

2023

Green Audit Report



EcoShastra



Nehru Yuva Krida & Sanskrutik Mandal, Chikhali
Gawande College of Pharmacy,
Sakharkherda.

Green Audit Report

Submitted by



EcoShashtra

INDEX

Sr. No.	Content	Page No.
1.	About the college	2
2.	Environmental Aspects of Buldhana District	4
3.	Environmental Audit Committee	6
4.	Biodiversity Audit	7

ECOSHASTI

Nehru Yuva Krida & Sanskrutik Mandal, Chikhali

Gawande College of Pharmacy, Sakharkherda

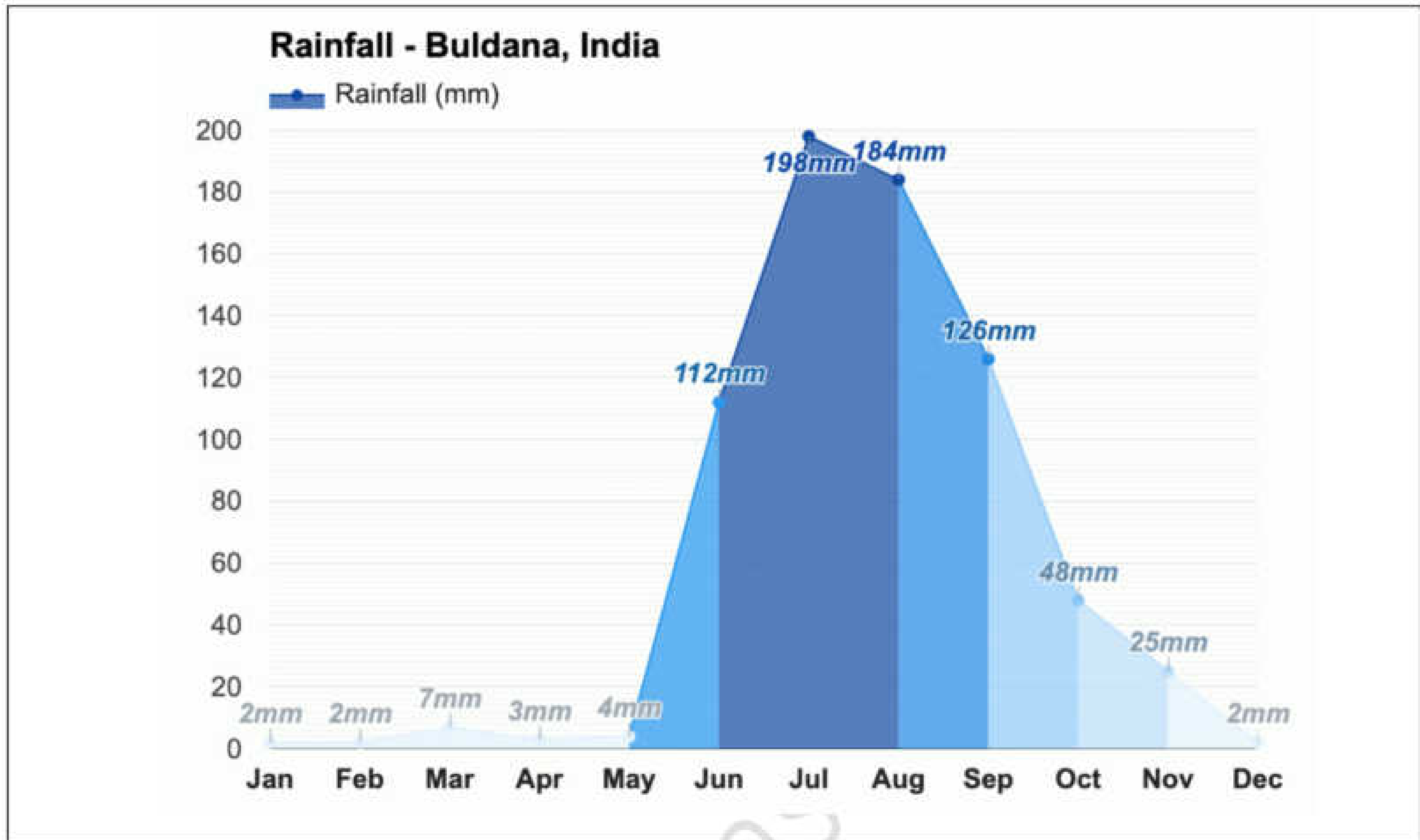
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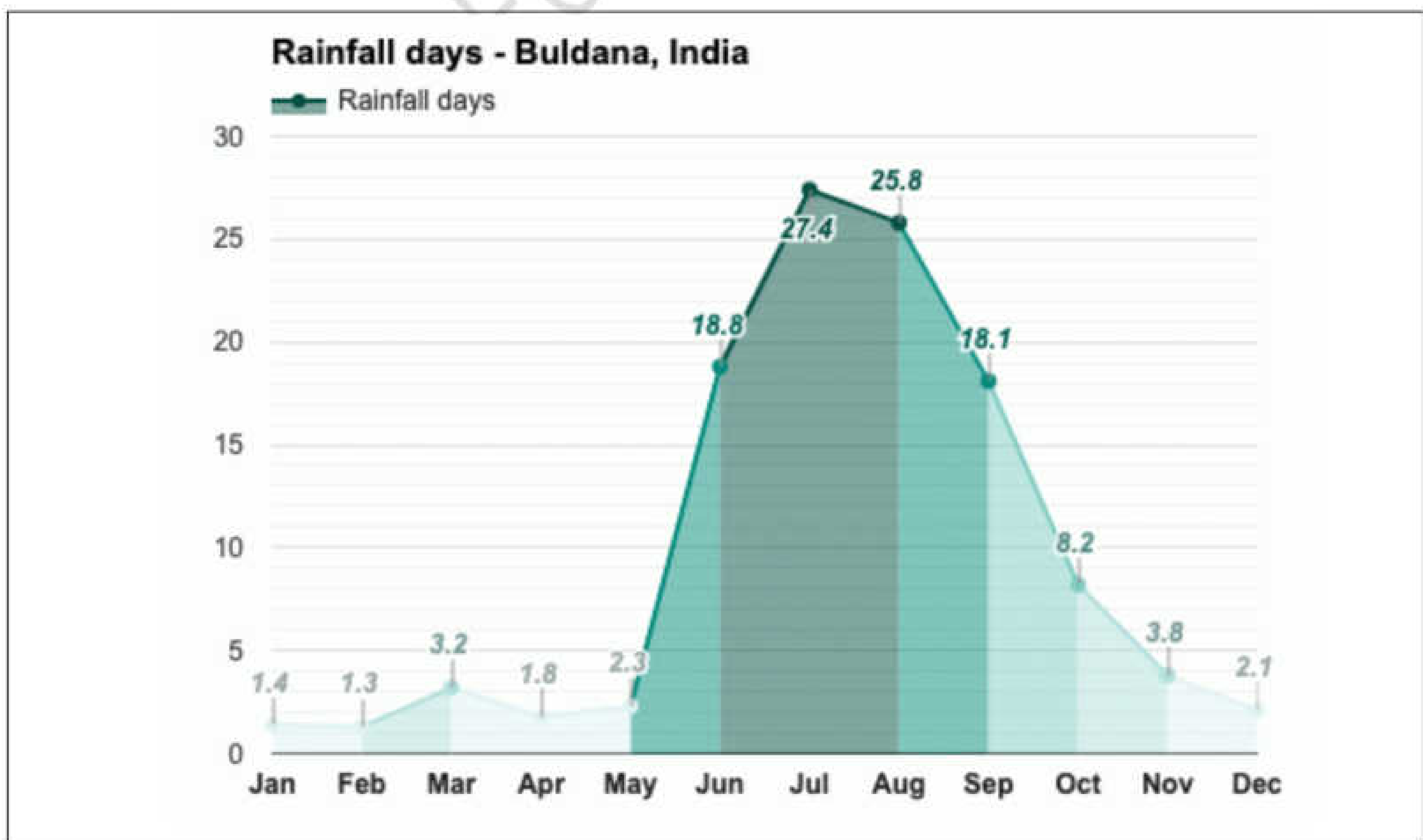
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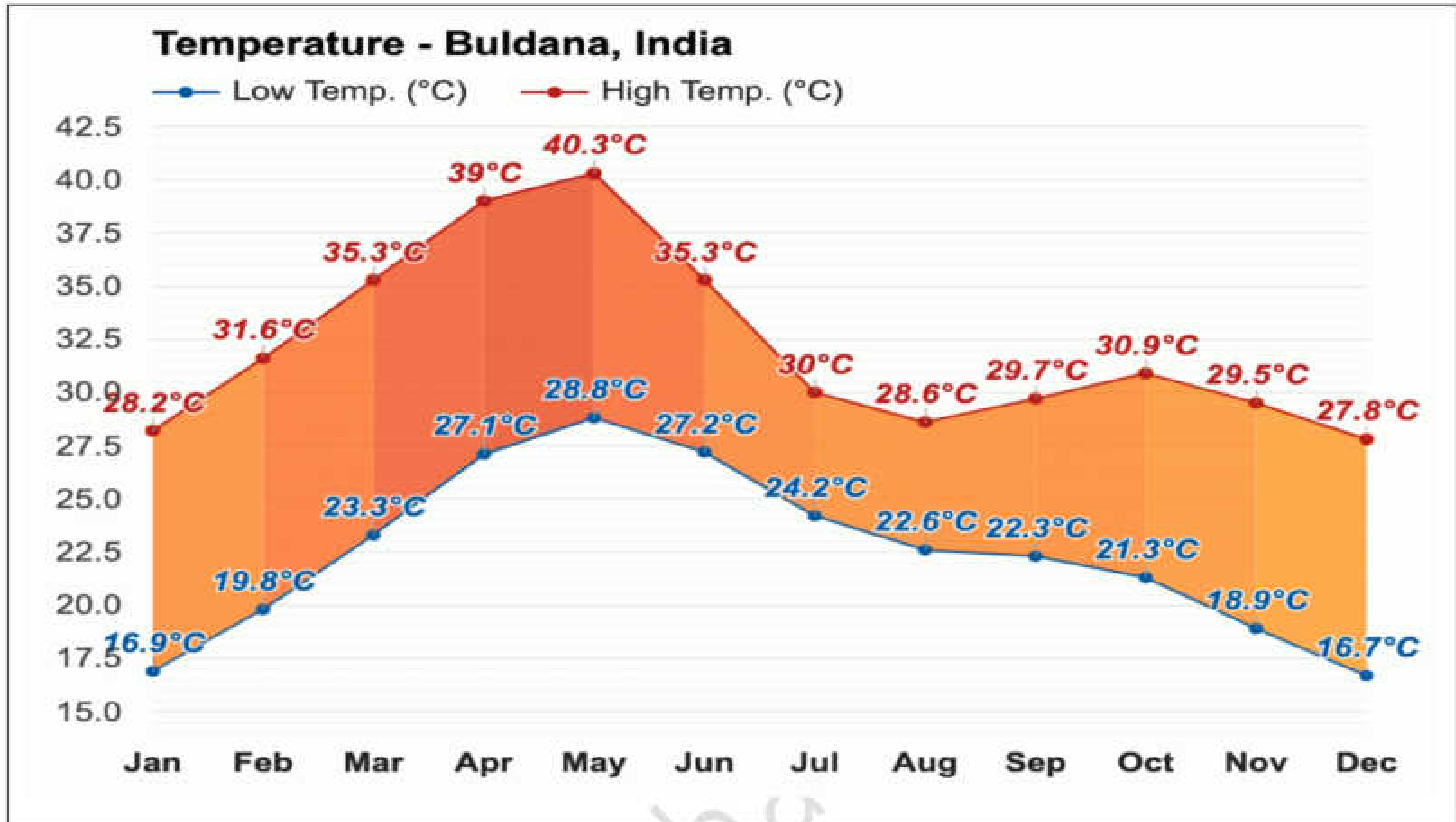
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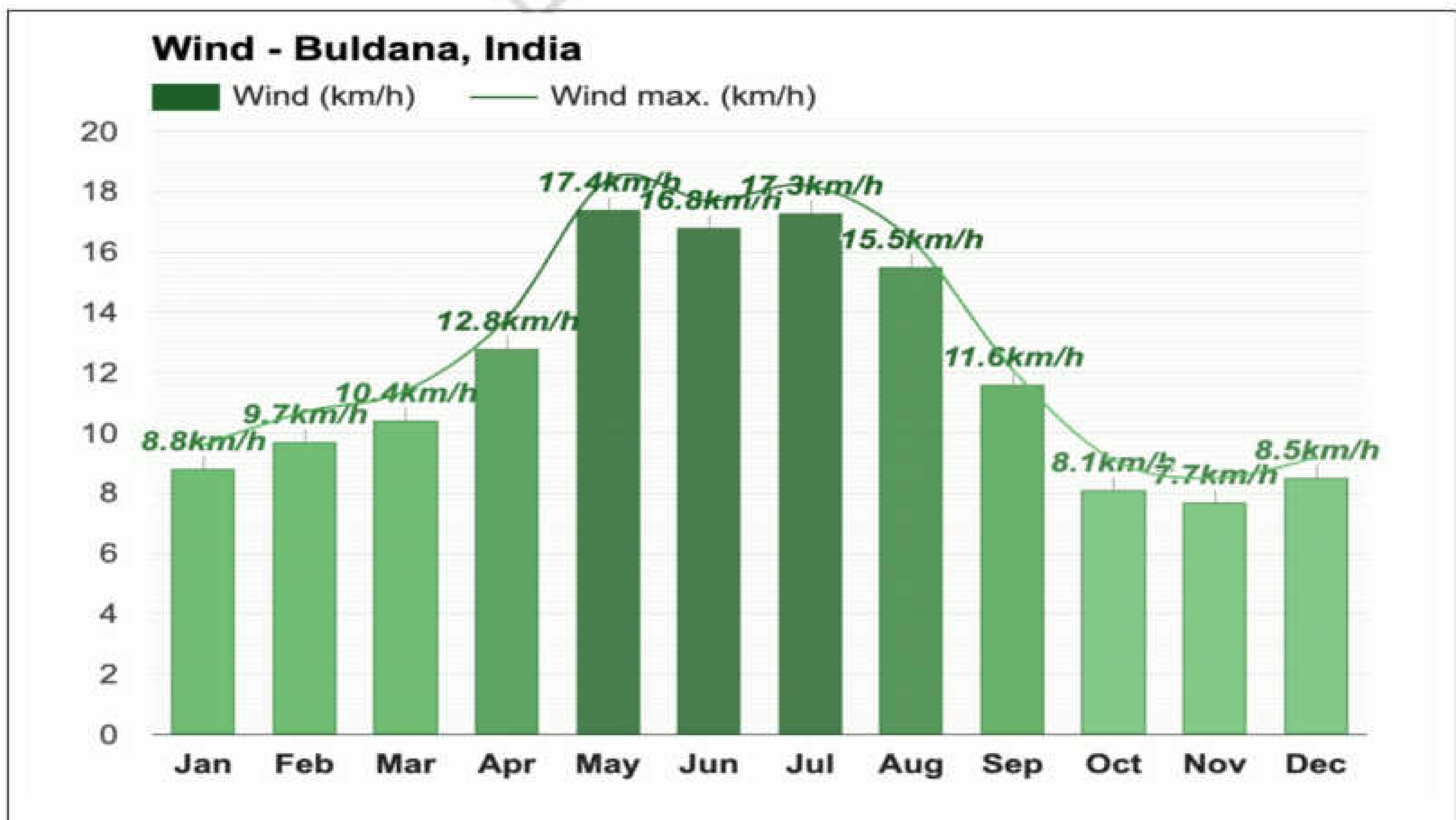
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Thombare S.P.

