicinal value, shade, biodiversity support, and microclimate regulation.

Table No. 2.1.6. Oxygen release of trees in tones on the campus

Botanical Name	Common Name	O2 released (Tons)
<i>Cocos nucifera</i>	Coconut	333.0808
<i>Ficus religiosa</i>	Pimpal	15.65351
<i>Eucalyptus obliqua</i>	Nilgiri	13.02216
<i>Ficus racemosa</i>	Umbar	8.155957
<i>Elaeis guineensis</i>	Oil Palm	6.980507
<i>Tamarindus indica</i>	Chinch	5.259554
<i>Polyalthia Longifolia</i>	Ashok	4.86496

Grevillea robusta	Silver oak	2.939842
Azadirachta indica	Neem	1.949021
Terminalia catappa	Wild Badam	1.348238

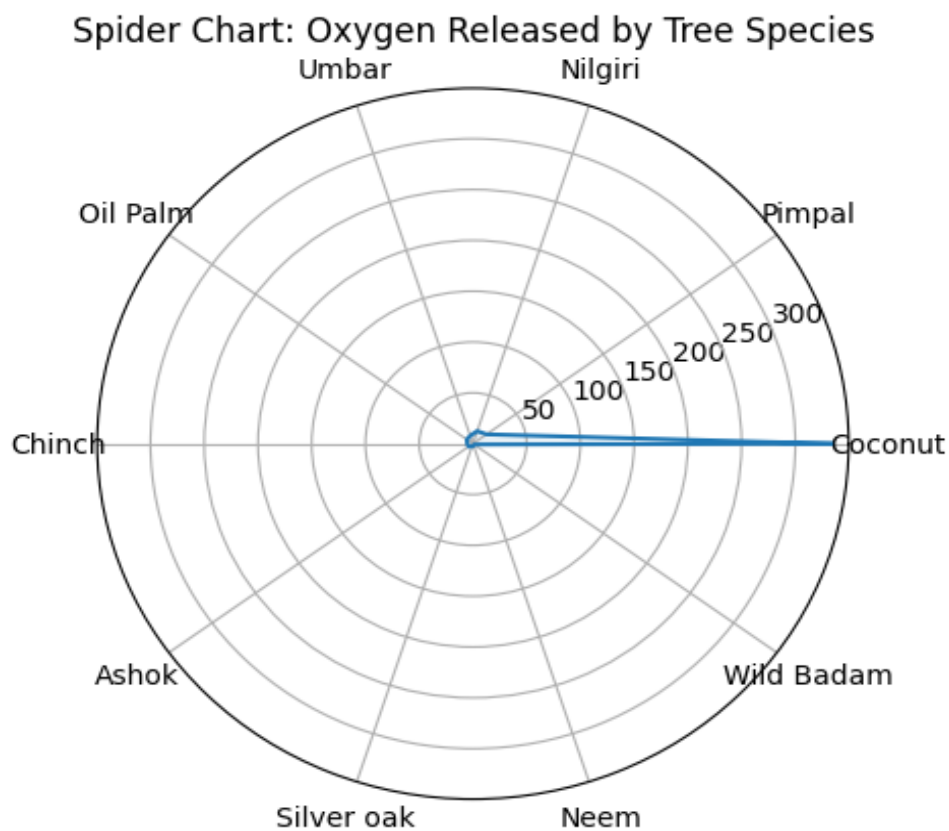


Figure No. 2.1.6. Highest oxygen release in tons

Key Observation:

- The college has a good capacity to create to green parks.
- The Institute take good initiative for green cover by planting fruiting.
- Weekly indoor awareness program for the students.
- Fire events near woody vegetation will be threat to vegetation on the campus as well as direct anthropogenic source of CO₂ emission.
- Roof of the college is the best place to practice some flower nursery or medicinal plants for the student.
- Nothing has been done for roof management though water is available.

CONCLUSION AND RECOMMENDATIONS

During the academic year 2024–2025, the Department of Environmental Science, Shivaji University, Kolhapur, carried out a Green Audit of Ashokrao Mane College of Pharmacy. A green audit is a systematic approach used to assess whether an institution's policies and practices are aligned with environmental responsibility and sustainability. The main objectives of the college's green audit were to evaluate the existing eco-friendly initiatives and to undertake a comprehensive review in order to determine the institution's overall standing in terms of environmental sustainability.

Conclusions:

The following are some findings from the team's green audit that can be used to improve the college campus and make it more environmentally friendly:

1. The campus's tree biodiversity is particularly strong.
2. The institute has made attempts to keep the campus green.

• Recommendations:

The primary recommendations for enhancing the campus environment are listed below.

1. The institute needs to put up a report on flora.
2. It is possible to start plant and flower nursery on the roof of the college.
3. In order to prevent fire occurrences on campus, fire lines should be getting ready.

ENVIRONMENT MANAGEMENT PLAN:

For the Ashokrao Mane College of Pharmacy we have developed an Environment Management Plan (EMP) by understanding the dynamics of the current scenario of resource usage and current practises of green inventory. This plan will prioritise the areas where the institution needs to make more environmental improvements while outlining the benefits, drawbacks, and solutions for maintaining a clean, green campus.

Environment Management Plan 2024-25

Sector	Strengths	Weakness	Suggestions	Priority
Tree Vegetation	There is a lot of space for plantation	Rooftop has the capacity double the greenery of the campus.	Avoid monoculture, variety of species should be planted in campus area	Medium