



AMITY
UNIVERSITY
— HARYANA —

NAAC 'A'
GRADE
ACCREDITED UNIVERSITY

REPORT ON SUSTAINABLE DEVELOPMENT GOAL

15 LIFE
ON LAND



YEAR 2021-22



PREAMBLE

In order to ensure that life on Earth flourishes, Sustainable Development Goal 15 aims to combat desertification, preserve and restore land degradation, stop biodiversity loss, preserve, repair, and promote sustainable use of terrestrial ecosystems.

Amity University Haryana is situated in 110 acres of lush green campus in the foot of Aravalli hills. It is committed to conserve the biodiversity and takes measures to protect the flora and fauna on campus through the following initiatives

1. Plantation Drive
2. Water conservation /collection
3. Green campus initiatives
4. Herbal Garden
5. Pollution control activities
6. Financing for sustainable campus management



Source: <https://www.thehindu.com/news/cities/Delhi/amity-campus-in-aravalli-hills-records-71-species-of-birds/article22926869.ece>

TEACHING AND LEARNING

Amity University play a significant role in educating students, faculty, and staff about the importance of ecosystem and biodiversity. The university create awareness about the goal by offering relevant courses, seminars, and workshops. It also facilitates research projects related to SDG 15, contributing to the development of new technologies for environment management. It leads by example by implementing sustainable environment management practices on campus.

Programs related to Sustainable Development Goal (SDG) 15, which focuses on Life on land are an integral part of the curriculum. The university offers various UG and PG programs to train students and professionals in the field of environment and climate.

S.No	Programes	School/Institute
1	B.Sc. (Hons) - Biological Sciences	Amity institute of Business
2	M. Tech - Biotechnology	
3	M Tech – Solar and Alternate Energy	Amity School of Applied Sciences
4	M.Sc -Renewable energy	
5	BSc- Earth Sciences	Amity School of Earth and Environmental Sciences
6	M.Sc.- Environmental Sciences & Management	

Some of the Open Electives those UG students across the university opts during their studies related to earth sciences, environmental sciences and climate change

- **Climate Science**

Semester 1- AST2151- Basics of Climate Science

Semester 2- AST2251- Introduction to Earth System Science

Semester 3- AST2351- Cloud Microphysics and Chemistry

Semester 4- AST2451-Climate Change: Impact, Vulnerability and Adaption

Semester 5- AST2551- Primer of Oceanography

Semester 6- AST2651- Fundamentals of Climate Variability and Modeling

- **Environmental Management**

Semester 1- ENV2151- Environmental Studies-I *

Semester 2- ENV2251- Environmental Studies-II *

Semester 3- ENV2351-Environmental Pollution and Waste Management

Semester 4- ENV2451-Environmental Management and Industrial Safety

Semester 5- ENV2551-Environmental Economics and Globalization

Semester 6- ENV2651-Sustainable Development Practices

- **Geotechnical Engineering**

Semester 1-CIV2351- Engineering Geology

Semester 2-CIV2451- Geo informatics

Semester 3-CIV2551- Geotechnical Engineering-I

Semester 4-CIV2651- Geotechnical Engineering-II

Semester 5-CIV2751- Project (Geotechnical Engineering)

Semester 6-CIV2851- Seminar-Geotechnical Engineering

RESEARCH & COLLABORATIONS

Environment and climate change is a topic of interest for researchers at Amity University Haryana. There are several research works conducted by faculty members in collaboration with R&D institutions. Some of these initiatives are listed below:

- **NASA-AERONET SUN-SKY MULTI-FILTER RADIOMETER**

In a collaborative research effort, a global network station of NASA AERONET (AErosol RObotic NETwork) site has been successfully established in May 2017 on the roof-top of Academic Block-A of Amity University Haryana, Panchgaon-Manesar-Gurugram for regional air quality and climate research (Figure 1). The valuable data sets (column-integrated aerosol optical depth, aerosol size distribution, aerosol refractive index, fine-mode and coarse-mode aerosol fractions, single scattering albedo, phase function, asymmetry parameter, water vapor, effective radius and current satellite and long-range transport model trajectories) from this real-time sun-sky radiometer provide understanding of almost complete characterization of aerosols over different environments. These real-time, network observations yield radiative forcing due to aerosols and various gases that play a vital role in climate change. These datasets have also been found valuable for developing models for forecast purposes and for calibrating/validating the satellite sensors (Holben et al., 1998; Giles et al., 2019; Vijayakumar et al., 2018, 2020).



- Multi-spectral Aerosol Optical Depth (340, 380, 440, 500, 675, 870, 1020nm)
- Aerosol Size Distribution
- Single scattering albedo
- Asymmetry Parameter
- Phase Function
- Total, Fine and Coarse-mode fractions
- Water vapor
- Aerosol Refractive Index
- Ozone optical Depth
- MODIS-Aqua and Terra AOD
- HYSPLIT Airmass Trajectories
- TOMS/OMI TCO

NASA-AERONET Multi-spectral Solar Radiometer installed at Amity University Haryana (AUH), Panchgaon-Manesar-Gurugram, India

- **MEMORANDUM OF UNDERSTANDING (MoU) BETWEEN NASA, USA AND AMITY UNIVERSITY, INDIA**

A prestigious MoU between NASA, GSFC, Greenbelt, MD, USA for NASA AERONET Facility at AUH has been signed on 14 June 2022 for the next 10 years (i.e., up to 2032). This MoU with Amity University in India plays the greatest role in advancing the Monitoring, Diagnosis, Modelling and Satellite Data Validation of Environmental Health and Global Climate and Allied Research.

