

Climate Change Sustainability at Air University Islamabad

The Higher Education Commission (HEC) has urged all Pakistani universities to comprehend the impact of climate change on the environment, to identify gaps and opportunities, and to establish developmental pathways and thought leadership toward a greener Pakistan.

Following the HEC's guidelines, Air University Islamabad has played a key role in promoting a culture of green, environmentally friendly practices and overcoming the challenges of climate change with the help of the government by organizing various activities and adopting various international standards as part of its commitment to university social responsibility.

Under the leadership of our honorable Vice Chancellor, the Prime Minister's Clean and Green Pakistan programme has been launched at Air University with zeal and initiative of all out support for his noble cause. The goal is to improve the environment, on campus, in the neighboring areas, and by adding to the existing forests.

This theme was intended to assist causes and raise individual awareness about the importance of a clean and green Pakistan. To improve the working environment and raise awareness among Air University staff, each office was given an indoor plant, and the building hallways were also decorated with indoor plants.

Air University planted around 800 plants at her newly established at campus Multan. Similarly, around 6000 plants were sowed at Kamra south campus. Additionally, around 2000 plants installation is in progress s at South Campus, Islamabad, whereas at main Campus, which is already thickly vegetated, places were critically worked out and around 200 trees have been planted. Additionally, around 11000 square foot lawn has been laid to add greener look to main campus.

Around 800 plants were planted at Air University's newly created campus in Multan. Around 6000 plants were also planted in Kamra's south campus. Furthermore, around 2000 plants are being installed at Islamabad's South Campus, although in the main campus, which is already densely vegetated, spots were critically worked out and around 200 trees were planted. In addition, an 11000 square foot lawn has been laid to give the main campus a greener appearance.

In order to encourage a greener Pakistan, Air University distributed roughly 300 plants to faculty, students, and staff for planting in areas of their choice within their city of residence. They were also made responsible for the maintenance of these plants to raise awareness. Air University, in her drive to support greener Pakistan, also distributed around 300 plants to faculty, students and staff for plantation in area to their choice within city of residence they were made responsible for look after of these plants as well to increase awareness.

Furthermore, Air University competed in the UI Green Metric race for the year 2021 and placed 40th out of 232 Pakistani universities, with an international ranking of 766. It also competed in the impact ranking based on UN Sustainable Development Goals for the year 2022, with results pending.

The following activities were held at Air University main campus Islamabad and its sub campuses (Multan and Karma) to make it more successful and to raise awareness of its relevance among students, faculty, staff and society at large.

Events held in Main Campus and its sub campuses

1. Plantation Campaign Go Green initiative 15th August 2021

On 14 August 2021, Air University New Campus Multan held a plantation campaign as part of the Go Green initiative. In the future, the AUMC Students Society intends to focus more on such initiatives.



2. Tree Plantation Drive at Islamabad Margalla hills 2021 dated: 12 August, 2021

On August 12, 2021, Air University hosted a Tree Plantation Drive at Margalla Hills, which was attended by a huge number of university students, academic personnel, and management team members in order to actively engage in Prime Minister Imran Khan's Clean Green Pakistan Movement.

Chairman Kashmir Committee Shahryar Khan Afridi, Director General Environment Irfan Ahmed Niazi, Assistant Commissioners Awaid Bhatti and Rana Musa, and Vice Chancellor Air University Air Marshal Javed Ahmed (R) along with other dignitaries were also present to support the campaign.

While interacting with volunteers, Chief Guest Shahryar Khan Afridi stated that tree planting is a continuous philanthropy and that everyone must play their part to create a clean and green Pakistan for the sake of our next generation. Youth, he believes, is the driving force behind the country's progress toward peace and prosperity.

More than 10,000 seed balls were dispersed near Talhar hamlet in the Margalla highlands as part of the AU Plantation Drive 2021. Sukhchain, Kachinar, Cheer, Wyeeping Willow, and Amrood were among the saplings delivered by the volunteers.



3- Clean & Green Pakistan (Plantation Drive 2021) dated: 10 August 2021

The Shaor Society, in partnership with the Forest Department in Islamabad and PTC, donated 2000 plants to Air University students, employees, and teachers. Sukhchain, Kachinar, Cheer, Wyeeping Willow, and Amrood were among the saplings delivered by the volunteers. On August 10, 2021, students, staff, and teachers planted 2000 plants at various areas in Rawalpindi and Islamabad in order to fulfil the goal of a Clean and Green Pakistan (Plantation Drive 2021)



4- March 7th, 2020 Safai and Awareness Walk

On March 7, 2020, the Air University Shoor Society will hold a Safai and Awareness walk at Hiking Trail 3, Islamabad. The walk was started by Air University students who had the concept that our country should be beautiful and clean, and that we can empower our youth to do so. This Safai and awareness walk educated the youth on the need of environmental cleanliness. The Vice Chancellor supported the youth in their efforts to launch this event and raise awareness in our community so that more people can adjust to the changes. The Shoor Society educated the students on the importance of cleanliness walks.

