

Volume 16 : 2020-21

## ANTHESIS



# The Green Wars

Uninstalling Ecocídio

Department of Botany Gargi College, Siri Fort Road New Delhi - 110049

ANNUAL PUBLICATION OF GARGI COLLEGE
BOTANICAL SOCIETY



THE ANNUAL PUBLICATION
OF GARGI COLLEGE
BOTANICAL SOCIETY

## Anthesis

**VOLUME 16: 2020-2021** 

Department Of Botany Gargi College, Siri Fort Road New Delhi - 110049

UNIVERSITY OF DELHI

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It is indeed a matter of pride to pen down the preamble for the 16th volume of the annual magazine "Anthesis" of the Botanical Society "TARU".

The human race to conquer everything possible including mother nature made us deaf about the signals that we were receiving in terms of polluted environment, unprecedented situations like the forest fire in Australia, flood in the desert of Saudi Arabia, uncontrollable air & water pollution in India to name a few. Climate change is an environmental challenge antagonising all countries across the globe although the intensity may vary.

Across continents, the adverse effects of climate change have been revealed over the years as ozone layer depletion, continental global warming, shower of acid rain, extended fires, melting ice, rise in sea level, and other extreme events which are alarming and need an urgent action at national and international levels.

This department is conscious about the environment. Its presence can be felt through plants, flowers, and scientific cataloging of the flora while walking down the corridors and lawns of the college. When the environment around you is clean, you experience a higher level of awareness and it helps you to see through things more evidently.

This department is committed to provide an environment which enriches the intellectual and emotional development of students in an atmosphere that is vigorous, happy and nurturing.

The foremost goal of the college is to provide an education which explores and strengthens the potential which is innate in every individual but awaiting expression. Taping the vast potential of our students through such magazines and newsletters is one such endeavour in this direction.

I congratulate the editorial team and contributors for this magazine and eagerly awaits the coming issue of "Anthesis".

PROF. (DR.) PROMILA KUMAR
PRINCIPAL
GARGI COLLEGE, UNIVERSITY OF DELHI



Anthesis is a forum where we get to see the creative expression of our students. The variety and creativity of the articles in the Anthesis represent the talents of our students and faculties. I congratulate the entire team for their hard work and dedication for making this magazine. The reflection of the students' and teachers' creativity is the epitome of the magazine. I am sure that the positive attitude, hard work, sustained efforts, and innovative ideas exhibited by our young budding talents will surely stir the mind of the readers and take them to the fantastic world of unalloyed joy and pleasure.

"Success comes to those who work hard and stays with those who don't take rest on the laurels of the past".

My heartfelt appreciation to our teacher editors Ms. Ruchitra, Dr. Gladys, Dr. Preeti, and Dr. Akanksha for constantly guiding students at every step. I congratulate the entire editorial team for their hard work and dedication.

"With warm wishes and God's blessings".

DR. GEETA PRABHAKAR
TEACHER IN-CHARGE
DEPARTMENT OF BOTANY. GARGI COLLEGE



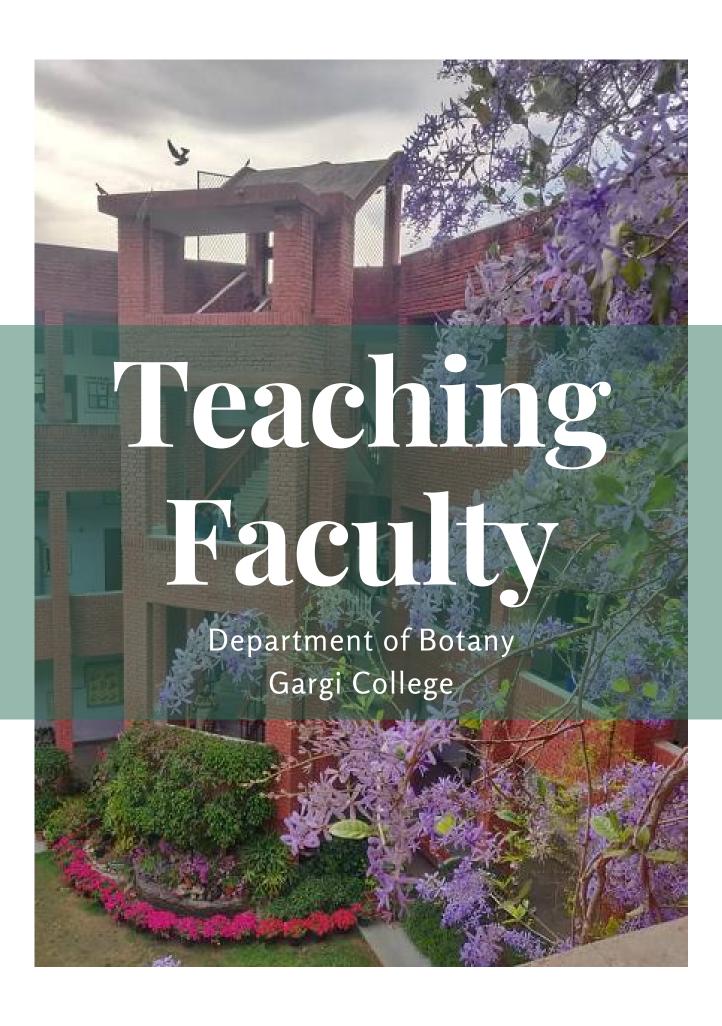
It gives me immense joy and pleasure to put forward the 16th Volume of the Annual Publication of Gargi College Botanical Society, Anthesis.

Anthesis began its journey about 16 years ago with mere 21 pages. Anthesis started as a paper-based yearly magazine, later transfiguring into an ezine. Since then, it has been exploring the vast realms of Plant Sciences & Environmental Sciences, in the most creative ways possible. It serves as a platform for both students and teachers to express their views and understanding about various topics that they find interesting in science. It comes forward with a brand new exhilarating theme every year to stir the curiosity of young budding minds.

Being a part of this team for three successful consecutive years, helped me learn and gain numerous new skills, enabling me to grow perfectly in this beautiful yet rapidly changing world. Since last year, the whole globe is confined between concrete walls, with people introspecting about their criminal deeds towards Mother Nature for the past few decades. Hence, the theme this year "The Green Wars: Uninstalling Ecocídio", majorly focuses on enlightening everyone of such defense mechanisms that our ecosystem is developing in response to the continued anthropogenic activities that grossly violate and destroys the integrity of the environment as well as the human efforts to protect it. Environment for long has been a casualty of unbridled human pursuits, from contamination of land resources to the increasing plunder of natural resources, from deflecting the natural routes of water bodies to damaging and destroying the habitat of other fellow earthites. The environmental consequences of human activities are widespread and devastating, and hence they need spotlights.

I am grateful to all the professors for their contribution to the magazine. I am extremely thankful to the faculty advisors Ms. Ruchitra Gupta, Dr. Gladys Muivah, Dr. Preeti Agarwal, and Dr. Akanksha Madan for their constant advice and motivation to improve and enhance the essence of the magazine. I am indebted to the amazing editorial team members of Anthesis for their immense cooperation and efforts, helping this edition to take the shape it has today. I would also extend my gratitude towards Principal Prof. (Dr.) Promila Kumar for giving us the opportunity to publish the yearly magazine.

SHREYA SHAMBHAVI EDITOR ANTHESIS VOLUME 16





### Professors of

### DEPARTMENT OF BOTANY



Professors of

### DEPARTMENT OF BOTANY



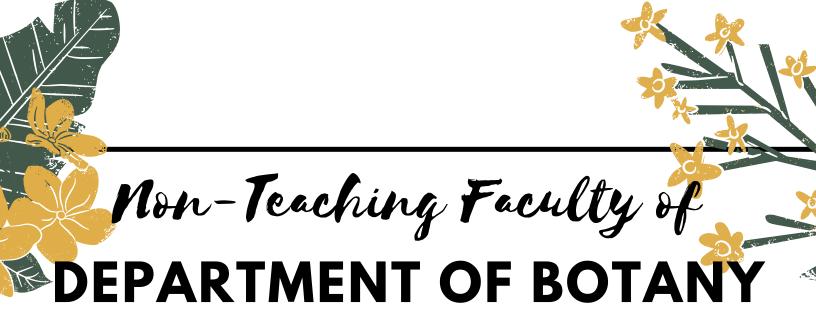
Dr. Geeta Mehta	Dr. Garvita Singh
Dr. Aparajita Mohanty	Dr. Samira Chugh
Dr. Priyanka Pandey	Dr. Gladys Muivah
Dr. Leisan Judith	Dr. Preeti Agarwal
Dr. Geeta Prabhakar	Dr. Neha Singh
Dr. Jasmeet Kaur Abat	Dr. Akanksha Madan
Dr. Renu Soni	Dr. Pritam Kaur
Dr. Reema Mishra	Dr. Sumit Raj
Dr. Vera Yurngamla Kapai	Dr. Renu Puri
Ms. Ruchitra Gupta	Dr. Bhavana Sharma
Dr. Anjana Rustogi	

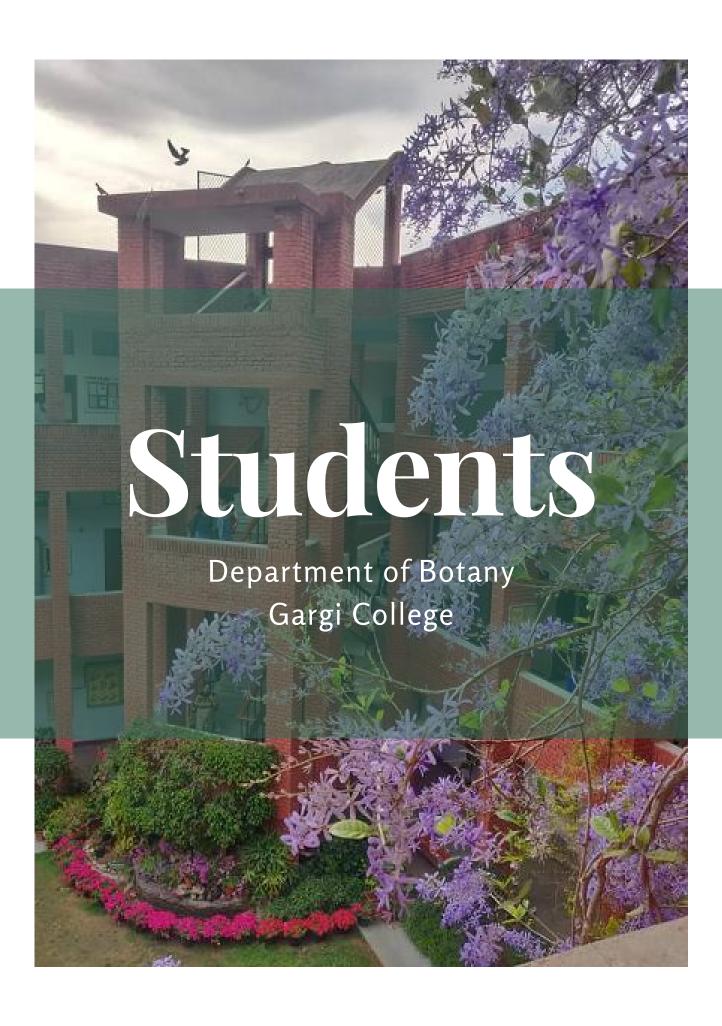
### Professors of

## DEPARTMENT OF BOTANY

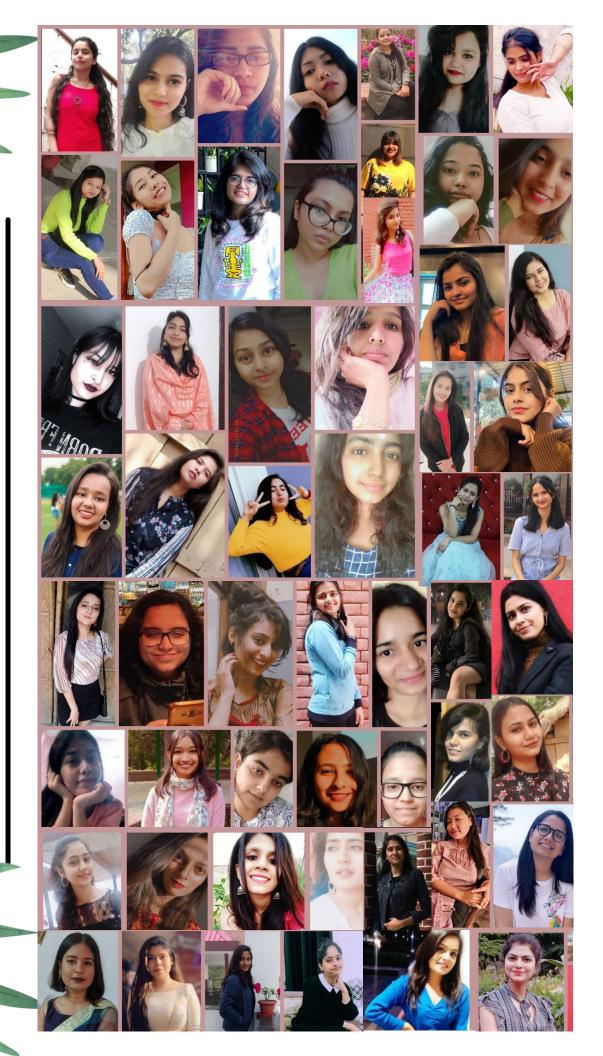


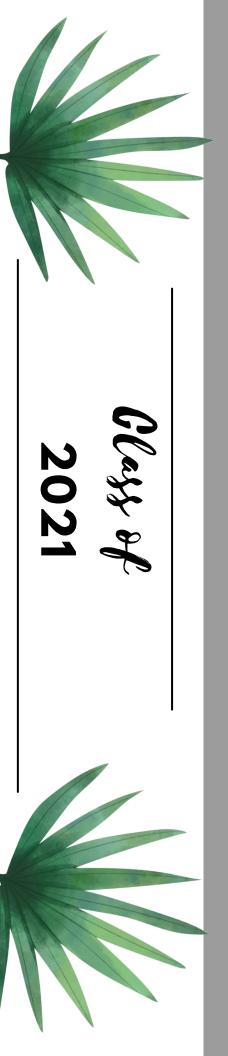
Mrs. M.D Sharma	Mrs. Shashi Bala
Mr. Ashok Kumar Rana	Mrs. Rajni
Mr. Arun Kumar	Mr. Panchan Singh
Mr. Vijay Kumar Pandey	Mr. Hansraj
Mr. Amit	Mr. Gopal





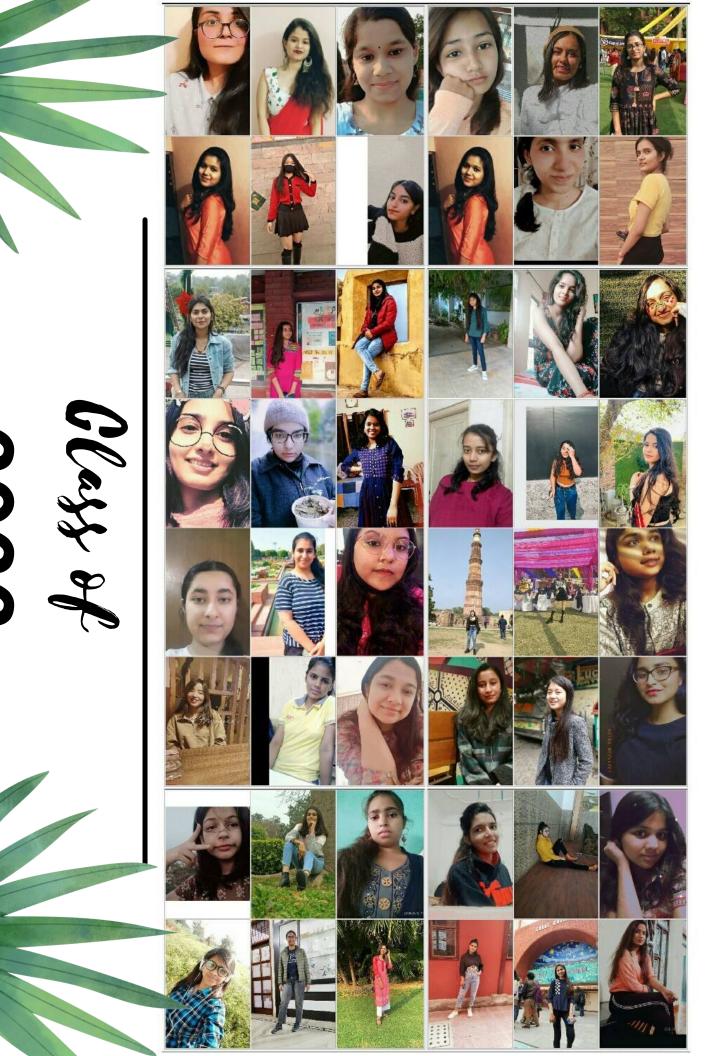
# Class of 2021

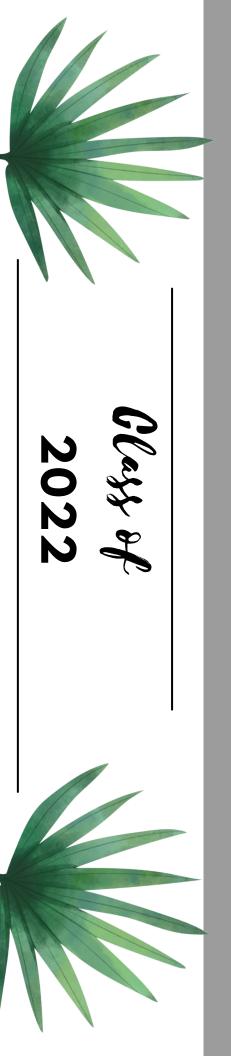




- Aarambhika Mehta
- Aayushi Kanth
- Aditi Sharma
- Aditi Yadav
- Anjali
- Anshu
- Arzoo Tanwar
- Chhavi Yadav
- Debasmita Saha
- *Ipsita Majumdar*
- Isha
- Joanna Niegnipar
- Khushboo
- Khushi Bhatt
- Kirti Sharma
- Km. Shivani
- Km. Monika
- Kritika Kalra
- Km. Deepak
- Mahima
- Mamta Yadav
- Manisha Yadav
- Midhat Imteyaz
- Mitanshi
- Muskaan Veer
- Muskan Gupta
- Neha
- Neha Sharma
- Pinki

- Poonam Yadav
- Poornima
- Pratishtha Singh
- Priya Chillar
- Rachna
- Rashmi
- Richa Sarkar
- Roohani Sharma
- Ruchi Prajapati
- Sachi
- Sakshi Dawer
- Sakshi Sharma
- S. Khoreelembi Chanu
- Sanchita
- Shivani Yadav
- Shiwani
- Shreya Shambhavi
- Shritika Sagar
- Shrushti Rout
- Smriti Rakesh
- Surbhi Jakhar
- Sumi Kalita
- Umang Khatta
- Vaishali
- Yamini Saini
- Yashasvi Sharma
- Yukta
- Makshu

