Sustainability Report

2021
Fiscal Year

اسلامیہ یونیورسٹی بہاولپور

Vice-Chancellor's Message

In the face of an ever-changing climate and a growing world, educational institutes play an important role as innovators and leaders to bring eco-environmental sustainability. Through innovation, dedication, and collaboration, The Islamia University of Bahawalpur (IUB), is committed to the vision of sustainability along with providing higher education.

This first baseline sustainability report of IUB is a snapshot of our progress to achieve a sustainable system, composed of optimized usage of energy, water, fuel, plastic, and paper, as well as reduced waste generation, controlled food wastage, constructing green infrastructure, and promoting green health care system.

I hope this initiative will prompt a culture of sustainability and transform the IUB into a sustainable university – the first of its kind in Pakistan – that will be more efficient in utilizing environmental resources along with basic curricular and co-curricular activities. I congratulate the entire team of the Environment Management Committee (EMC) for putting efforts and producing this valuable document that will serve as a baseline for the upcoming years.

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1 BACKGROUND

The large size public sector universities are like a small city having a large population, acreage, and complex operational activities. The everyday activities have significant environmental implications. Therefore, campus sustainability has been a much-needed global concern for university planners, stakeholders and policymakers. An environmentally sustainable campus is considered to cause the least environmental degradation while producing education and research services for the community. Theoretically, a sustainable university can be defined as "A higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources to fulfil its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles" (Velazquez et al., 2006).

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. Since University is a community, the sustainability goals may address urgent environmental preservation challenges in the campus area, thereby providing a controlled environment for the change interventions.

The Islamia University of Bahawalpur (IUB), Pakistan is one of the largest public-sector universities with around 50,000 population in a little over 1400 acres. The worthy Vice-Chancellor (WVC) has taken many initiatives to transform the IUB from a traditional university to a sustainable/green campus. Many eco-friendly development projects for water management and green energy with the help of the Punjab Government and other funding agencies are in progress. Moreover, an integrated environmental management program has also been launched to address the environmental concerns for the university campus in line with the concept of a sustainable campus. To execute the vision of sustainable/green campus, WVC has formed an Environment Management Committee (EMC). A schematic layout of the EMC is illustrated in Figure 1.

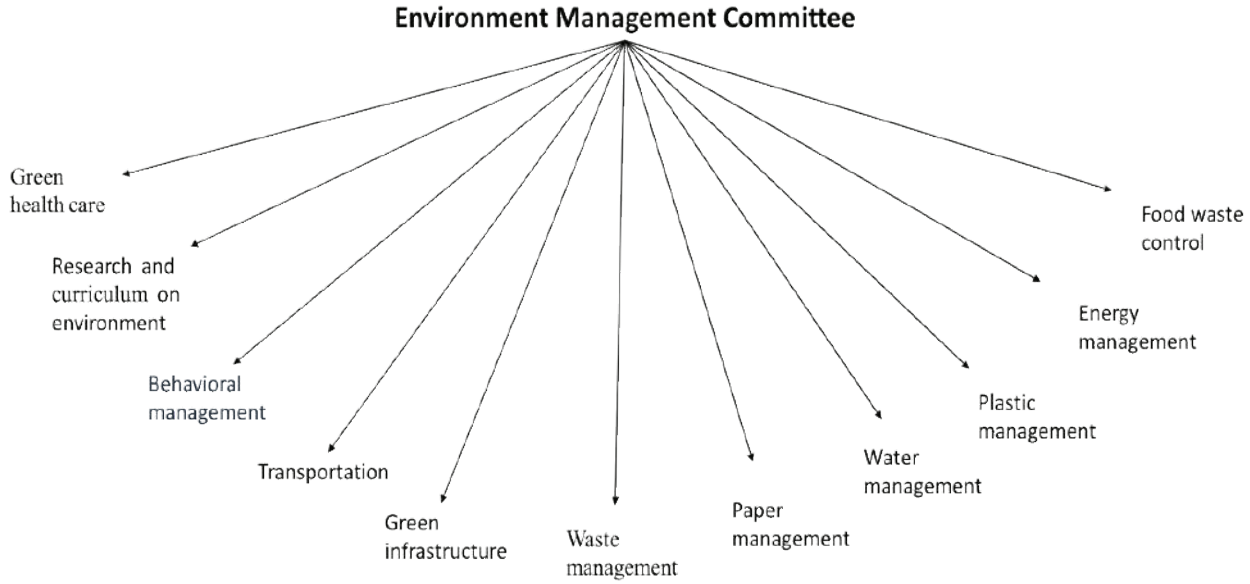


Figure. A schematic layout of the Environmental Management Committee.

The EMC has multifarious domains to be examined and portray the current standings of IUB in terms of environmentally sustainable initiatives. The foremost challenge confronted by the EMC was to develop a baseline sustainability report of the IUB.

As sustainability becomes more ingrained in the framework of the university, the importance of effectively monitoring the progress increases. This first sustainability report surmises the progress of IUB on the environmental front and introduces the objectives and measures of the environmental management program for the coming years.

2 GREEN INFRASTRUCTURE

Green infrastructure seeks to minimize the negative environmental impact of buildings by efficiency and moderation in the use of materials, energy, and development space. It uses a conscious approach to energy and ecological conservation in the design of the built environment.This practice increases the efficiency of buildings and their use of energy, water, and materials, and reduces building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and considering every aspect of the complete building life cycle. Effective green building can lead to reduced operating costs by increasing productivity and using less energy and water, improved public, and occupant health due to improved indoor air quality reduced environmental impacts by using sustainable resources.

2.1 Characteristic features of green infrastructure

The main elements of green infrastructure are green roof, solar shingles, cob houses, rainwater harvesting, shipping container buildings, energy efficiency and waste management. Some of these could be as simple to achieve, as just a couple of types of ground covers or include a beautiful mix of moss, succulents, and even herbs and plants. The other elements may use recycled materials, therefore preserving the source, minimize demand through serious conservation, and supply energy with maximum efficiency using renewable sources.