NATION-FIRST SUN-SKY-MOON-POLARIZED MULTISPECTRAL RADIOMETER AT AMITY UNIVERSITY HARYANA (AUH), GURUGRAM, INDIA



Despite the high temporal and spectral resolution provided by different aerosol networks, the sun photometry yields aerosol information limited to the daylight period and column averaged. Moreover, polarization measurements that provide composition and shape of aerosols are sparse. These important limitations hamper our understanding of aerosols for climate studies, particularly over high-latitude regions where we encounter extended periods of darkness at wintertime. To acquire this vital information, as a part of the ongoing long-term research collaboration program which is in progress between NASA-AERONET, GFDL, USA and Amity University Haryana (AUH), India, a sun-sky-lunar-polarized multiband photometer has been installed at AUH,



Fig. 2.:
NASA CE-386-T Day-Sky-Night Polarized Multi-Wavelength Radiometer at AUH

Panchgaon, a pristine location in the Haryana State. Some salient features of this new system together with some preliminary results that merit over the earlier conventional network systems (Holben et al., 1998; 2021) for climate sustainability studies have been reported elsewhere (Devara et al., 2023).

MAIA-AMOD SAMPLING SYSTEM FOR SPACEBORNE HEALTH STUDIES

As a part of the CAL-VAL Program of NASA's satellites, a Network of Citizen-Enabled Aerosol Measurements for Satellites (CEAMS), involving MAIA (Multi-Angle Imager for Aerosols Investigation) AMOD (Aerosol Mass and Optical Depth) samplers are being installed by Emory University Rollins School of Public Health, Atlanta, Georgia, USA at different Suitable locations all over the globe. The ACOAST-AUH has been selected as one of the sites in this global network (Figure 3). The IIT-D is coordinating these installations in India. Very recently, a MAIA AMOD

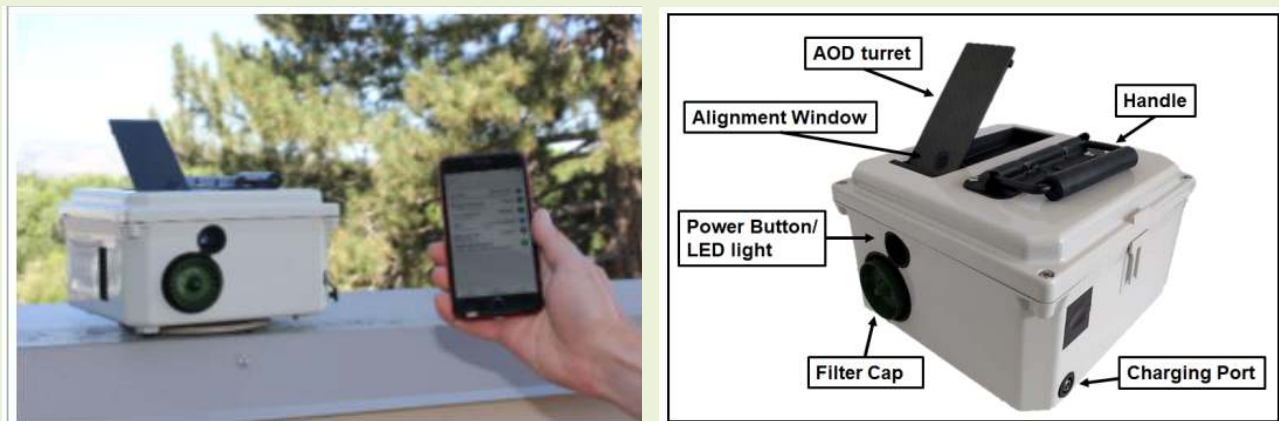


Fig. 3. MAIA-AMOD Sensing and Data Acquisition system installed at Amity University Haryana (AUH), Gurugram, India for Calibration and validation of NASA satellites.

sampler has been installed (Figure 2), co-located with the existing NASA-AERONET instrument, which has been operating for the past more than 4 years at AUH. The data from MAIA AMOD would improve our understanding of how aerosols affect local air quality, visibility, and human health through the connections between AOD and fine particulate matter of PM2.5.

The faculty members received recognition for their contribution in the field of environmental sciences.

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1	ACOAST	Prof. Dr. P.C.S. Devara	Best Research Award	The Award was presented by Science Father, Scifax company (Reg. No. 130116), Approved and Registered by Ministry of Corporate Affairs (MCA), Govt. of India.	2021
2	ACOAST/ ACESH	Prof. Dr. P.C.S. Devara	Jury, AARA Fellows of 2022	Asian Aerosol Research Assembly (FAARA-2022), Elected as Member, Selection Committee of Fellow, Asian Aerosol Research Assembly (FAARA-2022)	2021
3	ASET/CIVIL	Sakshi Gupta	IGBC Accredited Faculty' certificate	IGBC FDP on Green Buildings & Built Environment held during 02 – 06 August 2021	2021
4	ACOAST/ ACESH	Mr. Shubhansh Tiwari	Environmental Award (Copy Attached)	The Award was presented in October 2021 by the NSDA during the World Environment Summit 2021, held at India International Centre, New Delhi during 1-3 October 2021.	2021
5	ACOAST/ ACESH	Prof. Dr. P.C.S. Devara	Work Agreement (MoU) between NASA-AERONET, USA and AUH, Gurugram, India	NASA, Greenbelt, MD, USA	2022

Some of the publications made by researchers in high impact journals are listed below:

1. Fadnavis S, Chavan P, Joshi A, Sonbawne SM, Acharya A, Devara PCS, et al. Tropospheric warming over the northern Indian Ocean caused by South Asian anthropogenic aerosols: Possible impact on the upper troposphere and lower stratosphere. Atmos Chem Phys 2022;22(11):7179-7191.
2. Sonbawne SM, Fadnavis S, Vijayakumar K, Devara PCS, Chavan P. Phase-Resolved Lockdown Features of Pollution Parameters Over an Urban and Adjoining Rural Region During COVID-19. Front Environ Sci 2022;10.