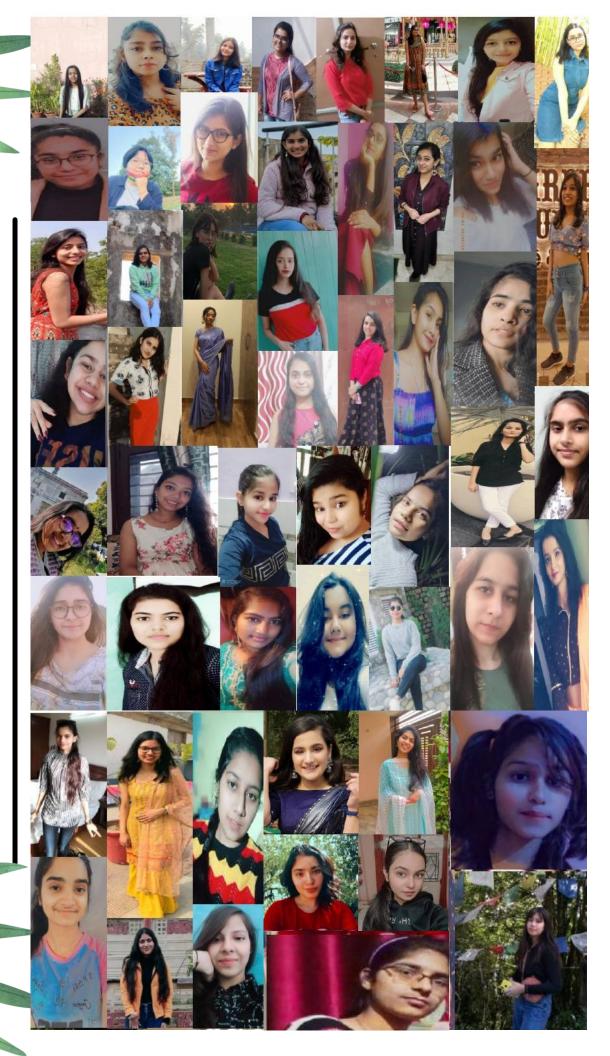


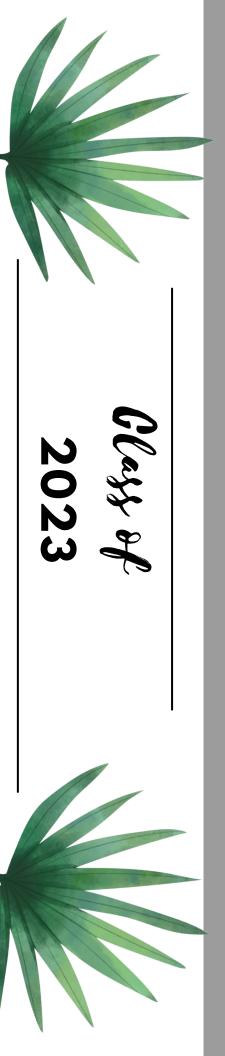


- Akanksha Awasthi
- Akshita Sharma
- Anjali Verma
- Astha Ojha
- Ayushi Patel
- Bhawna Kumari
- Bhoomika Goyal
- Bisma Butool
- Divya Goel
- Divya Mangla
- Himanshi
- Jayati Pandey
- Kanishka Saxena
- Kavita Jainwal
- Khushi Singh
- Kunchuk Ongmu Bhutia
- L Elone Eshena
- Lyangmit Lepcha
- Manisha
- Monika Mishra
- Muskan Goswami
- Nasra
- Nidhi
- Nima Bose

- Nisha
- Niva Parmar
- Pallavi Sahu
- Prachi
- Priyanka Kumari
- Raidhani Shome
- Rakhi
- Rashmi
- Ritika
- Riyanshi Joshi
- Rupal Siwach
- Sakshi
- Sakshi Pandey
- Sakshi Sharma
- Sapna
- Shephali Gupta
- Shikha Yadav
- Shreya Singh
- Shristy Chaudhary
- Shruti Bisht
- Sneha Bhat
- Tanya Dogra
- Valya Singh
- Varsha

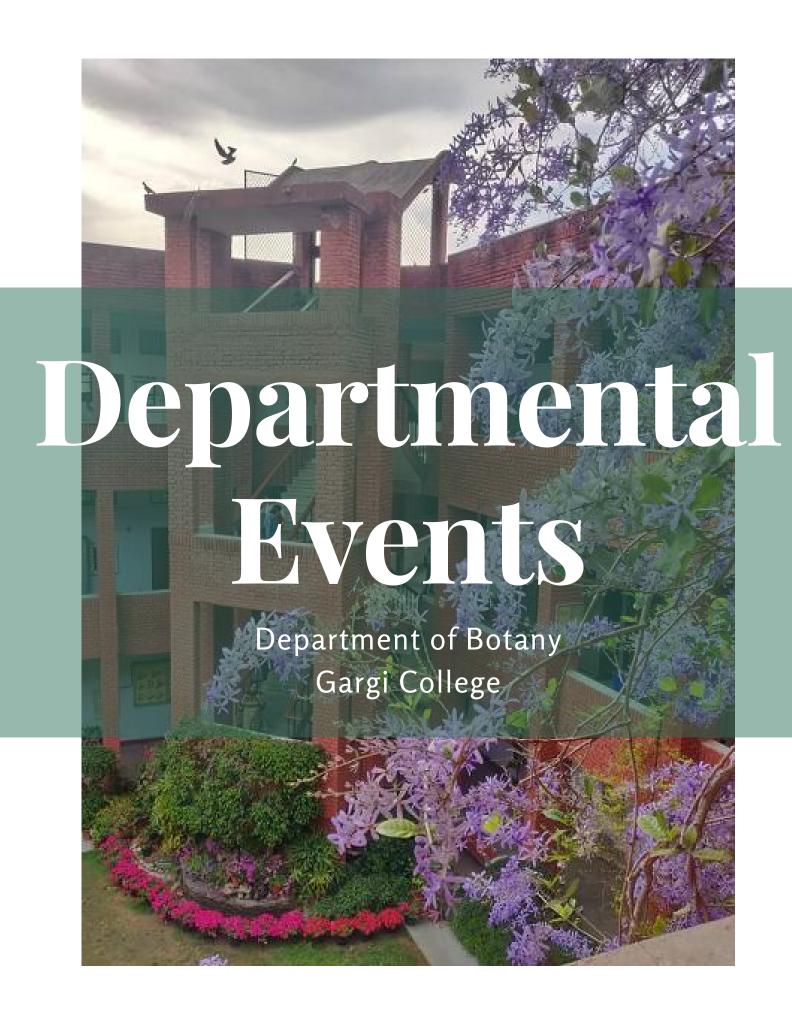
# Class of 2023





- Aarushi Gautam
- Abhinavya
- Adithi Rao
- Akshita Gahlot
- Amisha Garg
- Ananya Chamola
- Anjali
- Anjali Yadav
- Ankita Kumari Gupta
- Arshita Wadhwa
- Asfiya
- Chetana Sharma
- Deepanshi Singh
- Devyani Dwivedi
- Disha Gautam
- Geetanjali Negi
- Hansa Wali
- Kalpana Jha
- Kesang Lhamu Bapu
- Khushi Tanwar
- Khwaish Yadav
- Kirti Sharma
- Komal Sharma
- Maitrayee Paliwal
- Mallika Ghosh
- Mausam
- Moumi Mukherjee
- Nandita Yadav
- Nidhi
- Nidhi Yadav
- Nisha
- Nishu
- Padma Deachen
- Paku Hibu

- Prachi Mahajan
- Pragati Devi
- Pragya
- Pratima Pratim
- R Bhargavi
- Rakhi
- Riddhi Papnai
- Ridhima Sharma
- Rishita
- Riya Arya
- Samiksha
- Shagun Shukla
- Shalu Yadav
- Shefali
- Shikha Jha
- Shreya Gusain
- Shruti Jha
- Shruti Apurva
- Shubhi Srivastava
- Simran Thareja
- Siya Thakur
- Sneha Baghel
- Sonal Yadav
- Soniya Chanchal
- Sunayna Mahalder
- Surbhi Chaturvedi
- Surbhi Mendiratta
- Swati
- Tamanna Sharma
- Tejsevi Sharma
- Vanshita Khangarot
- Vishakha Rana
- Yashasvi Saini
- Yogita



#### **Annual Report**

Sakshi Dawer, President GCBS

## A GOOD EDUCATION IS A FOUNDATION FOR A BETTER FUTURE

The Department of Botany, Gargi College, established in 1967 has been a platform for young women to excel in all fields of academics and extracurricular activities. The Gargi College Botanical Society formed in 1994 was christened as "TARU" in September 2012, which over the years has evolved to provide opportunities to showcase talents, by organizing guest lectures, seminars, field trips, competitions, and non-academic activities of both literary and artistic creativity. Besides these, the annual e-magazine "Anthesis" provides a magnificent opportunity for both teachers and students to express their views and provides a depth understanding of unique themes and incidents happening around the globe.

For the academic year 2020-21, the activities were conducted on virtual platforms due to the pandemic. The society began its year with an inaugural guest lecture presented by Dr. Shashank Mauria (Former Assistant Director-General of ICAR) on 6th January 2021 where he provided an insight on the topic "Biodiversity, Biotechnology, Bioeconomy- Understanding IPRs is a Necessity". The lecture was a great learning opportunity for all the students which was followed by an investiture ceremony and theme reveal of Anthesis for the year.

On 23rd April 2021, another guest lecture was organized which was preceded by Dr. Raj K Bhatnagar [Assistant Scientist and Group Leader for Insect Resistance in International Centre for Genetic Engineering and Biotechnology (ICGEB)]. It was an interactive session on the topic "Search for New Insecticidal Molecules from Nature" where he discussed how insecticidal molecules could be generated from nature, completion of which marked another informative and successful event.

To enhance students' creativity, "TARU" conducted an Inter-Departmental Character Drawing Competition on 9th February based on the theme "Personifying Plants" where participants had to personify plants as a famous personality/character and an overwhelming response was seen in the competition. On 23rd February an Inter College Green Canvas Competition was organized on the theme "Uninstalling Ecocídio" and it was wonderful to see participants exhibiting their views towards the environment through canvases. Another Inter College Competition "Just A Pic" was organized by the society on the 5th of March on the theme "Sustainable Urbanization/Modernisation". It was great to see participants expressing their views on how we can develop sustainably. All the events saw an overwhelming response from the participants from different departments and colleges.

Despite these difficult times of the pandemic, this academic year has truly experienced extraordinary participation by the students of the Botany Department, in various events and has brought laurels to the department, in academic as well as extracurricular activities. The Department always stands for its students in every way possible and strives for them to excel in different fields.

#### Inaugural Lecture

Khushi Bhatt, Co-Editor, Anthesis

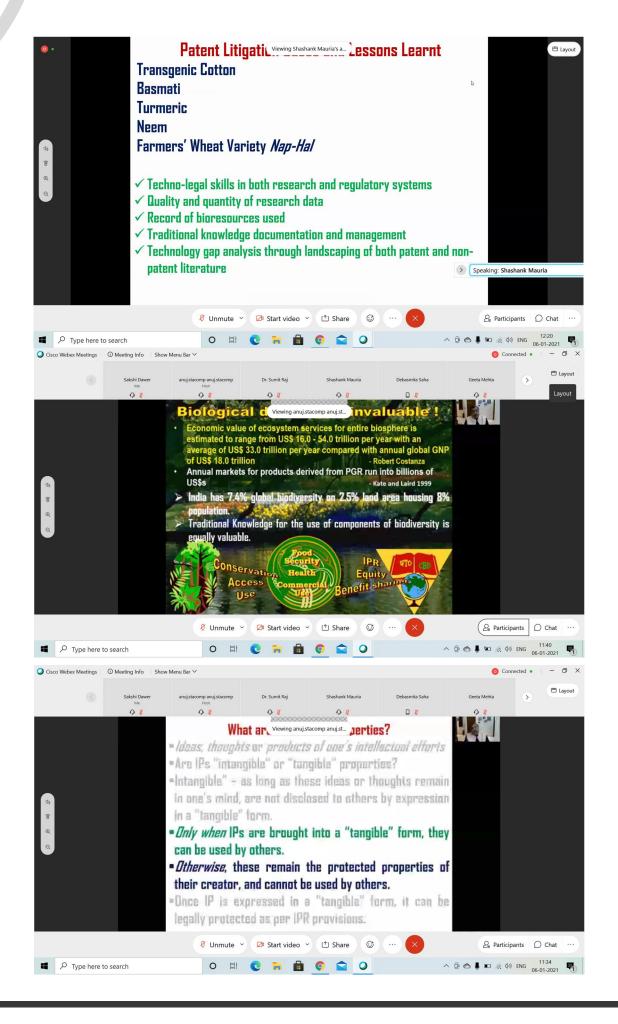
## "LAWS ARE MORE POLITICAL THAN SCIENTIFIC"

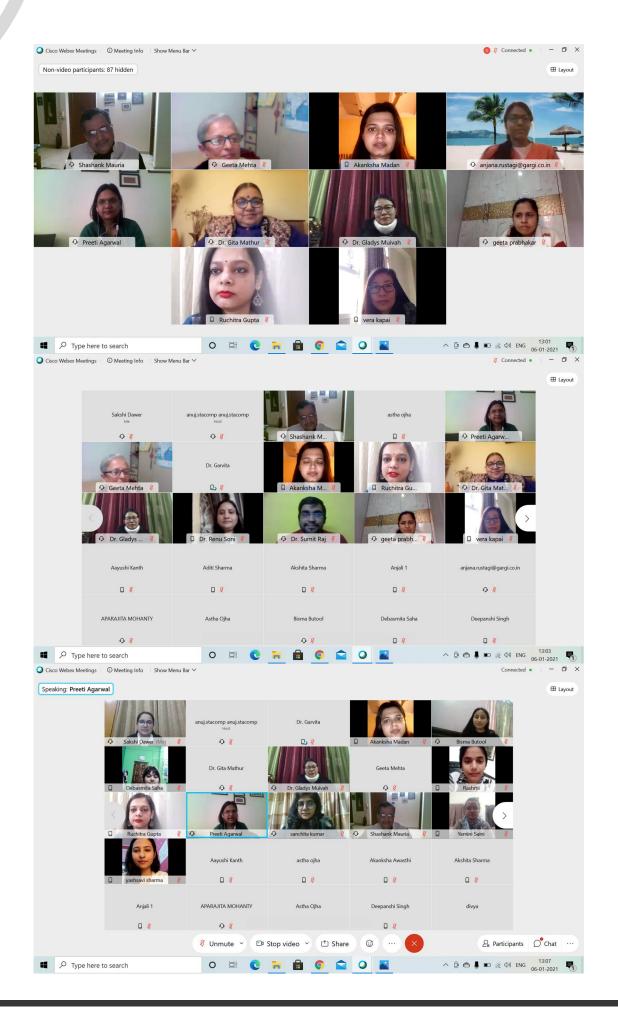
With all the positive enthusiasm, GCBS "TARU" organized the inaugural lecture (2020-2021) on the 6th of January 2021. In between such extreme conditions worldwide, the fresh start for the new session took place in an online platform of 'Cisco Webex' with Dr. Shashank Mauria as our honorable guest speaker for the day. He is currently an independent IP practitioner, a member of the Bar Council Of Delhi, and has been the former assistant director-general of the Indian Council Of Agricultural Research. The session was on the topic "Biodiversity, Biotechnology, Bioeconomy: Understanding IPRs is a necessity."

With the auspicious ritual of paying our respect to the goddess Saraswati, Saraswati Vandana was beautifully performed by the student. The program proceeded with a welcoming gesture towards our guests by the respected professors, from then on Debasmita Saha presented the crisp introduction of Dr. Shashank Mauria's achievements and recognition.

He provided the audience with a gist of IPR history in India and how IPR laws came into enforcement and took shape over the period of time. He made us thoroughly understand the impeccable worth of biological diversity and Traditional Knowledge. It was interesting to know how IP laws created a tug of war between two groups of people, one that was dealing in finance and economics and others that were dealing in conservation and ecology as well as the seed industry scenario in India. He concluded the lecture by summarising the key points and the scope of IPR as well as its applications. At last, he generously addressed the questions raised by the curious audience.

Thereafter, a vote of thanks was delivered by the GCBS member followed by the unraveling of this year's Anthesis theme, "The Green Wars: Uninstalling Ecocídio." With the introduction of this year's GCBS and Anthesis members, the inaugural ceremony was dismissed after taking some group photos to add to the yearly departmental magazine.





### **Character Drawing Competition**

Jayati Pandey, Co-Editor, Anthesis

## LIKE A SUNFLOWER THAT FOLLOWS EVERY MOVEMENT OF THE SUN

Plants personified into characters! With an enthralling theme-"Personifying Plants", an Inter-departmental Character Drawing Competition was organized by the Botany Department on the 9th of February 2021. The event unfolded with an unbidden zest at an online platform, marking the beginning of another year brimming in creativity at Gargi. Students across the departments participated with an insurmountable amount of intrigue for the theme, and with immense creativity.

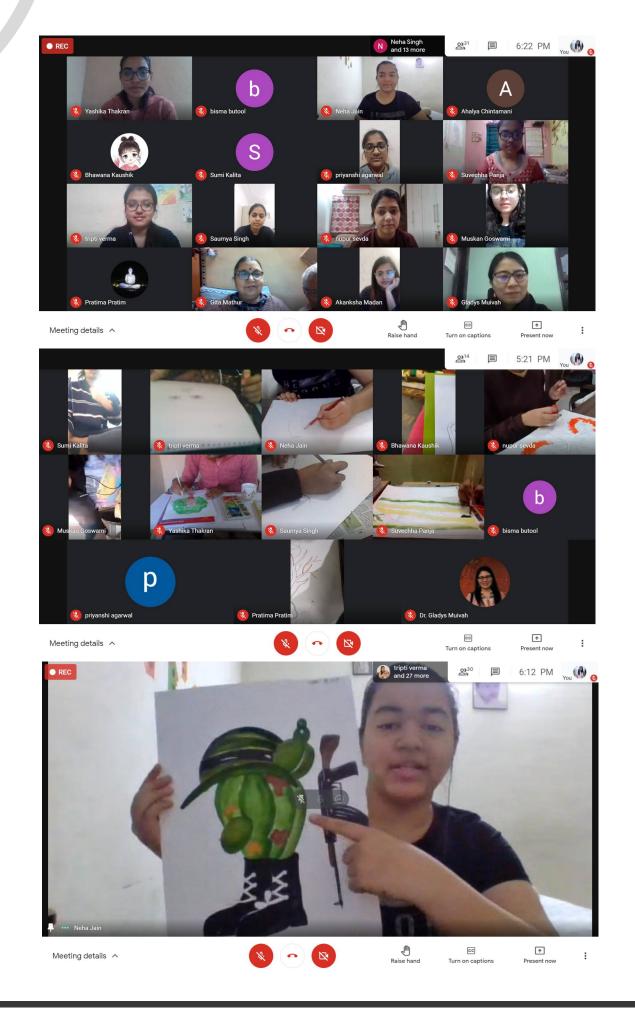
Aristotle once said, "The aim of art is not to represent the outward appearance of a thing, but their inward significance". The words unfurled true in the competition as participants fascinatingly portrayed a vast realm of meanings and emotions in beautiful characters, drawn at the moment.

Truly, art spoke for itself in the competition leaving the spectators speechless. The characters seemed very much true, rather than fantasy, as they each represented something that plants would've said if they could speak in words. This activity to personify plants was an amazing opportunity to delve in and develop an insight into a very

humane perspective towards plants. Though every entry was a winner in itself, the judges had to come up with some positions,

- The first position was backed by **Saumya Singh**, B.A. (Political Science + Philosophy), 1st year
- The second position was shared by **Tripti Verma**, B.Com Programme, 1st year & **Neha Jain**, B.A. Programme, 1st year.
- The third position was backed by **Suvechha Panja**, B.Sc. (Hons.) Zoology, 1st year & **Priyanshi Agarwal**, B.Com (Hons.), 1st year.

On behalf of all the participants and attendees team Anthesis is grateful for the support of our teachers and judges for their honorable opinions and constructive criticism.



### The Green Canvas Competition

Aayushi Kanth, Editorial Member, Anthesis

### PAINTING IS A SILENT POETRY

On 23rd February 2021, Green Canvas Competition by Botany Department took us on a whole different journey. The theme "Uninstalling Ecocídio" was depicted by each artist in so many different ways that it gave a new point of view to the rest of the members. It's said that "Painting is a silent poetry", and each canvas reflected the outlook and imagination of the artist.

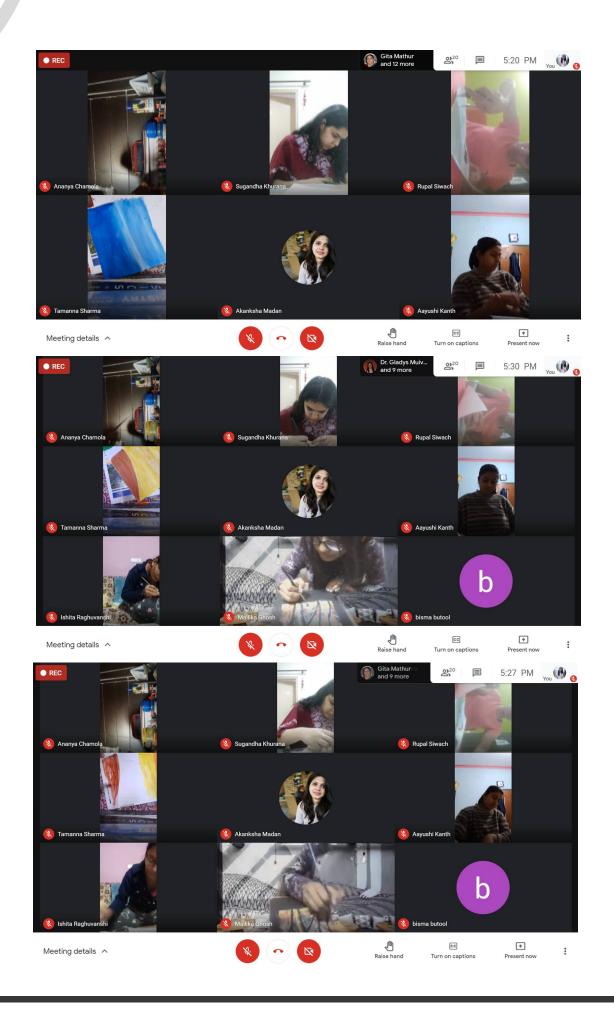
During these difficult times when the world and nature itself are coping up with the ill effects of coronavirus, an online competition was organized by TARU of the Department of Botany. The main organizer of the competition Ms. Ruchitra Gupta and Dr. Gladys Muivah, choose the theme to create awareness of the current situation and at the same time to uphold the talent and brilliant imagination of the young artists. The event was held effortlessly in presence of Dr. Preeti Agarwal, Dr. Akanksha Madan, and many other teachers and members. It was an inter-college competition and attracted the attention of many enthusiastic artists across the entire University of Delhi. The anchor of the event was Debasmita Saha who gave an elucidative introduction of the entire event.