Shubham P. Thombare
Green Auditor



H.S. Patil

Dr. H. S. Patil
Lead Auditor

Green Audit Committee

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2.	Dr. H. S. Patil	Lead Auditor
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9.	Mr. Amol G. Jadhao	Coordinator

Biodiversity Audit

1. Biodiversity Audit:

Introduction:

The biodiversity of any institute defines the perspective of the institute towards the environment. More the diversity more the concern college has paid towards the environment. Keeping this in mind biodiversity audit is carried out on the campus of Gawande College of Pharmacy, Sakharkherda. This report includes the aims and objectives set for the audit, observation, conclusion, and recommendations in a brief and this report also mentions the best practices carried by the college including awareness programs, plantation drives, etc.

Aims and Objectives:

1. Enlisting of species biodiversity of the campus.
2. Analyzing spatial features of the area.
3. Mention the best practices carried out by the college.
4. Recommend new best practices

Methodology:

- 1. Field surveys:** Extensive field surveys are carried out to enumerate floristic diversity and enlisting of faunal diversity.
- 2. Collection and analysis of data:** The collected data from field surveys are tabulated and analyzed for deciding the biodiversity status of the campus.
- 3. Discussion:** The aspects regarding the biodiversity audit and environment-centric approach of an institute are discussed in great detail.
- 4. Recommendations:** The recommendations are issued after a detailed study of the data.

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Observations and inventory

Sr. No.	Common Name	Name of the plant	Number of units
1.	Neem	<i>Azadirachta indica</i>	86
2.	Gulmohor	<i>Delonix regia</i>	99
3.	Karanj	<i>Pongamia pinnata</i>	06
4.	Palas	<i>Butea frondosa</i>	17
5.	Kaner	<i>Nerium indicum</i>	20
6.	Bael	<i>Aegle marmelos</i>	02
7.	Lime	<i>Citrus acida</i>	05
8.	Audumbar	<i>Ficus glomerulata</i>	02
9.	Aamba	<i>Magnifera indica</i>	04
10.	Jambhul	<i>Eugenia jumbulona</i>	10
11.	Tad	<i>Phoenix sylvestris</i>	48
12.	Amla	<i>Embelica officinalis</i>	04
13.	Naral	<i>Cocos nucifera</i>	01
14.	Gulab	<i>Rosa sentifolia</i>	03
15.	Hirada	<i>Terminalia chebula</i>	02
16.	Chandan	<i>Santalum album</i>	23
17.	Vad	<i>Ficus benghalensis</i>	02
18.	Kachnar	<i>Bauhinia veriegata</i>	23
19.	Tulsi	<i>Ocimum sanctum</i>	50
20.	Korphad	<i>Aloe vera</i>	02
21.	Satvin	<i>Alstonia scholaris</i>	26
22.	Parn beej	<i>Bryophyllum pinnatum</i>	02
23.	Kamal	<i>Nelumbo nucifera</i>	01