2.2 Where do we stand in green infrastructure

The habitat area at Baghdad ul Jadeed Campus can be divided into four major zones:
i) The academic zone consisting of all academic activities
ii) The residential area for student's hostels
iii) The residential area for employees
iv) The open spaces act as a buffer zone between all the above zones and consists of roads, pathways, lawns etc.
The non-habitat area in the BJ campus consists of agricultural land, dunes and experimental areas which will convert to habitat area after expansion of infrastructure. All existing buildings in the first three zones are not the green buildings due to non-availability of the following factors. First, less appropriate with the culture and second, less energy efficient buildings design. Third, extensive use of imported materials rather than indigenous materials. Fourth, no provision of green roof, liquid waste segregation in the drainage system and rain harvesting.

The fourth zone which are open spaces acting as a buffer zone and liking all other zones have no green passage/links, or pedestrian culture in the university. Resultantly, promotion of vehicles on the campus which causes environmental pollution and carbon emission is mandatory.

2.3 Measures taken for green infrastructure

Since 2019, under the vision of worthy Vice Chancellor DR Athar Mahboob, all new building are designed energy efficient by using cavity walls on the east, west and south side and roof treatment to get maximum comfort level inside without mechanical means and footpaths under shady trees are being constructed to link all zones for comfort movement of students and encouraging a pedestrian culture in the university rather a vehicular movement.

Initially, the infrastructure of the university was governed and approved by the Campus Development Committee (CDC), comprising of professionals, educationists and officers from all over Punjab. Once the infrastructure of the University was developed, said committees were resolved and expansion of IUB was managed internally by the engineering department of IUB. Later a new CDC was formed headed by a senior Professor with the participation of professional department of the Government of Punjab, like building, highway and water and power development authority (WAPDA). Role of the committee was just approval of IUB's new projects and normally meeting was held once in a year.

Recently, under the vision of WVC, the above committee was reactivated and a regular meeting is being held as per TORs of the committee to execute the vision of WVC for the development of the university. In the last meeting of the CDC held in 2020 under the chair of WVC, committee approved the master plan for all campuses of the university including BJ Campus, Abbasia Campus, KF Campus, Rahim Yar Khan Campus and Bahawalnagar Campus and decided future infra-structure of the university will be according to the approved master plans.

These master plans are prepared by the consultants and concerned professionals reflecting the future need of the university and its campuses for the next 50 years with all basic and allied facilities which are mandatory for the development of a green campus.

3 ENERGY USAGE

At present, 80% of global energy is being produced through the burning of fossil fuel (coal, oil and gas) that is the most pollution-intensive process. Consequently, the energy sector is considered one of the largest contributors to environmental degradation (Roser, 2019). The air pollutants generated by human activities are mainly derived from the production and usage of energy generation from fossil fuel. Dangerous pollutants such as Sulphur Dioxide (SO2), Nitrogen Oxides (NOx) and Carbon Dioxide (CO2) are 85 percent of total emissions of particulate matters, which are related to energy generation from fossil fuels (IEA, 2017). Energy generated from coal, oil and gas produce dangerous toxins and emit millions of tons of carbon dioxide into space annually. Carbon dioxide hangs onto heat, which builds up in the atmosphere and contributes to climate changes. The conventional fossil fuel energy resources like oil, coal, and gas, therefore, have become under intense pressure due to a host of environmental problems. In the 70s and 80s fossil fuel was considered a blessing, nevertheless it has damaging impact on the future productivity of the earth.

The report for electricity and gas consumption of Baghdad campus, Abbasia campus and Railway campus of The Islamia University of Bahawalpur has been prepared in detail for 2019 and 2020.From the monthly consumption details, it has been depicted that the electricity and gas consumption of the Baghdad campus during the year 2019 is 4,886,064 kWh and 7,415.88 Hm3 respectively, whereas it is 4,242,960 kWh and 7,297.68 Hm3 during the year 2020.For the Abbasia campus, the electricity and gas campus forthe 2019 year is 924,660 kWh and 336.66 Hm3 respectively, whereas it is 631080 kWh and 457.992 Hm3 during 2020.The yearly electricity and gas campus of the Railway campus for 2019 is 205,368 kWh and 50.34 Hm3, whereas in 2020 the electricity and gas consumption is 162,708 kWh and 63 Hm3 respectively.

As per the statistics, all three campuses of the IUB are very energy extensive.The university is paying a huge amount in lieu of utility bills. The economic, as well as environmental benefits,therefore, can be ripened through implementing energy conservation strategies and using renewable energy resources instead of conventional sources.

Energy conservation plays a vital role in lessening energy consumption and therefore in reducing pollution. Energy conservation is often the most inexpensive solution to energy shortage, and it is a more environmentally kind solution. The motivations related to energy conservation include both economic and environmental. The benefits of energy conservation include reducing the risk of depletion of natural resources, construction of fewer power plants, boosting human health, mitigation of global warming, ensuring constant safe water supply, mitigation of habitat destruction, and maintaining steady prices of energy.

The measures of energy conservation includethe use of energy-efficient bulbs (LEDs), installation of light sensors, sun-proofing the building, replacement of conventional air conditioners with inverters,Plug leaks in room/building, consider using renewable energy resources insulation of all ac rooms.

Under the regime of the current WVC, a2.5 MW solar energy project is under construction that would reduce the dependency of IUB on fossil fuel. Moreover, the green campus: IUB programme intends to start an effective energy conservation programme in the coming years.