.As our beloved Prophet Hazrat Muhammad SAW said “SAFAI NISF EMAN HAI”



5- Safai and Awareness Walk Hiking trails 3, 5 and 6, Islamabad dated: 20 Feb 2019

On February 20th, 2019, Air University Shoor launched Safai and Awareness Week. The Shoor society organised a Safai walk along Hiking Trails 3, 5, and 6. People go hiking there, and the majority of them discard their trash on the trails, thus the Shoor Society devised the idea of a safai walk and awareness campaign on hiking trails. Students on the Air University campus came up with this concept. Our beloved country must be kept clean and orderly, and we can encourage our youth to do so. This week of cleanliness and awareness walks taught the youth about the necessity of keeping our surroundings clean. The Vice Chancellor backed the young in their efforts to start this event and raise awareness in our community for a brighter tomorrow.

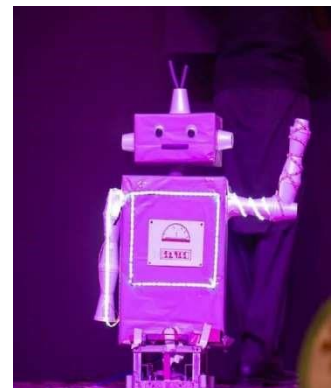


6- Decor by recycling waste dated 4th -6th Oct ,2019

At Air University Islamabad, an event about decorating using recycled garbage was held. Various attempts were made in various events that had the essence of sustainability in their preparation and execution. One example was a student team that used plastic bottles and cans to decorate the campus for the Air Tech technical Olympiad.

During the event, recycled bottle dustbins were also placed throughout

campus.



Air University initiated the programs as follows to reduce the paper and plastic on campus.

1. Anti- littering Program

The goal of the initiative was to keep the campus clean. On campus, improper litter disposal of any kind was severely prohibited. Posters for the proper disposal of litter, which includes but is not limited to food, food wrappers, paper, cans, bottles, or discarded detritus, were displayed throughout the campus.

2. Safai ko pasand kro (Love Cleanliness) Program

The Safai Ko Pasand Kro (Love Cleanliness) program was introduced at class level to refresh the ideology of cleanliness and to make the environment around the university squeaky clean and hygienic

3. Environmental Solutions(Recycling) Program- in Air Nexus 2018

The aim of this program was develop environment friendly projects, where no hazardous material was suggested to be used. Every product contained at least 85% of useless things to produce a recycled products. The idea was to bring something innovative with no copyrights.

4. Re-craft Competition Program - eNexus'20 (Recycle, Rebuild, Reuse)

The students were suggested to use home materials for crafts competition. The target was to make craft of recyclable things or depict some idea regarding recycling.

5. Decor by recycling waste

The sustainable solutions efforts were carried out by planning and executing waste products. The plastic bottles and other recyclable waste were reused to make dustbins, robots and other products to décor the campus.



7- Seminar on Climate Change dated: 3rd Oct, 2019

The honourable Minister of Climate Change Affairs, Zartaj Gul, was invited as the chief guest to a symposium on "Climate Change and Sustainable Development in Pakistan." Other distinguished guests, including representatives of NGOs working in Pakistan to combat climate change, were also invited and briefed the audience on their work. There was a panel discussion, and some proposals for projects to solve the problem were offered. The ceremony was closed by a tree plantation discussion and its outcomes.



8- Work Shop on Building energy saving systems dated 28th Sep, 2019

On September 28, 2019 at BBA Auditorium, Air University, an automation workshop was held for students to design an indigenous system to save electricity in household appliances. A pedestal fan was operated during the operation. It only turns on when it detects human presence nearby. The Robotics & Automation Society of Air University organized this activity.



9- Work Shop on Building Water Saving Devices dated: 21st Sept, 2019

At the BBA Auditorium of Air University Islamabad, a workshop on Building Water Saving Devices was held.

The Robotics & Automation Society at Air University created the first Smart Tap prototype. The prototype was well received, and the university administration requested that it be used in the ablution area and washrooms.

Scrap materials were used to construct the body and all of the building components. Discarded dispenser bottles and damaged PVC pipes were used for the main body. This system is suited for use in underserved communities.



10- Plantation Drive 2019 Margalla hills, Islamabad (Near Pir sohawa Village) dated: 12 Aug 2019

Under the AU Plantation Drive Project, more than 4000 seed balls were thrown at Margalla hills on 12th August 2019. The volunteers also brought various saplings including Suk Chain, Cheer, Weeping Willow and Amrood.

Air University is committed to follow the Plantation drive mission to make Pakistan the beautiful nation. It is worth mentioning that Air University has also planted 7000 trees this month in its campuses, including Kamra, Multan and South Campus. Earlier, the volunteers of Air University Shaoor Society, with the collaboration of civil society and industry partners, had also achieved a target of collecting 8,000 seeds from waste in addition to organizing plantation drives for school children in the twin cities.



11- Plantation drive Islamabad Model College for Girls G-11/1, Islamabad

Venue dated: 14 Aug, 2018

On 14-Aug-2018, the Air University Shaoor Society planted trees at the Islamabad Model College for Girls G-11/1, Islamabad. This was done to inform the children about the mission, including why the plantation drive is vital and why it is necessary to raise awareness among school students . The Shaoor Society of Air University planted 200 plants in the school. Miss. Fazaila Ali Qazi, Deputy Director Student Affairs, led the team with her support for this worthy cause around the city.