3. Khan AA, Pant NC, Joshi R, Devara PCS. Chemical and isotopic variability of Bhagirathi river water (Upper Ganga), Uttarakhand, India. *Ecological Significance of River Ecosystems: Challenges and Management Strategies*; 2022. p. 133-146.
4. Sonbawne SM, Devara PCS, Bhoyar PD. Multisite characterization of concurrent black carbon and biomass burning around COVID-19 lockdown period. *Urban Clim* 2021;39.
5. Srivastava AK, Bhoyar PD, Kanawade VP, Devara PCS, Thomas A, Soni VK. Improved air quality during COVID-19 at an urban megacity over the Indo-Gangetic Basin: From stringent to relaxed lockdown phases. *Urban Clim* 2021;36.
6. Sonbawne SM, Devara PCS, Bhawar R, Reddy RPRC, Siingh D, Fadnavis S, et al. Aerosol physico–optical–radiative characterization and classification during summer over Ny-Ålesund, Arctic. *Int J Remote Sens* 2021;42(22):8760-8781.
7. Devara, P.C.S., K. Vijaya Kumar, B. Holben, P. Gupta, J. Kraft, E. Lind, S. Tiwari, and P.B. Sharma, (2023). Prof. IASTA Conference, 12-14 December 2023, Mumbai.
8. Giles, D.M., A. Sinyuk, M.G. Sorokin, J.S. Schafer and Co-authors (2019). *Atmos. Measure Techn.*, 12, 169-209.
9. Holben, B.N., T.F. Eck, I. Slutsker, D. Tanre and Co-authors (1998). *Remote Sense of Environ.*, 66, 1.
10. Vijayakumar, K., P.C.S. Devara, D.M. Giles, B.N. Holben and Co-authors (2018), *Intl. J. Remote Sens.*, 1-21.
11. Vijayakumar, K., P.C.S. Devara, S.M. Sonbawne, D.M. Giles, B.N. Holben and Co-authors (2020), *Atmos. Measure Techn.*, 13, 5569–5593, 2020 <https://doi.org/10.5194/amt-13-5569-2020>.

GOVERNANCE

Amity University Haryana with a legacy of world class academic infrastructure is a part of Amity Education Group, a pioneer of global culture in education in India. AUH - a research and innovation driven university, is built on a foundation, which embodies the qualities that have made Amity institutes world class. Spread over a 110 acre green campus in the close proximity of Gurugram, one of India's biggest corporate hubs, AUH is India's first University to be awarded LEED Platinum certification for its green building.

Over the years, the University has instituted global standards in education, training and research with state-of the-art infrastructure, the latest teaching methodologies and digital integration. With the mission to train budding leaders of the corporate, social and cultural world, the University strives to blend modernity with tradition for sustainable future.

AUH has committed to preserving the native plants in its campus. It has a full-fledged horticulture department which takes care of the vegetation, flora and fauna with a team comprising of local farmers 25 in number, 2 staffs who are qualified practitioners in plant sciences and a researchers in agricultural technology. The team works dedicatedly to maintain the green campus. The farmers are given salary and incentives as per the HR Policy 2021 laid for all teaching and non- teaching staffs.

7.6. INCREMENTS

The management as per its policy always endeavors to reward the individuals for their professional performance and achievements. As one of the incentives, faculty members are considered for suitable Increments/ Allowances based on their assessed Performance Grade and recommendations of the HO/ HOD.

For Teaching Staff Performance Grade/ API Ratings, API Score of PBAS will be considered.

Timelines for Increment (Teaching and Non-Teaching Staff):

Increment for Teaching and Non-Teaching are filled twice a year.

(a) Employees who had joined (April- September) will fall in JULY CYCLE.

(b) Employees who has joined (October- March) will fall in JANUARY CYCLE.

Increment Process for Teaching and Non-teaching staffs as per HR Policy

The sustainable use of land refers to the responsible management and utilization of land resources in a manner that meets current needs while also preserving and protecting the land's capacity to meet the needs of future generations. This concept is closely related to sustainable development, which aims to balance economic, social, and environmental considerations. The Mission Green initiative adopted by AUH have the following key principles and practices for achieving sustainable land use:

- Land Conservation: AUH protects natural habitats and ecosystems from excessive development and urbanization. This includes creating and maintaining protected areas, wildlife reserves, and green spaces.

- **Agricultural Sustainability:** AUH Promoting sustainable agricultural practices, including crop rotation, soil conservation, organic farming, and reduced chemical use. This helps maintain soil fertility and prevents degradation.
- **Afforestation and Reforestation:** AUH Planting trees and restoring forests to combat deforestation, enhance biodiversity, and sequester carbon dioxide, mitigating climate change.
- **Waste Management:** AUH maintains Proper disposal of waste materials, including hazardous waste, to prevent contamination of the land and groundwater.
- **Land Use Planning:** AUH make Comprehensive and forward-thinking land use planning that considers population growth, economic development, and environmental protection, aiming to strike a balance between competing interests.
- **Land Restoration:** AUH Rehabilitating degraded land through various techniques, such as re-vegetation and soil improvement, to bring it back to a productive and sustainable state.
- **Education and Awareness:** AUH Promoting public awareness and education about the importance of sustainable land use and its long-term benefits. At this university, we strive to support the preservation and sustainable use of all land, including forests and wild areas, by preserving organic farming, converting wild areas into amla and kinnu gardens, and maintaining herbal gardens.
- **Land-Use Planning:** AUH had developed comprehensive land-use plans that consider the needs of both agriculture and tourism. These plans should consider factors such as soil quality, water resources, and ecological sensitivity.
- **Crop and Livestock Rotation:** AUH implement crop and livestock rotation to maintain soil health and fertility, reduce the need for synthetic fertilizers and pesticides, and prevent soil erosion.
- **Agroforestry:** AUH Integrate tree and forest systems into agricultural landscapes to provide multiple benefits, such as carbon sequestration, habitat for wildlife, and potential tourism opportunities like agro-tourism or forest-based tourism.