Electricity & Gas Consumption of BJC Campus

2019

4,886,064 kWh & 7,415.88 Hm3

2020

4,242,960 kWh & 7,297.68 Hm3

4 WATER USAGE

Water is the basic need and primary distinguishing feature between the earth and all other planets. Globally, there are many regions where freshwater resources are inadequate to meet the needs of domestic users, environmental and economic development. These water-scarce regions pose a greater threat to human health and productivity and make it extremely difficult to sustain a clean environment and healthy ecosystem. Pakistan's scenario is more critical and complex as we are a nation of more than 220 million with a river-based water system. Located in a region where events related to climate change loom large and most of the pivotal rivers flowing from a disputed region, therefore, the issue of water conservation and judicious use has gained much more significance.

The region of Bahawalpur, where sprawling campuses of The Islamia University of Bahawalpur (IUB) are located, is one of the driest areas of the country with severe hot weather and scorching winds elevating water needs. This region has mostly brackish/ unfit groundwater except for the area around the rivers or unlined canals. The drying beds of once "mighty" Sutlej and diminishing water supplies in the link canals feeding Sutlej valley highlight the importance of water conservation. The old maps depicting the path of Hakra River abandoned forts in the Cholistan and the ruins of "once-flourishing Hakra civilization" is a clear warning for the policymakers, researchers, academicians, social workers, and the inhabitants of the region that nature does not spare those who don't pay heed to its call and don't plan accordingly.

The Baghdad ul Jadeed campus of the IUB is located along the Ahmad Pur East Branch emerging from the Lal Sohanra headworks. This canal is the major artery of freshwater supply for both irrigation and domestic consumption as six turbines are installed to mine groundwater. Though IUB is deemed to lead the way in planning and should act as a role model for the other public and private entities unfortunately the layout of water supply apparatus, irrigation system, selection of plant and tree species and the management system for landscaping is the worst example of ill-planning lacking purpose, conviction, local needs with no focus on near and distant future. Such an institutional approach robs the nation and its people of precious resources and adds not only to the financial crunch but environmental sustainability is also jeopardized. The picture gets bleaker when turbines are used to extract groundwater and this 'precious' groundwater is then directed in open water channels just to irrigate Conocarpus erectus and other exotic species planted at the campus never calculating the cost of energy, labour and of course water. This non-scientific, illogical, and inefficient resource utilization needs serious deliberation and corrective measures must be placed to stem this brutal resource wastage.There are two main sources of water supply to the campus.

4.0.1 Groundwater extracted through turbines.

- Number of total turbines- 06
- Number of turbines exclusively for domestic water supply- 03 (Turbine # 1, 2 and 5)
- Total number of overhead reservoirs- 02
    - o Reservoir # 1- 100,000 gallons capacity. Supplies about 500,000 gallons per day
    - o Reservoir # 2- 100,000 gallons capacity- supplies about 200,000 gallons per day
- Almost 25 % of the above-mentioned water is utilized for irrigation of lawns
- Turbines # 3 and 4 are operated by the Estate Care division and are meant for the provision of irrigation water to the lawns, roadside plantation, and green areas.
- Turbine # 6 is operated by the Farm Management division.

4.0.2 Canal Water

• Supply of water from three water outlets which supply about nine cusecs of irrigation water. Farm Management and Estate Care are the major canal water users while this water is also provided to the Directorate of Sports, Hostels and CIDS.

According to the World Health Organization (WHO), between 50 and 100 litres of water per person per day are needed to ensure that most basic needs are met and few health concerns arise. However this amount varies for different countries e.g. in India, the standard norm for domestic water usage is 135 litres per day. In Pakistan, where almost one-third population don't have access to safe drinking water, there is a huge disparity in water usage for domestic consumption varying from 30-350 lpcd. In short, 100 L of water can sufficiently fulfil the requirements of a person.

4.1 Policy guidelines for judicious use of water

The rampant wastage of water is having its unbearable impact on the environment of the BJ Campus. The excessive use of water is contrary to the concept of water conservation and to that of the Green Campus. Being an institution of higher education and research, it is of paramount importance that all-out efforts be carried out to mitigate this huge and unnecessary loss. Any effort to achieve this goal will only yield results if all the concerned from policymakers to those who implement it and from the source up till the consumer at the bottom is taken on board.

The current regime has started many initiatives in this regard. The worthy vice-chancellor has approved the installation of a water recycling plant in the university that will reduce the water footprint of the university. Moreover, under green campus: the IUB programme water conservation programme will be implemented that will change the water using practices in the university. The following set of recommendations for water conversation will be followed to address this issue.

4.1.1 Creating Awareness

a. Permanent banners, panaflexes depicting various sayings regarding water conservation must be mounted on all the prominent places of the campus.

b. Water conservation society must be organized on the lines of already existing student societies. Till then, other societies like the Environment Protection Society, Science Society and Social Welfare Society must be tasked with this campaign. A dedicated stall highlighting this issue must be arranged in every event of the IUB where handouts, brochure and other relevant literature is distributed among the participants.

c. Faculty members may be requested to delineate the importance of water and its safe use during their lectures. Material for discussion can be attained from this directorate. Similarly, the Khateeb of Jamia Masjid should be requested to educate the audience about water in the light of the teachings of the Holy Prophet (PBUH).

d. All the stakeholders using irrigation water must be taken on board to utilize both the canal and turbine water in a judicious way.

e. The contact number of an official (Supervisor of Estate Care/ Sub Engineer of Engineering Branch) must be displayed in all the faculties and administrative blocks; He will be responsible to fix leakage issues. A mechanism for monitoring his performance must be prepared.