12- Plantation Drive Govt. Girls high school, Khayabn-e-sir syed Sector 2, Rawalpindi 150 plants dated: 07-aug-2018

Air University Shaoor Society started plantation drives in Govt. Girls High School, Khayabn-e-sir syed Sector 2, Rawalpindi on 7th August 2018 . Air University Shaoor Society planted 150 plants in the school. Deputy Director Students affair Ma'am Fazaila Ali Qazi lead the team with her support to plant trees to make our city country more green.



13- Plantation drive; Board Room, Air University Islamabad dated: 17 July 2018

Air University Sha'oor Society and Friends of Environment decided to work together to convert today's wastage into a Greener and Cleaner Pakistan. Air University also signed a MOU with Friends of environment for the project titled From Waste to Plant. Under this project Shaoor Society's volunteers achieved a target of 17,000 trees plantation all across Pakistan using the waste to plant concept.



Air University Islamabad

Environmental education measures

Air University Main Campus Islamabad for Smart and Sustainable Living Environment

- Air University in Pakistan is working for developing a research center for Smart and Sustainable Living Environment. Their objective is to help both urban and rural communities to use green and sustainable technologies so that they can improve their living standards without negatively impacting our global eco-system.
- In this, the team is working on various projects, including development of; Energy Monitoring, Control and Conservation Systems, Green Construction of Smart Buildings for Sustainability, Smart agriculture systems including, an agricultural robot for performing precision operations like seed dispensing, on-spot irrigation and on-spot pesticide spraying and low cost solar powered Automated Irrigation System.
- The group also holds workshops to educate the next generation on the use of renewable and sustainable energy systems, highlighting the importance of using sustainable technologies.

Design and Fabrication of Vertical Axis Curtate Wind/Water Turbines

- The aim is to design and fabricate a vertical axis wind turbine with automated blade angle correction (alignment of the blade to maximize lift by adjustment of angle of attack) depending on fluid speed and angle of incidence.
- This will increase the efficiency of the turbine. It is planned to make a small scale prototype for this purpose that can be used as proof of concept.



Development of a Solar Powered Automatic Drip Irrigation System

- The variation of spatial and temporal distribution of available water for irrigation makes significant demand on water conservation techniques. Hence solar powered Automated
- Irrigation System provides a sustainable solution to enhance water use efficiency in the agricultural fields using renewable energy.
- This system allows farmers to apply the right amount of water at the right time.



This system can automatically irrigate the fields according to the pre-defined conditions. It allocates water according to the crop water requirement and availability of solar radiation.

Development of Automated Smart Home Systems

- Home automation is the automatic control and monitoring of household appliances and house features like doors, windows, fans and so on. This project presents the overall design of wireless Home Automation System.
- This system improves the standard living at home, saves energy and money and it also provides support to elderly and disabled people in home.
- This project not only focuses on controlling the home appliances and devices automatically but it will also enable the user to control them through a web application or smartphone application.
- It is planned to cover some basic, frequently used modules which are in general required for every household.

Analyzing Strategies for Cost Effective Net-Zero Energy Buildings in Different Climatic Zones of Pakistan

- We see that a major portion of Total Energy (>50%) and Electric Energy (>60%) in Pakistan is being consumed by Residential and Commercial buildings. This huge consumption ratio is impacting negatively on the energy available to our Industry and thus the growth in Pakistan GDP is being stunted badly.
- It is therefore, imperative that a detailed study be carried out to ascertain the wasteful usage of energy in buildings due to poor design and non-usage of the latest energy conservation technologies as well as determine the cost effective methods of integrally incorporating the use Renewable energy sources for producing electricity, within the building design to meet majority of the lighting, heating and cooling requirements of existing and new buildings. That is, to make these buildings self-reliant on energy needs.
- If the concept of reverse metering of electricity is applied, and maximum options for energy generation are used within building design, it may be possible for the buildings to sell additional electricity (over and above their own requirements) they produce during daytime, to the grid; while buy back the same electricity at night-time to fulfil their requirement.
- Thus the feasibility of introducing the concept of Net-Zero Energy Buildings can be introduced in Pakistan.

Development of Solar Powered LED Smart Street Lighting System

- The major objective of the study was to design and develop a Smart Solar

Powered LED Street Lighting System.

- The project is different from conventional street lighting systems not only in the sense that it uses solar energy, but more importantly, it is also a standalone device that provides for an efficient energy management program that ensures effective maintenance and reduced energy wastage due to malfunctioning lighting controls. In addition, it is much cheaper to fabricate and maintain as compared with its commercially available counterparts.
- One important feature of the project is that it automatically controls the brightness of the LED lamp depending on a particular time of day, especially in cases where full level illumination is not needed, thus reducing power consumption.
- It automatically activates and deactivates lighting depending on the hours whereby daylight is sensed, thus ensuring a continuous cycle of charging and discharging the storage battery for maximum efficiency. All of these functions are possible since the project uses a controller, allowing for variable settings of time activation as well as brightness level, depending on the preference of the end-users. The project functioned according to expectations, being a cheaper and environment-friendly alternative as compared with its commercially available counterparts.
- It also provided a cost-effective approach to managing street lighting systems in a wide variety of applications.