Sr. No.	Common Name	Name of the plant	Number of units
24.	Champa	<i>Michelia champaca</i>	05
25.	Bamboo	<i>Bambusa arundinacea</i>	280
26.	Chinch	<i>Tamarindus indica</i>	04
27.	Sitaphal	<i>Annona squamosa</i>	10
28.	Phanas	<i>Artocarpus heterophyllus</i>	02
29.	Kardal	<i>Canna indica</i>	01
30.	Shirish	<i>Albizia lebbek</i>	10
31.	Bor	<i>Zizyphus jujuba</i>	07
32.	Chameli	<i>Jasminum grandiflorum</i>	02
33.	Shevga	<i>Moringa oleifera</i>	01
34.	Pimpal	<i>Ficus religiosa</i>	02
35.	Chikoo	<i>Achras sapota</i>	04
36.	Peru	<i>Psidium guajava</i>	10
37.	Sadabahar	<i>Catharanthus roseus</i>	01
38.	Sagwan	<i>Tectona grandis</i>	11
39.	Parijatak	<i>Nyctanthes arbor-tristis</i>	02
40.	Jai	<i>Jasminum sambac</i>	02
41.	Erand	<i>Ricinus communis</i>	04
42.	Amaltash	<i>Cassia fistula</i>	24
43.	Vilayati Chinch	<i>Pithecellobium dulce</i>	03
44.	Anjir	<i>Ficus carica</i>	01
45.	Gondan	<i>Cordia dichotoma</i>	02
46.	Australian Babul	<i>Acacia auriculiformis</i>	03
47.	Shisam	<i>Dalbergia sissoo</i>	17
48.	Ritha	<i>Sapindus mukorossi</i>	02

Sr. No.	Common Name	Name of the plant	Number of units
49.	Rain tree	<i>Samanea saman</i>	08
50.	Kate savar	<i>Bombyx ceiba</i>	02
51.	Star ficus	<i>Ficus benjamina</i>	01
52.	Royal Palm	<i>Roystonea regia</i>	19
53.	Morpankhi	<i>Thuja occidentalis</i>	05
Total			883

Discussion:

The 883 plants from 53 species among many other planted ornamental shrub and herb species show the richness of the campus in biodiversity sense. The institute is trying its best to maintain biodiversity on the campus as well as off-campus. As a part of the off-campus plantation, the institute is planting more than 100 tree saplings in the surrounding villages.

Best Practices in regards to Green Campus:

- i. **Medicinal Garden:** The College has developed a medicinal plant garden having 65 medicinally important species.

Recommendations:

The following recommendations are issued after studying the collected data:

1. As the campus is rich in floristic diversity, efforts should be taken to raise seed banks in the campus, which can be useful in conserving biodiversity.
2. The plants from native flora should be preferred for further cultivation activities on the campus.

ANNEXURE

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2023



Gawande
College of
Pharmacy,
Sakharkherda

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Sr. No.	Content	Page No.
1.	About the College	2
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4.	Solid Waste Audit	
5.	Water Audit	
6.	Noise Audit	