Sakshi (President of GCBS), took in charge of the entire event and cooperated with the participants during the whole duration. Decision-making was a very tough call for the panel of judges. Through the judge's keen observation and incomparable artistic view finally, three winners were selected out of a group of talented artists:

- Ishita Raghuvanshi, B.Sc. Life Sciences, 1st year, Gargi College (1st)
- Rupal Swach, B.Sc. (Hons.) Botany, 3rd year, Gargi College (2nd)
- Mallika Ghosh, B.Sc. (Hons.) Botany, 1st year, Gargi College (3rd)

E –certificates along with cash prizes were awarded to the winners to encourage them for their future artistic work and all the other participant were also awarded certificates for their enthusiasm.

**ANTHESIS** 



## Just a Picture Inter College Competition

Jayati Pandey, Co-Editor, Anthesis

## SUSTAINABILITY CARRIES MODERNIZED URBANIZATION HAND IN HAND WITH RESOURCE PRESERVATION

The concept of Sustainability often gets misinterpreted with compromised development, so, to bring to light the innumerable ways that sustainability carries modernized urbanization hand in hand with resource preservation, TARU, Gargi College Botanical Society put together a Show-Tell competition, "Just a Pic" Themed-Sustainable urbanization on March 5, 2021. Participants from colleges across University of Delhi enthusiastically registered for the competition. The theme was kept a secret until March 3, giving everyone the equality in preparation time.

The event unfolded with great zest online on Google Meet, the participants, after drilling through their galleries and all across the Internet, portrayed pleasingly sustainable aesthetics in just one picture, along with giving a brief account of some of the most revolutionary innovations that aim to sustain resources considering modernization. For fairness, each participant was allotted a code and their names and colleges were kept confidential until judgment.

The session proceeded smoothly as the attendees intriguingly gained deep insights into each other's presentation. The winning innovation

was Pavegen V3 Energy Tiles installed in public spaces, that harness energy from footsteps and produce clean, off-grid electricity.

Every presentation brought an immense sense of wonder as well as the hope and encouragement for everyone to strive towards a more sustainable modern world. Judgments for the winner and the runnerups were hard to come through, but they did indeed.

• The 1st position was backed by **Midhat Imteyaz**, B.Sc. (Hons.) Botany, 3rd year, Gargi College

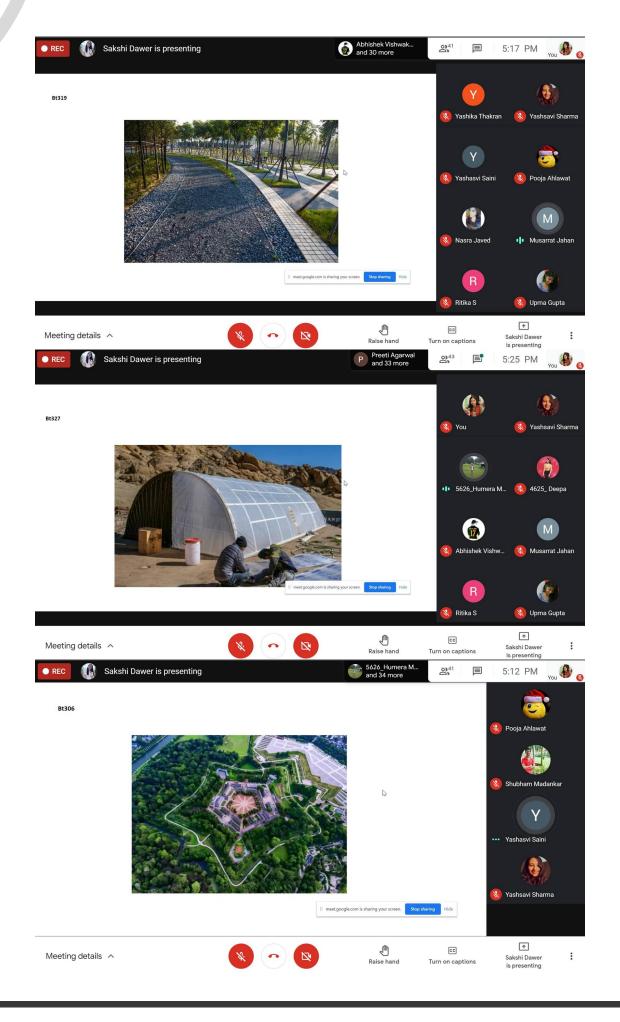
followed by,

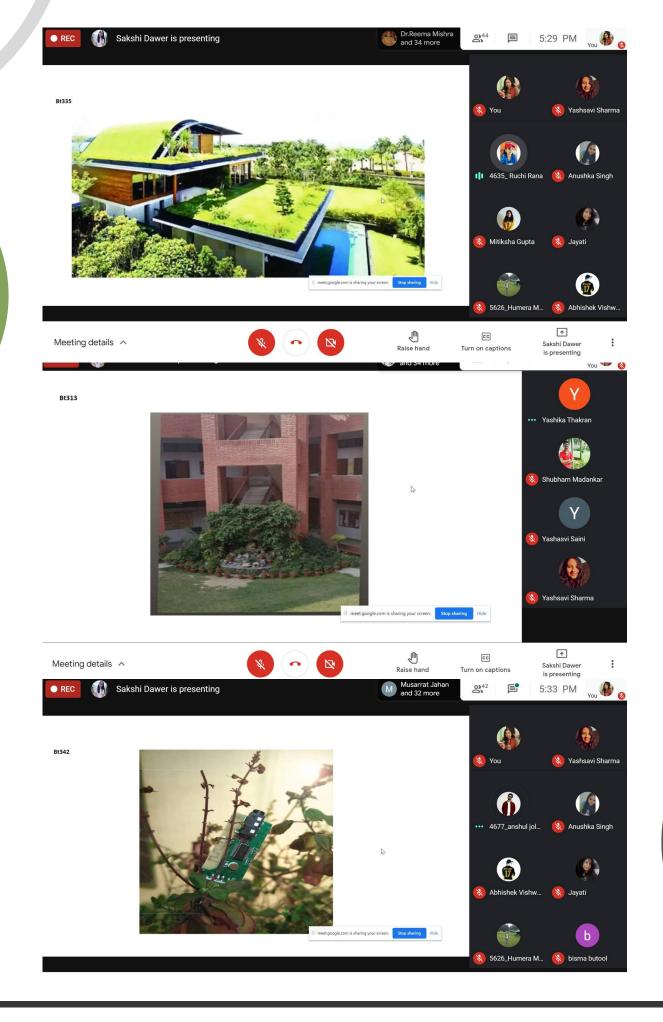
• Shruti Apurva, B.Sc. (Hons.) Botany, 1st year, Gargi College

and 3rd position to

• Musarrat Jahan, B.Sc. (Hons.) Zoology, 1st year, Gargi College

On behalf of all the participants and attendees team Anthesis is grateful for the support of our teachers and judges for their honorable opinions and constructive criticism.





#### **Valedictory Lecture**

Nasra, Editorial Member, Anthesis

## THINGS END BUT MEMORIES LAST FOREVER

The new insecticides introduced in crop protection are quite different in chemical structure over the existing groups and target alternate physiological and biochemical effects exhibit diverse modes of action. It is important to maintain the diversity in the chemistry of insecticides for maximizing flexibility, precision, and stability in pest management. So in order to enlighten everyone on the same TARU, Gargi College Botanical Society organised a valedictory lecture on the topic – 'Search for new insecticidal molecules from nature ' on 23rd April 2021, Friday. It was taken by respected Dr. Raj K Bhatnagar [Associate Scientist and Group Leader for Insect Resistance in International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi].

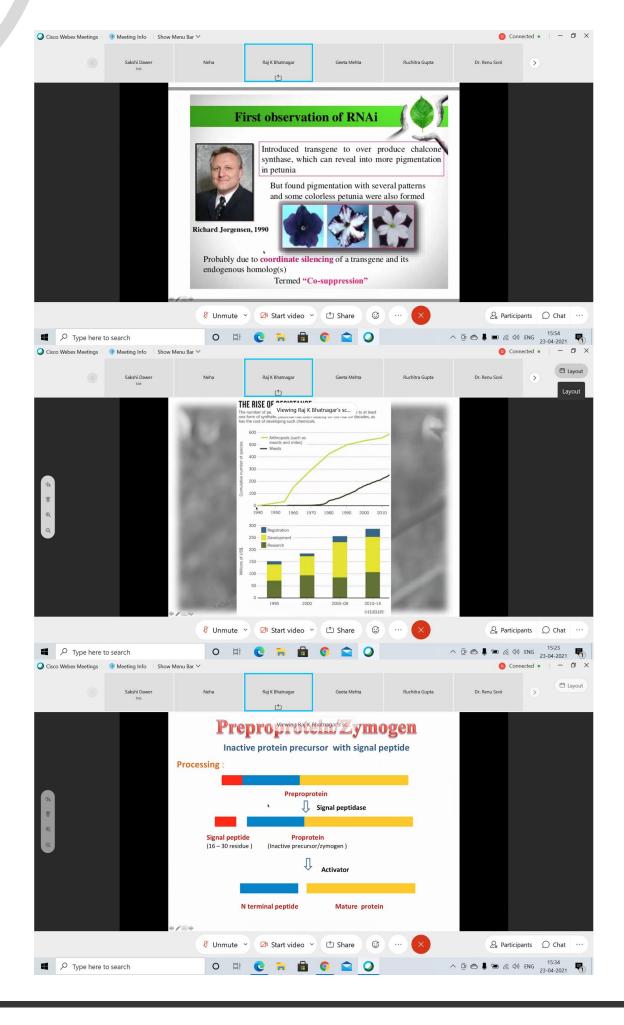
The lecture commenced with a warm welcome and Saraswati Vandana followed by the insightful lecture by Sir Raj K Bhatnagar wherein he explained everything exceptionally well with intricate details and the audience was highly enlightened by the plethora of knowledge they gained.

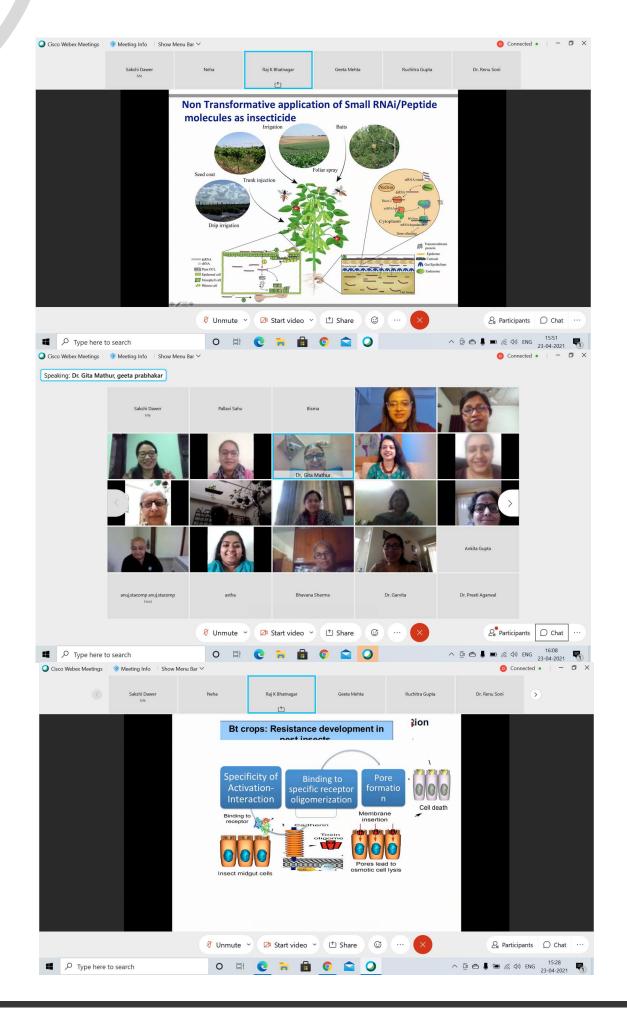
The lecture was followed by some queries and questions from the audience which were resolved by Sir quite efficiently.

Subsequently, Dr. Geeta Mehta ma'am gave the vote of thanks in the wake of concluding the lecture. Succeeding, the president of the society Sakshi Dawer with her presidential speech expressed her gratitude for being part of the society and announced the winner of the competitions held during the session while extending a vote of thanks to everyone.

The event was concluded by a photo session of our guests along with all the teachers and members of the society.

On behalf of the audience, Team Anthesis is grateful for the presence of our guest lecturer and for the support of our teachers and their efforts to make the event a success.





#### **ALUMNI INTERACTION 2021**

Dr. Renu Soni, Dr. Reema Mishra, Dr. Neha Singh Ms. Shrushti Rout, Ms. Yamini Saini, Ms. Yashsavi Sharma

### A TRIP TO NOSTALGIA NOW & THEN IS GOOD FOR THE SPIRIT

The Department of Botany has organized an alumni interaction 2021 on April 24, 2021, wherein the alumni of BSc (H) Botany, Batch 2020 and superannuated teachers of Department of Botany, Gargi College, University of Delhi joined the meet and shared their experiences and success mantras with the undergraduate students of BSc (H) Botany and BSc (P) Life Science.

In the first session, Ms. Yashsavi Sharma of BSc (H) Botany III year welcomed the principal, superannuated teachers of the Botany Department, and BSc (H) Botany batch of 2020 students, all faculty members, and students. Dr. Shashi Tyagi, Dr. Usha Prasad, Dr. Gita Mathur, and Dr. Kiran Prabha joined the interaction. They guided the students about different career options that they can pursue in the field of Botany and various other courses, for example, MBA in science background, IPR lawyer, Science Journalism etc. They gave the essential tips that the students should follow for personality development, like ability to converse with self-confidence is the key factor when they need to deal with anyone officially. They also explained about the importance of skill development along with academics. Participation to its maximum will help the students explore different things besides bookish knowledge. One should love

their subject, be confident about it, keep trying new things, and participate in different areas of their respective fields.

After the interaction with the superannuated teachers, the session was handed over to Ms. Yamini Saini wherein she introduced the Alumni of the Botany Department of Batch 2020. Ms. Aadrita Das, Ms. Ankita Srivastava, Ms. Apoorva Vardhan, Ms. Farheen Islam, Ms. Gayatri Devi, Ms. Kangkana Khakhlari, Ms. Preeti Dahiya, Ms. Ritu Kumari, Ms. Shambhawi, and other students also joined the meet. They showed great enthusiasm in attending the session and enlightened their juniors in every possible way. They advised the students to self-assess themselves first and find out more about the course they are interested in. They also listed the names of few examinations for example, IIT JAM, TIFR (JGEEBILS), GAT-B, BHU ENTRANCE, CU-CET, DU-CET etc. for pursuing masters in Botany, Plant Biotechnology, Plant Molecular Biology, Agricultural Biotechnology etc. They advised them to keep a check on all the websites of various universities and register accordingly.

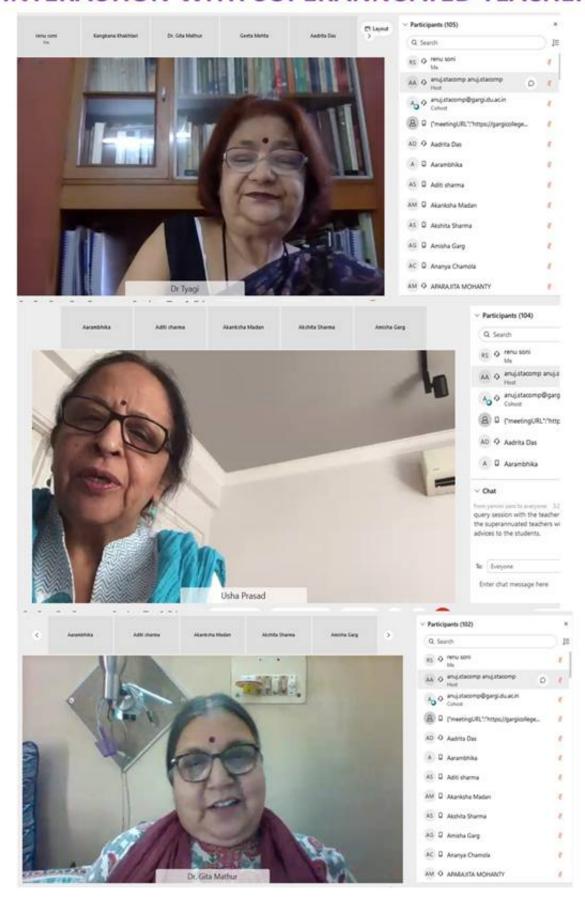
Following this, the query session was taken up where all the doubts put forth by the students were answered by our teachers and the alumni students, clearing all the concepts and queries of the audience.

As we moved towards the end of the session, Dr. Geeta Mehta, Senior- most professor of Botany Department, Gargi College, thanked all the speakers for such an inspiring and informative session and gave her best wishes to all the students.

In the end, Ms. Shrushti Rout compiled all the facts and information. She firstly talked about various professions and jobs that the students can pursue in the future. She discussed that students should focus on skill learning and some personality traits like consistency and hard work which are necessary for success. She also mentioned about

diverse courses which a student can choose after graduation. Then she talked about the examination tips for both OBE and entrances. She also mentioned a list of different entrance examinations and examination procedures for different universities. In the end, she appreciated and thanked everyone for their participation. The session was concluded with blessings and best wishes to the students.