Policy on plastic waste reduction year :

This policy is for Plastic waste reduction which is a pressing global imperative that necessitates collaborative action across various sectors. The crux of this effort lies in a multifaceted approach encompassing public awareness, policy interventions, and innovative solutions. Initiatives focused on educating communities like AUH about the environmental repercussions of plastic use play a pivotal role in fostering behavioural change.

Policy on reducing plastic waste disposal.

Efforts to achieve reduction in plastic waste disposal involve a combination of waste reduction strategies, increased recycling initiatives, and widespread adoption of sustainable practices. Implementing effective waste management systems that prioritize recycling and proper disposal is essential. Amity university promotes the three Rs—reduce, reuse, and recycle—encouraging citizens to minimize their reliance on single-use plastics, opt for reusable alternatives, and actively participate in recycling programs.

EVENTS AND SOCIAL OUTREACH

At AUH, events are organized by the school of earth and environmental sciences in collaboration with horticulture department to involve students and faculty member in conserving the environment. It provides them with hands on knowledge about the methodology that needs to be adapted while doing plantation or during the time of growth of the plant. Some of the events organised at AUB are listed below:

Visit to Herbal Garden by the Cadets of Military Training Camp

Military Training Camp is a compulsory programme for completing graduation or master's degree in Amity Universities. Students come to attend 5 days camp in that programme one detailed visit is scheduled for them to understand the importance of Herbal plants.



Visit to Herbal Garden by the MTC cadets

Educational Programme on Ecosystem for Local or National Communities

School Students visit: School student visit organises by Amity Schools to aware students about the medicinal plants, herbs, and their importance in today's world. AUH Herbal Garden and Dog academy make sure to give them the appropriate knowledge about the Plants and Animals.



Students from Amity School visiting Herbal Garden

Visits of Guest:

Every visitor to the university, regardless of their employment objective, is given a comprehensive tour of the campus that includes a visit to the dog academy, an organic farm, and a herbal garden to educate them about ecosystem management.



Visit of external expert form Industry to the Herbal Garden organised by Amity School of Earth and Environmental Sciences

Workshops on Plant Based Food Products

The students gained a lot of information about several plant-based food products that are available in market under brand name PLANTMADE, vegan diet, keto diet, Jain kosher meals, nutrition associated with plant-based food, various food allergies, why to choose plant-based food products over animal-based food products, comparison of plant-based food products with animal-based food products in terms of nutrition, digestion, availability, price, ingredients, variety, taste, cooking style, cooking time etc.

Link for the event:

<https://www.amity.edu/gurugram/events/12403/workshop-on-plant-based-food-products-by-mr.-prakarshi-pulkit,-chief-of-operations-&-innovations-plantmade>

Social Outreach:

Most of the students at AUH are from urban background. The university provides them the opportunity to come close to the nature and learn from the farmers by interacting with them on the field. This is a great learning opportunity for the students and some of them take up projects in the area of agricultural sciences and apply their expertise to solve the problems or provide innovative techniques which can be adapted by farmers. They are also involved in field work; prepare a plan for the field study, schedule interviews with locals and conduct interviews. The interaction with the farmers give them the opportunity to learn about their culture, food habits, health issues and their socioeconomic conditions to understand the life of the people who feed India.

Community Outreach Programme Agricultural Transformation: A Study of Farming Households in Eight Villages of Haryana Organized by Amity School of Economics

Helps in spreading awareness towards environmental issues and problems associated with it. How can we invest in making our planet a better place to live.

<https://www.amity.edu/gurugram/events/12927/amity-school-of-earth-&-environmental-sciences-celebrated-earth-day>

Amity School of Earth & Environmental Sciences organized online Poster Competition on International World Environment Day

A plastic-free planet should not be only for the privileged but should also provide solutions and alternatives for many who depend upon this cheap, light, and accessible material. It is important that in the rush to become plastic-free, we do not suddenly turn to unsustainable or damaging alternatives.

Sustainable management of land for agriculture and tourism

Sustainable management of land for agriculture and tourism is crucial to ensure the long-term well-being of both the environment and the economy. Here are some key principles and practices for achieving this balance:

Plantation Drive under the campaign of “MISSION GREEN”

Objectives of the Plantation Event:

Deforestation is one of the main reasons for the earth's climate change. As per some scientists, it is said that deforestation is responsible for around 18-25% of climate change. Trees are the only way to overcome unstable environment. From a long time, AUH ensure adoption of native species of vegetation for plantation and landscaping. Due to natural vegetation patches AUH campus is very much ecologically sound reflected by large number of Birds and butterflies inside the campus to continue the chain you can join the plantation drive.

On the occasion of 75th Independence Day, Plantation Drive at AUH Campus was conducted by Amity School of Earth and Environmental Studies in collaboration with the Horticulture Department. The event was conducted to create awareness towards the importance and benefits of environmental conservation and plantation including use of each parts of neem plants in our daily life. Faculty discussed the urgency of latest techniques that would benefit mankind by by creating solution which is beneficial to both environment and society and expressed concerns for environmental restoration, Green Energy, and environmental conservation.

Through the MISSION GREEN we motivate our youth to protect the environment and hope that we will be successful. The First Phase of plantation has been successfully completed on August 15, 2021 under the supervision of Prof. I.S. Thakur & Dr. Viveak Ballyan and Second Phase was be scheduled on August 27, 2021. Under the plantation drive, 150 trees (Neem, Papri, Alstonia (Chitvan) and Jamun) were planted at along the boundary wall from Gate No. 3 towards Hostel Backside and up to STP Plant and also along the boundary wall from Gate No. 2 towards Amity Dog Academy total 75 trees were planted. Team members of the Environmental and Consumer Protection Foundation (approx. 20 numbers) and the faculties, staff members and students participated in plantation drive and they were highly interested to become part of the Green mission.