4.1.2 Technical measures

a. Complete data/ logbook of turbines supplying water for the domestic purpose must be maintained. The Directorate of Engineering will provide accurate data of water being supplied through overhead reservoirs on daily basis, both for working days and on the weekends.

b. Similar data/ logbooks must be maintained at both of the overhead water reservoirs.

c. As a pilot project, separate water meters should be installed to quantify the water being supplied to one of the faculty (e.g. Science faculty), one of the Boys hostels and a Girls hostel during the next financial year (FY 2021-22). The data will be thoroughly analyzed and then all of the faculty buildings and hostels will be equipped with water meters during the FY 2022-23. The residential colony may be brought into this loop at the final stage of implementation i.e. in the FY 2023-24. To optimize the water usage free supply of water must be stopped and charges are levied on the use of this commodity, which is at the moment wasted lavishly.

d. Water coming from the overhead reservoir must be completely banned for maintenance of lawns/ gardens etc. This water is pumped twice costing a lot of electricity and can't be allowed to use for this purpose. Alternate arrangements must be carried out for irrigation purpose in locations where canal/ turbine water is not being supplied. This can be very easily done by employing High-Efficiency Irrigation Systems (HEIS). Similarly, wastewater after thorough treatment must be supplied to the HEIS.

e. It has been observed that the faucets/ taps in all the public places are mostly out of order causing 24/7 loss of water. Usually, these malfunctioning taps are not fixed at once. A record of all such replaced taps must be maintained for better check and balance and quality maintenance. These faucets must be replaced initially by those which have lesser discharge and in the final phase, those faucets are used which are equipped with sensors.

f. Separate logbooks must be maintained for the turbines which are supplying irrigation water.

g. To avoid over/ under irrigation, it is recommended that Tensiometers or other such water monitoring devices must be installed to properly utilize irrigation water.

h. Sewage water must be utilized for irrigation after treatment. This source can be utilized in a befitting manner as dependence on freshwater can be mitigated by its proper utilization.

5 TRANSPORTATION

The transportation sector includes the movement of people and goods by cars, trucks, trains, ships, aeroplanes, and other vehicles. The high growth rates of transportation activity have generated negative effects on the environment and on populations (Eppel, 1999) who are experiencing numerous traffic problems such as severe traffic congestion and road accidents coupled with air and noise pollution (Sarkar & Tagore, 2011). The transportation sector is the second largest contributor to polluted emissions due to fossil fuel combustion.

Residential university campuses are distinct compared to other communities. They are characterized by three specific population groups, namely faculty, staff and students. Their movements are governed by the institute schedules and are focussed during the daytime either at home/hostel or on departments/facilities. Evenings are marred by the movements between shopping areas and places of residences. Motorisation has impacted university campuses in a big way. An increase in motorized traffic has safety implications especially towards students, space use implications regarding parking and environmental implications. The major environmental impacts of transportation on university campuses include disturbance to teaching, loss of natural environment and greenery, despoliation of the visual environment by parking provision, and health effects on staff and students.

Most campuses have been designed as pedestrian campuses but are caught by a culture that encourages driving at every opportunity. This puts more pressure on campus officials to develop parking lots, increase the size and number of roadways, and neglect the type of infrastructure that would encourage non-motorized transportation.

The Islamia University of Bahawalpur (IUB) has also various types of fleets that are utilised for different purposes. Broadly, fleets may be divided into two categories:

i) Heavy Vehicles
ii) Light Vehicles

5.1 HEAVY VEHICLES

Sr No.	Vehicle Description	Available Qty	Total
Buses			
1	Bedford Buses	Bwp**8**	8
2	Isuzu Buses	Bwp**04**	4
3	Hino Buses	Bwp**24**	24
		Total	**36**
Coasters			
1	Hino	Bwp**05**	5
2	Mazda	Bwp**02**	2
3	Dongfeng	Bwp**03**	3
		Total	**10**
Tractors			
1	Massy	Bwp**09**	9
2	Roosi	Bwp**01**	1
3	John Deer	Bwp**01**	1
		Total	**11**
Water Bowzer			
1	Master Truck (Water Bowzer)	Bwp**01**	1
2	Hino Water Bowzer	Bwp**01**	1
		Total	**2**
Total Fleet			**59**

Firstly, heavy vehicles are further divided into four sub-categories namely buses, coasters, tractors, and water bowzer. The total number of fleets for all Bahawalpur campuses are fifty-nine (59). Secondly, light vehicles including cars, jeeps, loaders, ambulances, vans, and motorbikes are a total of eighty-two (82) in number. As per the official source of the IUB, the total cost of fuel for all heavy and light vehicles was for the year 2018-19.

5.2 LIGHT VEHICLES OF BAHAWALPUR CAMPUS

	Cars		
Sr. No	**Vehicle Description**	**Campuses**	**Total**
1	Toyota Fortuner	Bwp 01	1
2	Toyota Cars	Bwp 13	13
3	Honda Civic Car	Bwp 1	1
4	Suzuki Liana Car	Bwp 1	1
5	Suzuki Alto Cars	Bwp 2	2
6	Hyundai Santro Cars	Bwp 4	4
7	Suzuki Cultus Cars	Bwp 16	16
		Total	**38**
	Jeeps, Loaders, Ambulances, Hiaces		
8	Suzuki Pothohar Jeeps	Bwp 02	2
9	Toyota Hilux (01 Exam, 01 Security)	Bwp 02	2
10	Suzuki Ravi Pickup	Bwp 04	4
11	Toyota Hiace Ambulance	Bwp 01	1
12	Suzuki Bolan Ambulance	Bwp 02	2
13	Hyundai Shehzore (01 Exam, 01 T.P)	Bwp 02	2
14	Suzuki Bolan vans	Bwp 04	4
15	Toyota Hiace + Hyundai Grace	Bwp 03	3
16	Chitral Pickups	Bwp 02	2
		Total	**22**
	Off-Road Vehicles		
17	Chitral Pickups	Bwp 03	3
18	Kaghan Ambulance	Bwp 02	2
19	Kaghan Van	Bwp 02	2
		Total	**7**
	Motor Bike		
20	Honda CD-70	Bwp 05	5
21	HONDA CG-125	Bwp 07	7
22	Yamaha-100	Bwp 03	3
		Total	**15**
	Grand Total		**82**

The Islamia university is one of the largest public sector universities in Pakistan with more than 47,000 students and over 1000 faculty and supporting staff. A large and effective transportation system has been developed to cater to its stakeholders. To run this large transportation system, the university is incurring a huge cost of fuel and other supporting elements such as lubricants and Mobil oil. The expenditure incurred so far in the fiscal year of 2020-21 is 35.4 million PKR for all campuses of Bahawalpur.