#### INTERACTION WITH SUPERANNUATED TEACHERS



#### FROM BATCH 2020







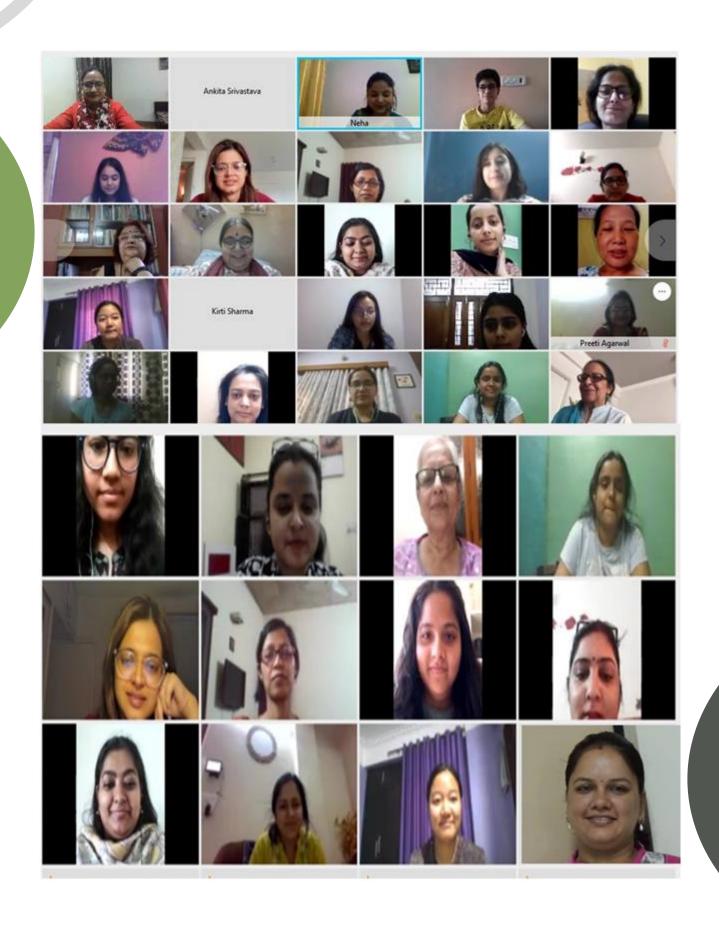


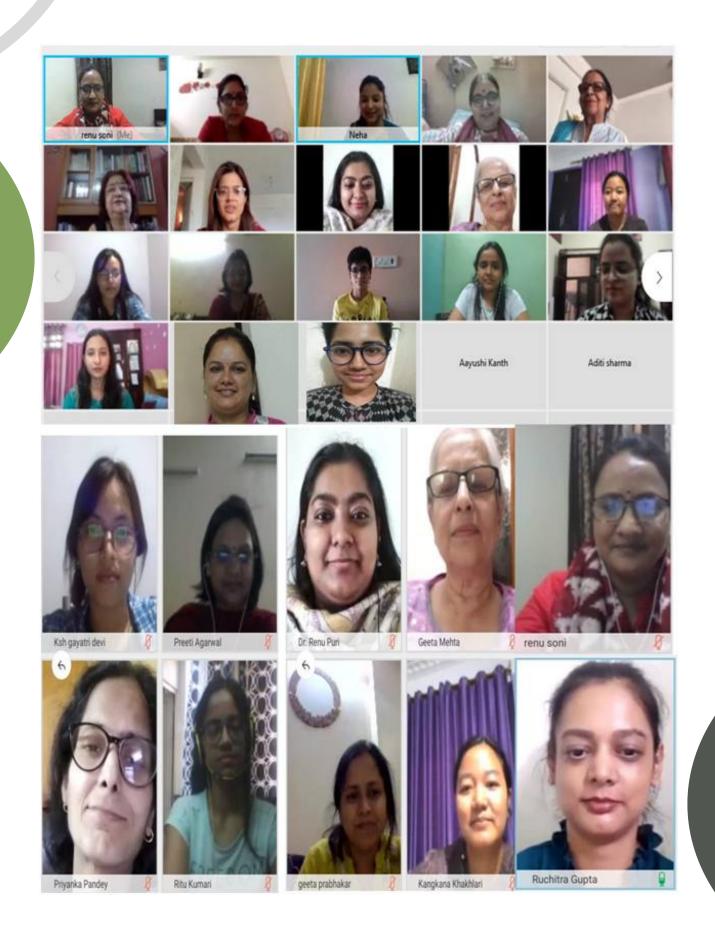












#### Adieu Seniors: Farewell 2021

Jayati Pandey, Co-Editor, Anthesis

#### CELEBRATION OF A BOND BEYOND LOVE

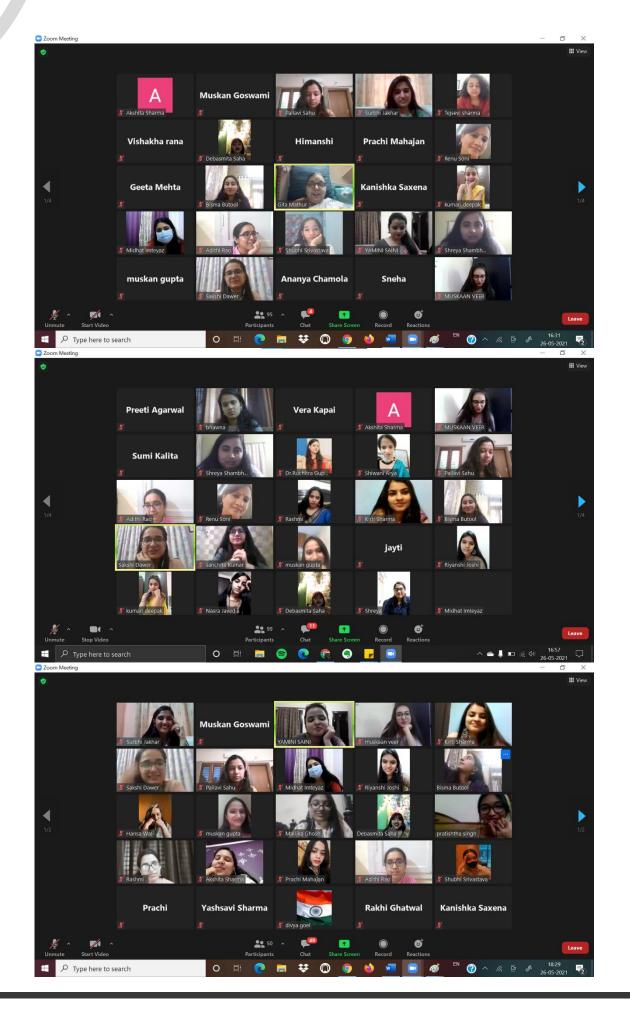
It's a too huge world, dispersing us, but this goodbye is vaulting us forever. Together.

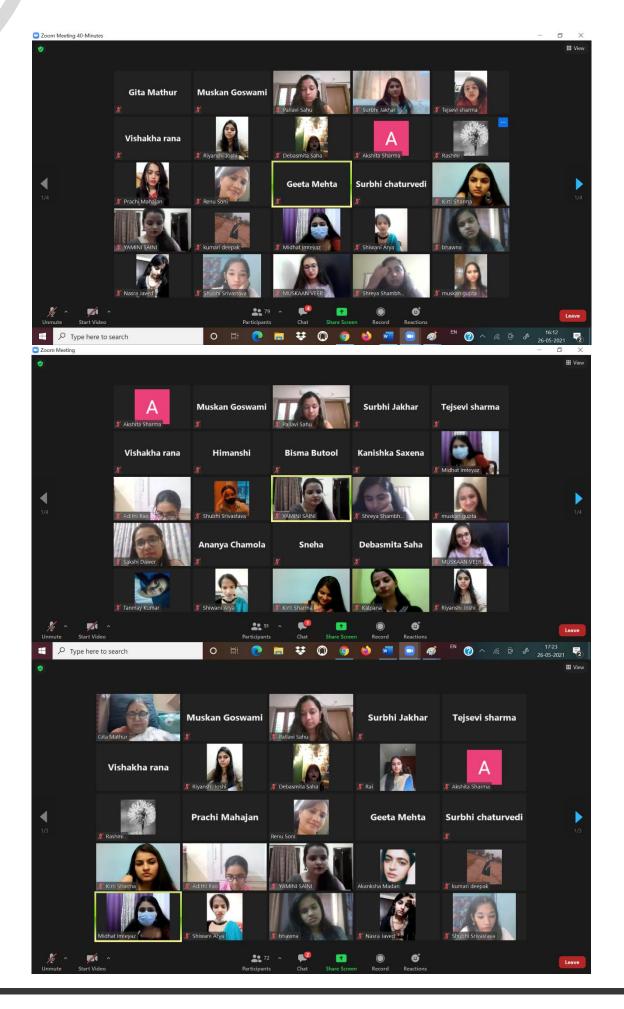
There's always a baggage of reminiscence, weighing in unbidden nostalgia, that comes with goodbyes and farewells. And there's a heart grateful for all the people time has put us across to, on 26th May 2021, the Department of Botany organized a little meet up to express a truck full of these emotions that had them tied to the Class of 2021, bidding them a sweet farewell.

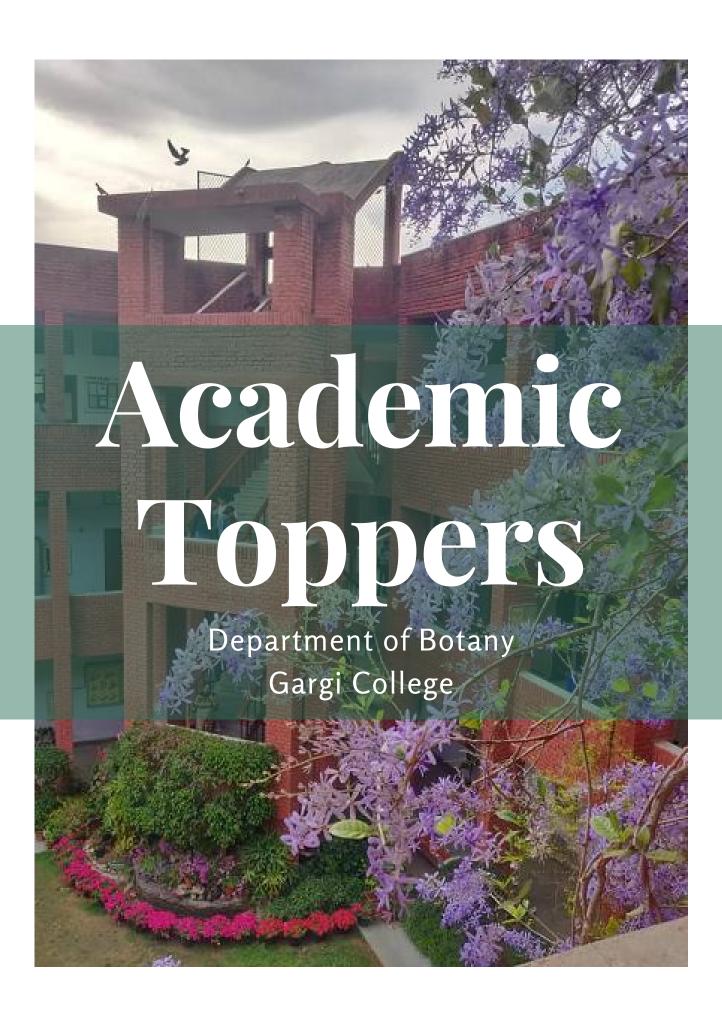
The event unfolded with brimming emotions on an online platform, with our seniors dressed in beautiful pastels. The professors and juniors of the department welcomed them with heartfelt smiles and greetings. There's always a lot to say, and express when you know someone's going a bit farther from you, our professors too with their hearts on their sleeves took the dais to wish our seniors the best of all lucks to come, as they now lean forwards to an amazing new venture. Leaving us with a twinkle of ambition and a tear of reminiscence, our seniors too spilled their hearts, expressing an immeasurable amount of gratitude.

To lighten the mood, together the entire department held a talent show, many seniors took to presenting a variety of hobbies they've garnered, singing, dancing, art pieces, and what not! We also played a little paper dance game, making everybody go 'shimmy shimmy'.

The event that started with heavy emotions eventually came to an end with talks of moments that the department had spent together, and lots of giggles. Memories are treasurable, and so are our seniors, as you all carry on with your journey, The Department of Botany, your juniors, and Professors will always be supporting you!







#### **ACADEMIC TOPPERS**



Km. Shivani Singh - SGPA: 10 5th Semester (3rd year)



Aditi Sharma - SGPA: 10 5th Semester (3rd year)



Chhavi Yadav - SGPA: 10 5th Semester (3rd year)



Sanchita - SGPA: 10 5th Semester (3rd year)



Kirti Sharma - SGPA: 10 5th Semester (3rd year)



Isha - SGPA: 10 5th Semester (3rd year)



S. Khoreelembi Chanu - SGPA:10 5th Semester (3rd year)



Kritika Kalra - SGPA: 10 5th Semester (3rd year)



Priya Chhillar - SGPA: 10 5th Semester (3rd year)



Yamini Saini - SGPA: 10 5th Semester (3rd year)



Bisma Butool - SGPA: 9.55 2nd Semester (2nd year)



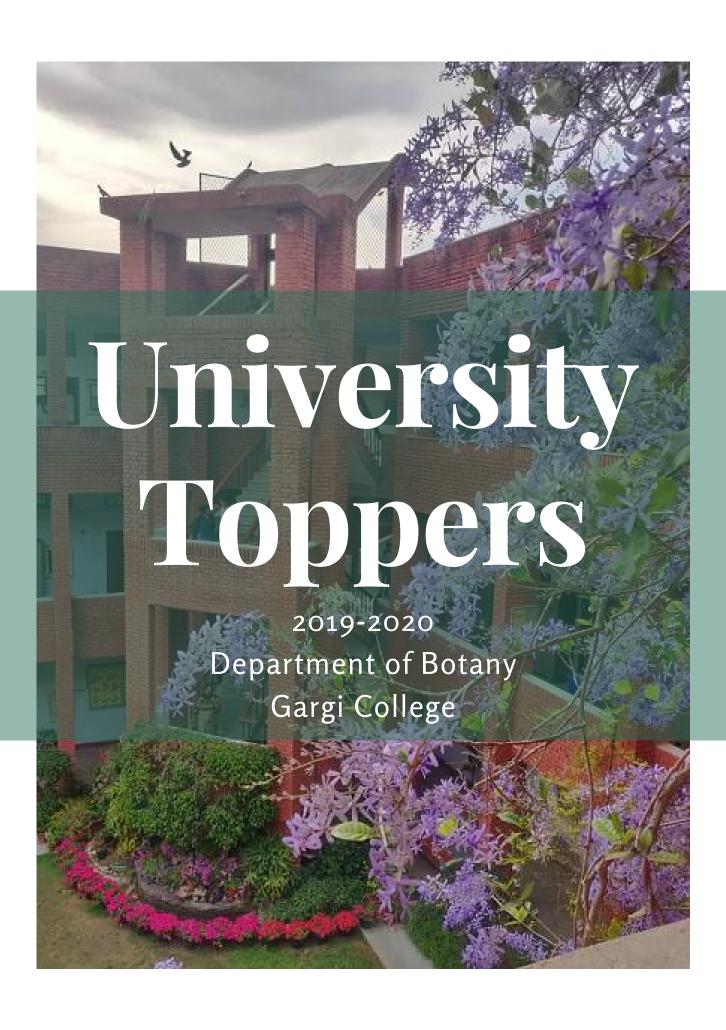
Sakshi Pandey - SGPA: 9.55 2nd Semester (2nd year)



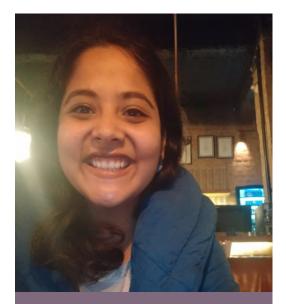
Akshita Sharma - SGPA: 9.55 2nd Semester (2nd year)



Muskaan Goswami - SGPA: 9.55 2nd Semester (2nd year)



#### Meritorious students (2019-2020)



Apoorva Vardhan Year: 3rd (2017-2020) Roll no.: 17024556010 CGPA: 9.527 College Rank: 1st University Rank: 5th South Campus Rank: 1st



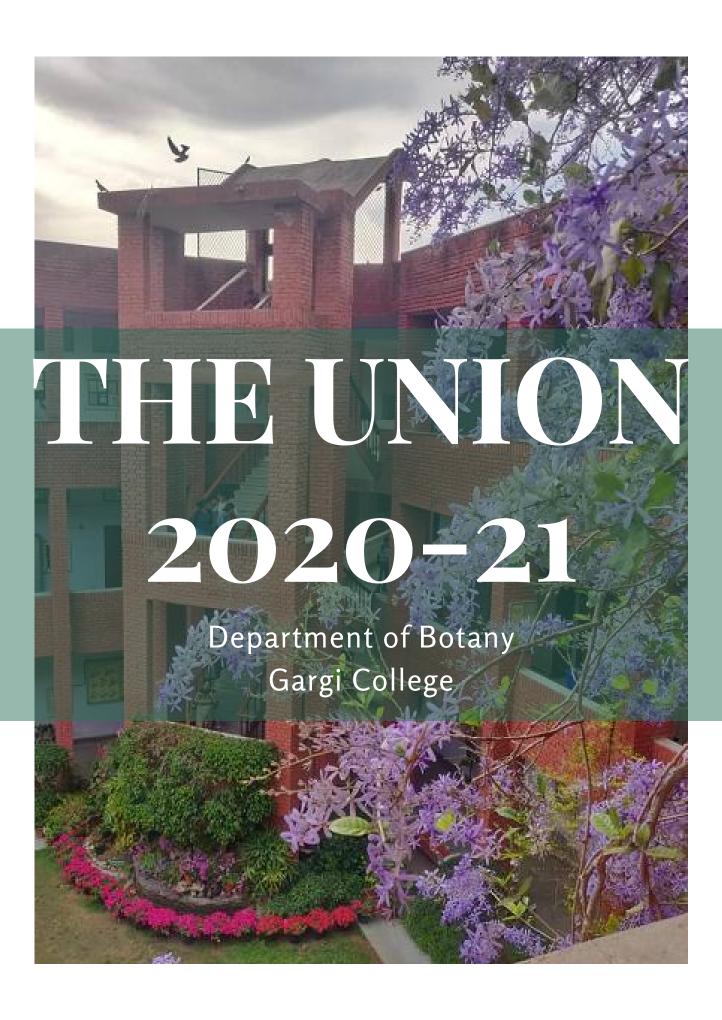
Sakshi Dawer
Year: 2nd (2018-2021)
Roll no.: 18024556041
CGPA: 9.79
College Rank: 1st
University Rank: 4th
South Campus Rank: 4th



Minora Priya
Year: 3rd (2017-2020)
Roll no.: 17024556024
CGPA: 9.527
College Rank: 1st
University Rank: 5th
South Campus Rank: 1st



Bisma Butool
Year: 1st (2019-2022)
Roll no.: 19024556008
CGPA: 9.27
College Rank: 1st
University Rank: 9th
South Campus Rank: 4th



#### **Faculty Advisors of TARU & ANTHESIS**









#### **Faculty Advisors of TARU & ANTHESIS**

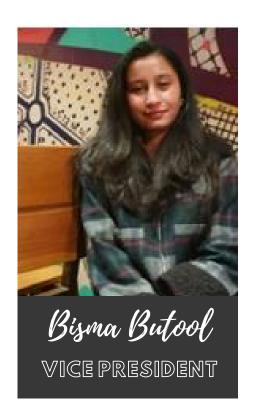






#### **Gargi College Botanical Society "TARU"**







Yashasvi Sharma
TREASURER

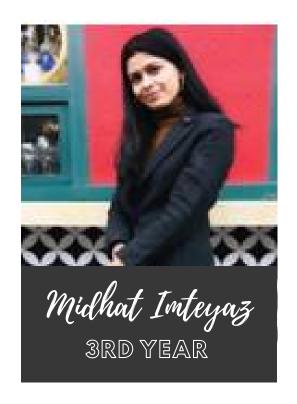


Debasmita Saha GENERAL SECRETARY





#### **Executive Team Members**





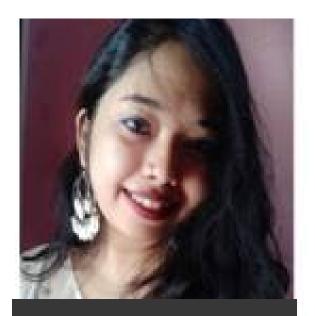




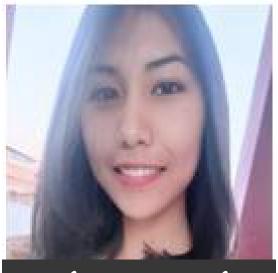
#### **Creative Team Members**



Pratishta Singh 3RD YEAR



Sumi Kalita 3RD YEAR



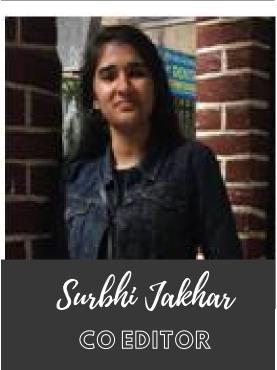
S Khoreelembi Chanu
3RD YEAR



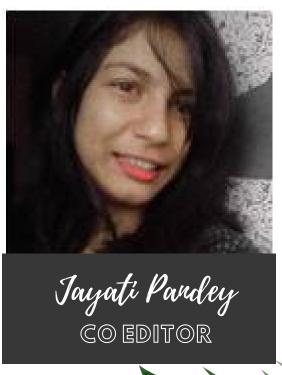
Yamini Saini 3RD YEAR

#### **ANTHESIS EDITORIAL BOARD**

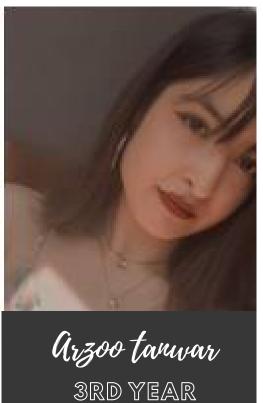




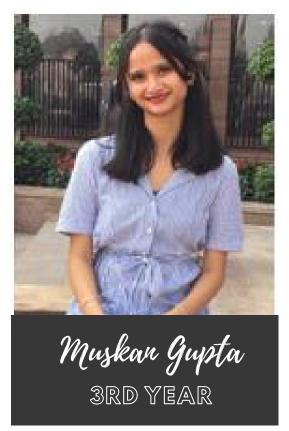




#### **Editorial Board Members**









#### **Editorial Board Members**









# THE GREEN WARS: UNINSTALLING ECOCÍDIO

A warzone with sufferers on both sides.

#### ZERO WASTE LIFESTYLE

Rebuilding a more resilient earth after the pandemic

# THE MELTING ARCTIC IS NOW OPEN FOR BUSINESS

Is Habitat destruction leading to Zoonoses?