Plantation Drive at Amity University Haryana

UNIVERSITY INFRASTRUCTURE

LEED Lab

Three academic buildings on the Amity University Haryana Campus have received certification as LEED PLATINUM for their green building design, operation, and maintenance. This is the highest rating granted by the USGBC (U.S. Green Building Council) for LEED (Leadership in Energy and Environmental Design) in July 2017; the buildings are among the most educational in Asia and India.

The LEED is the most widely used third party verification for green buildings incorporating highest levels of green parameters in use of materials, construction technology, use of natural light but are also operated and maintained with highest standards of energy efficiency. LEED is a framework to provide a life cycle of building from construction to operation by connecting our daily activities to the impacts they have on our planet. It also provides an opportunity to transform the built environment to green building.

Amity University has joined hand with GBCI to train and educate students to cater the upcoming industry need of green building by initiating an educational module; LEED Lab. LEED Lab is a unique academic initiative which integrates a policy framework to classroom activity to get desired outcome in arena of sustainable built environment. The university has decided to start a LEED Lab for this noble cause of ensuring sustainability. It is a key educational tool connecting students' passion for sustainability with their academic pursuits. It will help to equip the next generation of sustainability advocates with the practical experience needed to differentiate them in today's job market. Through this program students will be trained for green building framework through classroom activity along with project on existing building of AUH campus and their monitoring and assessment of existing building provide performance score of said building. At the end of the course students will be prepared to take the exams of LEED Green Associate and LEED Accredited Professional.



GBCI Launches First LEED Lab In North India At The Amity University, Haryana Read more at: <https://www.magzter.com/stories/Art/Commercial-Design/GBCI-Launches-First-LEED-Lab-In-North-India-At-The-Amity-University-Haryana>

Rich in Flora and Fauna

Amity campus in Aravalli hills records 71 species of birds as reported by The Hindu. <https://www.thehindu.com/news/cities/Delhi/amity-campus-in-aravalli-hills-records-71-species-of-birds/article22926869.ece>

There are 49 different species of butterfly in Gurgaon region in which 40 is in AUH.



Different species of butterflies at AUH, <https://ebird.org/hotspot/L5441195>



Butterflies at AUH Campus, <https://ebird.org/hotspot/L5441195>

AUH provides the birds a natural habitat comprising of vegetation, water environment, pollution free open space and food. Faculty members have conducted 57 surveys & documented the findings which are as follows:

- Birds Diversity: 139 Species
- Campus Bird Count (most diverse in NCR)
 - Year 2017- 53 Species
 - Year 2018- 71 Species
 - Year 2019- 83 Species
 - Year 2020- 97 Species

- **Diverse Avifauna**

Native/Migratory (Summer/Winter)
Waterfowl/Herons/Shorebirds
Pigeons/Doves/Cuckoos/Barbets
Bird of Prey/Owls/Crows/Hornbills
Mynas/Wagtail/Flycatchers
Babblers/Parrots/Shrikes/Drongo

- **Unique Birds**

Indian Pitta, Small Minivet, Knob billed duck Spotted Owlet, Red Avadavat, Peafowl