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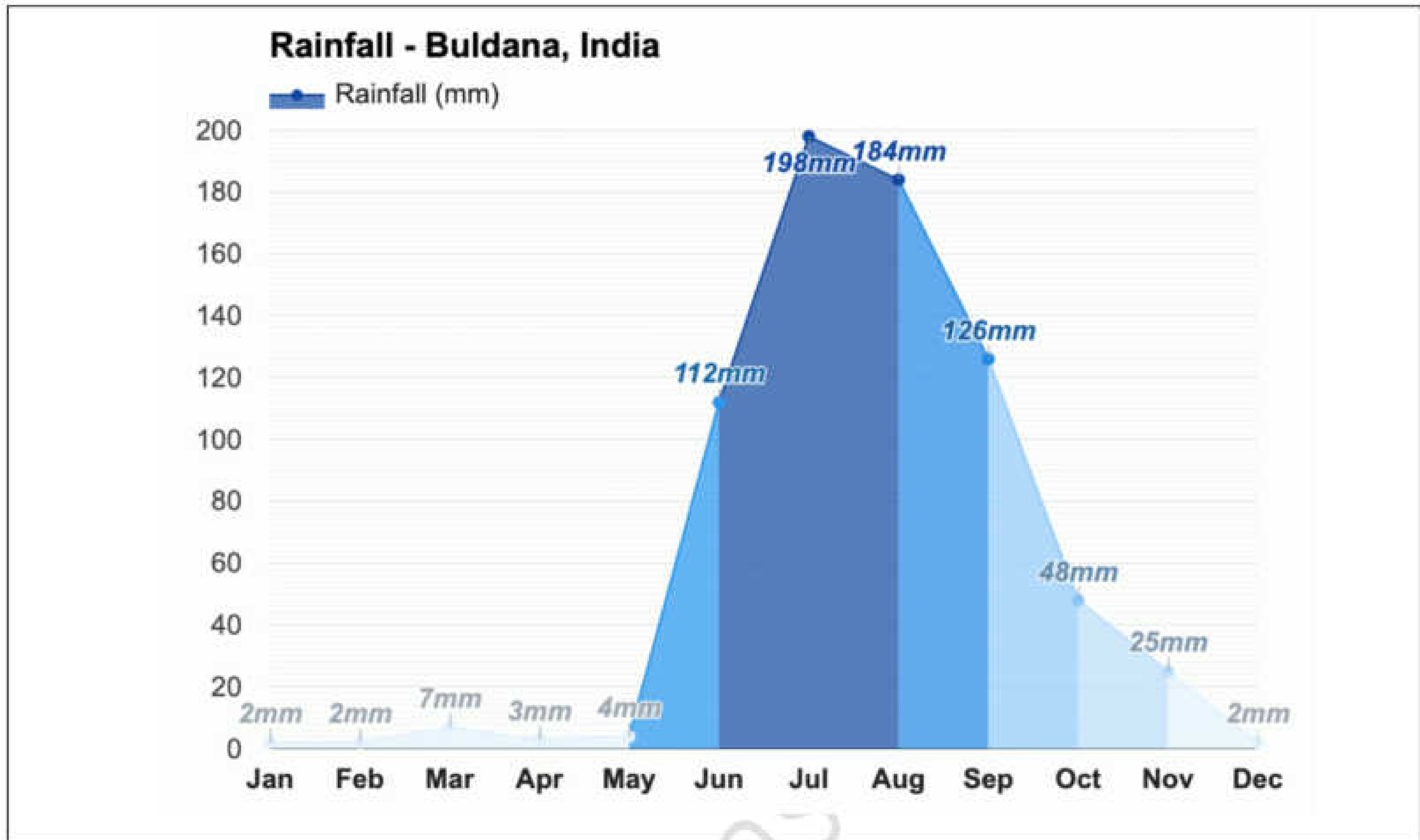
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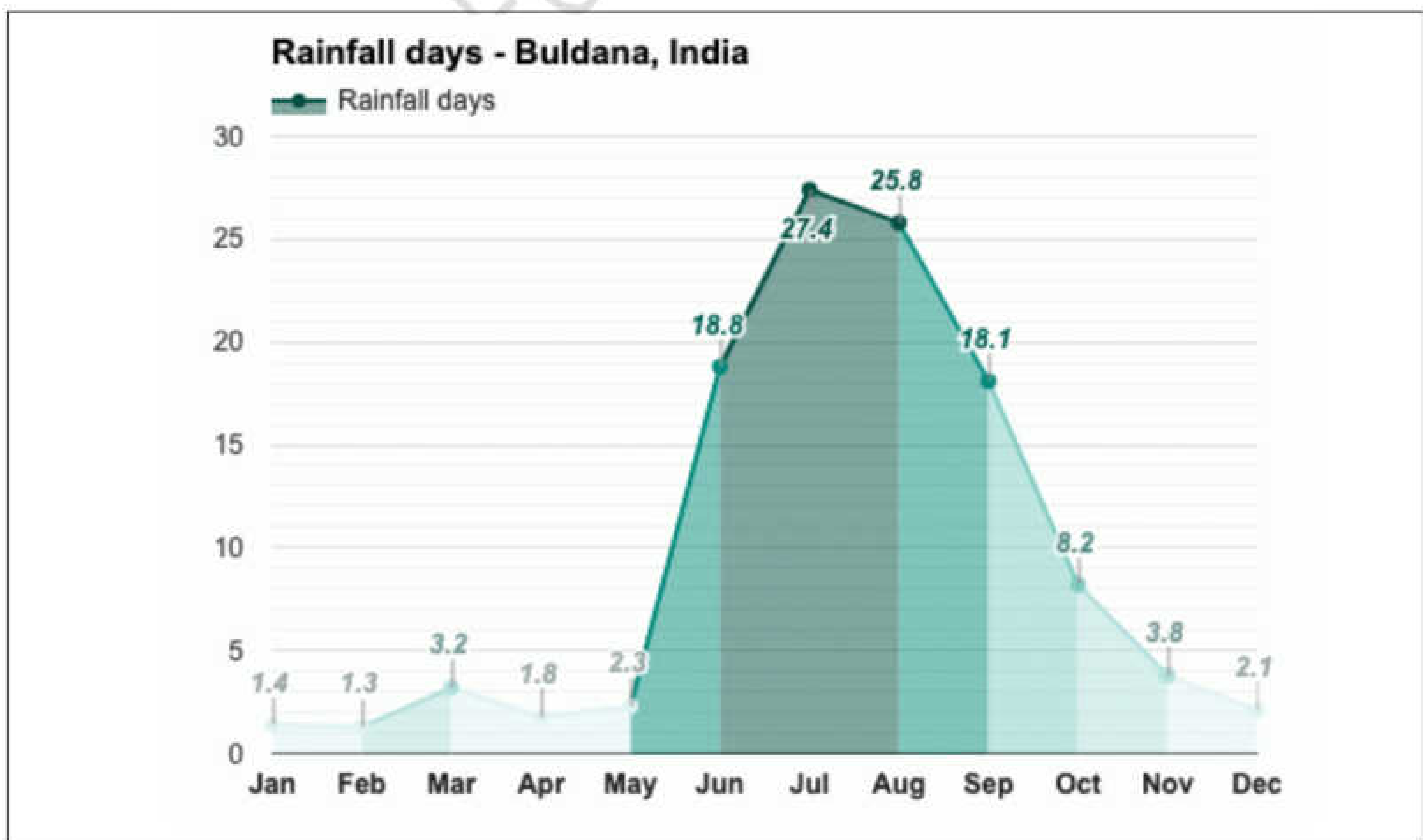
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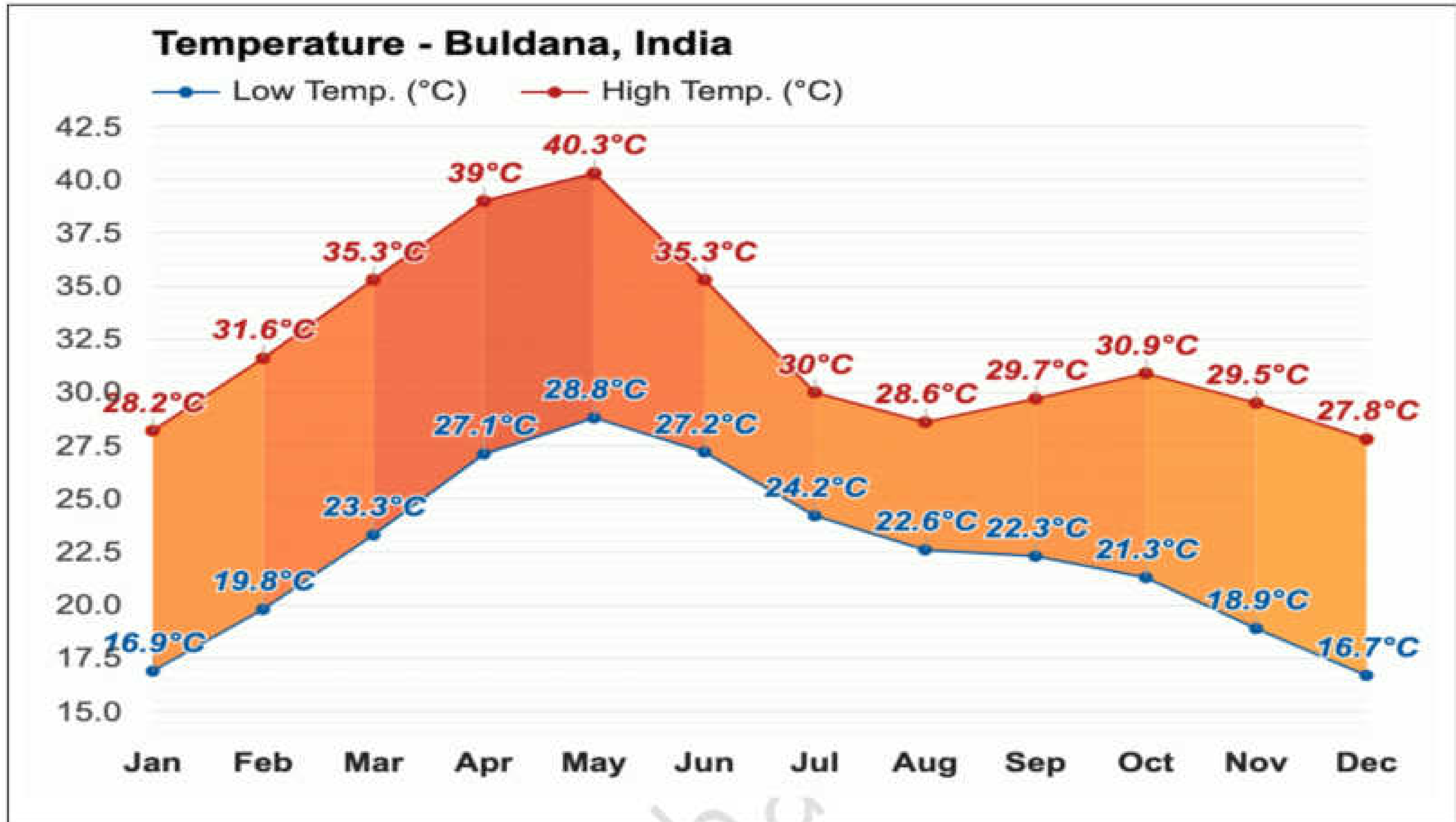
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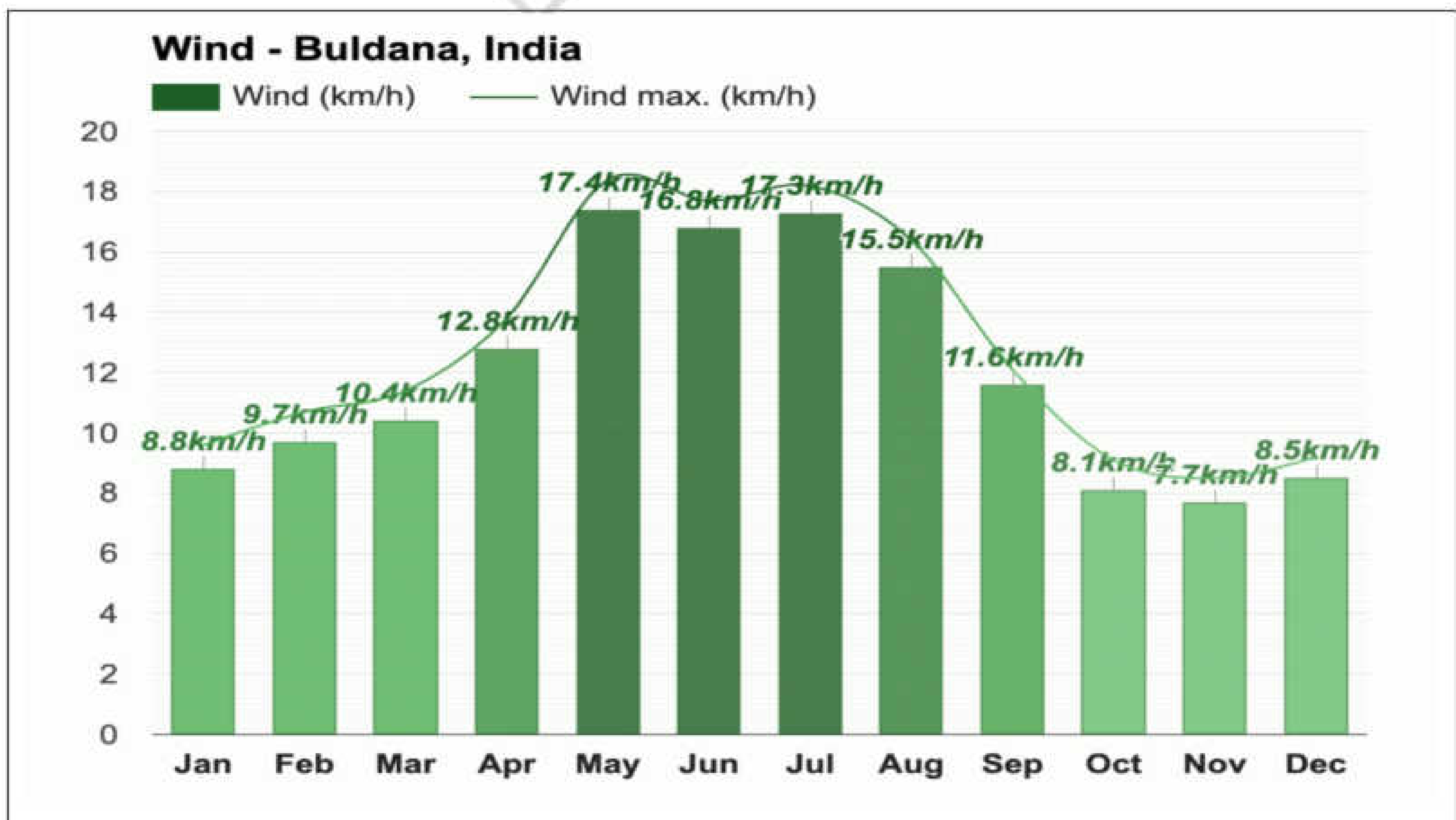
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Solid Waste Audit

1. Solid Waste Audit

Introduction:

Gawande College of Pharmacy, Sakharkherda is a well-known educational institute that progresses with an environment-friendly approach, and for any Environment-friendly institute, a Solid Waste Audit is considered a crucial part. In the educational institute, Paper, Chalk, Polythene, Glass, and Biomass are the major constituents for solid waste production. Although Paper, Chalk, and Biomass wastes are considered Bio-degradable wastes, these products directly or indirectly control the environmental cycles and their inappropriate management can raise environmental issues like eutrophication if this waste goes into the local water stream. To avoid such circumstances solid waste auditing is essential as it gives an actual idea about solid waste generation on the campus current strategies for its management and recommendations for more ecofriendly management. In this report, studies were carried out to analyze the solid waste profile of the college and corresponding waste management techniques.

Aims and objectives:

- i. To calculate total solid waste generation on the campus.
- ii. To classify solid waste according to categories and places.
- iii. To analyze the obtained data and find key solid waste generation places.
- iv. To discuss the present-day waste management strategy of the institute
- v. To issue appropriate recommendations considering different parameters like solid waste generation, management strategies, etc.