Whenever there is theft, murder, exploitation, or any conflict or injustice in general, the only places we march towards to seek justice are the courts. The set of laws provides us a sense of satisfaction and the punishment a sense of deterrence. Seeking justice is one's most important right to which everyone is entitled. Then, why not earth?

From time and again, Earth has not only fulfilled one's need but has been exploited worse for everyone's greed. There has been an increase in industrialization, population, capitalism, corruption, demand, selfishness, and a major decrease in human values like sensibility, care, etc. Today, every day some of the forests are either burnt or cut down, rivers and rain has become acid or dried out, glaciers are melting, the air is not pure, etc. We have to understand that the earth has reached its limit and is not well. Humans have committed several crimes against it and it is seeking justice. Humans have stolen its beauty, pureness, and happiness. They have harmed all of its elements and are exploiting them to establish their supremacy. Humans have taken earth for granted and are assuming that if the earth can't speak, it doesn't have an opinion.

This is the time we need to understand that it is already very late and we need to take steps to prevent the earth from any further damage. There is an extreme need for some laws that will put humans in the box of their accountability. The exploitation that earth is facing with the advent of life is far more heinous than any crime. Thus, it becomes important to place earth also as one of the stakeholders in our criminal justice system. making this happen we need a lawyers/ group of environmentalists who can work selflessly and work towards providing justice to the earth. This set of rules will also make people understand the importance of the earth and their obligation to protect it. This will force them to take steps for protection as it is high time. All those especially



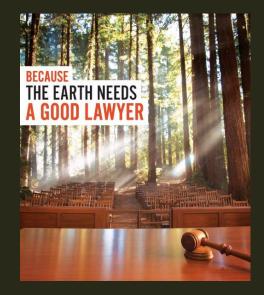
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Earth has suffered a lot and the various steps taken have not provided any tangible benefits. Thus, strict rules are necessary. It is necessary to name the crimes that are committed against the earth, as the earth is the only residence for us. There is no "Planet B". The fact that we can't and shouldn't exploit others whether it be earth or anything else remains constant



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SOAK-THESE-AMAZING-EARTH-PHOTOS

# Why call recent disasters 'natural', when they really aren't? Surbhi Jakhar B.Sc. (Hons.) Botany IIIrd year

In the rapidly moving world, life has become fast and eventful. A lot is happening around us at every moment. Human civilization has made it a way in nature. All this speed of life is hampered when we face any sort of calamity or natural disasters. But the fact to be undertaken is, are these disasters really as natural as we suppose they are?

People play such an important role in framing the world around us right now. Nature is the supreme power undoubtedly. No matter what humans want or decide, natural events would occur and there is little we can do to alter it. Hurricanes, floods, droughts, wildfires, cyclones, viruses, and other epidemics used to occur since the origin of life, but now, they are exacerbated by climate change, the rise of population, global warming, overloading, and lots of other reasons. So we shall not hide our deeds under the name "Act of God" and instead call them what they are, disasters of our own making, the MAN-MADE NATURAL DISASTERS.

Let us take some examples. In mid-August of last year, 2020 there were around 367 known wildfires going on in The States.

A week later, the number rose to 560. A few weeks later, many of blazes were still burning, and one of them, The Doe Fire, Santa Rosa, grew into the largest conflagration in California. A decade earlier, this could have been called a complete natural disaster, but the fact can't be ignored that right around that time, the mercury in Death Valley hit 130°F, the highest temperature ever recorded on Earth.

Hurricanes can draw energy from the surface water warmth, and thus become stronger, more intensified and damaging. Now increasing the water pollution leading to hot water bodies can definitely not be called nature's fault.

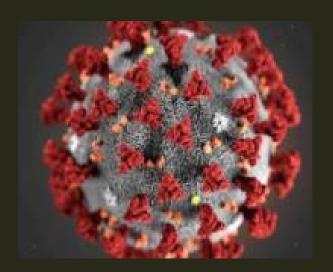
We cut down forests, disbalance the nature's maintenance cycle and convert it into barren land. With all the mining, construction and factories, and waste dumping along with construction in the path of rivers, I guess we know human beings are to be blamed for whatever is happening around us and not mother nature.

Another case is the most recent pandemic, The Covid 19. There aren't clear evidences if the virus was natural or not, let's say if it is naturally occurring, still, if this had occurred around 20 years earlier, it could have been limited to the particular area. Before we knew the intensity of this virus, it has reached to even the remotest areas of the world as the Falkland Islands and the Kamchatka Peninsula. It all happened due to global connectivity and communication. David Quammen has put it this way: "We disrupt ecosystems, and we shake viruses loose from their natural hosts. When that happens, they need a new host." Often, that new host is going to be us.

Since, the nature is same, human beings are to be held accountable for these not so natural disasters.

Natural hazards become disasters when we come into the picture. When we barge in between the ratio of nature. A lot of gas leakages, hurricanes and cyclones in the last few years could haven't been avoided, but we need to look into the fact that we could have done something to less intensify them.

It's high time we question ourselves, for what we are doing to our own earth and not be ignorant under the statement of claiming them to be natural, while they clearly are not. Controlling the under population, construction proper management, proper with the reporting correct terminology, and a little concern towards the mother nature individual level could starting steps of at least reducing be numbers of these hazards.



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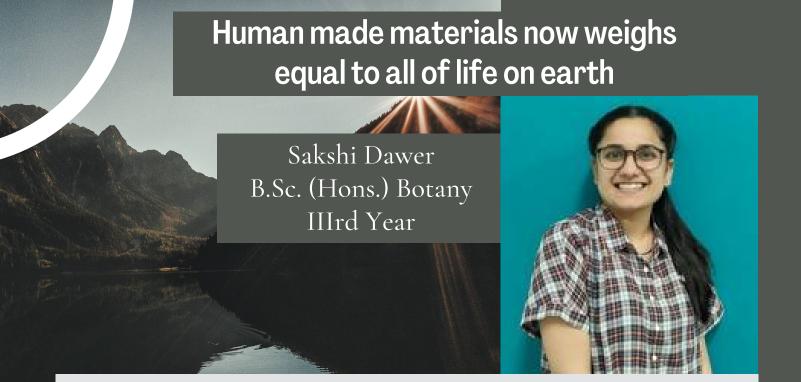
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  OCESSES



Anthropogenic innovations and discoveries have put together the lives of all human beings at ease. Besides food, air, and water, most resources in our lives are attributable to human brilliance. Inventions that were at first regarded as a success in all terms have now started being a burden not just for humans themselves but for the entire Mother Earth. Plastics, electronic devices, glass, and what not that alleviates human efforts is tremendously adding to the total anthropogenic mass on the earth, is well approximated to double in the near future. Currently, 1.1 trillion metric tons of anthropogenic mass is figured to exist on earth which comes about to the combined weight of all the life forms on Earth. This is becoming a matter of concern due to its deteriorating effects on living forms and nature. Enlisting a few of them include an increase in carbon footprint, climate change, rising temperatures, deforestation, and the list goes on.

By the side of expanding innovations and discoveries in almost all the fields by human beings, which is also entitled as development, mother



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earth is now going through a huge burden of environmental changes which actually take years to renew.

Plastic, which has been considered as the biggest environmental threat, is now known to weigh twice the weight of all zoological forms on the earth. Similarly, buildings and infrastructure outweigh trees and shrubs. Despite a tremendous increase in the anthropogenic mass, there is a sharp decline in the total biomass on earth due to factors like land exploration, deforestation etc. Hence, in the sake of development and invention of new human objects, we have started destroying the environment by exploiting various natural resources. The greed of humans as a species has started ignoring the importance of environment and other life forms for our

very survival. It's high time to realize the necessity of maintaining a balance between anthropogenic development and the environment in a sustainable manner.

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### COVID-19: When the world caught a glimpse of a cleaner world





It has been more than a year since the COVID-19 pandemic hit the world. Everybody witnessed surreal situations in life, which they never even imagined. Staying inside the house for weeks, watching their loved ones struggle or struggling themselves, we have all been in the same boat. In the bigger picture, with the crumbling economy and dwindling resources, the impacts are even more disheartening.

But our humane spirits always find a good side to every situation, and even in the pandemic, we managed to keep our hopes alive. When a nationwide lockdown was announced in March 2020, under forced restrictions the pollution levels drastically went down all over the country, especially in the megacity Delhi. There were lesser vehicles on the road, lesser effluents and pollutants from the industries, and we breathed a sigh of relief in a cleaner air.

With the aid of air quality data of seven pollutant parameters (PM10, PM2.5, SO2, NO2, CO, O3 and NH3) for 34 monitoring stations spread all over Delhi, National Air Quality Index compared the spatial pattern of air pre and during lockdown phases. The results showed that pollutants had undergone the highest reduction compared to preas lockdown years.

The northern India parts of experience atmospheric pollution and poor air quality due to emissions from power plants, brick kilns, crop residue burning, During etc. lockdown all of these activities were on halt. All types of non-essential vehicular transports including domestic and international flights, trains and buses were stopped. It did cause inconvenience to a few, but on the brighter side, experience the cleanest air in years. This news brought a wave joy and hope for everyone.



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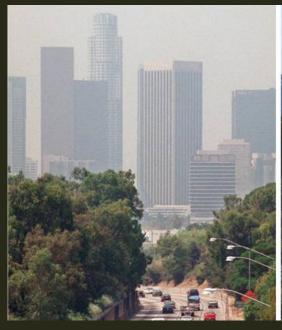
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### GLOBAL CONNECTIVITY TURNING PROBABLE EPIDEMICS INTO PANDEMICS

Debasmita Saha B.Sc. (Hons.) Botany IIIrd year



Globalization is not a monolithic force but an evolving set of consequences, some good, some bad, and some unintended. It is the new reality.

Globalization is a multi-faceted set of processes having a widespread impact on human civilization worldwide. Precisely, it can be defined as changing the nature of human interactions across a wide range of spheres including the economic, political, social, and environment. It is driven and constrained by a number of forces and as it spreads across the world, there is so much to know about how the wide-ranging changes are affecting infectious diseases.

Globalization appears to be causing profound and unexpected changes in all aspects whether its ecological, biological or social.

worldwide resurgence The dengue fever, the introduction of West Nile virus into New York City in 1999, the rapid spread of human immunodeficiency virus (HIV) infection in Russia and the global spread of multi drugresistant tuberculosis (TB) are a few examples of profound effects of globalizing forces distribution, emergence, and spread of infectious disease.

A very recent advancement of how global connectivity turned an epidemic into a pandemic was the widespread of SARS-CoV-2. It began like all new viruses with an ordinary moment when a cluster of patients admitted to the hospital with pneumonia turned out to have a new strain of coronavirus. The virus & high transmissibility and trans-border turned an epidemic in China into a global pandemic destroying millions of innocent lives with each passing second.

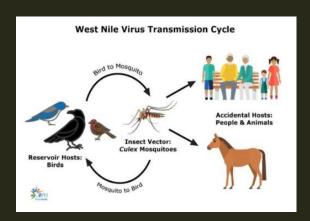


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The inescapable process of global connectivity proves its effect on a wide range of social, environmental, and biological factors that affect the multi-dimensional spheres of human infections. Despite the contested nature of globalization and the continued debate about its scope, pace and driving force, there is clearly a better need for conceptual and empirical understanding of its specific impacts. The impact of global connectivity on infectious diseases demands an appropriate form of global governance on keystone issues to improve systems of preventing & controlling such hazardous circumstances of emergency.

National level efforts and International health cooperation, notably through The International Health Regulations (IHR) remains the corner stone of effective infectious disease policy. Necessary steps must be implemented to enhance training on the global dimensions of infectious diseases.

Today whether carried by an unknown traveler or an opportunistic vector, human pathogens can rapidly arrive anywhere in the world and have a damaging impact on the lives of people around the globe. To prevent and maintain the functionality of the entire system, preventive laws and orders are a mandatory asset for the well-being and survival of humankind.

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# Oceans & Ice: Absorbing the brunt of climate change Khushi Singh

Khushi Singh B.Sc. (Hons.) Botany IInd Year



It would not be wrong to say that the oceans and the ice have been saviours of our ecosystem and the living beings on Earth, standing at the forefront 'taking the heat' from climate change for decades. The high seas and the Arctic ice have absorbed more than 90 percent of the additional heat trapped in the atmosphere resulting from the excessive human-emitted greenhouse gases since the 1970s. Thus, playing an important role in shielding the land dwellers from the worst effects of climate change.

But nothing comes free in this world. The oceans and the cryosphere absorbing the excessive heat also came at a cost. The limit of oceans and the ice absorbing the heat has reached its maximum limit, and now it's paying back in ways that will not just impact the present, but also the future of the existence of many species.

The consequences for the human-induced greenhouse gases are severe for humanity as well as nature. The effects of the rapid changes are observable and impact people globally. The increasing greenhouse gases and carbon emission is alarming and has taken a toll on the oceans and the planet's ice covers.

The United Nation's Inter Governmental Panel on Climate Change (IPCC) highlights that the oceans are warming up twice the rate and the Arctic ice is warming by at least four times more than the global average.

The oceans are warming resulting surface into warmer waters. the melting ice caps, and acidification of ocean's water. putting the life of tiny planktons to oysters to massive reef-building corals at grave risk. Hotter oceans will lead to worldwide calamities like intensified tropical cyclones, hurricanes, and rainier storms putting immense stress on the



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already impacted marine life. In addition, Marine heatwaves are also contributing to the increased temperature of the oceans leading to the shrinking of fisheries and many fish species moving to the polar regions for cooler climes. Before(L) and After(R) coral bleaching, American Samoa, South Pacific Islands (in the picture) can be observed. The cryosphere is rapidly changing too. The glaciers of the Himalayas and the Andes are retreating at an unprecedented rate.

The disappearing of the polar ice threatens ice-dependent species such as walrus and penguins due to habitat loss. The melting ice sheets of the Antarctic and the Greenland contribute to the global sea-level rise. Seasonal sea ice thickening and stratification are altering the marine ecosystem. The permafrost temperatures have risen to a record high leading to Arctic permafrost thawing. The crumbling of the permafrost will in turn release carbon dioxide and methane in the atmosphere further amplifying global warming and accelerating climate change.

Many reports even suggest that the life of more than a billion people will be at stake danger due to the melting of glaciers and frosty mountains leading to increase in water levels in oceans, all as a consequence of global warming. The world leaders and countries need to come together and take collaborative actions that will be impactful in turning the tide over and into the direction of a sustainable environment. The present choices and the conscious efforts made by each individual will shape the future health of the ecosystem, wildlife and our planet.

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### **UNRAVELLING "ECOCIDE": ECOCIDE IN INDIA**





Ecocide refers to the deliberate destruction of natural environment by negligent human actions like overexploitation of resources or dumping of toxic chemicals. Ecocide violates the principles of environmental justice. The term "ecocide" was coined in 1970 at a Conference of War and National Responsibility by an American biologist Arthur Galston. Humankind's push for development has led to serious consequences for the environment. The ever-growing demand for natural resources by the rising human population has led to a disbalance in Earth's natural state in a way never seen before. Patrick Hossay, an environmental theorist and activist says that the human species is itself committing ecocide via human actions.

India has been uniquely placed in terms of wildlife diversity. It serves as a custodian of many species that are either extinct or found in very low numbers elsewhere. India is badly affected by our constant assault on the environment resulting in massive destruction and a colossal loss to our ecosystem. For evidence, many cyclones hit India in 2019-20. They were caused by climate change for which humankind is largely responsible.

By the side of expanding innovations and discoveries in almost all the fields by human beings, which is also entitled as development, mother earth is now going through a huge burden of environmental changes which actually take years to renew.

The year 2020 marked the first pre-monsoon cyclone in a century-Cyclone Amphan. Cyclone Nisarga in Maharashtra was the second pre-monsoon cyclone after Amphan. These cyclones led to the destruction of life and property. They caused flooding and the storm surge was dangerous for coastal areas. If climate changes aren't taken care of, India could witness many other pre- monsoon cyclones in the coming years. The Bhagjan gas leak in Assam on 27 May 2020 left rivers contaminated with oil spill residue and suffocated the aquatic species of the wetlands. On 3rd December, 1984, an extremely toxic gas, methyl isocyanate, leaked from a chemical plant owned by Union Carbide in Bhopal, Madhya Pradesh. 3800 people died and thousands of people became permanently or temporarily disabled by the toxic gas. The disaster occurred due to state failure to monitor irregularities at Union Carbide Corporation. The site remains toxic to this day. If human activities continue to imperil the ecological balance of the planet, the future of various species and humanity will

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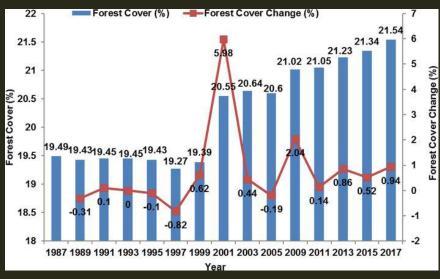
be threatened.

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## Green Technology: Can technology save the world?

Shreya Singh B.Sc. (Hons.) Botany IInd Year



The twenty-first century is known to all folks as the "century of the atmosphere." We tend to be a part of this human community, cannot assume the social challenges like pollution, degradation of natural resources, and global climate change as something set aside for future generations.

Through policy, research, education, incentives, and advanced relationships with businesses, the government can play a central role in building an experienced future, community by community.

### What counts as Green Technology?

Green-tech can be called an umbrella term that describes the utilization of technology and science to form environmentally friendly merchandise. The goal of green-tech is to shield the atmosphere and, in some cases, to even repair the past injury done to the atmosphere.

Global warming is a reality. It's a growing downside displeasing government and society normally and is endangering our health and also the atmosphere.

Engineers and scientists around the world are developing technological solutions geared toward reducing and eliminating everything that causes warming and, therefore, climate change.

A few inexperienced technologies are given below:

### 1. Effluent Treatment

In this, the key development embraces membrane filtration, microbic fuel cells, applied science, development of biological treatments, and natural treatment systems like wetlands. This technology supports in considerable scale back the presence of pollutants from what's discharged into the ocean and rivers.

### 2. Utilization and Waste Management

The increase in home and industrial waste has been disproportionate. Managing solid waste should be taken as a commitment as people. Outstanding technologies like sensible containers, machine-controlled refuse pursuit systems, and automatic optical scanning technologies will facilitate kind mixed plastics by separating them from others.

### 3. Self-Sustaining Buildings

Self-sufficient buildings are those constructions that will perform by themselves by generating energy while not requiring external contribution. A method for larger productivity of energy with the use of solar panels is can be proven to be effective.

### 4. Waste-to-Energy

The generation of energy from waste additionally referred to as Waste-to-Energy, is that the technology that generates energy from garbage. In this scientists tend to develop waste treatment solutions that generate energy within the style of steam, hot water, or electricity that every company will later use for internal processes.

### 6. Vertical gardens and farms

The installation of vertical gardens in buildings additionally helps save energy and brings several edges to the atmosphere. Vertical gardens do not require watering routines that involve needless use of water, and since they're put in on a wall, they scale back the extraordinary hearing pollution that comes from the skin and even that one that you simply will generate. Moreover, it helps isolate the high temperatures that are conferred by global climate change, leading to important savings in energy, heating, and air-con. If we tend to extrapolate this technology to farms, we will save plenty of water and watch out for the fertile soil. Today, there are vertical farms of up to a hundred hectares.



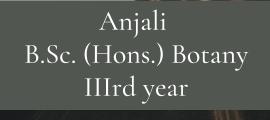
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HTTPS://C4.WALLPAPERFLARE.COM/WALLPA PER/125/663/689/HIGH-TECH-EARTH-HD-WALLPAPER-WALLPAPER-PREVIEW.JPG The main goal is to conserve nature and to remedy the negative impact that humans have on it. Since the 1990's a lot of focus is being put on green technology. It offers a lot of benefits to not only nature itself but also for a clean and greener human lifestyle. Human beings need Earth to stay alive. This technology ensures that the Earth remains healthy for all life to continue existing.

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# Toxic technotrash :Are your electrical equipments giving nature nightmares?





When the Electronic gadgets are of no use or when it is discarded then it makes a surplus waste which is also known as E-waste.

Mainly it is generated by business companies, household uses, Institutions, and many manufacturers. And when this becomes of no use it is a waste that is very complicated to dispose of.

According to the estimates, we are accumulating e-waste or electronic waste at the rate of 50 million tonnes every year across the world. Out of all of this, only 20% is reported to be recycled or properly collected. When in developing countries it is recycled then the toxic chemicals are released in the surrounding causes severe damage to human health and the environment.

At international levels, export of e-waste is occurring as a part of the global waste trade which is sadly a symptomatic of global inequalities and overconsumption in the 21st century.