Unique bird species at AUH



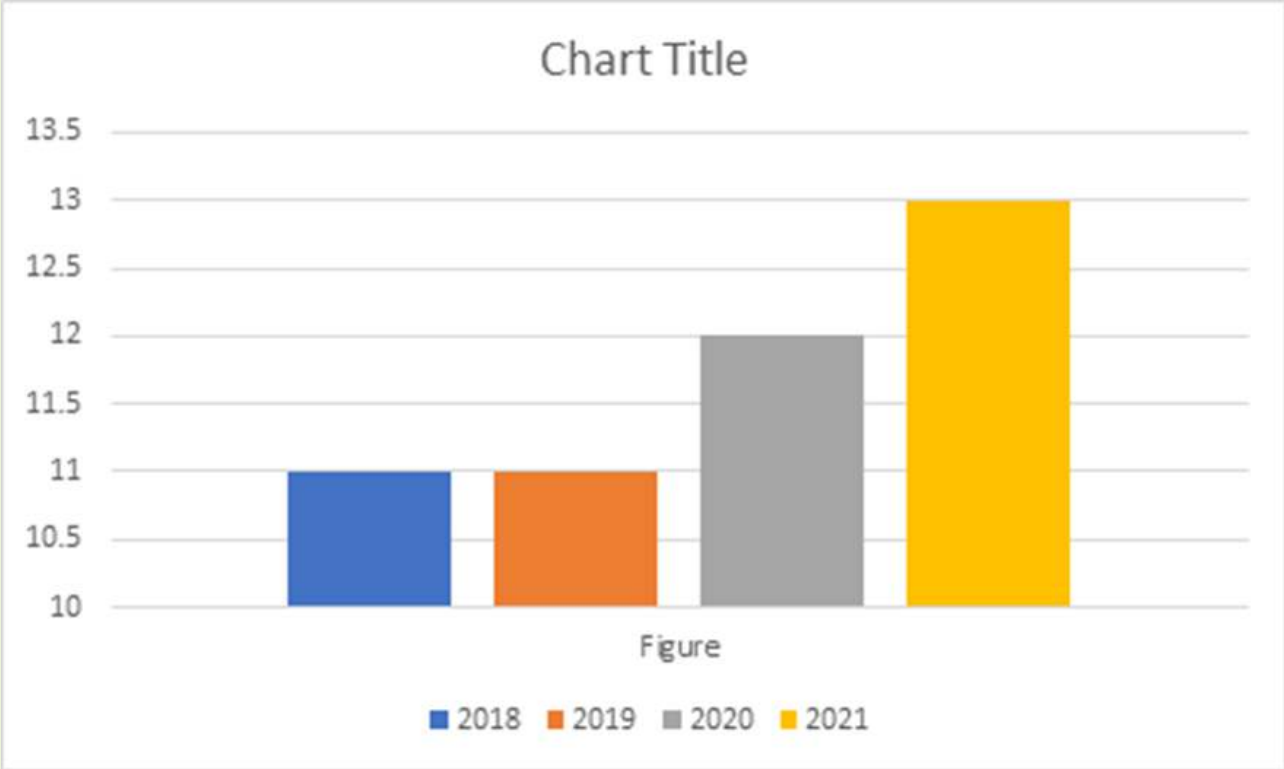
Peacock at AUH

Greenery at Campus

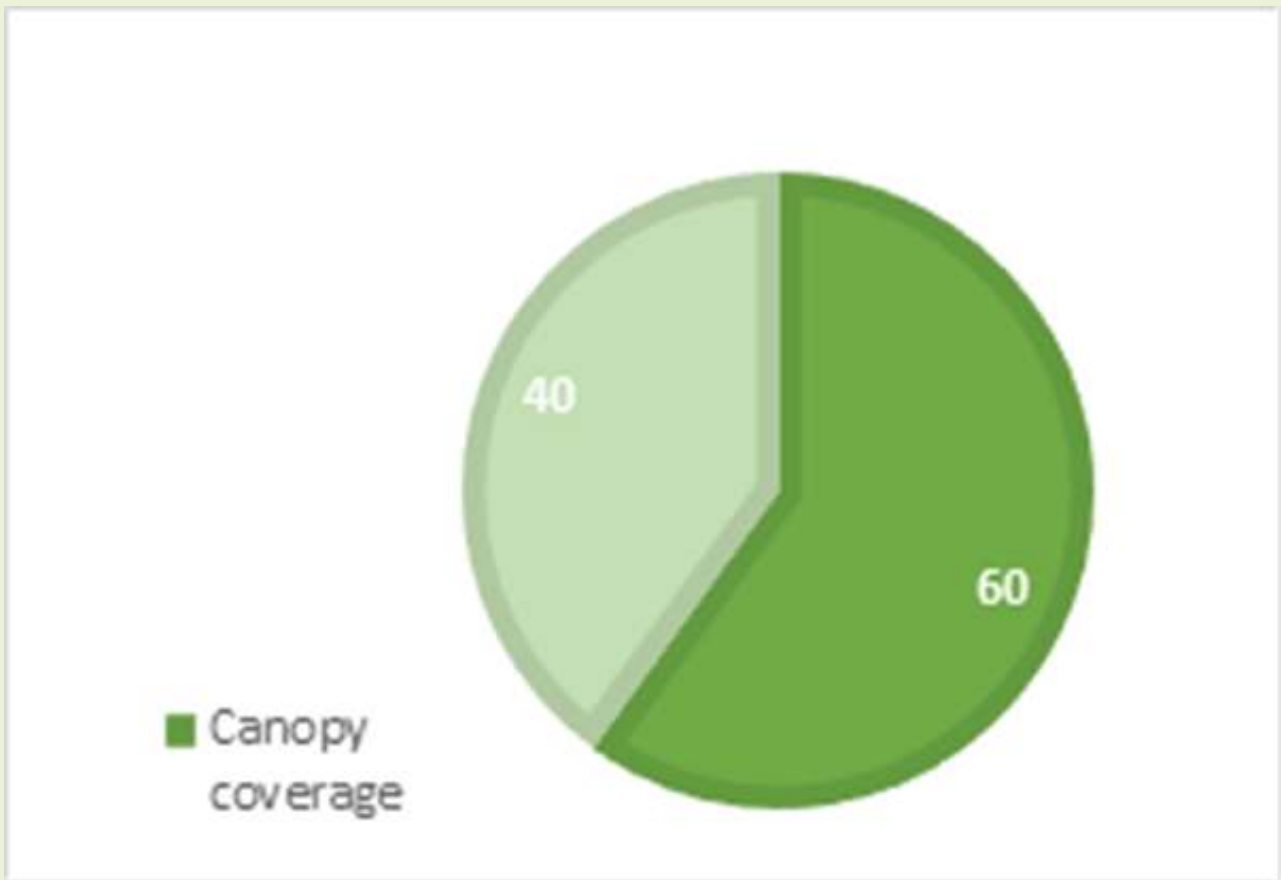
In University the total land area is 110 acres from this only 36 acre is taken by buildings or infrastructure rest 74 acre is green area which includes Trees, shrubs and Lawns and playground. Mostly multipurpose trees are planted along the side of the roads, which gives Aesthetic feel, shadow and they are fast growing, native so easy to maintain like Alstonia, Shisham, Neem, Peepal Ficus, Sagwan, Poplar Indian Mahogany, Frangipani, Pilkhan etc .



The green cover consists of trees and grass cover around the university which are 60% of trees and 40% of grass cover as represented on below figure.



This graph represents that in 2018,2019 we were having 11 acre (44515.4 sq.m), 2021 having 12 acre (48562.3 sq. m) and in 2021 having 13 acre (52609.1 sq. m) of grass cover.



Medicinal Plants – Herbal Garden

An herb garden is often a dedicated space in a garden, devoted to growing a specific group of plants called herbs or medicinal plants.

On our campus, a 5-acre herbal garden is a rich resource for advanced research in the field of Medicinal Plants. The herbal garden is treated as a field laboratory for creating awareness amongst students and visitors.

Here Herbal Garden is a separate space in garden devoted to growing a specific group of plants known as herbs. In our herbal Garden there is combination of ornamental and medicinal plants which we used for research and demonstration purpose.