Methodology:**1. Data collection:**

While collecting data, solid wastes like paper, polythene, glass, chalks, etc. are stored separately in a dustbin for a week for each mentioned place and weighed on a balance at the end of the week. Solid waste like kitchen and food waste are weighed each day and disposed of, and the data of all seven days are added and represented separately.

2. Data analysis:

The obtained data is represented in tables and analyzed in MS Excel by pie diagrams and bar diagrams.

3. Comment on Recommendations:

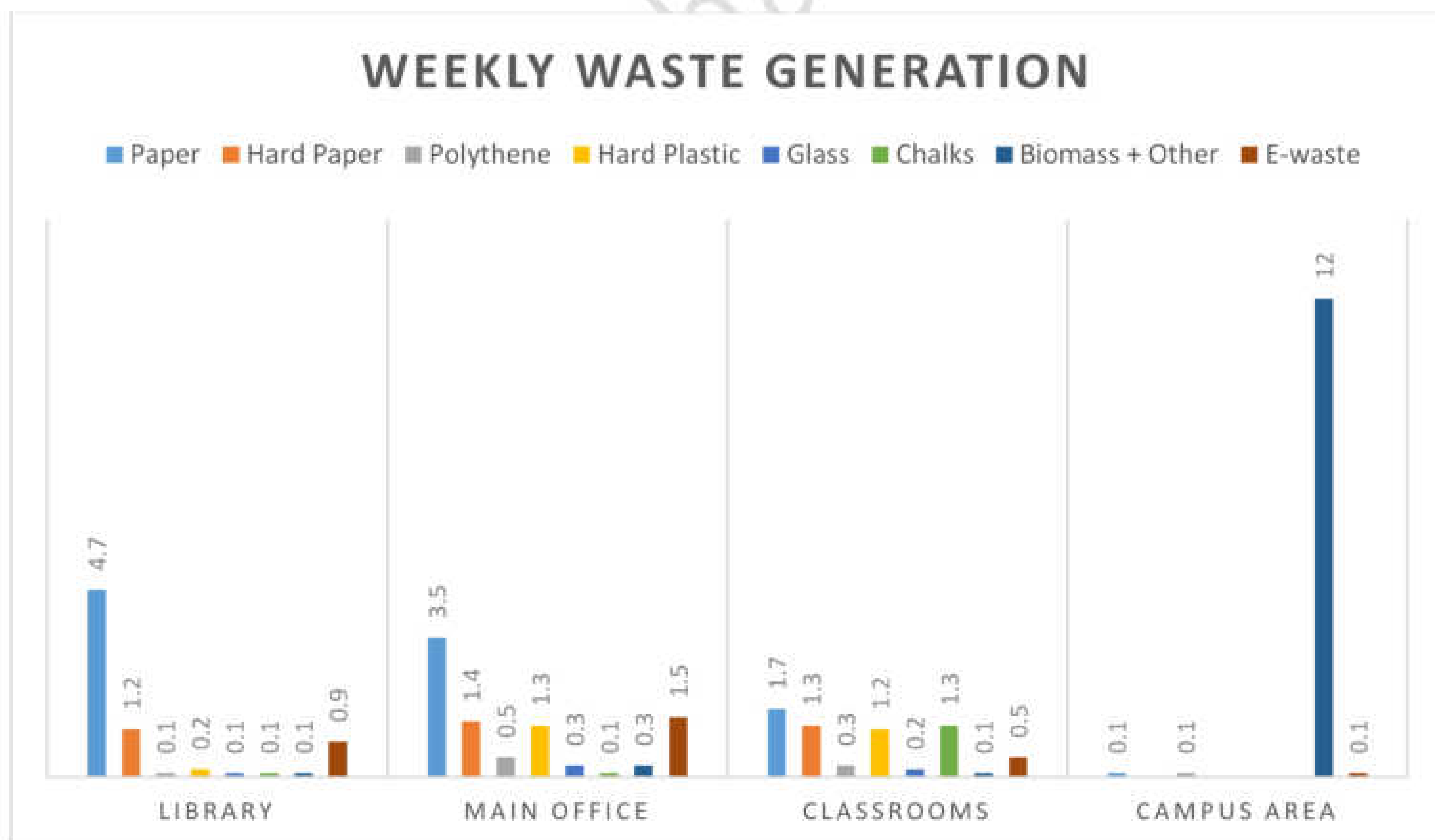
The comments have been made considering the number of stakeholders, the amount of total waste generation, the present-day waste disposal method, and research has been done to recommend more efficient methods of solid waste management.

Observations:

Solid Waste Accounting by Weight

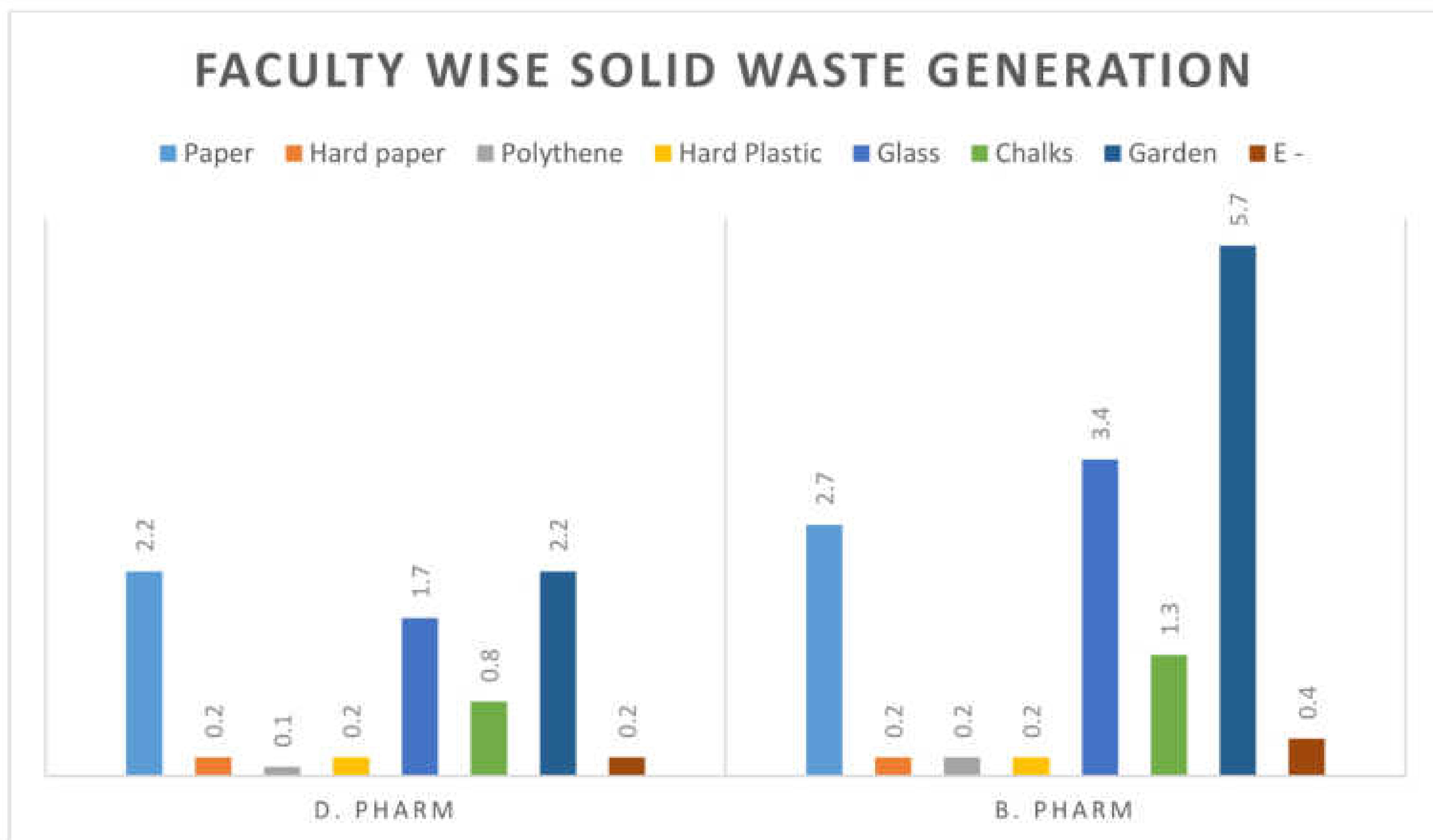
Place	Paper	Hard paper	Polythene	Hard Plastic	Glass	Chalks	Biomass + Other	E-waste
Library	4.7	1.2	0.1	0.2	0.1	0.1	5.5	0.9
Main office	3.5	1.4	0.5	1.3	0.3	0.1	9.4	1.5
Classrooms	1.7	1.3	0.3	1.2	0.2	1.3	7.0	0.5
Campus Area	0.1	0.0	0.1	0.0	0.0	0.0	12.0	0.1
Total	10.0	3.9	1.0	2.7	0.6	1.5	33.9	3.0

TABLE 1 Weekly Waste of Offices, Classrooms & Library in Kilograms. (Apx.)