Development and Analysis of Energy Efficient Sustainable Building Materials

- With the rapid development and modernization, cities are growing at a very fast pace and the buildings are the main component of cities. Building construction in the world annually consumes around 25% of the global wood harvest, 40% of stone, sand and gravel and 16% of water. It generates 50% of global output of GHG and agents of acid rains.
- The manufacturing process of building material contributes to Green House Gases such as CO₂ to the atmosphere to a great extent.
- The natural disasters like global warming, ozone layer depletion, unexpected seasonal variations and decreasing land surface have now moved the center of attraction from development to sustainable development.
- Since we have limited resources and energy, our development should focus on conserving the energy.
- Due to the continuous exploitation of natural resources, there is an urge to produce environmentally responsive building material for the construction of new buildings to meet the rapid urban growth.
- Sustainable buildings are designed, constructed, maintained, rehabilitated, and

demolished with an emphasis throughout their life cycle on using natural resources efficiently while also protecting global ecosystems.

- Selection of appropriate building material helps to use the energy efficiently. In the rapidly changing scenario of building sector, planners, architects, engineers and builders are looking for new materials and technologies to adopt in future constructions that benefits like energy efficiency, resources and water conservation, improved indoor air quality, life cycle cost reduction and durability.
- This paper presents a brief study of sustainable aspects of building materials and a tool for Life Cycle Assessment criteria that helps in selecting proper building material

Energy Saving in School Buildings in Pakistan.

- Energy use data of the sample school was gathered from available records as well as measured using an in-house developed metering device that recorded the electric consumption data on hourly bases.
- Building energy simulations were also carried out using TRNSYS© software for

Improvements in Energy Performance of Buildings



validating and comparing the actual energy consumed and optimal energy consumption resulting from building energy simulation of the existing and re-designed building.



- The results highlighted that if the building had been designed with proper

considerations for energy efficiency, up to 30% of energy could have been saved.

- The measurements and analysis indicated that other measures like the use of different types of window glazing, LED Lighting, efficient gas heating, and improvement in behavior pattern could also result in substantial energy savings.
- The maximum achievable savings can be as much as 50% of the energy cost of the school buildings. Additionally, once extrapolated over the entire school-going population of Pakistan the CO₂ emission savings come out to be substantial, amounting to 3.07 M tonnes annually.

PROJECTS AND RESEARCH CONDUCTED RELATED TO ENERGY

S No	Projects and Research Areas
1	<p>Electrical energy management of building using fuzzy control</p> <p>Publication: M. Ghaffar, N. Naseer, S.R. Sheikh, M. Naved, U Aziz, ZU Koreshi, Electrical energy management of building using fuzzy control, 2019 International Conference on Robotics and Automation in Industry (ICRAI).</p>
2	<p>AI for Energy Demand Energy Management.</p> <p>Project Submitted for ADB High Level Technology Challenge: “AI for Energy Demand Energy Management” Submitted in Nov 2019, Shortlist by ADB for final round of selection.</p>
3	<p>Artificial Intelligence-based Building Energy Management System for Near Net-Zero Energy Buildings and Demand-side Responsive Load Management.</p>
4	<p>A Study on the Mechanism and Control of Dynamic Stall on a rotating Airfoil (Rotors & Turbines) using Unsteady Aerodynamics and Computational Fluid Dynamics. (Flow control using; synthetic jets, steady and unsteady suction & blowing, moving surfaces).</p> <p>Publication: M Sun, S.R. Sheikh, Dynamic stall suppression on an oscillating airfoil by steady and unsteady tangential blowing, Aerospace science and technology 3 (6), 355-366</p>

Hydrodynamic Design and Optimization of Cycloidal Vertical Axis Water Turbine for Efficient Power Extraction in Shallow Streams.

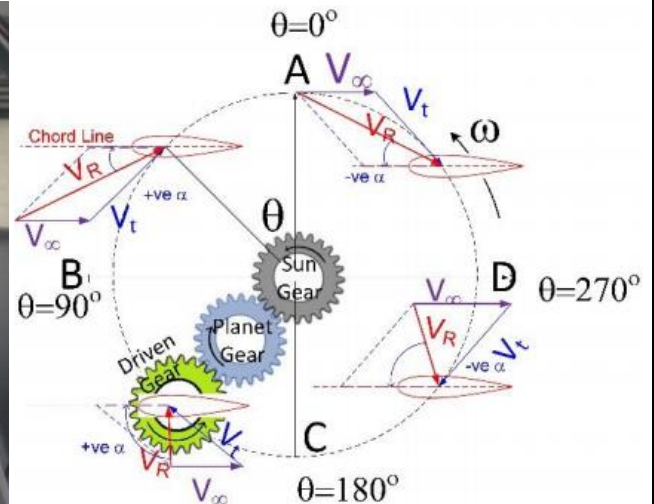
Publication: Syed Hassan Raza Shah, S.R. Sheikh, Meesam A. Naqvi, Hydrodynamic Design and Optimization of Vertical Axis Water Turbine for Shallow and High Velocity Water Streams of Pakistan, UMT National Multidisciplinary Engineering Conference 2015 (NMEC-15)

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Analysis of Vertical Axis Water Turbine for River Application using