It also plays important role in biodiversity conservation, commercial cultivation of medicinal & aromatic plants, production of quality planting material, processing & value addition, education, product development, capacity building, education and consultancy, marketing, database and publications.



List of Drought Resistance Plants –

1. Includes drought resistance trees.
1. Drought resistance shrubs
2. Drought resistance ground covers
3. Drought resistance ornamental grasses

Organic Farming:

Organic farming is often considered a sustainable and environmentally friendly agricultural practice that can contribute to land conservation in several ways. Land conservation is essential to maintain soil health, biodiversity, and overall ecosystem stability. Here are some of the ways in which organic farming can promote land conservation:

Reduced Soil Erosion: Organic farming practices, such as crop rotation, cover cropping, and reduced tillage, help to reduce soil erosion. By minimizing soil erosion, the topsoil layer, which is critical for plant growth and soil health, is preserved.

Enhanced Soil Health: Organic farming relies on the use of compost, manure, and organic matter to improve soil fertility. This approach enriches the soil with nutrients and organic matter, promoting soil structure and microbial activity. Healthy soil is better at retaining water, preventing runoff, and supporting long-term land productivity.

No Synthetic Chemicals: Organic farming avoids the use of synthetic pesticides and fertilizers, which can have adverse effects on soil and water quality. By eliminating these chemicals, organic farming reduces contamination of the land and adjacent water bodies.

Biodiversity Conservation: Organic farming often supports higher levels of biodiversity compared to conventional agriculture. By avoiding synthetic pesticides and promoting diverse crop rotations, organic farms can provide habitats for beneficial insects, birds, and other wildlife. This contributes to land conservation efforts by maintaining healthy ecosystems.

Preservation of Native Plants and Heirloom Varieties: Organic farming often encourages the cultivation of heirloom and native crop varieties, helping to preserve genetic diversity and traditional farming practices. This is essential for land conservation because it maintains unique and regionally adapted plant species.

Water Conservation: Organic farming practices, such as mulching and efficient irrigation methods, help conserve water resources. Water conservation is closely linked to land conservation because water is a critical element of soil health and ecosystem stability.

Reduced Energy Usage: Organic farming often involves more labour-intensive practices but may require fewer energy-intensive inputs like synthetic pesticides and fertilizers. By reducing the energy footprint, organic farming contributes to the overall conservation of natural resources.

Vermicompost:

Vermicompost is indeed beneficial for the conservation of land and soil for several reasons:

Soil Erosion Control: Vermicompost improves soil structure, making it more resistant to erosion. It helps bind soil particles together, reducing the risk of soil erosion caused by wind and water.

Increased Soil Fertility: Vermicompost is rich in organic matter and essential nutrients. When added to soil, it enhances its fertility, providing plants with the necessary nutrients for healthy growth. This can lead to increased crop yields and better plant resistance to diseases and pests.

Enhanced Water Retention: Vermicompost improves the soil's water-holding capacity by increasing its ability to retain moisture. This is particularly beneficial in arid regions, as it helps conserve water and reduces the need for frequent irrigation.

Reduced Soil Degradation: The use of vermicompost can help mitigate soil degradation caused by continuous agricultural practices. It replenishes essential nutrients and organic matter in the soil, preventing nutrient depletion and maintaining soil health.

Decreased Soil Pollution: Vermicomposting is an eco-friendly method of managing organic waste. By diverting kitchen scraps and other organic materials from landfills, it reduces the risk of soil pollution caused by harmful substances leaching from landfills into the soil.

Minimal Chemical Dependency: The nutrient-rich vermicompost reduces the reliance on synthetic chemical fertilizers, which can harm the soil and surrounding ecosystems over time. This is especially important for sustainable agriculture and land conservation.

Soil Microbial Activity: Vermicompost contains beneficial microorganisms that promote healthy soil microbial activity. These microorganisms can break down organic matter further and aid in nutrient cycling, leading to improved soil health.

Enhanced Biodiversity: Healthy soil, supported by vermicompost, can sustain a diverse range of soil organisms, including earthworms, beneficial insects, and microorganisms. This biodiversity contributes to the overall health of the ecosystem.

Sustainable Land Use: Vermicompost is a sustainable and renewable resource that supports long-term land conservation efforts. It can be produced locally, reducing the need to transport soil amendments over long distances.

By improving soil quality, reducing the need for synthetic inputs, and supporting sustainable agricultural and gardening practices, vermicompost contributes to the conservation of land and helps ensure that it remains productive for future generations. It is an eco-friendly solution to many of the challenges associated with land degradation and soil depletion.



Biogas Plant:

In all spheres of socioeconomic and agro-industrial growth, a far larger focus on green energy technologies, green science, and green engineering would be necessary in the post-COVID-19 future. A green and bright future for the people of India and the global society is guaranteed by this significant transition towards green technologies. With the blessing of solar energy from the sky and a vast amount of biological green waste from its agriculture, India has a ripe chance to accelerate the adoption of green energy technologies. India has achieved remarkable success in solar energy, but its commitment to producing and using biogas has increased much too much. Biogas generation from the country's biowaste produced in plenty.

Hence, Amity university Haryana inaugurated its biogas powered Bio Lamp



GOVERNANCE & MANDATES

Amity University Haryana has implemented a comprehensive set of preventative measures to maintain the greenery of the campus and ensure the safety of its eco system. These practices contribute to maintaining a clean and sustainable environment.

1. **Plantation drive** : Amity University Haryana plant every year around 500 plants by arranging events one's in a while for students and nearby locals.
2. **Importance to native plants:** In AUH focus is mainly on planting the native plants, so the mortality rate can be high.
3. **Maintenance:** checking growth and maintenance of plants is in high priority , for that we have 25 gardeners they are trained in maintaining plants .\
4. **Minimizing the use of chemicals:** we focus on using the vermicompost for the growth of plants in AUH.
5. **Water management for plants:** AUH have 110-acre total land area in which 60% is lawns and plants so maintaining the water we keep watering them in a rotational way so every plant can be cover in a suitable time.