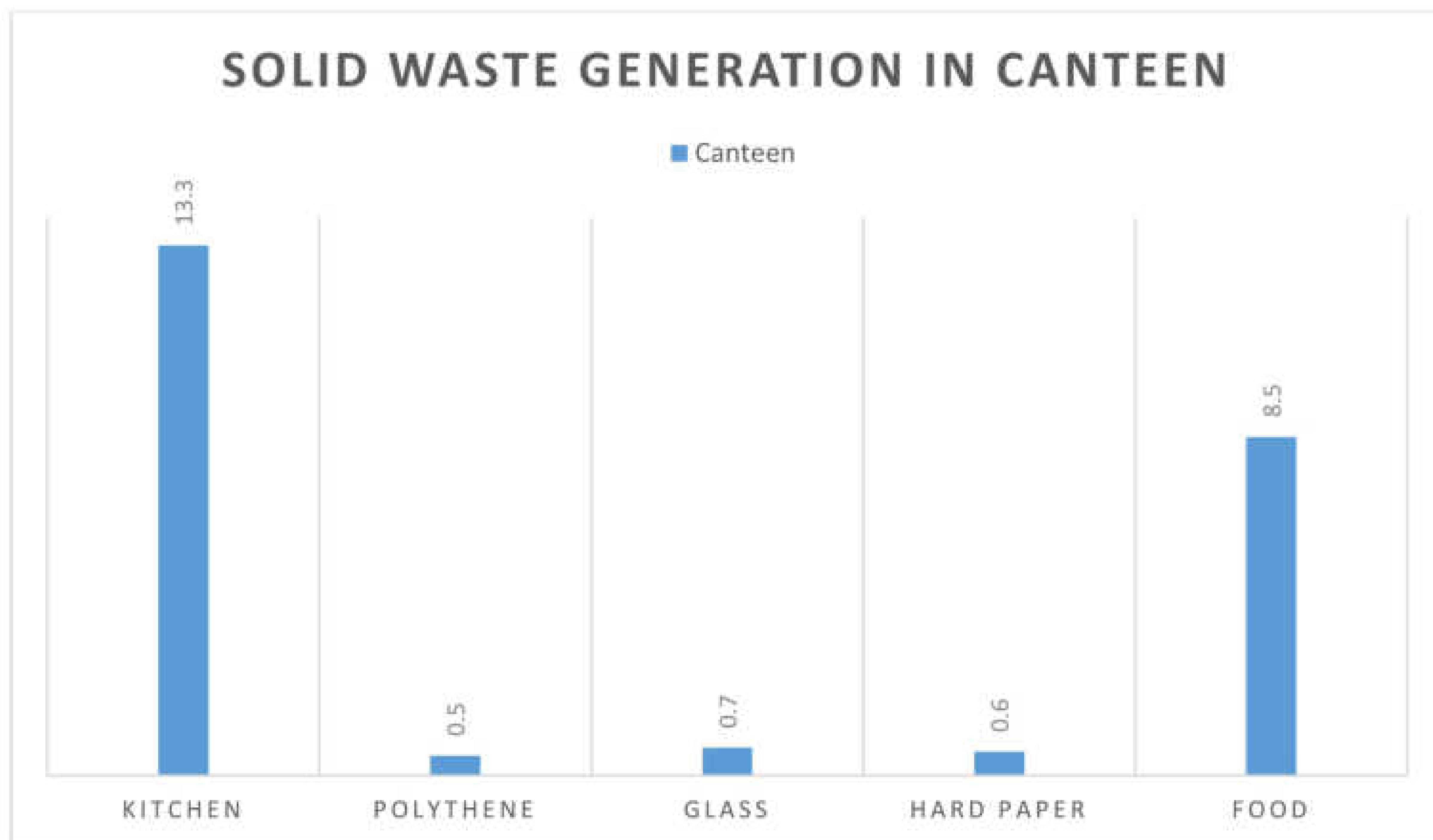
Departments	Paper	Hard paper	Polythene	Hard Plastic	Glass	Chalks	Garden	E - waste
D. Pharm	2.2	0.2	0.1	0.2	1.7	0.8	2.2	0.2
B. Pharm	2.7	0.2	0.2	0.2	3.4	1.3	5.7	0.4
Total	4.9	0.4	0.3	0.4	5.1	2.1	7.9	0.6

TABLE 2 Weekly Faculty Wise Solid Waste Generation of College in Grams



Place	Food	Kitchen	Polythene	Glass	Hard paper
Canteen	8.5	13.3	0.5	0.7	0.6

TABLE 3 Canteen – Weekly Solid Waste Generation in Kilo-Grams



Conclusion:

Paper, Food, and Garden waste (biomass) are the major constituents of solid waste generation on the campus. Hard Paper, Hard Plastic, and Chalk waste are the minor components of solid waste generation. After detailed studies, we observed that the campus has negligible polythene generation and that is mostly due to the inevitable sources like wrappers and milk packets, etc.

Discussion:

Gawande College of Pharmacy, Sakharkherda is a well-known institute in Buldhana District. The institute is famous for conducting curriculum-based activities and delivering social, moral, and ethical values to its stakeholders. As an environment concerned institute, the college knows Solid waste, the most common type of waste, should be managed properly. So, the college is working on various projects to inform students about solid waste management, including cleanliness drives, guest sessions, and scientific field projects.

To avoid the solid waste scatter on the campus, the institute has installed several waste collection bins on campus, as a result of this only biomass is found in the major source of Solid Waste Generation on campus as shown in table 1.

Recommendations:**1. Paperless Campus:**

To achieve and extend the goal of a paperless campus, the institute should work on the following aspects:

- i. The steps like preference should be given to cloud storage against hardcopy prints for storing office-related documents and paper.
- ii. The surveys and tests should be conducted on virtual platforms like Google Forms.

Water Audit

ECOS

2. Water Audit

Introduction:

Water is the prime important constituent of life. The quality of water and availability of water are the factors that define the health of the system. In education institutes having science faculty the amount of chemical mixed wastewater generation is considerable. While the college has around 600 stakeholders, so, it counts for moderate demand for potable as well as non-potable water. So, the necessity to build appropriate water storage systems, check on the water demand, ensure efficient use of water, and develop appropriate wastewater management systems is of primary importance. The campus of Gawande College of Pharmacy, Sakharkherda holds several trees, a canteen, and a toilet which are key sink areas for non-potable water. Water purifiers in the campus, as well as in the canteen, and the mess are major potable water storage systems. All the detailed study regarding the water system of the campus is reported in this report.

Aims and objectives:

- To describe the water storage system of the campus in great detail.
- To estimate the total potable and non-potable water demand of the campus.
- To compare data regarding water storage systems and estimated water demand.
- To recommend specific techniques to use water efficiently.

Methodology:

1. Data Collection

i. Water storage system:

The water storage system of the college is documented by organizing broad interviews with the college staff and spot inspection by audit experts.

ii. Potable and non-potable water demand:

For estimating the water demand of the campus, surveys are carried out among all the stakeholders and staff digitally (Google Forms), and the collected data is then analyzed and represented in Microsoft Excel.

iii. Wastewater management system:

The data on the wastewater management system is collected through visits to the places on the campus by audit experts and auditors.

2. Data Analysis

The collected data from digital surveys, interviews, and spot visits is then analyzed by MS Excel and represented in suitable diagrams.

3. Comments and Recommendations

The comments and recommendations have been made considering the number of stakeholders, the total water demand, the water storage system, wastewater generation, and the wastewater management system.

Observations:**Water storage details:**

Sr. No.	Non-Potable Water Storage System	Capacity in Liters
1.	Boys Common Room	5000
2.	Girl Common Room	5000
3.	Principal & Bord Room Toilet	3000
4.	Canteen Tank	3000
5.	Bore well	5.8 HP
Total		16,000 + B.W.

Sr. No.	Potable Water Storage System	Capacity in Liters
1.	Water Tank - 1 in the campus	5000
2.	Water Tank - 2 in the campus	3000
3.	Canting water tank	3000
Total		11,000

WATER USAGE

Water users	Number
Students	530
Teaching staff	32
Non-teaching staff	28
Total	598

The total number of taps including toilets, washrooms, garden, and departments.

Sr. No.	Place	Number of taps
1.	Toilet	6
2.	Washroom	6
3.	Garden	02
6.	Department	14
Total		28

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Calculations:

1. Non-Potable Water Demand: (excluding laboratory and garden use)

Per Head Non-Potable Water Demand Calculated by analyzing data of personal individual water use.

Net Non-Potable Water Demand is: 04 Lit/head/day

Number of Users = 600

Total Non-Potable Water Demand = 2,400 Lit/day

Total Non-Potable Water storage system capacity = 16,000 lit

The Non-Potable Water Demand to Storage ratio of the college is 1:6

Discussion: After considering water flow to the laboratory and garden including leakage and wastage, the water storage system is properly built considering water demand.

2. Per Head Potable Water Demand:

Per Head Potable Water Demand Calculated by analyzing data of personal individual water use collected by Google Forms.

Net Potable Water Demand is: 02 Lit/head/day

Number of Stakeholders = 600

Total Potable Water Demand = 1,200 Lit /day

Total Potable Water storage system capacity = 11,000 lit

The Potable Water Demand to Storage ratio of the college is 1:9

Recommendations:

1. By calculations, it is recommended to install at least 2 RO filters and storage assemblies minimum of 50 liters.
2. The storage tanks should be cleaned every week.

Discussion:

The key water sources on the campus are-

1. Bore-well

Recommendations:

1. Wastewater disposal:

As the practical in pharmacy college involves the use of various chemicals for its practical purposes, healthy practices should be adopted for wastewater disposal at Chemistry laboratories, which includes- keeping three separate containers for the chlorinated chemicals, non-chlorinated chemicals, and water-miscible chemicals. The generated waste chemicals are then suggested to be handed over to the water treatment laboratories.