6

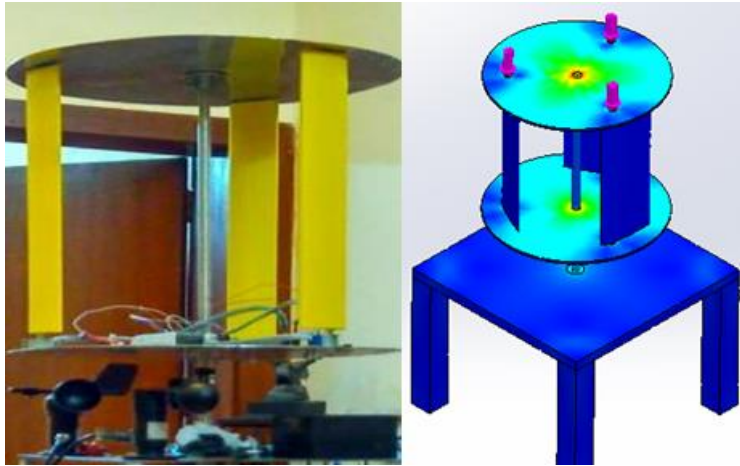


Computational Fluid Dynamics. Publication: S.R. Sheikh, Zafar U. Koreshi, Umar

Rauf, Shahid Khalil, Umair Aziz, A Novel Blade-Pitching Mechanism Design and Testing for Micro Vertical-Axis Water Turbines, Technical Journal, Vol 25 No 02 (2020).

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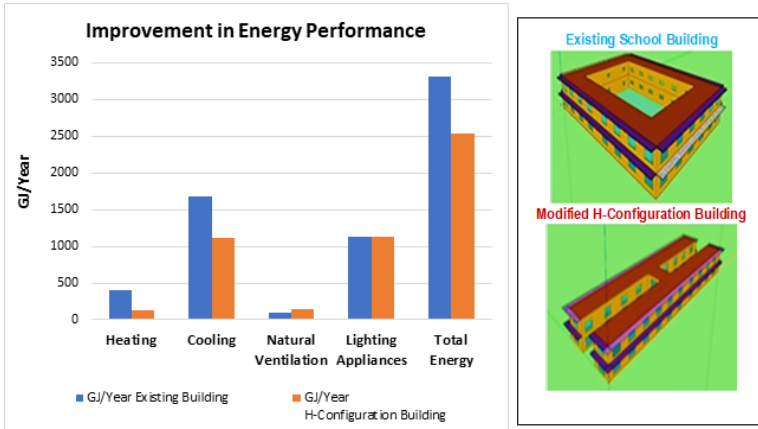
Wind Turbine Analysis and design Optimization for increasing Electric Power Generation Efficiency in Pakistan’s Wind Condition and Fabrication of a Vertical Axis Curtate Wind Turbine.



8

Development of Smart & Assistive Technologies for Energy Conservation in Buildings.

Publication: S.R. Sheikh, ZU Koreshi, N. Ghafoor, MS Khalil, M Ghaffar, Mitigating CO2 Emissions of Academic Buildings in Pakistan Using Energy Conservation Techniques, Journal of Engineering and Applied Sciences, 38 (2), 75-86.



Category	GJ/Year Existing Building	GJ/Year H-Configuration Building
Heating	~400	~100
Cooling	~1600	~1100
Natural Ventilation	~100	~150
Lighting Appliances	~1100	~1100
Total Energy	~3300	~2500

9 **Solar Powered Intelligent LED Street Light with Sun Tracker**



10	<p>Assistive Technologies for Smart Homes Using Head Gestures And EEG Control Schemes.</p> <p>Patent filed: “Assistive Smart Home Environment using Head Gestures and EEG Eye Blink Control Schemes (ASHHE)”. Filed in September, 2018.</p>
11	<p>Analysing Strategies for Cost Effective Net-Zero Energy Buildings in Different Climatic Zones of Pakistan.</p> <p>Funding Proposal being submitted for LCF</p>
12	<p>Energy Saving in School Buildings in Pakistan; as Part of Social Integration Outreach Program 2015, Sponsored by Higher Education Commission (HEC) and Air University (AU), Islamabad.</p> <p>Publication: SR. Sheikh, Nouman Ghafoor, Atiq ur Rehman, Muzammil Ghaffar, Reducing the Environmental Impact of School Buildings Through Better Design: A Case Study in Pakistan, European Conference on Sustainability, Energy & the Environment”, ECSEE, Brighton, UK, 06-08 July, 2018</p>
13	<p>Workshops for Introducing Sustainable Energy Related Technologies to School Students; as Part of Social Integration Outreach Program 2016, Sponsored by Higher Education Commission (HEC) and Air University (AU), Islamabad.</p>
14	<p>Design of of an AI based Building Energy Management System.</p> <p>NRPU Proposal submitted: “Design and Development of an AI based Building Energy Management System”, Jan 2020</p>