15.3.1 Sustainable use, conservation, and restoration of land (policy) 22:

This policy stands for practices that meet the needs of the present without compromising the ability of future generations to meet their own needs.

Key Principles:

Resource Efficiency: Minimize waste and maximize the efficient use of resources to reduce environmental impact.

Biodiversity Conservation: Protect and enhance biodiversity by promoting diverse and resilient ecosystems.

Community Engagement: Involve local communities in decision-making processes to ensure that their needs and perspectives are considered.

Conservation involves the protection and preservation of natural resources, ecosystems, and biodiversity to maintain their integrity and prevent degradation.

Strategies:

Protected Areas: Establish and manage protected areas such as national parks, wildlife reserves, and marine sanctuaries to safeguard critical habitats.

Habitat Restoration: Restore degraded ecosystems to their natural state through reforestation, wetland restoration, and other conservation activities.

Sustainable Practices: Promote sustainable agricultural, forestry, and land management practices that reduce negative impacts on ecosystems.

Land Use Planning: Implementing comprehensive land use planning that considers ecological, social, and economic factors to guide sustainable development.

15.3.2 Monitoring IUCN and other conservation species (policies) 22:

15.3.3 Local Biodiversity included in planning and development:

AUH build by considering the fact in notice that is without the plants and biodiversity we can't survive on a longer-term basis. We have a Banyan tree which is approx. 200 years old. We planned buildings in a way that it doesn't affect any existing ecosystem.

Incorporating local biodiversity into planning and development is crucial for creating sustainable and resilient communities. This process involves considering the variety of life in a particular habitat, including ecosystems, species, and genetic diversity.



15.3.4: Alien species impact reduction (policies)

Policies to reduce the impact of alien species reduction plays important role for maintaining sustainable environment.

Awareness Programme:

AUH has its own clubs / society of students which helps the nearby local people for spreading awareness regarding plantation, food, nutrition, pollution, menstruation, malnutrition, deforestation etc.



15.4: Land sensitive waste disposal:

Waste disposal in AUH handled with sensitivity and responsibility to minimize environmental impact and promote sustainability. Land-sensitive waste disposal practices are essential for university to contribute positively to their local ecosystems and communities. Here are some steps AUH take for responsible waste disposal:

Waste Segregation: AUH Implement a robust waste segregation system on campus. Provide clearly marked bins for different types of waste, such as recyclables, organic waste, and non-recyclables. Education and awareness programs help students and staff understand the importance of proper segregation.

Composting: AUH Establishing composting facilities for organic waste, including food scraps, yard waste, and other compostable materials. The resulting compost can be used for campus landscaping or community gardens.

Reuse Programs: AUH Encourage the reuse of items such as textbooks, office supplies, and furniture. This not only reduces waste but also saves money for both the university and students.

Green Purchasing: When the university purchases goods and equipment, prioritize environmentally friendly

Sustainability Committees: AUH Form sustainability committees involving students, faculty, and staff to drive waste reduction initiatives and promote environmentally responsible behaviour.

Environmental Impact Assessments: When planning new construction or infrastructure projects, conduct environmental impact assessments to evaluate the potential effects on local ecosystems and take measures to mitigate them.

Heart shaped bin: In the campus heart shaped bin is established to aware students more about the environment cleanliness



15.4.1 Water discharge guidelines and standards year: 22

To treat wastewater, Amity University Haryana now has two operating sewage treatment plants (STP) and two operational effluent treatment plants.



ETP



ETP Laundry



Pump Room



Oxidation Pond



PREVENTING WATER SYSTEM POLLUTION



Free Drinking water provided :

Amity University makes a special effort to provide students, staff, and visitors with free access to safe, clean drinking water. On the university campus, there are 47 water coolers spread between the dorms, academic blocks (A, B, C, and D), AIMC, and other sites. The specifics of where the water coolers are located are given as proof.

RAINWATER HARVESTING STRUCTURE AND UTILIZATION IN THE CAMPUS

Amity University Haryana is situated in a semi-arid area with no transient water sources, so rainwater is the only source of water that is available here for groundwater recharge, which is the university's primary source of water. Since the university's inception, rainwater harvesting facilities, which are comprised of a complex network of rainwater harvesting wells dispersed throughout the campus, have been an essential part of its development plan. The watershed contour of this area is used to determine the size and location of the water harvesting infrastructure, ensuring maximum rainwater harvest.

MAINTENANCE OF WATER HARVESTING STRUCTURE BEFORE RAINY SEASON

Through the following methods, the university works to promote water efficiency and sustainability:

1. Encourage water-saving techniques among all University stakeholders.
2. Maintain a close eye on and reduce the university's water usage.
3. Native plants are planted to conserve water.
4. Encourages the planting of native trees near and around the university to save water.
5. Evaluates potential locations on campus where alternative water systems could be installed on a regular basis.
6. Continue using cutting-edge water-saving technologies like rainwater collection, water reusing, etc.

Awareness Programs:

Workshop on 'Circular Economy & Zero Waste Campus Program' Organized by Amity Centre of Excellence for Innovation in Education In collaboration with 3R and SDG Choupal on 22nd November 2022

"Awareness Week on Waste Management" Organized by Chem Club of CBFS, Amity School of Applied Sciences from 14 to 20 November 2022.

The United Nations Sustainable Development Goals (SDGs) are the focus of Amity University Haryana of Eminence. The four pillars of our approach to the SDGs are research, teaching, basic institutional practices, and collaborations.

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15 LIFE
ON LAND