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Noise Audit

ECOSHA

3. Noise Audit

Introduction:

Gawande College of Pharmacy, Sakharkherda believes in student's utmost development by providing quality education. The institute takes all moral, ethical, and social responsibilities that will enhance students' focus in all aspects of the course curriculum. For the same, the institute has taken in its policy that, the institute will have silent but happening premises which will lead to better growth of students. This report includes the data, calculations, analysis, and discussion about the noise index of the campus and corresponding standards set by government agencies.

Aims and Objectives:

1. To analyze noise level on the campus considering road traffic parameters, different noise indices, and altitudinal response.
2. Recommend healthy practices to minimize or maintain noise levels.

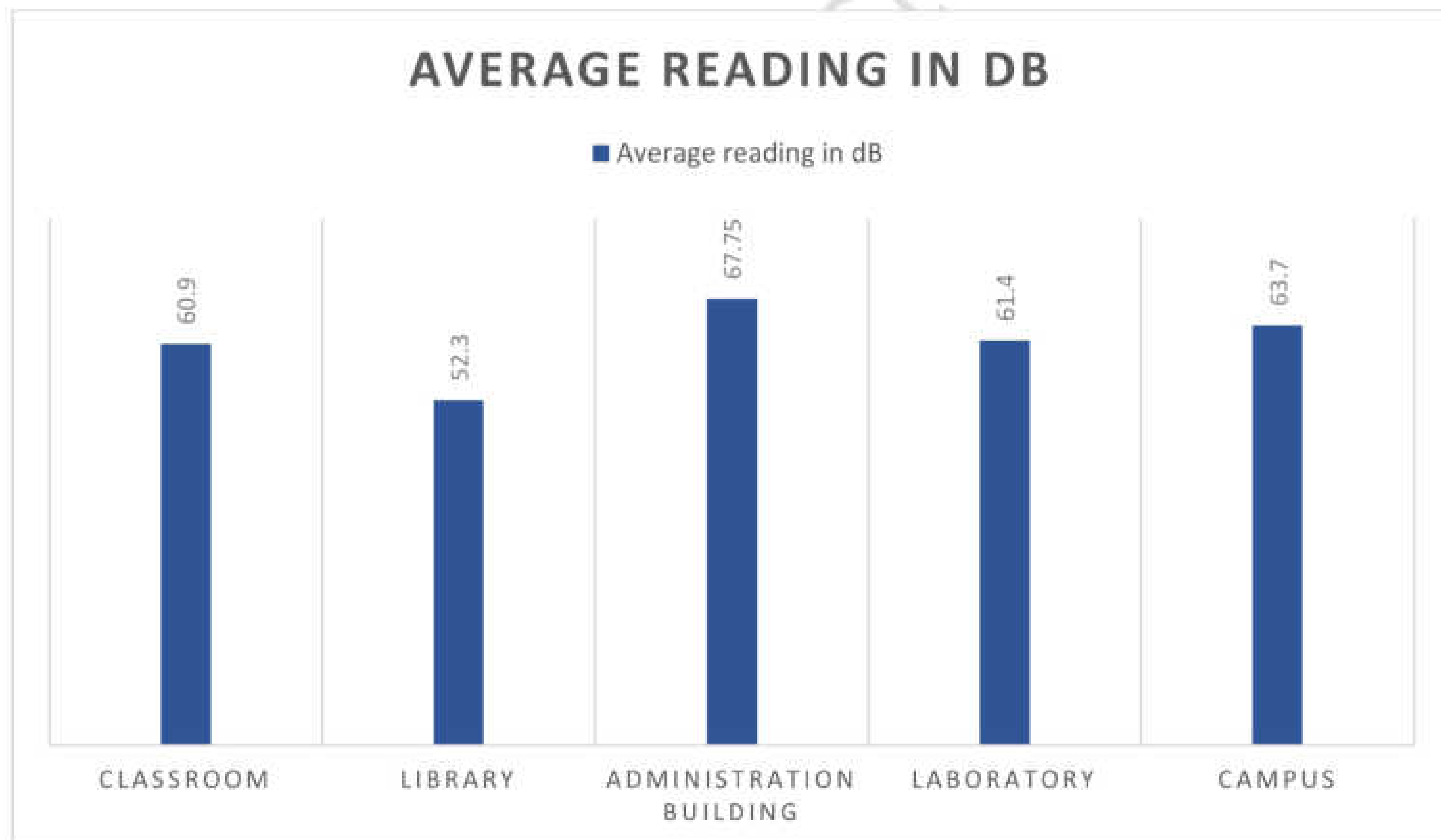
Methodology:

- 1. Review of literature and Government standards:** This audit procedure included a review of government policies related to noise standards in educational institutes.
- 2. Data Collection:** The data regarding noise is collected from different locations and times. A noise Meter is used for the collection of data in decibels.
- 3. Result and Conclusion:** The result and conclusion are drawn after the detailed analysis of the literature reviewed and the data collected.

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Observations:**Observations:**

Sr. No.	Location	Time slot	No. of reading taken	Average reading (db)
1.	Class	12 to 4	10	60.9
2.	Library	11 to 5	10	52.3
3.	Administrative Building	10 to 6	10	67.75
4.	Laboratory	1 to 3	10	61.4
5.	Campus	11 to 5	10	63.7

**Conclusion:**

The key place for noise generation is the Administration Building, which shows the highest (Average for the location) i.e. 67.75 dB and Classrooms, Campus, and

Laboratory have moderate noise generation ranging from (60.9 dB to 63.7 dB) while the Library has the lowest (Average for the location) noise generation i.e. 52.3 dB

Discussion:

The standards set by CPCB (Central Pollution Control Board) for silent zones include noise levels of 55dB in the daytime and 45 dB in the nighttime. The core study areas of the college premises meet the standards set by CPCB for the educational institute and so the college can be considered as a silent zone as it meets the standards set by CPCB. The highest level of noise on the campus is at the entrance gate (69.5 dB), which is due to the vehicular noise on the street next to the entrance gate. The lowest noise level on the campus is near the classroom, library, and botanical garden (51 dB \pm 2 dB), which is due to the architectural planning of the infrastructure and dense vegetation on the campus.

Recommendations:

The following recommendations are made to monitor the noise level on campus:

1. It is recommended to plant more trees near the boundary of the college campus, which will reset the noise level caused by vehicular traffic on the road.
2. The institute should organize at least one session during the student's induction program for awareness regarding noise pollution including the preventive measures, causes, and solutions to noise pollution.



Energy Audit

Gawande College of Pharmacy

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GAWANDE COLLEGE OF PHARMACY

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The management established Gawande College of Pharmacy in 2015–16, originally with a 60-student intake capacity for the D.Pharm degree (2 years in length), and later on with a 100-student intake capacity for the B.Pharm course (4 years in length). All governing authorities, including Sant Gadge Baba Amravati University, the State Government, the DTE, PCI, and MSBTE, have authorized the college. The management chose qualified and experienced employees for academic and support roles and created good infrastructure for both courses in accordance with AICTE standards.

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8.	Mr. Sharukh Khan	Energy Audit Expert

GAWANDE COLLEGE OF PHARMACY

Our nation has potential in intelligence but was on back foot in terms of quantity and quality of education. Today our nation is marching towards developed nation in numerous fields. Among these fields, we have to meet energy demand and to produce clean sustainable energy. Our world is now in energy crisis, we as world facing energy shortage, in future it may increase. This causes lack energy for institutional work. Thus, we need institutional management in saving electricity, using it in smart way and producing electricity effectively for socio-economical purpose.

For energy, our nation is entirely depending upon fossil fuels. India has huge potential in producing energy in renewable sector. In India, 35% electrical energy is used by industrial sector, 28% by domestic sector, 21% agriculture sector, 9% Commercial sector and rest of electricity is used by common public applications. Energy conservation is the solution to the energy crisis, meaning reduction in energy consumption without compromising quality and quantity of work. Energy Conserved is the start of energy management, it leads to adequate rating of equipment's, replacing it with efficient (high rating) and improving habits to save more energy. It will vital to being self-sufficient organization in terms electricity.

In the present study, energy audit has been done. For these audit laboratories, instruments, air conditioners, fans, lights, fans, computers and its peripheral devices are considered in the study. The study also include total economic budget of college for the

electricity. We have calculated exact number tubes, computer instruments etc. We studied all these mentioned things by collecting exactly data from survey.

EXPERIMENTAL AND DATA COLLECTION:

In building, in every room, how much fans, computers, instrument, AC etc. were measured. According to survey following data is collected.