### Electronic devices are making you sleepless.

As we know that in a healthy adult's body follows a 24-hour sleep-wake cycle. When in the morning as sun rises our body secrets a harmone called cortisol which makes us feel alert and awake. And when the sun shades it's light in the evening the body secrets a hormone called melatonin which makes you sleepy.

Electronic gadgets like cell, mobile, computers these are emitting a short wavelength enriched light called blue light. Fluorescent and LED'S also emits blue light which has been reducing or we can say that reducing the natural production of melatonin in the evening and that's how reducing the feeling of sleepiness.

Tips to use technology at night: we can avoid using the blue lightemitting device or our gadgets at the hours leading up to bedtime. Or you can make Your room a screen-free room. Also, we can buy orange tinted Eyeglasses which have been designed specially to give protection from blue light.

Nightmares: They are occurring during that portion of sleep when we are in dreams. Or we can say them as bad dreams. We can say that this is something we are imagining or we are experiencing in the stressful condition. We are unable to predict the nightmare when it will occur. They can be brought by stress, traumatic events, using electronic gadgets before going to bed.

### HABITS GIVING US RELIEF FROM NIGHTMARES

- We can read some books which will keep our mind calm.
- We have to sleep and wake up at the same time daily by same routine.
- We should avoid scary movies or reading scary books when it's time to sleep.
- We should make our bedroom an electronic-free zone, which will help us to have a stress-free sleep.

How the wrong technology causes nightmares scenarios?

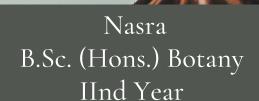
Some ways in which technology causes problems:

- 1.Out of date technology.
- 2. Some poor migration plans.
- 3. Sometimes moving to unnecessary solutions.

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### SUSTAINABLE HOUSES: DREAM OR REALITY





What is sustainability, and how would it look like in our own home? Sustainable housing is one that efficiently uses resources and energy causing minimal impacts on the environment. Green building practices remarkably reduce dependency on non-renewable sources, which are expensive and major contributors to environmental pollution.

Energy efficiency is the core component of green homebuilding. Features including closed foam insulation, solar panels, low-emissivity windows, sealed attic spaces, advanced framing techniques, and energy-efficient heat pumps are some of the various ways used to make a home more sustainable.

Here, are 5 eco-friendly house designs that will amaze you.

### TINY HOMES

They're economical using less energy, materials, and space than the average-sized home, and environmental solution to living simply and

sustainably. They're usually between 100-400 square feet, although some can be a bit larger or smaller. They can also be mobile, fitting on a trailer and can be moved to different places.

### **PREFABS**

Prefabricated homes are homes built off site and ahead of time and they're manufactured using less materials, energy, and space than the average-sized home parts shipped and assembled on the site.

Since their pieces are made in a factory by a very specific building procedure, they create less waste than site-built homes making them green.



PREFABS

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EARTHSHIPS

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### STRAW BALE

Straw bale homes are made using bales of straw as an actual structural component or for insulation. Straw is a natural material releasing no harmful chemicals making straw bale homes quite sustainable. Also, turning straw into something useful rather than burning it into waste.

### ZERO CARBON

A zero carbon home's annual net carbon footprint is zero. They are still tied to the grid, but are so airtight, insulated, needing low energy, that they've become carbon-free. These homes balance out any energy costs by producing enough renewable energy.

### **EARTHSHIPS**

An Earthship is constructed of both natural and recycled materials. These homes heat and cool themselves naturally, collect wind and solar power, harvest water from rain and snow, treat their own sewage, as well as produce food.

With all of these functions, does the name "Earthship" make a little more sense now?

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# Has the electric car's moment arrived at last? Prachi B.Sc. (Hons.) Botany

IInd year

The research estimates that vehicle emissions were linked to about 36,000 Premature deaths and on-road diesel vehicles contribute nearly half of the health impacts of air pollution. Passenger vehicles are the major contributors to pollution, which produces a significant amount of harmful gases like nitrogen oxides, carbon monoxide, and other pollutants.

In 2013, Transportation contributed nearly half of the harmful gases including nitrogen, CO (carbon monoxide), and almost a quarter of other hydrocarbons emitted into the air. Nearly half of everyone living in the United States lives in an area that doesn't meet the federal air quality. Carbon monoxide is the most harmful gas emitted from automobile vehicles that causes air pollution. It has ample health implications like it degrades the blood's ability to carry oxygen, thus making a person experience difficulty in breathing, with eventually leads to other severe respiratory problems.

The invention of the e-car was done in the year 1828 by Anyos Jedlike, at that time people were not much aware of the future situation and hence, the concept of e-car didn't got much recognition.

At the beginning of the 21st century, interest in e-car and other alternative fuel vehicles has increased due to growing concerns over the problems associated with hydrocarbon field vehicles and its deteriorating impacts on the environment. Considering the exponential rate at which the Air Quality Index continues to degrade in Multiple nations, it is certainly true that the moment we flip the switch to the use of electronic cars has arrived at last.

An electric car is a car which is propelled by one or more electric motors using energy stored in rechargeable batteries. An e-car generally produces lower or almost no emissions during their lifetime as compared to vehicles that run on fossil fuels, this will become surely advantageous for our environment as well. All electric direct vehicles produces zero direct emissions, which specifically helps in improving air quality in urban areas.

Everyone is aware of the bad effects of automobile vehicles that run on fossil fuels, hence there's a need to bring reform into actions, thus by making strict laws against car emissions and giving incentives to the people, we might be able to curb air pollution up to some extent.

Though governmental organizations have begun enforcing strict emission standards, the change from gas to electric may still prove slow. E-car are still not popular but companies like Tesla, Lucid Motors and many more are coming up with advanced features and with innovative ideas for e-cars, in order to provide incentives to the customers.

E-cars are the future, in order to save this world from natural calamities and to curb pollution caused by fossil fuel vehicles, we need to make electric cars, the norm.



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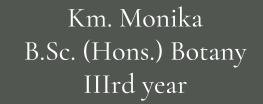
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## Intact ecosystem vital for well being of humanity





AN INTACT ECOSYSTEM can be visualized as a functional unit of nature, where our health is particularly dependent on them. In a fundamental sense, an Intact Ecosystem is one of the pillars of human existence. Although it is a nature that provides the ecosystem services that are essential for survival and crucial to our well–being: i.e., clean water, healthy food, and medical products. In another sense, an intact ecosystem is the planet's life support system – for human species and all other forms of life.

# IMPORTANCE OF A HEALTHY AND INTACT ECOSYSTEMS

The ecosystem carries all human life and activities. The necessity of the human organisms for food, water, clean air, shelter, and relative climatic constancy are basic and irreversible. Ecosystem services that benefit people obtain from ecosystems:

Healthy ecosystems: Provides clean water, pure air, maintained soil, regulates the climate, recycles nutrients, and provides us with food, raw materials, as well as resources for medicine. Acts as a key for future economic and social development.

#### ECOSYSTEM SERVICES AND HUMAN HEALTH

Fresh Water: Many aspects of the world's hydrological (water) cycle are regulated by the natural functions of ecosystem and associated geophysical reactions (such as functioning of the climate system). Human interference in watersheds, river systems take many forms – deforestation, farming, irrigation, river damming and extractions from subterranean aquifers.

Fresh and clean water is essential for human health. It is used for drinking, personal hygiene, washing, cooking and the dilution and recycling of wastes. Wetlands play an important role in the filtering of freshwater, including the removal of various chemicals and toxic elements.

Food: Productive marine and terrestrial ecosystems, both wild and determinate, are the source of our food, a condition for health and life. In poor countries and some rural areas the human health is directly dependent on local productive ecosystem providing sources of essential nutrition.

Biological Products: People around the world depend fully on natural products collected from ecosystems for medicinal purposes. Although, synthetic medicines are available for many purposes, the global necessity and demand for natural products persists. Few of the better-known mainstream pharmaceuticals from natural sources include aspirin, digitalis and quinine.

# NUTRIENT AND WASTE MANAGEMENT PROCESSING AND DETOXIFICATION

Ecosystems play an essential role in the redistribution and recycling of nutrients. This fundamental service promotes the health of plant and animal species everywhere. Disorganization of nutrient cycling can ruin soil fertility, resulting in reduced crop yields.

#### REGULATIONS OF INFECTIOUS DISEASE

Contagious diseases are caused by viruses, bacteria and other types of microbes or parasites. Only some contagious agents cause actual disease in plants, animals and humans. Generally, these are artificial geographically and seasonally by ecosystems and ecological relationships in nature. Pattern's microbes or mutant's entry into the human species (sometimes as new mutants) are susceptive to microenvironmental conditions. These factors may affect the spread of microbes between humans - their more distant dissemination and the activity of vector organisms (e.g., mosquitoes) involved in their transmission. Often human activities induce changes in microenvironmental (ecosystem) and in physical environmental conditions change these natural impacted contagious agent range and activity.

# CULTURAL, SPIRITUAL AND RECREATIONAL SERVICES

People and society obtain many non-material benefits from ecosystems. Ecosystems provide mediums and opportunities for tourism, recreation, aesthetics, inspiration, and education. Such services can progress in mental health, enhance a subjective sense of place or culture and also increase objective knowledge of natural and social sciences, e.g. botany, biology, history and archaeology. The health benefits of these services can be materially less tangible than those captured by conventional health factors or standard economic valuation measures.

#### **CLIMATE REGULATION**

Regional climatic conditions effected by changes in ecosystems and landscapes, especially disforestation and desertification. On a larger scale, the ongoing human-induced alteration of the greenhouse effect also affects climatic conditions.

Each of the ecosystem services explained above is sensitive to climatic conditions and therefore will be influenced by human-induced climate change.



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Earth, our mother, nourishing millions, let us all volunteer to make our dear mother nature more sustainable for her children in the future. One of the many problems earth faces is due to plastic; first created in the 19th century, but it was only during the 1950s that disposable plastics began leading to the global crisis today.

So far, we have produced about 9.2 billion tonnes of plastic, of which nearly 6.9 billion are now waste, and of that 6.3 billion tonnes have never been recycled. Half the plastic ever manufactured has been made in the past 15years. Coca-Cola annually produces 128 billion bottles possibly making this one company, the world's largest producer of plastic bottles. China produces in excess of 25% of all the world's plastic items.

Globally only 18% of all single-use plastics are recycled. Plastic debris in the ocean is a threat to marine life and by extension also a threat to humans.



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#### WHAT INDIVIDUALS CAN DO?

- Refuse plastic straws and ask everyone to join "no straw movement." The same applies to plastic cutlery plates and carryout food containers.
- Choose sustainable alternatives to throw-away plastic items, for example use a metal straw instead of a plastic one.

## Initiative taken by some countries to ban plastic

- Thailand: Ice cream served in banana leaf cups and bamboo spoons.
- Italy: Since 2019 Italy has been using pasta straws to help reducing plastic waste .

Some Companies are making plastic cutlery and straws from avocado seeds that are biodegradable.

But, the sad truth is that plastic is slowly overtaking our oceans and forests. We must slow this down by changing our consuming habits and using less waste.



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# Why extinction affects us all? A crucial recalculation

Shruti Apurva B.Sc. (Hons.) Botany Ist Year



I remember when I was in standard 12 my biology teacher taught us about the "Rivet Popper Hypothesis" proposed by Paul Ehrlich and I found it very interesting as although I knew about the contribution of certain species towards our ecosystem and how difficult it will be for us to sustain life on earth without them, but I didn't know that all the species on this earth are equally important and we all are interdependent upon each other. The hypothesis suggests that, how important is species richness in the maintenance of the ecosystem. Paul Ehrlich compared the rivets of an aeroplane with species in an ecosystem. If the passengers of the plane start to pop the rivets from the wings of the aeroplane, it will collapse and it will not be able to perform its function, similarly, if any of the species present in the ecosystem are reduced or removed the whole ecosystem will collapse.



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After studying this hypothesis, I was curious to know about how will extinction of a species which may not appear very important, affect our lives?

While extinction of species is a part of the natural process of evolution, human activities have increased the rate of extinction. We share our ecosystem with many species and thus our life is dependent on them. Activities such as habitat destruction, climate change, resource depletion and many more has increased the rate of extinction by 1000 times. Most of these activities are carried out by humans.



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To explain us how extinction affects us all our teacher gave us an example of the common honeybee which is responsible for pollinating more than 250,000 species of plants. Due to a disease called the "colony collapse disorder," the entire population of insects was wiped out that led some farmers to import colonies to their fields to keep their yields up.

Worldwide, about 87 of the food crops are those where humans rely upon pollinators like honeybees, whereas only 28 different crops could survive without them.

Due to both natural and manmade causes, 99 percent of the total species that ever lived on earth have gone extinct. From the fossil records, five mass extinctions have been recorded which were caused by major geologic and climatic events. And now we are moving towards the sixth mass extinction that will be caused due to human activities. Scientists consider that the sixth mass extinction began in the Pleistocene epoch due to the over killing of big mammals like the mammoths, and since then human activities had an ever-greater impact on other species which led to the present rate of extinction that is 100 to 100,000 species per year. At this rate the earth will lose more than half of its remaining species in the coming 100 years.



HUNTING OF MAMMOTHS BY HUMANS

Extinction of certain species may seem unimportant to us but it matters as all species are connected through their interactions in the web of life. In an ecosystem, all species are interdependent and are equally important as they rely on the services provided by each other. So, for an ecosystem to be healthy and balanced each species belonging to it should sustain, that means if we save one species, we are saving the habitat for another species.

Losing a species, which may or may not be a keystone species, can have some serious consequences such as disruption of the food web. It is the leading part of the disruption of the whole ecosystem. We can site here the classic example of the kelp forests when the sea otters and the sunflower starfish started to get wiped out due to overhunting and virus infection respectively. The purple sea urchins began to feed on the kelp forest, which resulted in its decline by 93 percent between 2013 and 2018. This resulted in damage to the fish market of North California as many species of fish were dependent on the kelp forest for spawning.



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So, we can conclude that every creature of this world matters. Our quality of life, survival rate and sustainability are directly dependent on the species we share the earth with. Without them, we'll have to face many problems like ecological imbalance, rise in infectious disease in humans, food scarcity, and economic crisis. That means "with extinction we not only lose a species, but we lose part of ourselves".

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# Can the most degraded ecosystems, rivers and lakes, be saved?

Tamanna Sharma B.Sc. (Hons.) Botany Ist year



Almost every ecosystem on earth has been altered by human activities. The impact of some of these activities is neutral but rarely contributes to sustainability, certain exploitive activities threaten species or even affect an entire ecosystem's ability to sustain itself.

The impact of ecological degradation on biodiversity has been causing the extinction of various endemic species of flora and fauna, however, it has recently started manifesting into direct impacts on human livelihood as well.

For instance, the constantly degrading biodiversity due to various ecological imbalances caused by human prying in the Western Ghats poses a direct threat to water security and in turn to the livelihood of millions of people in the plains degradation, therefore, has a serious implication for human well-being and economic sustainability.

The result as laid out last year reported by 16 conservation organizations is that freshwater ecosystems have become the most degraded in the world.

This crisis has received a far less than other attention environmental emergencies like deforestation plastic or factors pollution. Several responsible for the degradation the include ecosystem Industrial waste, sewage and waste water, mining activities,



MUSKEGON LAKE NEARS RECOVERY AFTER YEARS OF RESTORATION

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HTTP://IMAGES.APP.GOO.GL/PBCQUTECKZYTSKS1AFOR OVER DECADES

marine dumping, burning fossil fuels, accidental oil leakage, chemical fertilizers and pesticides influx. "We have to get away from thinking about land first and river second," says Zablocki whose organisations is working with multiple municipalities in the western Balkan nation of Montenyro.

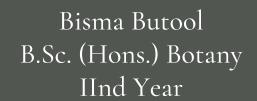
The lower reaches of the highly biodiverse Zeta River have finally been recently designated as a Nature Park. It is very important that children and more so, adults involved in industrially exploitive businesses are educated about the adverse environmental consequences of their activities and the way we can reduce our ecological footprint. We should also reduce the consumption level of substances that cause environmental degradation and legal penalties must be executed actively against the harm doer to prevent any such further actions. However, for the milk that has been spilt is there a way to reverse the damage done?

For over decades Michigan's Muskegon Lake was considered as most degraded lake in the Great Lake region. NOAA and the great lakes commission had collaborated since 2008 to restore the habitat and improve the quality of lake in the area. With much of this hard work almost finished, Muskegon lake has now been successfully removed from the list of great lakes of concern.

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## Is climate change too expensive to fix?





"Climate change is the greatest threat to our existence in our short history on this planet. Nobody's going to buy their way out of its effects"

#### Mark Ruffalo

Climate change is proceeding rapidly with major temperature fluctuations, floods, and wildfires ripping across the world. However, climate change manifests itself as the ultimate equalizer- with every living being facing the challenges put forth by it. In spite of the youth movements, demonstrations raging across our television screens calling out the governments to implement policies to control the catastrophic results of climate change fuelled by the anthropogenic activities threatening the lives of thousands, the main argument put forward for doing nothing is that doing anything would be too expensive with few cynics questioning the feasibility of laws stopping climate change as it might not be economically viable. However, on deeper introspection, it seems to be a misguided belief stemming from incorrect assumptions.



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When focused on the long-term plans to tackle the menace of climate change, initially the ideas of installing the wind or waterpower plants, sources of renewable energy, might seem to be expensive in comparison to our fossil fuel power plants, however, with time, drawing energy from the former will be highly feasible, both economically as well as source-wise.

This, coupled with the fact that further ignorance of climate change under the garb of apprehension about how expensive it is might further be a precursor for economic downfall with its negative impacts.

Geopolitical crisis, disease breakouts, food shortages etc. are inevitable as the climate change progresses which shall incur huge economic losses.

Keeping this in mind, it is never too late to realise that with the time left in our hands, all of us can collectively make conscious efforts to turn back the clock of climate change and avoid these inevitable economic losses.

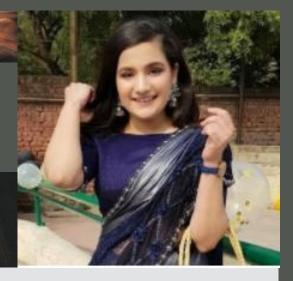
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## What's your "Fair Share" of Carbon?

Surbhi Mendiratta B.Sc. (Hons.) Botany Ist Year



What if out of all your family members only you consume all the drinking water available in the house and your close ones lie there in thirst? Even a thought of it leaves us in guilt but what happens to this guilt when it comes to our fellow dwellers of Earth? Aren't they our family?

The term 'Fair share' refers to having not more or less than what we deserve so that we don't eat up from somebody else's share. When we talk about our fair share of carbon it is the equal piece of cake of Earth's bio capacity where bio capacity is the productivity of these resources. Sustainable development when viewed from a long-term perspective, should take into account equitable sharing of resources. Ecological footprint refers to the ecological assets a population consumes. This term is commonly used for carbon resources, carbon footprinting is a more specific term.

Studies conducted on various regions of the world such as Indonesia, Vietnam, Canada, England, and New Zealand indicate there are differences in the ecological impact of a person based on their

occupations and lifestyles. Carbon footprint analysis helps in a better sustainable planning.

Data collected through surveys across a plethora of countries indicate that the rich consume more resources than the poor. The numbers say it! 18 billion global hectares per capita is the ecological footprint of humanity. Mankind is blindly consuming the carbon share of other living creatures on Earth. It is high time that we stick to our fair share of carbon and live in an ecological balance with other creatures or else we should all start counting for the Doom's

day.



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## Making a commitment back to our Oceans

Pallavi Sahu B.Sc. (Hons.) Botany IInd Year



"Oceans give us life. What we give in return is something that is destroying them at an alarming rate. Oceans produce more than half the world's oxygen, cover 70% of the earth's surface, and serve as the primary source of food for over 3 billion people. Despite this amount of dependence on the oceans for survival, almost 8 million metric tons of plastic waste are dumped into the world's oceans every year.

Oceans make it possible for us to live on this Earth, and hence it is our sole responsibility to protect them. As scientists have estimated, plastic kills as many as 1 million sea creatures annually. Also, it has been predicted that the year 2050 will be a desolate year for the oceans. Experts say that by 2050 there will be more plastic in the oceans than fish, or perhaps only plastic will be left.

The first thing that comes to our mind while witnessing this dismal situation is, "What are we supposed to do to save the oceans"?

Well, there are plenty of steps that we can take at our individual levels to help save our oceans. The first and foremost thing is to reduce energy consumption and mind our carbon footprints.

Some easy steps by which these aims can be achieved are avoiding the usage of cars for short distances; being conscious of our energy usage at home and work; switching to compact fluorescent light bulbs; instead of using an elevator, taking the steps, wherever feasible; and minimising the use of electrical appliances.