Under the green campus IUB programme: IUB intends to reduce the fuel use of the transportation department in coming years. It will be beneficial for the universities in terms of lowering the cost and consequently, reducing air pollution. In this regard, following measures are under consideration to minimize the transport fuel consumption of the IUB.

- Eliminate unnecessary bus stops in Bahawalpur city and surroundings by analysing the number of student (approximately) who use the university transportation from each designated point.
- Start a campus-wide bike share program for IUB students, faculty and staff.
- Investment in promotion of alternative transportation use within the campus.
- Investment in better methods of communicating transit-related information such as bus tracking info on smartphone apps and improved signage at bus stops.
- The transportation department should collaborate with the IT department to utilise technology (i.e., algorithms) to identify roots that have more students, heavy traffic and other hazards to rationalise the bus roots.
- Buildings of all university should be connected well with each other so that students, staff and faculty may move easily on foot or use bicycle.
- Horizontal expansion of the university in terms of buildings should be discouraged as it compels to connect distant buildings through transportation system that adds extra cost and pollution.
- Fossil fuel-based vehicles may be replaced with renewable energy-based vehicles particularly medium and light vehicles.
- Appropriately training drivers could reduce emissions by avoiding heavy accelerations and decelerations and being mindful of the fuel consequences of high speeds.

6 WASTE GENERATION

Solid waste generation is one of the biggest challenges to the authorities of both small and large cities in developing countries. This is mainly due to the increasing generation of solid waste and the burden posed on the municipal budget to handle it. In addition to the high costs, solid waste management is associated with a lack of understanding of different factors that affect the entire handling system and associated environmental challenges. From an environmental perspective, solid waste can be hazardous and cause serious environmental degradation such as deterioration of water, soil, and air quality. Solid waste can impact and degrade the environment in various ways, depending on how it is managed. For example, waste disposal may degrade soil and water, furthermore, the production of gases such as methane at landfills contributes to greenhouse gas emissions.

Reduction of solid waste is inevitable to reduce the demand for energy and new resources to manage the waste. Ultimately, it will help reduce greenhouse gas emissions at a smaller scale and global warming at a larger scale. Therefore, for a sustainable and green university, it should be the first step to reduce the production of solid waste.

The basic information about solid waste yield in Abbasia campus (old campus), Baghdad-ul-Jadeed Campus, and Khawaja Fareed Campus (Railway campus) was obtained from Mr Adnan Rehmani sb., Deputy Registrar in the state care IUB. Unfortunately, the state care office does not record detailed information, such as the type of waste generated. The only information they have is how many trollies of solid waste has been generated nowadays (downtime, without normal strength of students i.e., 2020) and before COVID (peak time, normal strength of students i.e., 2019). Based on the number of students in 2020, we projected the solid waste yield in the next academic year. Around 13,000 students were considered for 2019, whereas for the next academic year 43,000 students were considered. We got the data for 2 campuses i.e., the Abbasia campus and Baghdad-ul-Jadeed campus. They do not have a record for the Railway campus.

Table.Solid waste generation (kg) per student and faculty member in 2019 from IUB Bahawalpur campuses. For this speculation, the number of students and faculty members was used as 13,000 and 2095, respectively.

		Abbasia Campus / Old campus	**Baghdad-ul-Jadeed Campus**	**Khawaja Fareed Campus / Railway campus**
Student peak time - Pre COVID (Student strength ~13,000)		Solid waste yield (kg)		
	Per student	4-6	45-51	-
	Per faculty member	28-35	279-314	-

The results of solid waste yield per year (2019 to 2021) in IUB Bahawalpur campuses are presented in Fig. 1. Before COVID, in 2019, the solid waste yield from the Abbasia campus and Baghdad-ul-Jadeed campus were 58 to 73 tons and 190 to 248 tons, respectively. During COVID, in 2020, the solid waste yield was decreased (25 to 40%). Based on the number of students, it is expected that there will be an increase in solid waste generation in 2021. To get the baseline data, the waste generation was calculated per student and faculty member in 2019. The data is presented in Table 1.

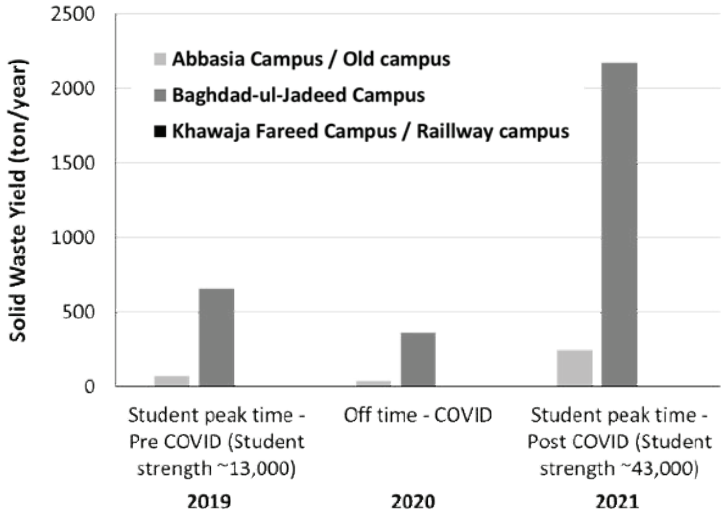


Figure.Solid waste yield (ton/kg) from IUB Bahawalpur campuses.