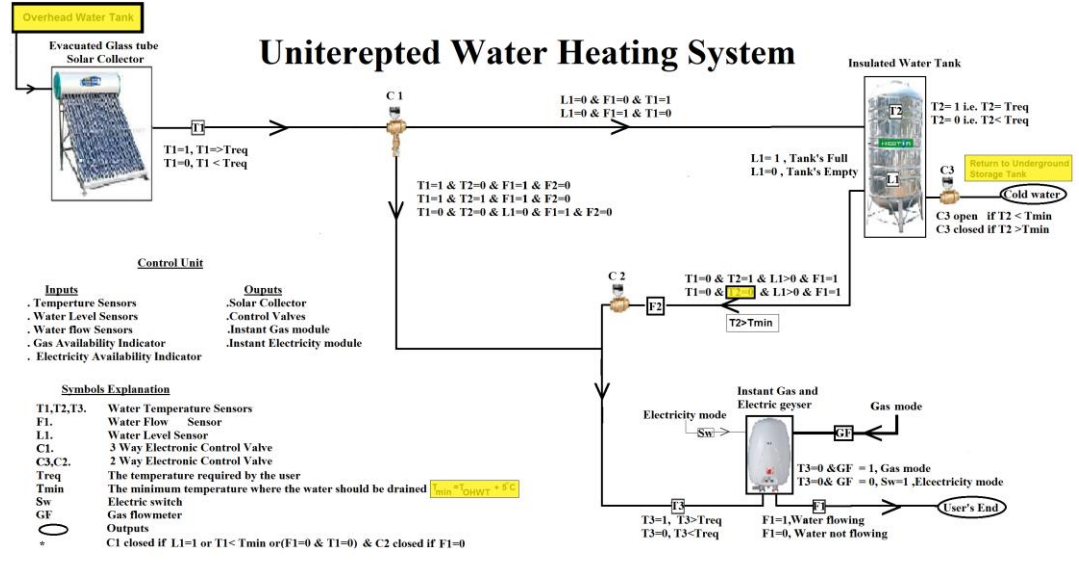
Solar powered Automatic Drip Irrigation System.

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Design of Intelligent Hybrid Water Heating System (Solar / Fuel / Electric)

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Design of a Portable Off-grid Solar Powered Compact Incubator.

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Patent filed: "Advance Design of a Portable Off-grid Solar Powered Compact Incubator". Filed in September, 2018.

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Design and Development of a IOT based Smart Meter Lab Model:

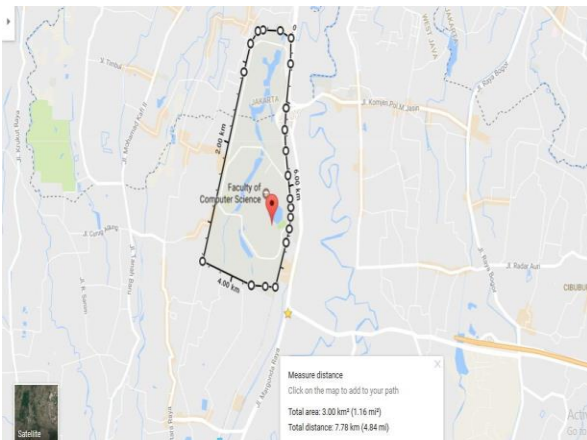


Workshops for Introducing Sustainable Energy related Technologies to School Student

- Air University helps school students get acquainted to, and gain knowledge in the field of sustainable energy by conducting different workshops, experiments and activities.

Air University Main Campus Islamabad initiatives for climate change

- To avoid the climate change risk and promote greenery.
- It has total area on campus covered in forest vegetation (meter²) =208, 183 Square Feet



As shown in the picture

- Total planted vegetation area is= 5100 m²
- **Partnership for the goals**
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- Air University takes pride in being the organizer of Pakistan's largest technical Olympiad, Air Tech. The event is an amalgamation of numerous technical events highlighting a theme which always is a major problem being faced globally. AirTech'19 addressed the issue of **Climate Change**, with the underlying theme ***"Thinking Green for Sustainable Development."***
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- The Seminar was held on this critical issue; **Climate Change and its effects on society.**
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- Following prestigious organizations entered into a **collaborativ partnership** with the Air University in order to organize this mega event:
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- **1. Ministry of Climate Change, Government of Pakistan**
- **2. SDPI: Sustainable Development Policy Institute**
- **3. Pakistan Red Crescent Society**
- **4. WIRE Pakistan (Women in Renewable Energy)**
- **5. Bahria University, Islamabad.**

A distinguished panel of guests from the partner organizations addressed important topics on the occasion.

Dr. Mahmood A. Khwaja - SDPI (Keynote Speaker)

- Dr. Khwaja is a Senior Advisor, Chemicals and Sustainable Industrial Development, Sustainable Development Policy Institute (SDPI), Islamabad. Pakistan. He earned his Ph.D. and M.Sc. in Chemistry, respectively, from La Trobe University of Science and Technology, Melbourne, Australia and University of Peshawar Pakistan. Dr. Khwaja has been SDPI lead investigator & focal person in several joint/collaborative projects/programs with partner organizations in Pakistan and Switzerland, Japan, Czech Republic, India, Republic of Korea and USA. Dr. Khwaja has over 75 publications to his credit. Recently, in September, 2019, Dr. Khwaja was awarded with Chairman's Trophy from Pacific Basin Consortium (PCB) on Environment and Health, for his contributions in research and support to PCB. Dr. Khwaja, he shed light on Climate Change & Pakistan: challenges and Opportunities

Javeria Nasir (Keynote Speaker)- Assistant Director Climate Change Adaptation in Pakistan Red Crescent Society

- Her areas of interests are Natural Resource Management, Result Based Project Management, Environment and Climate Change. She received her Master's Degree in Environmental Sciences from University of Peshawar. She has vast experience of more than 10 years in community mobilization, monitoring, reporting of developmental projects and trainings. She spoke on Thinking Green for Sustainable Development: Local Perspective.

Event Panel Moderator Aneela Khan – Bahria University

- Ms. Khan holds a Masters in Geophysics and is pursuing her Doctoral in Environmental Science and working as a researcher and academician for nearly 5 years. She has vast knowledge on adverse effects of climate change in Pakistan.