The next step is to reduce the plastic waste generation, by using fewer plastic products, and avoiding wherever possible. Instead of using plastic bags, we can carry our own cloth tote or other reusable bags. Storing food in non-disposable



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containers will also contribute to reducing the amount of plastic usage. All living beings on earth are connected to the oceans and its inhabitants. Hence, it is our duty to educate ourselves about oceans and marine life and save them till time permits. So, let us get inspired as well as inspire others, and make a commitment to give back our oceans the respect and health they deserve.



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# PANDEMIC AND MENTAL HEALTH Divya Goel B.Sc. (Hons.) Botany IInd year

Nobody in this world has ever dreamt, that they would be sitting in their respective homes for like half a year without any work, but this unusual thing did come true in the year 2020 'The year of pandemic'.

Everyone was a little shocked as this whole thing of lockdown was new to them, many people even didn't know the meaning of the term 'lockdown'. At first, people were curious and alarmed and everyone collected all the required groceries and stored them at home. There were rumors that soon the markets would be out of groceries, this led to rush buying and it was not at all smart.

This whole new thing and fear of getting ill above that have adversely affected the mental health of people.

Coming of coronavirus in 2020 lead to many new things in everybody's life from college-going students to home workers. The road that was used to be busy was now all the time at peace as the people who used to be on it were at their homes trying to get used to the new way of living and also some new words.

This big change led to a great effect on mental health of people. A businessman who was busy for every hour of the day was now sitting idle doing nothing, this somewhere led to boredom and also sometimes depression as his mind was idle and was thinking unnecessary things. On the other side were people who were at a great trauma by the death of someone who was fit and fine due to corona and this trauma slowly turned to breakout of tears every day. Some get depressed as the person they lost was very closed to their heart.

Students also who were free every time had nothing to do rather than just scrolling their mobile and this led to stress and also mind getting tired. People were facing financial crisis also as they were losing their jobs and this finally led to depression.







WWW.AMSA.ORG

This pandemic was surely whole negative but there were sure some positive outcomes too. Firstly, everyone got time for their family, they got more connected. People used to spend time with families by playing games and also cooking some delicacies till 12 at night as there was no stress of waking up early, there was a stress-free life and which was full of peace, this peace gives mental peace to people and also increases happiness rate of mind.

So, in the end, I think this pandemic has affected our mental health in both ways, sometimes it has made us a little bored, sometimes it has made us enjoyed at our homes. This total thing was mostly how a person spend his whole day, if it was with family, there he was enjoying this time to fullest and if it was scrolling mobile whole day no one could stop him from being tired and stressed.

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# Antibiotics: Leading to resistant strains

Jayati Pandey B.Sc. (Hons.) Botany IInd Year



"It is not the strongest species that survives, nor the most intelligent, but the one most responsive to change"

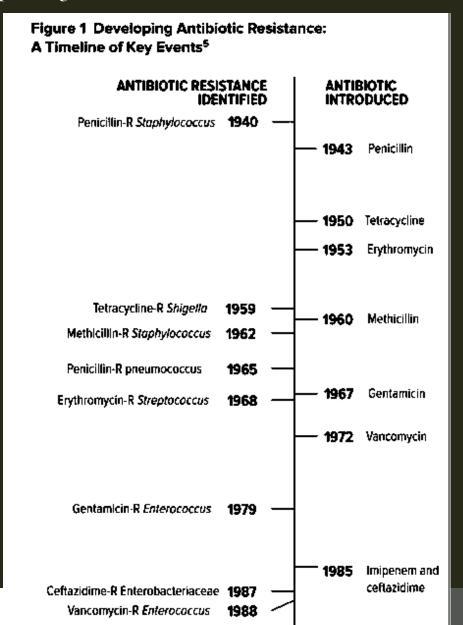
Charles Darwin

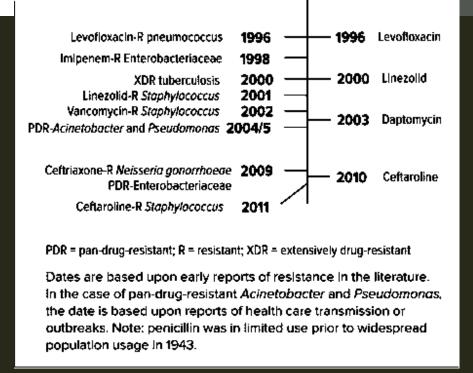
Evolution remains the biggest factor in determining the existence and proliferation of a species on earth. Incorporating genetic characteristics adaptable to the constantly changing environment, in one's genome ensures the continuation of life. For microorganisms after natural selection, countering the fatal effects of antimicrobials became the utmost reason for developing genomic and phenotypic mutation to resist their growth-inhibiting, often deadly maneuver.

In 1908, Alexander Fleming's discovered the antibiotic properties of *Penicillium* (a fungus) which heralded the era of pharmaceutical antibiotic production. By the mid-20th century, pharmaceutical production of antibiotics increased significantly. In around 1935-1968, 12 new classes of Antibiotics were established.

Ever since the introduction of these antimicrobial drugs, microorganisms, like bacteria have been evolving constantly to thwart their growth-inhibiting mechanism, along with evolving mechanisms to disseminate their resistance genes to other susceptible bacteria.

Researches have revealed that such adaptions in many cases have occurred at no cost to the bacteria's fitness. Rather, numerous bacteria are continually developing 'Multi-resistance' against not just one antibiotic, but towards various classes of antibiotics, giving rise to 'Super Bugs'.





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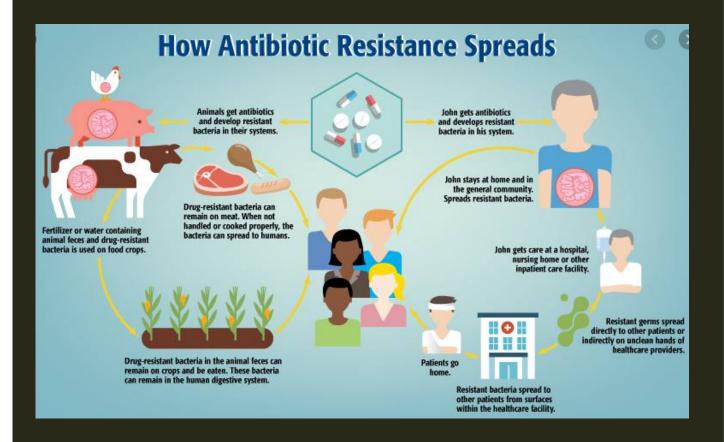
The global spread of drug resistance among common respiratory pathogens, including *Streptococcus pneumoniae* and *Mycobacterium tuberculosis*, are developing into epidemics in various countries across the world.

### NDM1 producing Superbugs

New Delhi Metallo-beta-lactamase I or NDMI is a protein that has started emerging in various pathogenic microbial species including *Enterobacteriaceae*, *Vibrionaceae*, and other non-fermenters by single and double amino acid residue substitutions at different positions. The evolution of the NDM-I coding gene has thrown light on the fact that several commensals are capable of becoming pathogenic as hundreds of commensal strains of *E. coli* that have acquired the NDM-

1 encoding gene, through horizontal transfer of plasmid have now become pathogenic. New Delhi metallo- $\beta$ -lactamase and it's variants are a class of carbapenemase compounds that can hydrolyze a wide range of  $\beta$ -lactam antibiotics that are often the last resort used to treat various resistant strains.

So far 17 variants of *bla* NDM-type gene, that differ in only a few amino acid residues have been reported in various pathogens from different countries.



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SA=I&URL=HTTP%3A%2F%2FWWW.YOURROLEMATTERS.COM%2F&PSIG=AOVVAW3DD11RBWWJE7E4D AHPPW8P&UST=1621911412070000&SOURCE=IMAGES&CD=VFE&VED=0CA0QJHXQFWOTCID33FYO4FA CFQAAAAADAAAABAD Tuberculosis Epidemic: Antibiotic Resistant Mycobacterium

Various strains of *Mycobacterium tuberculosis* have developed resistant genes against the antibiotic Rifampicin. WHO in a study estimated that in 2018 there were about half a million cases of Rifampicin-resistant TB globally.

These recent outbreaks are more than just a wake-up call to stop the prescription and usage of antibiotics and other antimicrobials when infections are manageable.

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## **LOCALS: The Real Protectors**

Khushi Bhatt B.Sc. (Hons.) Botany IIIrd Year



"Before talking about the vital role of indigenous people and local communities as the guardian of our environment, first, let's learn about the meaning of them. According to the United Nations Permanent Forum on Indigenous Issues, people with historical reference or relation with the mentioned region before colonization are considered as indigenous and a part of a local community. Indigenous people have a distinct culture and they practice different social, cultural, economic, and political characters than the dominant communities of the society. They gained recognition by their beautifully unique lifestyle, tradition, and heritage from around the world.

The world has kept the native's people perception on guarding the ecosystem aside for far too long. Their role was first recognized worldwide, in 1992, in the United Nations Conference on Environment and Development.

Indigenous people are known to live in localities surrounding the rich biodiversity. Indian ethnicity compromises of 68 million people who belongs to different 227 ethnic group with 573 tribal communities.

These indigenous tribes mostly thrive in close vicinity to the forests and have proven and managed to conserve their natural habitat for far too long than some of the main stream communities around the world. Local communities had maintained several virgin forests for many decades and form an



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enthralling network of in-situ conservation in sacred groves.

With the reluctance of any kind of human activities, these forests are well conserved in their natural environment. In Maharashtra western ghats, the tree *Mangifera indica* entwined with the twiner of *Tinospora sinensis* resembles the Elephant trunk. Because of the religious beliefs of tribes, they worship the Mango tree and have conserved them for years in their natural environment. In western ghat one can find the *Curcuma domestic*, the wild herbaceous species growing as carpet along with piper in some rare sights. Some of the plants growing in sacred groves in India are preserved by Jain.

Some ethnic races perform the practice of shifting agriculture in North-eastern regions of India referred to as 'Jhoom'. Whereas, in central India and in south Indian states the burnt biomass of the tress is collected and spread in the field which provides essential nutrients

to the plants. Some tribes do not fell the complete trees, instead, they preserve several species horticultural and agricultural importance like Musa spps. (Banana), Phyllanthus embilica (Goose berry), Zea mays (Maize), Saccharum spps. (Sugarcane) etc. Many plant species are conserved by the tribes for the purposes of medicinal healing, setting bone fractures, snake bite, scorpion stings etc. Some of the examples of such plant species are Vanda tessala. Alternanthera sessiles and of roots of Cassia adnata, Sida cordata, Bauhina purpurea etc. are





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tied for healing of wound for 10 - 15 days on broken bones. Plants like Bauhinia purpurea, Sida acuta, Jatropha curcus, Grewia hirsutum, Albizzia lebbeck, Capparis deciduas are conserved as used in muscular pain, cure of fever, headcache, and body swelling.

It's time that the world should recognize the learnings and efforts of indigenous communities in the preservation of the biodiversity. The recent survey by the Food and Agricultural Organization (FAO, 1999) states that there are more than fifty countries looking forward for the collaboration with the local communities in planning out an effective way of conservation.

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Ecotourism is described as "responsible travel to natural areas that conserve the environment and improves the well-being of local people." Ecotourism helps in social development by providing the local people with a source of livelihood, which is more sustainable. It helps to contribute to the conservation of biodiversity.

Eco-Tourism is all about saving the environment around us and preserving the natural beauty of the environment, some of the fields that are closely related to ecotourism are historical, biological, and cultural conservation.

Ecotourism can be described as a variety of travel practices that are responsible for the conservation of the environment. It is also called Sustainable Tourism. Also, ecotourism helps to improve the lifestyle of local people, it helps to preserve many historical landmarks. It helps to learn more about the history of other cities.

#### General Principles of Ecotourism

- Sustainable business practices.
- Community development
- Environmental stewardship

#### Importance of Ecotourism

Ecotourism is important because it helps to preserve the natural beauty of the environment. It helps to improve the economy of local areas, local society can earn extra income from the creation of handcrafts which they can sell to tourists.

It helps to preserve the wildlife especially the endangered species, ecotourism helps in learning the various religion of different community and also helps people to get closer to the natural beauty.

There are some more actual benefits about Ecotourism.

- Makes the world a more beautiful place
- Supports local community and conservation efforts
- Improves the quality of travel
- Ecotourism gives a positive experience to both the local and the visitors
- It promote various culture and economic stability. Ecotourism helps minimize carbon dioxide across the world.

- It helps to reduce the need to hunt animals for income. It helps to reduce the pollution caused by tourist. It helps to gain knowledge about ecosystem biology and geology of various natural occasions.
- Educates people.



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## Wetlands are slipping away

Aayushi Kanth B.Sc. (Hons.) Botany IIIrd Year.



We all have come across the word "WETLAND" at least once in our life. The word reminds me of a wet piece of land, as the name suggests, right? So, is it something just like a large pothole with stagnant water? Then why has there been so much stress about wetland conservation and it's being an important part of our ecosystem? Well, nature never fails to unfold surprises, so let's unveil some facts on our own.

As, botanist we would suggest wetland as a separate ecosystem, which is covered with water temporarily or permanently (even though soil remains saturated during the non-flooding period) and oxygen-free processes prevail. A more precise definition would be:- Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water.

#### Types of Wetlands

The wetlands have basically been classified into types:-

Swamps:- Wetland that is saturated with water permanently and has a dominant woody vegetation. Found in low elevation floodplain region along the bank of the river. They are rich in nutrition. Their shallow standing water provides important habitat for wildlife like wood duck, prothonotary warbler, river otters, cottonmouth snakes.

Bogs:- These are basin wetlands living with precipitation as the sole source of water and do not have surfacing water or streams. These are generally inhibited by *Sphagnum* (liverworts) and helps in the survival of several species.

#### Wetland Conservation and it's necessity



REFERENCE HTTPS://UNSPLASH.COM/PHOTOS/HQ-UYUC-ZY8

Ecosystem provides more than three billion people with basic fresh inland water. Over 90% of wetlands in New Zealand have been drained since European civilization, now they are under the act of

protection. Similarly, in Rajasthan government is acting proactively to protect the wetland system and has embarked 52 wetlands under time-bound development process.

Rajasthan's Sambhar Lake and Keoladeo National Park have the prestigious status of wetland of International importance.

#### Ecosystem and Biodiversity Support

- Wetlands are highly productive and provides the world with two-third of total fish harvest.
- Wetlands play an integral role in the ecology of the watershed. The high levels of nutrients is ideal for the development of organisms such as species of fish, amphibians, shellfish and insects.
- Wetlands' microbes, plants, and wildlife are part of global cycles for water, nitrogen and sulphur. Wetlands store carbon within their plant communities and soil (carbon sequestration) instead of releasing it to the atmosphere as carbon dioxide.
- An important source of ground water recharge.
- Human Dependence: More than one billion people depend on them for a living.
  - Wetlands are a vital source for food, raw materials, genetic resources for medicines, and hydropower.

- Many wetlands are areas of natural beauty and promote tourism and many are important to Aboriginal people.
- Also, they help in controlling floods.

Human intervention for resource exploitation are posing a number of threats to wetlands, these threats include urbanization, agriculture, pollution change dredging and sand mining, along with introduced alien species like water hyacinth threaten the survival of indigenous flora.

#### Convention in India for Wetland protection

#### Ramsar Convention

- The Convention came into force in 1975 and is one of the oldest inter-governmental accord for preserving the ecological character of wetlands.
- India has 37 Ramsar Sites which are the Wetlands of International importance.

#### Montreux Record

• Montreux Record is a register of wetland sites on the List of Wetlands of International Importance where changes in ecological character have occurred.





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- Wetlands of India that are in Montreux Record: Keoladeo National Park (Rajasthan) and Loktak Lake (Manipur).
- Chilka lake (Odisha) was placed in the record but was later removed.

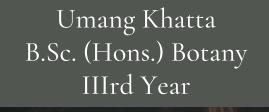
National Plan for Conservation of Aquatic Ecosystems (NPCA)

- NPCA is a single conservation programme for both wetlands and lakes.
- It is a centrally sponsored scheme.
- It was formulated in 2015 by merging of the National Lake Conservation Plan and the National Wetlands Conservation Programme.

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## Restoring Ecosystem: Learning from the World





'Ecosystem restoration' a process where we get the degraded part of the ecosystem back to its original form. An ecosystem is an interaction between the biotic and abiotic components. Hence its degradation not only impacts the biological diversity but also people's livelihood. Still, confused? Let's use an example to get clear with this. The best example could be from our safest place during this pandemic year –Our Home! Yes, it too forms a tiny ecosystem. Now suppose, one day due to some technical issues, the refrigerator stopped working. This damage will not only affect the food being kept in it but it will impact our daily routine too! Refrigerator, an abiotic element of the house (an ecosystem) is affecting both the abiotic (food) and biotic (us) elements. Same is the case with the world as an ecosystem.

Ecosystem degradation has shown a striking rise, the primary cause of which is a sudden increase in the rate of anthropogenic activities. The way we humans are exploiting the environment it is ultimately making our livelihood suffer. The Uttarakhand flash floods of 2013 are a lifelike example of this extreme destruction to humanity, reasons being deforestation, climate change, to mention a few. Hence it's been a proven fact that resource exploitation always leads to life destruction.

Therefore, it gets clear and of utmost importance why the degraded ecosystem needs to get restored to the earliest. The Amazon forest fires, Delhi pollution, Chernobyl disaster, Gulf War oil spill and many such man-made tragedies, had made people all around the world realize the need to restore the utilized and degraded resources. Many hands have now come forward in concern to this issue. The CEM (Commission on Ecosystem Management) has made Ecosystem restoration one of its 19 priority thematic areas. Students are made aware of the necessity of ecological restoration via various additional courses along with their curriculum. SER (Society for Ecological Restoration), IUCN Commission, Parks Canada are some of the forces taking active participation towards ecosystem restoration. Hence in conclusion, 'World is trying their bit, you also try your bit'.



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### VIRUS AND VACCINE





With the onset of the pandemic, we came across new terms like a pandemic, epidemic, vaccines, herd immunity, social distancing, sanitizing, and much more. It definitely improved the general awareness of the public regarding public health issues and pandemics in general. There were more conversations about biology and how science should be supported across the streets. Everyone had an opinion and for sharing the same, they used various platforms. Social media being on top of those platforms. So the thought exchanges were monumentally high during the lockdown.

And with such high intensity of exchange of thoughts, there was also a lot of misinformation about the virus, vaccine, and whatnot. This was the infodemic. Undoubtedly, infodemic turned out to be another problem we all were struggling with. When the trial for vaccines began, everyone saw the light at the end of the tunnel. Everyone shared a sense of hope but few people also misled the masses to believe and join the anti-vaccine movement.

Thankfully, the smart ones led people to the truth and people finally got aware of the necessity of vaccinating everyone. But the bad times weren't over even with the vaccine.

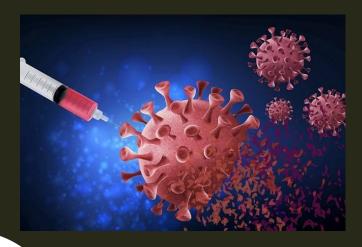
It needed both taking precautions and vaccinating to keep the people safe against the virus. The next problem was keeping precautions wasn't a choice but for the poor classes, it is a privilege.

"This pandemic has magnified every existing inequality in our society

– like systemic racism, gender inequality, and poverty," said Melinda

Gates in an interview in September.

This quote reverberated the most with the current situation. After countering the new virus, our society crumbled, learned to survive, and tried to row its way out of the worst periods. Without any confusion, the vaccine is a lifesaver but we still have a long way to go. For now, the best we all can do is avoid unnecessary outings, take precautions, look out for others, and get vaccinated.



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Science never fails to amaze us at any point in our lives and regardless of how far we go something is usually hidden under the covers as a surprise for us. Recently the discovery of some new species has proved that.

The discovery of *Synsepalum chimanimani* (Sapotaceae), a replacement species from the Chimanimani Mountains of Mozambique and Zimbabwe, by Saba Rokni, Bart Wursten, Lain Darbyshire has created a replacement sensation in field of botany. This plant is endemic to the southern foothills of the Chimanimani mountains. The differences with the already existing *S. kaessneri* and *S. muelleri* were found and therefore the new species has been resolved. The new species is endangered thanks to habitat loss within the restricted region.

Saba Rokni joined Kew as an intern in May 2015, performing on the Guinea-Conakry TIPAs (Tropical Important Plant Areas) project, followed by a few of months within the Plant Assessment Unit, writing IUCN Red List assessments for threatened plants in Cameroon.