6.1 The "3 R's" rule

Under the Green Campus: IUB programme, IUB intends to practice the "3 R's" of waste reduction - reduce, reuse, and recycle. Practising the "3 R's" IUB can not only reduce the production of waste but also increase the reuse and recycling of the products commonly considered as waste. Moreover, for the students living in the IUB hostels, IUB intends to follow Boston University's move-out program, "Goodwill, not Landfill".

That program is implemented at the end of each semester to capture all the usable stuff students leave behind when they move out of their hostels/residences. For context, since May 2009, this program has diverted about 754 tons of clothing, electronics, and housewares from the landfill from Boston University alone. As a side product, Goodwill Industries has been established that sells these items to support important social programs that benefit the Greater Boston community.

This programme can be implemented at the IUB campuses by installing GREEN bins with proper logos and information at different locations to collect useful stuff such as clothes, shoes, stationery and small appliances. It is very important to mention that these GREEN bins are not to collect food or any perishable stuff. Overall, this program will help to reduce solid waste generation during everyday life and in the student move-out period from hostels at the end of semesters. Like the Boston University program, IUB can be partnered with any small industry that will be responsible to collect all the stuff from the GREEN bins and sell those items at a very reasonable price to support some local non-profit activities such as awareness towards Down Syndrome.

7 PLASTIC

The world now produces more than 380 million tonnes of plastic every year, which could end up as pollutants, entering our natural environment and oceans.Recent years have seen an unprecedented recognition of the rising plastic pollution. To begin with, it's worth reminding ourselves that plastic is not just one materialtechnically it's a collective term for a variety of synthetic polymers. Goods made from plastics have been increasing exponentially since the middle of the last century. Many of these products, unfortunately, are created for single-use roughly half of plastic is used once and thrown away.

Pakistan has the highest percentage of mismanaged plastic in South Asia. Several countries have duly banned the use of plastic bags such as Bangladesh, France, and Rwanda. Pakistan also has issued a (Statutory Regulatory Order) SRO to ban plastic bags in Federal Capital Islamabad and other cities including Lahore and Hunza.

Currently, the policy framework is non-existent at the federal and provincial levels that address the aspects of single-use plastics and plastic waste management in a broader domain.The problem of plastic is complicated, as climate change is complicated. It is hard to say what is the best thing you can do. The solutions like banning and switching from single-use plastic to multi-use alternatives as only one side of the coin. Plastics are cheaper, durable, and accessible in the country, with a struggling economy a blanket ban will put many people out of jobs or reduce their customer footfall if no alternative bag is available.

While PET bottles and other plastics of higher economic value get scavenged, most of the single-use non-biodegradable plastic finds its way to open garbage sinks, landfill sites or municipal sewers, choking sewage disposal systems.

AS so for the case of IUB, it produces about 538 kg/day of plastic waste on average and only 3% of this waste is recycled. The rest of the waste a year increases the risk of diseases in the environment. The most obvious forms of plastics found being used in IUB stores include stationery item, gum bottles and plastics. On the other hand, canteen used plastic stuff that is again huge in percentage. It includes plastic soda bottle and plastic bags being used.

Under the Green Campus: IUBprogram IUB intends to curtail plastic waste through:

- Engaging students in group discussions and projects in which they canassist in developing a plastic-free campus.
- Conduct guest speaker's session and training workshops to bring awareness tothe benefits of building a plastic-free society.
- Research solutions to plastics challenge and identify IUB's unique positioning and added value to address this challenge.
- Develop a document on plastics in connection with climate change, nature, and energy, including the baseline analysis, activities, results in framework, M&E plan, communications and knowledge management plan and other elements as required.
- Identify partner organizations both nationally and internationally to cultivate relationships and security interests to support the development and implementation of the plastic-free campus.
- Provide technical assistanceand policy support on a plastic-free society to the district government.
- Collect good practices, identify viable solutions to scale up, and facilitate learning and knowledge sharing in a plastic-free campus.

8 CURRICULUM

The professionals, business managers, technicians, engineers, information technology (IT) specialists' economists and politicians etc, are prepared at universities. These individuals have a strong influence to shape future societies. University, therefore, is an effective avenue to educate sustainability issues to a broad spectrum of students. Against this backdrop, IUB aims to include sustainability issues in the curriculumof social science, natural science, humanitiesarts, and management sciences. At the movement,IUB is offering (131 out of 9634) courses related to or focused on environment and sustainabilityacrossall disciplines. Moreover, the Associate Degree Programme which is being launched from this year in IUB and all affiliated colleges of the university also offers one optional course:environmental science.

Under the green campus: IUB programme, the courses on environment and sustainability will be increased in coming years. All the departments will be asked to include courses on the environment that are present in their scheme of studies such as the department of Phycology will be asked to include environmental phycology, political science department will be asked to include political ecology. Moreover, it will also be made compulsory for all the student of the degree programme of the IUB to have one course on environment and sustainability.