Panelists

- **Dr. Salman Akbar Malik**

Mr. Malik has a Ph.D. in Biochemistry. He has 26 years' Experience in Environmental, Biochemistry, Metabolism, and Clinical Biochemistry. He has served as a Professor and Chairman at, Faculty of Biology, Department of Biochemistry in Quaid-e-Azam University, Islamabad

- **Prof Dr. Sarwat Mirza**

Dr. Mirza holds a Ph.D. from Utah State University USA. He has 35 years 'of experience in teaching and Research in the discipline of Forestry and Environmental sciences. He has also served as Dean Faculty of Forestry, Range Management & Wildlife in Arid Agriculture University, Rawalpindi

- **Ms. Anila Fatima**

Ms. Fatima is the CEO and Founder of WIRE Pakistan (Women in Renewable Energy) - She has assisted diverse SMEs for B2B business development, strategic consultancy, and served different business institutes as visiting faculty member at graduate and undergraduate level. She is serving as Director Programmes at Global Entrepreneurship Network Pakistan (GEN Pakistan) since 2017.

- **Session III – National Climate Change, its policy and governance**
Speakers

- **Ahad Nazir – SDPI**

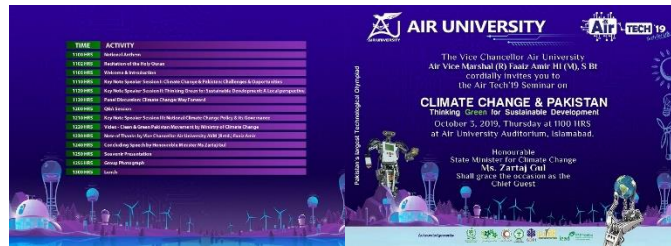
Head – SDPI Centre for Private Sector Engagement
National Climate Change Policy & its Governance,

- **Dr. Imran Khalid - SDPI**

Dr. Imran Khalid. Dr. Khalid heads the Environment and Climate Change Program at the Sustainable Development Policy Institute (SDPI) based in Islamabad. His research focuses on identifying institutional vulnerabilities and

analyzing the political economy of regions and communities most vulnerable to climate change. He holds a Ph.D. in Environmental and Natural

- The seminar acted as a model for the students to add recommendations to their set agendas and helped them create policies to work on in the future, which were executed on their flagship event AirTech'19. This year in particular Air Tech'19 served as a national platform in Pakistan to address this issue, encouraging students from technical disciplines to come up with ideas to prevent and fight with this life threatening problem. The events in the Olympiad were designed to make students think in the perspective to develop planet friendly technology.



Air University Kamra Campus

Energy Management Plan (Emp)

The Solar Set-up

As part of the Green Campus program, AU Kamra has installed 250 KW (extendable to 500 KW) Solar set-up during Phase-I—the copy of Contractual document is attached for kind reference please. The similar set-up is being made part of Phase-II. To promote the cause of Green Campus, it would be dovetailed with the Sewage Treatment, Solar Agriculture, and Rain Water Harvesting etc. The Financial Effect of Solar set-up of Phase-II is provided in the details of Capital Cost.

Solar Heating

In the Phase-II, Solar Heating is planned to provide Hot Water. The Solar Geysers are not preferred due to the higher sediment in this area. Instead, water heating is planned to be managed through PV Solar system. The similar method has been adopted

in the case of Phase-I of the Project. The financial details are made part of the Capital Costing.

Rain Water Harvesting

The land scape of AU Campus lends itself to be capitalized for subject harvesting plus water catchment. The 50 feet gradient of land has natural depression close to the down-stream end. This provides the opportunity for subject capitalization consequently, a small semi-pukka basement Lake is being planned to collect Rain water as well as water catchment holes to support the water table. The estimates of subject harvesting are provided in the Capital Cost

Sewage Treatment

As part of the Green campus, Sewage Treatment is also planned. This would greatly help promotion of safe environment as well as help agriculture by providing cheap fertilizer from the residue. The financial effect of this aspect is included in the Capital Cost.

Energy Conservation

It is worth mentioning that Phase-I of AU Campus has been designed to preserve energy. As part of the Architecture, the Cavities inside Outer Walls have been incorporated for this purpose. Additionally, the Architecture Design of the Phase-I as well as Phase-II is such that it utilizes natural light up-to maximum limit including; the bigger sizes of Windows and embedding of Open-to-Sky portions in the Buildings. Consequently, the electricity bills are reduced considerably.

Eco-friendly Environment and Its Implications

From the forgoing, it is evident that the AU campus Kamra has been designed as Eco-friendly and Energy Efficient set-up. In addition to energy conservation / efficiency, the set-up would also be highly Eco-friendly. Such a set-up, would surely serve the purpose of Green and Clean Pakistan. The Solar set-up and associated Energy Conservation as well as other measures including Sewage Treatment, Rain Water Harvesting etc, would significantly help reduce relative Carbon Emissions, Roof Top heating favourably affecting the Air Conditioning needs and equivalent planting of Trees to the tune of over two thousands per year. The detailed calculations of implications of Eco-friendly measures are attached as Annexure.