She then worked for 2 and a half years on the Mozambique TIPAs project, before starting the current role curator-botanist in November 2019. She belongs the to department of naming and identification team of Africa and Madagascar.





Synsepalum chimanimani

**A** Habit and leaves **B,C** Flowering stems **D** Flowers **E** Immature fruit (Photographs by Bart Wursten)

She has an M.Sc. in Plant Diversity from the University of Reading (2014) and a B.Sc. (Hons.) in Environmental Biology from UWE Bristol (2005).

While working on her project, she was tasked on identifying and promoting the methods of long-term conservation and sustainable management of Mozambique's most important sites for plant diversity.

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## Plant of the Year: Tinospora cordifolia

Muskan Gupta B.Sc. (Hons.) Botany IIIrd Year



Tinospora cordifolia is an evergreen herbaceous perennial climber. This deciduous and dioecious plant is native to lower elevations in tropical areas of the Indian sub-continent and climbs numerous types of trees. It grows in acidic to alkaline soil with moderate moisture levels. Tinospora cordifolia, commonly known as "Giloe" in Hindi and "Amrita" or "Guduchi" in Sanskrit, belongs to the family Menispermaceae which consists of about 70 genera and 450 species.

In classical texts of the Ayurvedic system of medicine, *Tinospora cordifolia* is mentioned under various names, viz. *Amara, Amritvalli, Chinnarrhuha, Chinnodheba* and *Vatsadini* etc. This family is a great and rich source of alkaloids and terpenes. Leaves of this plant are membranous, nerved, roundish, or heart-shaped with a petiole. Male flowers are small, yellow, or green in colour and occur in clusters while female flowers are usually solitary and similar to male flowers. The stem has a green succulent bark covered by a thin brown bark. Branches send down slender, pendulus, and fleshy roots. Fruits are scarlet or orange-colored aggregating in clusters of one to three.

Tinospora cordifolia has been a commonly used shrub in ayurvedic medicine to treat diseases various over centuries. Disease control through the biological functions of active obtained compounds through this plant has led to active interest in Giloe across the globe.



REFERENCE

HTTPS://5.IMIMG.COM/DATA5/SW/KD/MY-4280902/ORGANIC-GILOY-LEAVES-500X500.JPG

Medicinal properties like anti-diabetic, anti-leprotic, anti-allergic, antianti-arthritic, anti-stress. anti-malarial. inflammatory, immunomodulatory and anti-neoplastic have made this plant of immense interest for medicinal purposes. The immunomodulatory properties of this plant are well documented. Active compounds like syringin, N-formylannonain, magnoflorine, and cordifolioside in this plant have cytotoxic and immunomodulatory effects. Stem of Giloe is widely used to treat diabetes in the traditional folk medicine of India. It mitigates oxidative stress, promotes insulin secretion and also inhibits gluconeogenesis and glycogenolysis, thereby regulating blood glucose. The extract of this plant scavenges free radicals generated during aflatoxicosis. Oral administration of these extracts has prevented lead nitrate induced damage to the liver. Decoction of stem is administered orally by the people of Jammu and Rajasthan for the treatment of fever. Decoction of root is used for the cure of dysentery and diarrhoea.



REFERENCE

HTTPS://WWW.ALZDISCOVERY.ORG/COGNITIVEVITALITY/RATINGS/TINOSPORA-CORDIFOLIA

Tribals of North Gujarat have been using powdered root and stem bark of *Giloe* in milk for the treatment of cancer. This plant has been used in the treatment of Rheumatoid Arthritis in traditional medicine. The role of this plant in the treatment of osteoporosis and osteoarthritis has also been evident. Anti-HIV effects, anti-cancer effects and antimicrobial activities of this plant are also well known. The anti-bacterial activity of Giloe has been assayed against *E.coli*, *Salmonella typhi*, *Enterobacter aerogene* etc. In *Charak Samhita* and *Ashtang Hridaya*, this plant has been indicated in diseases like *Jvara* (fever), *Kamala* (jaundice) and *Vat Rakta* (gout), etc. In *Dhanvantari Nighantu*, its medicinal properties are mentioned for the cure of bleeding piles and itching along with promoting longevity.

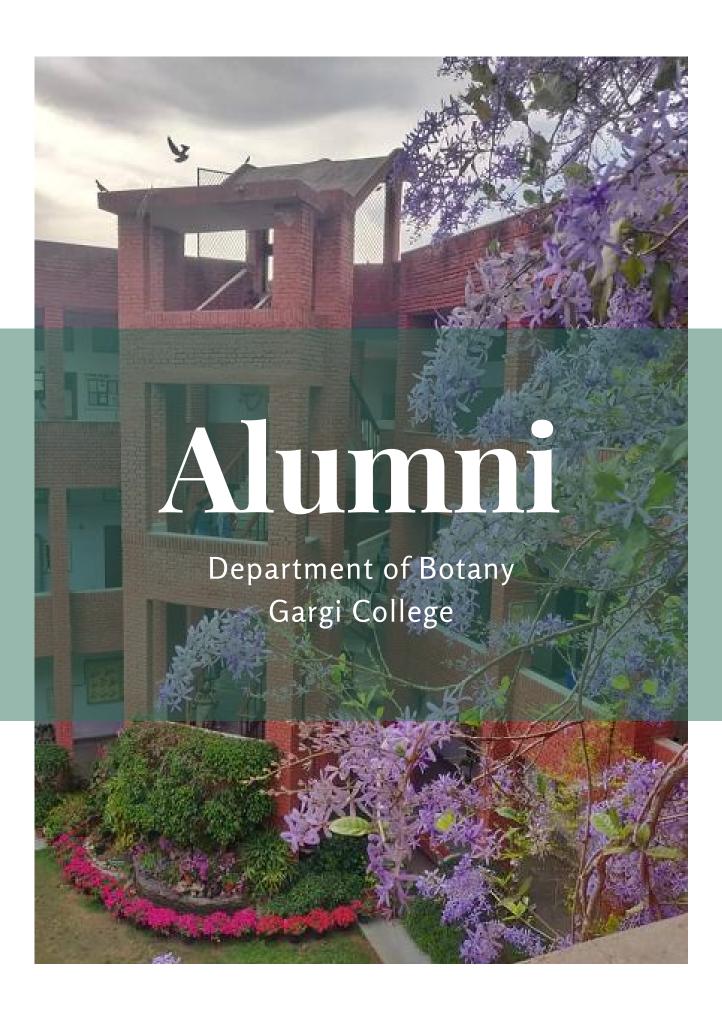
Giloe is also mentioned in ayurvedic literature as a constituent of several compound formulations to treat fever, urinary diseases, dyspepsia and general debility. Some important formulations are Kantakari avaleha, Guduchi taila, Guduchi ghrita, Dashmoolarishtha, Amritaguggulu, etc. In the Unani System, mostly "Sat Giloe" is incorporated in medicinal preparations.

Also, during corona infection, *Giloe* has helped us to raise our immunity to fight against this virus. This "ultimate immunity booster" is full of antioxidants that detox the body and improve immunity. This plant calms down our body and reduces mental stress and anxiety. A plant with as diverse role as Giloe is a versatile resource for all life forms. With so much to offer to the world of medicine *Tinospora cordifolia* is truly an incredible resource.

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Love and Aspiration in Plants



The movement of love is not limited to human beings and it is perhaps less distorted in other worlds than in the human. Look at the flowers and trees. When the sun sets and all become silent, sit down for a moment and put yourself into communion with nature. You will feel raising from the earth, from below the roots of the trees and mounting upwards and coursing through their fibers up to the highest outstretching branches, the aspiration of an intense love and longing – a longing for something that brings light and gives happiness, for the light that is gone and they wish to have back again. There is yearning so pure and intense that if you can feel the movement in the trees your own being too will go up in an ardent prayer for the peace and light and love that are unmanifested here.

DR. AHALYA CHINTAMANI RETIRED FACULTY DEPARTMENT OF BOTANY, GARGI COLLEGE

# Alumni Class of 2020

Aadrita Das	MSc Environmental Science	Tezpur University				
Ritu Kumari	MSc Botany	Miranda House, Department of Botany				
Utkarsha Hedaoo	Msc Botany	Hindu College , Department of Botany				
Farheen Islam	MSc Botany	Miranda House, Department of Botany				
Preeti	B.Ed	Maharishi Dayanand University,Rohtak				
Poonam	Msc Biotechnology	University of Rajasthan				
K Gayatri Devi	MSc Botany	Miranda House, Department of Botany				
Shambhawi	Msc Agriculture Biotechnology	Department of Molecular Biology and Genetic Engineering, G.B. Pant				
Ishita Chandra	MSc Botany	Miranda House, Department of Botany				
Daniya Shahid	MSc Botany	Kirori Mal college, Department of Botany				
Alka Yadav	Msc Botany	Hindu college , Department of Botany				
Neha Rawat	MSc Plant molecular biology and biotechnology	Department of Plant molecular biology, University of Delhi				
Kangkana Khakhlari	Master in Forest	University of Padua, Italy				
Ankita Srivasta	Msc. Biotechnology	Tata Energy & Resource Institute(TERI), New Delhi.				
Apoorva Vardhan	MSc. Sustainable Development	KU Leuven,Belgium				
Anveshna Shekher	M.Sc. Botany	Panjab University, Chandigarh (Main Campus)				
Manisha Kumari	M.Sc. Botany	Panjab University, Chandigarh (Main Campus)				
Madhu Yadav	M.Sc. Botany	Om Sterling Global University				
Rupal Yadav	M.Sc. Botany	Ramjas College, Department of Botany				





## FUN PAGES







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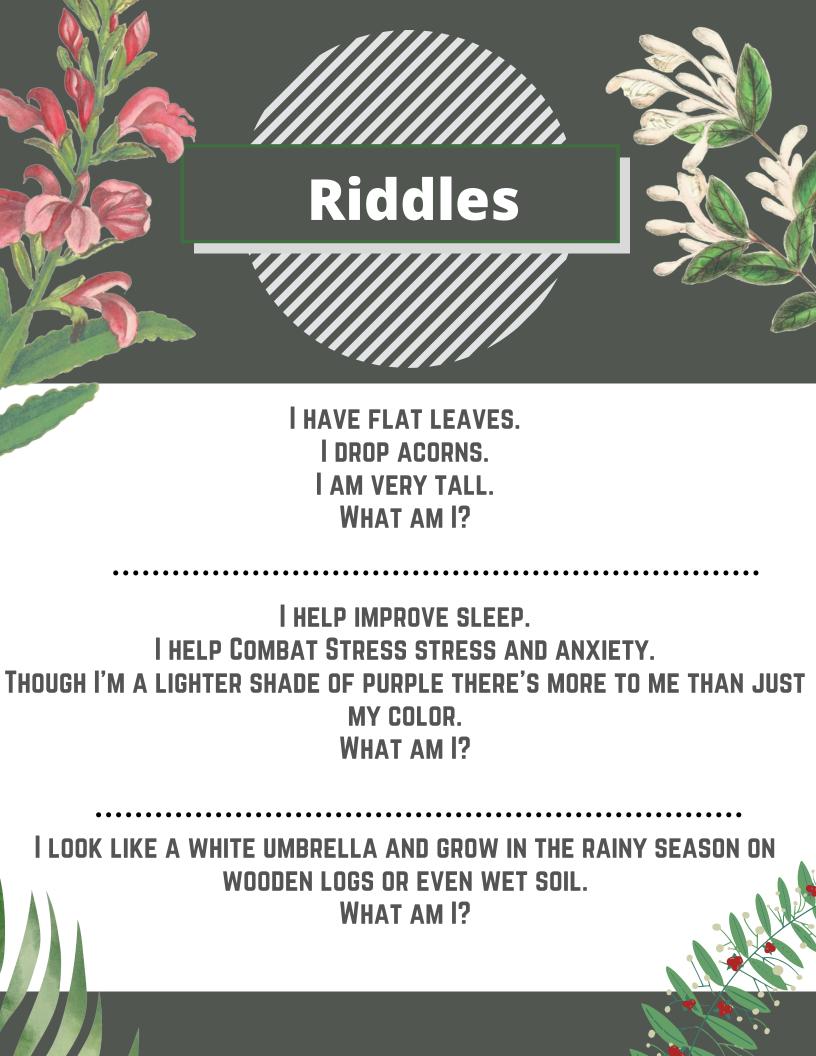
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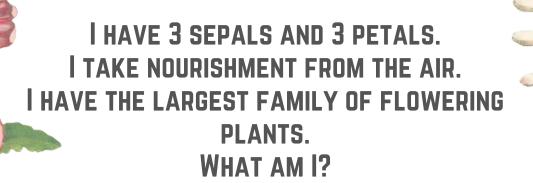
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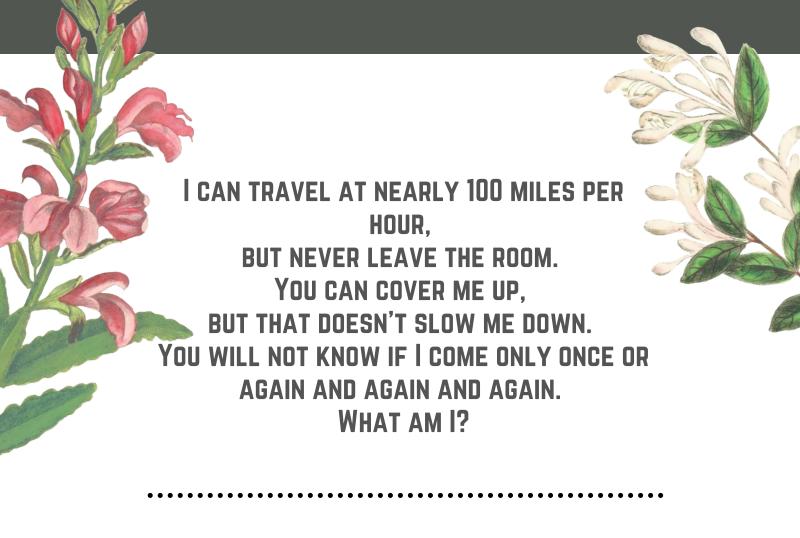
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I'M A PLANT.
I HAVE THREE LEAVES.
SOME PEOPLE THINK
I'M A LUCKY PLANT.
LEPRECHAUNS LIKE ME!
WHAT AM I?

YOU CAN TOUCH ME,
BUT I CAN'T TOUCH YOU BACK.
YOU CAN SEE ME,
BUT I ONLY REFLECT YOU AND CAN NEVER REJECT
YOU.
WHAT AM I?



I SOUND LIKE I COULD CUT YOU,
BUT I'M ACTUALLY QUITE COMFORTABLE.
I CAN BE GREEN OR YELLOW.
I CAN BE STIFF OR SOFT.
I AM A FRIEND TO BUGS AND ALSO BARE FEET.

WHAT AM I?



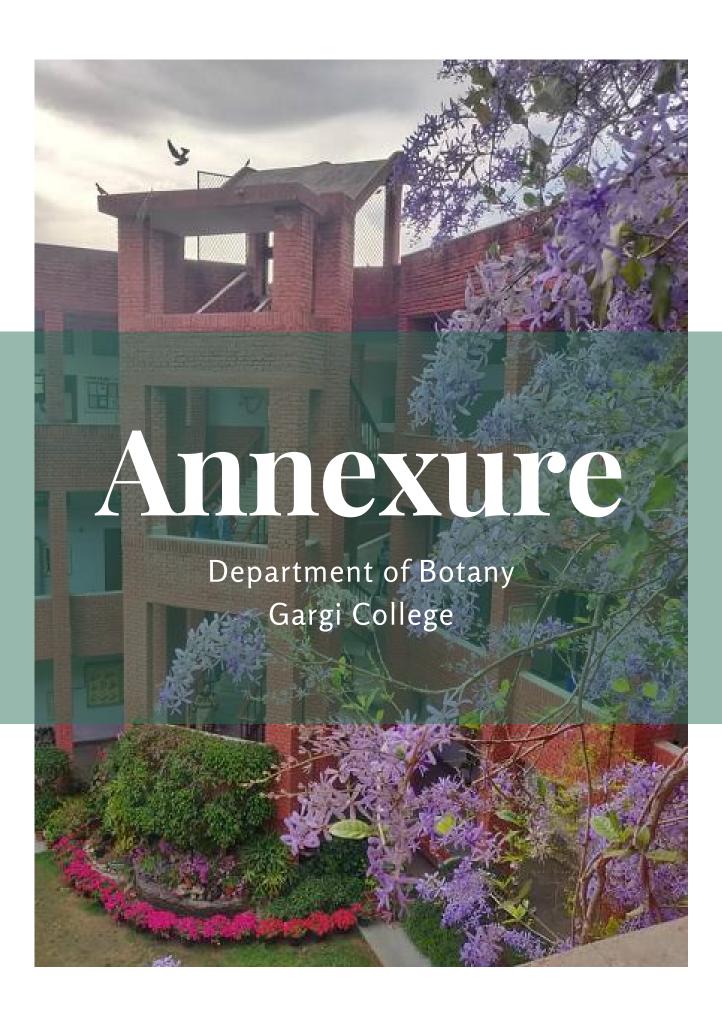
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6. MIRROR

7. A SNEEZE

8. A BLADE OF GRASS



## **Character Drawing Competition**











FROM UP TO RIGHT

**A 1ST POSITION** 

**B&C2ND POSITION** 

**D& E 3RD POSITION** 

ANTHESIS DEPARTMENT EVENTS

## **Green Canvas Competition**







#### FROM UP TO RIGHT

- **A 1ST POSITION**
- **B** 2ND POSITION
- C 3RD POSITION

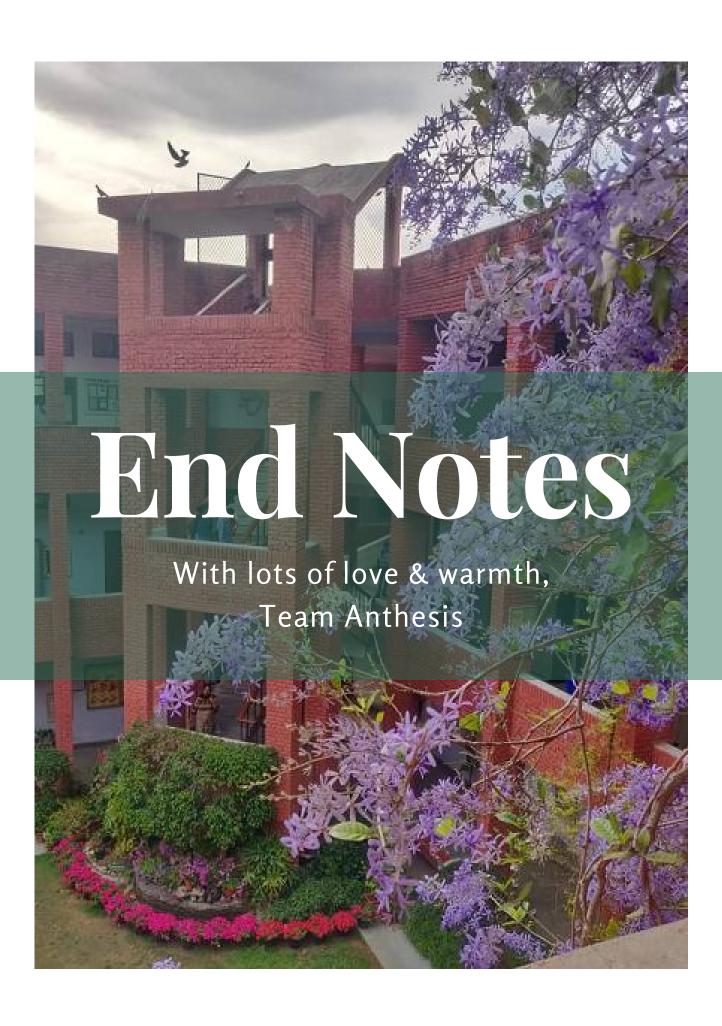
## **Just A Pic Competition**



**A 1ST POSITION** 

**B 2ND POSITION** 

**C3RD POSITION** 



Putting together the annual magazine, Anthesis representing the diverse minds of the department with providing an identical opportunity to every discrete idea, creativity and belief was an overwhelming task for the team, but nevertheless, the pride and happiness one gets after crossing each and every hurdle and by challenging one's own limits is priceless.

Emending each and every article was itself serendipity, a cruise with essence to learn in every moment. We grasped & learned a great deal with the magazine. Our hearts remain laden with precious thanks to our faculty advisors Ruchitra Ma'am, Gladys Ma'am, Preeti Ma'am & Akanksha Ma'am for guiding & believing in us.



Team Anthesis 2020-2021

ANTHESIS 2020-2021



Gargi College, University of Delhi