9 RESEARCH, CONFERENCES, SEMINARS, & WORKSHOPS ON ENVIRONMENTAL SUSTAINABILITY

Environmental issues have local as well as national and global implications. These are the glaring issues of today world. The universities, therefore, have a social responsibility to educate students and society on the environment and sustainability issues. This can be accomplished by conducting workshop, seminar, and research conferences. These activities provide an avenue to academia, business communities, local and international organizations to debate on environmental issues, to discuss their relationship with socio-economic activities.These activities foster a better understanding of the environment and sustainability issues. Through these academic activities, experts and policymakers come to gather and develop a network of research activities on sustainability issues. This ensures that people at university understand these issues that affect there day to day life.
University can also promote research on the sustainability issue.Sustainability research is research that leads toward solutions to environmental issues and supports social wellbeing, economic prosperity, and ecological health. Following this approach, out of 1004 research papers submitted to ORIC, IUB for research incentive, 250 (24.9%) research papers cover the aspects of Environmental Sustainability.
Moreover, IUB also observes forest day, earthday, biodiversity day, wildlife day, wetlandday, environment day, soil dayand water day. Also, IUB has IUB environmental protection society, that arranges different events for the students such as a clean and green campus. Additionally, the conference on the issue of smokeand loss of bio-diversityalso have taken place at IUB in 2020.
There are 30 international days related to the environment and sustainability, and IUB observes eight days out of them. Next year, IUB intends to increase the environment day that it celebrates such as world sustainability day, world cities day, world water day and world wildlife day. Moreover, 2021 will be a research challenge on environment and sustainability to find the socio-economic and technological solutions of environmental problems relatedto agriculture, industry,commerce and trade.

10 FOOD WASTAGES

Food waste management is a persistent global concern. According to FAO (2011), global food waste generation is estimated at roughly 1.3 billion tons per year. Moreover, it is estimated that increased water scarcity caused by food waste would have an annual cost of USD 164 billion globally (FAO, 2014). Food wastage is associated with the spoilage of raw or cooked food through 1) physical damage, 2) microbial contamination, 3) autolysis and 4) exposure to pests. It results in environmental degradation, health deterioration, and socio-economic losses.
United Nations (UN) has developed 17 Sustainable Development Goals (SDG) under its vision 2030, among which the following are related to food.
SDG #2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
SDG #3: Ensure healthy lives and promote well-being for all of all ages
SDG #6: Ensure availability and sustainable management of water and sanitation for all (This SDG has also been addressed in the Punjab Growth Strategy 2023)
SDG #12: Ensure sustainable consumption and production patterns.

The green status of food premises in IUB is unsatisfactory at the present due to the lack of training and awareness programs. There is no proper system for the control of food wastages. Most of the students and staff are unaware of the concept of a green campus. At the movement, IUB has eight mess halls, sixcanteensand 4 departmental contains. None of these food pointsfollows the SOPs of sustainability to avoid food wastage.

The green campus: IUB programme, therefore, has the following objectives to achieve in the coming years.

Reduction: Minimization of food wastage/rescue uneaten food. Monitoring of Good Manufacturing Practices (GMPs). Prevention of food spoilage. Prevention of the use of single-use plastic. Optimization of food servings. Use of personal spoons, plates, and water bottles. Reduced use of cooking oil. Reduction in Styrofoam food packaging. Ensuring that nearly all disposable containers and utensils across campus are made with compostable materials such as corn, potatoes, sugarcane pulp.
Reuse: Allocation of separate dustbins for organic, plastic, paper, glass, and spent oil. Use of reusable cutlery and china plates where possible, instead of disposable options. Donation of surplus food.
Recycle: Recycling the meal leftovers into chicken feed.
Recovery: Collection of spent oil from mess and canteens. Improvement of dumping practices.
Training and Awareness Campaign: GMPs training of staff. Use of brochures and banners, signboards in canteens and mess halls. Seminars.
IPM: Control of insects in food storage, cooking, and serving areas.
Recordkeeping: Use of digital inventory management tools.

11 GREEN HEALTH CARE SYSTEM

Green Healthcare System is a domain within the Green Campus Project of the Islamia University of Bahawalpur. Under this domain, we are committed to ensuring the quality use of medicines within the university. This project will not only involve IUB employees, but also the students. We are committed to optimizing the use of medicines and healthcare resources through promoting rational use of drugs, evidence-based drug use evaluation studies, use of branded generics, and improving health literacy among IUB stakeholders. Moreover, the drug use may be routed through the IUB community pharmacy which is expected to be operational within the next few months. We expect that after the implementation of this project, the healthcare expenditures of IUB could be reduced by 10% per year without compromising the patient outcomes and the health-related quality of life of the patients.

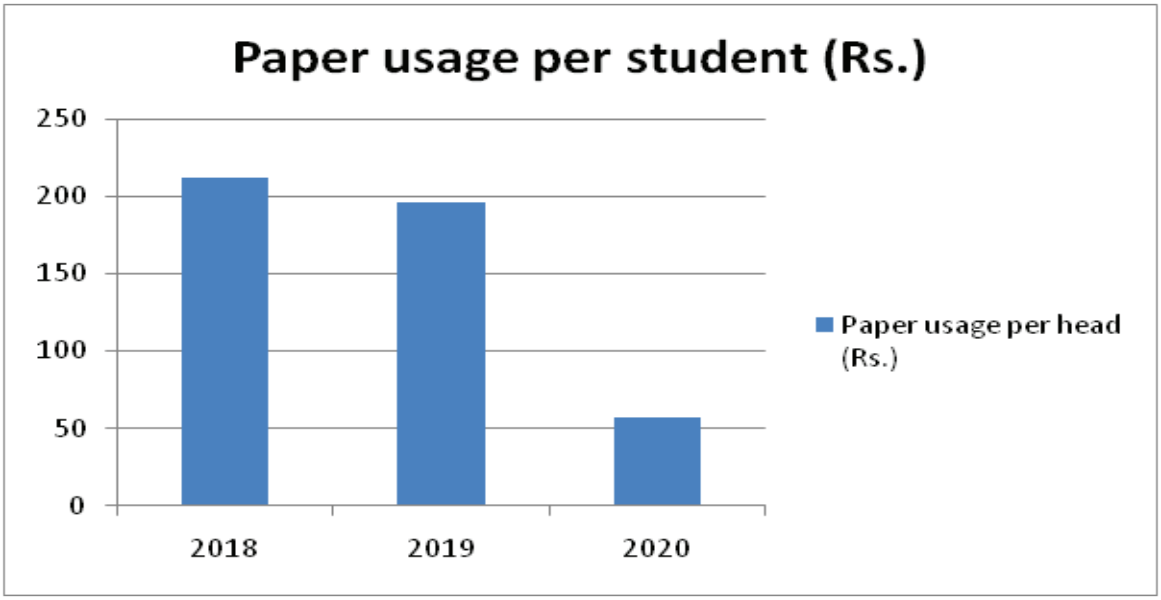
Type	Budget estimate	Revised budget	Total expenses	Balance
Consultation fees plus laboratory tests	3,000,000	5,000,000	3,474,202	1,525,798
Reimbursement of medicines (outdoor)	3,000,000	5,000,000	4,167,213	832,787
Reimbursement of hospitalization charges (indoor)	9,000,000	15,000,000	10,291,536	4,708,464
Subtotal	**15,000,000**	**25,000,000**	**17,932,951**	**7,067,049**
Purchase of medicines		8,000,000	7,996,360	3,640
Subtotal		**8,000,000**	**7,996,360**	**3,640**
TOTAL	**15,000,000**	**33,000,000**	**25,929,311**	**7,070,689**