Total Power requirement of various equipments:

Appliances	Total Number	Hours of operation (hr)	Wattage (Watt)	Total power used (Watt)
Aquaguard	1	2	25	50
Automatic Hand Dryer Machine	1	0.5	180	90
Blower	1	0.5	600	300
CCTV Camera	52	6	4	1248
Coffee vending machine	1	1	1100	1100
Deep Freezer	1	12	600	7200
Desktop computer	65	0.5	150	4875
Electric Chimney	2	0.5	150	150
Emergency alarm (Lifts)	1	8	10	80
Fake Currency Detector	1	0.25	9	2.25
Flour Kneading Machine	1	0.5	400	200
Lamination Machine	1	0.5	90	45
LED TV	1	2	80	160
LED Xray View Box	1	2	15	30
Lift pump	1	1	500	500

Appliances	Total Number	Hours of operation (hr)	Wattage (Watt)	Total power used (Watt)
Mic System	2	1	200	400
Microwave Oven	2	0.5	500	500
Mixer Grinder	2	1	450	900
Mosquito Killer Machine	16	0.25	40	160
Motorized Projector Screen	2	0.1	80	16
Note Counting Machine	1	0.25	9	2.25
PA System	2	0.25	300	150
Photocopy Machine	2	0.5	500	500
Printer	6	1	50	300
Projector	2	1	200	400
Punching machine	6	1	12	72
Refrigerator	2	1.5	300	900
Sanitary Vending Machine	1	0.5	200	100
Submersible Motor pump (Connected to well/ borewell)	2	1	2000	4000
Sprinkler system for garden	2	1	200	400

Appliances	Total Number	Hours of operation (hr)	Wattage (Watt)	Total power used (Watt)
Non-LED TV	2	2	140	560
Water Cooler	2	1	600	1200
Water Treatment Plant (RO Big machine)	1	3	60	180
Weight Machine	1	1	5	5
UPS	65	0.25	300	4875
Induction stove	2	1	900	1800
Total Consumption in a day (kW)				33.4505
Total Consumption in a month(kW)				1003.515

Equipemnt wise electricity consumption

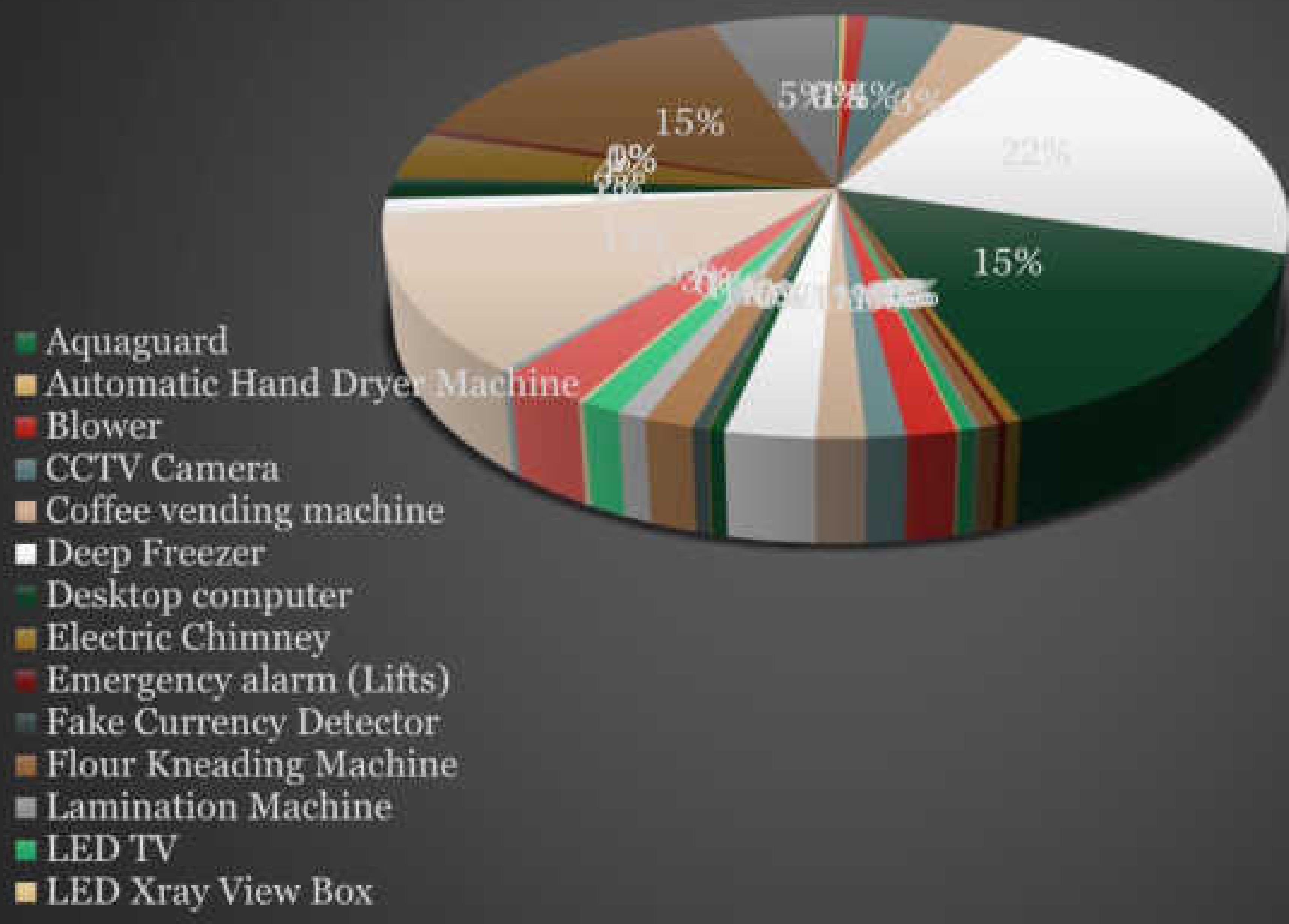


Fig. Power consumption by various equipments

Consumption Unit:

Sr. No.	Month	Consumption
1	June-22	1000
2	July-22	1000
3	August-22	1000
4	September-22	1000
5	October-22	1000
6	November-22	1000
7	December-22	1000
8	January-23	1000
9	February-23	1000
10	March-23	1000
11	April-23	1000
12	May-23	1000
Total Power Consumption in Yearly(Units)		12,000
Average Power Consumption in		1000

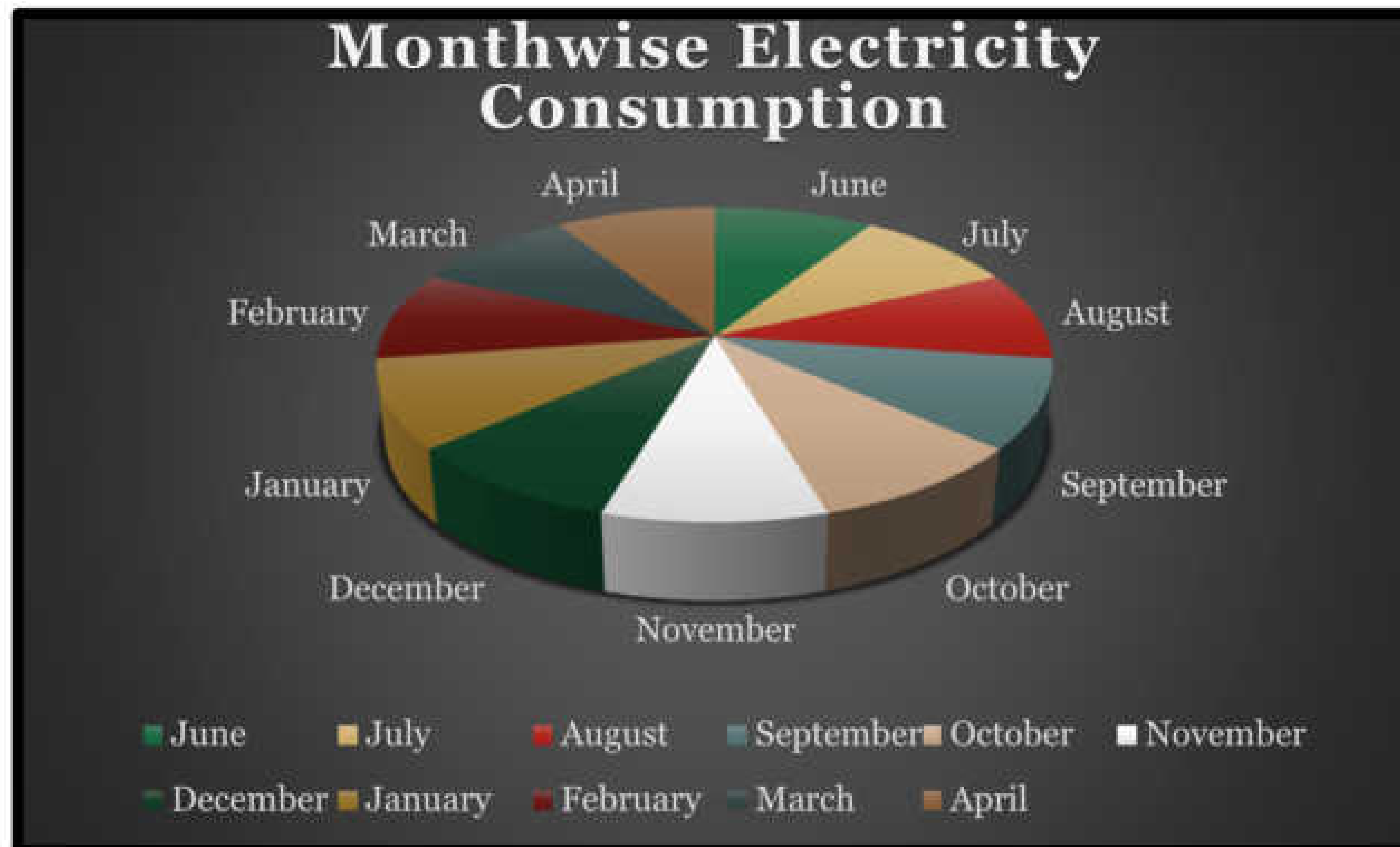


Fig. Month wise electricity consumption

Best practices and recommendations:

- College uses stabilizers for AC and Refrigerators.
- Colleges has connected computers and printers in LAN.

Recommendations:

- Replace all regular tube light and CFL tube light using LED bulb, to save more power.
- Use solar energy and/or wind energy to reduce grid electricity consumption.

Conclusion:

Data generated in energy audit are useful to understand the energy distribution and utilization of college. The college needs 12,000 KW of electricity. This is on average 1000 KW/month. There are some equipments which are not included because they are less or often used.

College runs during day time so there is very less electricity consumption.