The Proposed Structure

It is apprised that Phase-I, including Academic Block and a Half of Hostel Building of AU Campus Kamra has been completed. The similar structure is planned in Phase-II, and the Drawings of this phase are attached for kind reference please. The Academic Block would occupy an area of 183000 Sq Feet whereas, the Hostel Building' area is 83000 Sq Feet.

- Total area covered in forest vegetation =27143 m²
- 122810 square meter is covered in planted vegetation

Air University Multan Campus

- Total 35 Tall Trees are already there at New Campus in 278 meter square area and this year, under Go Green Movement; we planted 6000 new plants/trees at 5 Acres of area there.
- Covered Area with tall trees: 278 m²
- Total area covered in Forest Vegetation: 5 Acres (6000 New Plants/Trees planted)

Air University South Campus

Impactful university program(s) on climate change



- **Solar Energy Production Program in Planned**

Air University has decided to establish a Solar Energy Program that uses cutting-edge hybrid technology to provide electricity in the event of a power outage. The programme planning and feasibility assessment are under underway, and this programme is one of our long-term objectives.

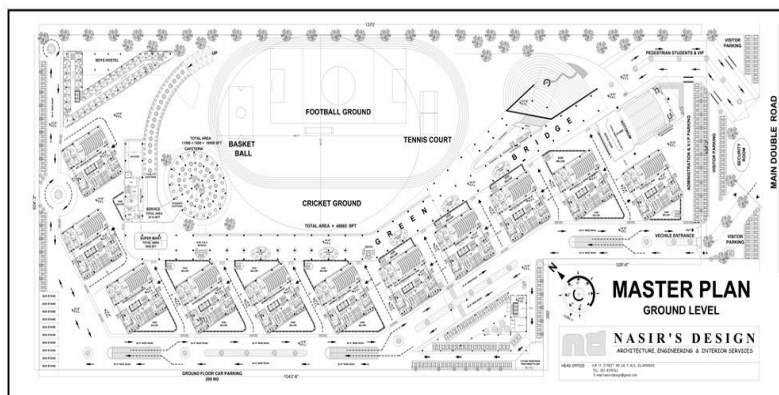
Air University South Campus

- In addition to this, The Air University South Campus (AUSC) project is directly linked with the Government's policies to promote quality education by providing necessary infrastructure and facilities especially in areas of higher education.
- The campus will be functional in the next year 2022 in H-11 Sector of Islamabad Pakistan.

Green / Environment Friendly Campus

The AUSC would be the first purpose built Green Campus which will be Environment-friendly and will considerably lower the carbon footprint of the Campus. The building blocks are esthetically sequenced in a manner to conserve energy at maximum, with ample opportunities for green energy, sparing reasonable green space to facilitate outdoor/indoor sports, adequate underground parking and the security arrangements. In the design, maximum Solar Energy generation has been planned to cater for sizable energy needs of the Campus. The Campus has been innovatively designed for:

- Future Requirements and Advancements
- Energy Efficient Sustainable Site Planning and building design
- Energy Efficient Building Orientation for efficient Ventilation and sun light
- Energy Efficient through Alternate/ Renewable Energy
- Safe Guarding Water and Water Efficiency
- Energy Efficient through Envelop Insulation and Architectural Elements as Buffers
- Conservation of Material and Resources
- The compliance of CDA By-laws has been ensured while preparing the Master Plan



Air University Clubs for Climate Action Plan

1. Sha'oor Society

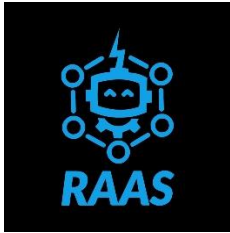


- AU Sha'oor Society was developed in Air University, for social welfare and character building of youth.
- AU Sha'oor is a team of youngsters who are dedicated to bring academic, social and moral awareness in the society. Explicitly, Sha'oor is nonpolitical, non-biased student organization which came about as an idea in 2007 and was established as a student society at Air University, Islamabad in 2008. Sha'oor Society works on numerous civic engagement projects and community development programs through its platform for the wellbeing of the community.

2. Green Youth Club

- Green Youth Club is initiated with the mission to restore and make aware students and society of the depletion of resources and importance to conserve and reuse. It is used as a forum where we empower students to participate and take up meaningful environmental activities and projects. It is a forum through which students can reach out to influence, engage their parents and neighborhood communities to promote sound environmental behavior.
- The purpose of the club is to create awareness of environmental issues, such as protection, conservation, preservation, and restoration, with an emphasis on educating and empowering students. Students who are interested in environmental advocacy and awareness are encouraged to join.

3. RAAS



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Air University's Robotics and Automation Society formed in 2009 to provide chance to the students of Air University to show their talents and make their engineering more interesting by participating in extracurricular activities. RAAS has its emphasis on providing sustainable solutions to environment and everyday life using technology. RAAS has contributed in areas such as energy efficiency and resource conservation by providing tech solutions.

Air University collaborates with NGOs on Climate Adaptation

1. Air University Sha'oor Society and Friends of Environment work together to convert today's wastage into a Greener and Cleaner Pakistan. Air University also sign an MOU with Friends of environment for the project titled from waste to Plant. Under this project Shaoor Society's volunteer achieve target of 17,000 plantation of Trees in all across Pakistan using from waste to plant concept.
2. **Source:** <https://www.facebook.com/AU.Shaoor/photos/1864143750312826/>