12 PAPER

Deforestation is an important issue and a primary environmental concern. One reason for deforestation is the increased use and demand for paper over time. The annual global average of paper consumption is 48kg of paper per person as of 2019. Paper is produced through trees (one tress produces around 8,000 sheets of paper) and plenty of forests have been cut down to feed this surge in demand for paper. 85% of all paper consumed comes through forests which are never replaced, whereas the rest 15% is produced through plantations specifically maintained for paper production. Deforestation not only results in loss of habitat for various species but also global warming (forest destruction is responsible for roughly up to one-fifth of global greenhouse gas emissions), climate change and proves to be a trigger various ecological catastrophe, leading to environmental degradation. Moreover, the paper industry also a very pollution-intensive production process.

Target reduction in paper usage may eventually cut down financial and environmental costs for the University. Reduction in usage of paper and recycling would reduce deforestation and greenhouse gas emissions that can contribute to climate change by avoiding methane emissions and reducing the energy required for several paper products. It will also help in extending the fibre supply and contributes to carbon sequestration.

Keeping in full consideration the risk of infections arising from pandemic and requirements of the online education system, The Islamia University of Bahawalpur shifted to the hybrid model of instruction in March 2020, which reduced the use and consumption of paper to a great extent. However, most communication is still carried out on paper and record is maintained in physical form. The last two semesters, Spring 2020 and Fall 2020 have witnessed a great reduction in paper wastage owing to computer-based online exams.As of now, IUB is not undertaking any measures to recycle paper.



The baseline is established on 2019 consumption of paper per head (48 kg per person) since 2020 marked an anomaly in the educational system due to pandemic. The target in the first year of operation would be to reduce per head paper consumption by 10% and a total of 20% at end of two years. Any effort to recycle paper would be considered a dividend over the established targets.The Green Campus: IUB programme,therefore, intends to take the following measures to make IUB a paper-free university.

- **Online meeting agendas, information, and notes:** The easiest way to move to paperless meetings is to store all meeting agendas, informational documents, and notes in an online website or shared spaces, such as Microsoft OneDrive, Google Team Drive, SharePoint, Wiki etc. Before meetings, a link to the relevant folder or documents can be sent out and after the meeting, participants will be able to go back to the folder to add or view notes.
- **Migration plan for non-duplex printers/copiers:** Many printers and copiers on campus cannot be immediately replaced because they do not have duplex printing capability. A migration plan identifies these printers and their contract expiration dates and commits to replacing these machines with duplex capable machines when possible.
- **Printing tracking:** Depending on the printer/contract, a tracking website may be readily available, a tracking program can be set up so we may track printing information. If not, every office may have to manually count reams used each month to track paper use.
- **Shared/Network printing:** A network printer is connected to the Internet and allows multiple computers to print to it. Having a network printer in the office will reduce the need for desktop printers, thus saving energy, maintenance costs and resources. IT can help set up a network printer in all administration offices.
- **Turning stationery into notepads:** We can create notepads out of our outdated stationery. Your old stationery should be brought or sent (via campus mail, attention: note pads) to the printing press building with instructions, contact information, and a budget number. Some Copy Centers on campus may also work with us to create notepads.
(Please be cautious with the paper that is turned into notepads and be sure that it does not contain sensitive information).
- **Other paper conservation resources may include the following:**Use both sides of the paper, optimize the size of the research thesis and discourage assignments in hard copy.

13 The Enviroment Management Committee

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Coordinator /
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Dr. Areeba Khan
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Dr. Zunaib Maqsood Haider
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Dr. Muhammad Ammar Khan
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Head of Green Infrastructure
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14 CONCLUSION

A sustainable university campus has a clear vision, guideline, targets, and commitment to manage its environmental issues. To further strengthen the University's sustainability program, IUB created and filled key positions for the Environment Management Committee (EMC) this year. Through the Green Campus initiative run by the University's EMC, a robust measurement program is in place for IUB's sustainability metrics that allow the University to build on existing programs and move forward with new initiatives. Finalizing and integrating the plans for energy efficiency and climate action into the daily operation for the University are ongoing and active tasks. The Green Campus: IUB programme intends to reduce 10 % use of all environmental resources at IUB next year as the EMC is committed to delivering results by employing all resources at its disposal to achieve sustainability targets. IUB is the first higher education institution in the country to start this programme. As this programme will become deeply ingrained in the fabric of the university, it will have a culture of sustainability.

THANK YOU

Thank you for your interest in The Islamia University's efforts to create a more sustainable campus and culture. We hope you have a better understanding of the breadth and depth the University's sustainability program covers and are inspired to act. Start by Joining the Challenge. Working together we can make a positive contribution to a more sustainable future.

The Environment Management Committee