

GREEN/ENVIRONMENTAL AUDIT REPORT



2021

GREEN/ENVIRONMENTAL AUDIT REPORT

2021



SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, LONGOWAL.
(DEEMED TO BE UNIVERSITY, MINISTRY OF EDUCATION)

GREEN/ENVIRONMENTAL AUDIT COMMITTEE MEMBERS (INTERNAL):

CHAIRMAN:

- ❖ **Dr. Sanjay Marwaha (Professor)**

MEMBERS:

- ❖ **Dr. C.S. Riar (Professor)**
- ❖ **Dr. Avinash Thakur (Professor)**
- ❖ **Dr. Indraj Singh (Associate Professor)**
- ❖ **Dr. Raj Kumar Garg (Associate Professor)**
- ❖ **Dr. Nikhil Prakash (Assistant Professor)**

CO-OPTED MEMBERS:

- ❖ **Er. Prabhdeep Singh (Estate Officer)**
- ❖ **Er. Rakesh Goyal (In-charge Electrical)**
- ❖ **Er. Mandeep Singh (SK/Estate)**

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1. INTRODUCTION

The green audit aims to analyze environmental practices within and outside the university campuses, which will have an impact on the eco-friendly atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of university environment. It was initiated with the motive of inspecting the effort within the institutions whose exercises can cause threat to the health of inhabitants and the environment. Through the green audit, a direction as how to improve the structure of environment and there are include several factors that have determined the growth of carried out the green audit. Green audit is a valuable means for a university/institute to determine how and where they are using the most energy or water or other resources; the college/university/institute can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values, and ethics. It provides staff and students better understanding of green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution.

Thus, it is imperative that the university/institute evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. The rapid urbanization and economic development at local, regional, and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

2. OBJECTIVES

In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The university has been putting efforts to keep our environment clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To map the Geographical Location of the university and to conduct the baseline survey to know reality status of green practices of campus.
- To document the floral and faunal diversity of the university.
- To record the meteorological parameter of Longowal where university is situated.
- To assess the quality of the water and soil of the campus, drinking water.
- To document the ambient environmental condition of weather, air, water and noise of the university.
- To document the waste disposal system and noise in the campus.
- To estimate the Energy requirements of the university.
- To report the expenditure on green initiatives during the last five years.
- To increase the environmental consciousness of all the stake holders and make aware students to real concerns of environment and its sustainability. To motivate staff and students for various green initiatives in the campus.
- To identify strength and weakness in Green initiatives adopted in the campus.
- To bring out a present status report on environmental compliance in the campus.
- To identify the gap areas and suggest recommendations to improve the Green campus

3. METHODOLOGY

The purpose of the green audit of SLIET is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The methodology includes collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

3.1 ADMINISTRATION

The Board of Governors of SLIET is under the SLIET Society, and headed by Dr. K. Radhakrishnan, an Indian space scientist, headed the Indian Space Research Organization (ISRO) between November 2009 to December 2014 as Chairman of Space Commission, Secretary of the Department of Space and Chairman of ISRO and Ministry of Education Development officials. The Administration Section of SLIET, Longowal is having function under the overall managerial control of the Registrar and Director.

SLIET receives its funding from the government, student fees and research funding by industry-sponsored projects. The academic policies of SLIET are decided by its senate. It consists of all professors of the institute, administrators and students. Registrar is the member secretary of Senate

There are Five deans, who look after different functions who are appointed by Director for a period of two years, with registrar as the central officer, who is appointed by Board of Management and is also member secretary of building works committee, head of examinations, planning and monitoring board and only authorized official to make outside correspondence on behalf of Institute

3.2 ADMISSIONS

The educational programs of this institute are non-conventional, innovative, practical oriented and contain all aspects of new education policy, Govt. of India. The Institute offers programs at Certificate, Diploma, Degree, Post-graduate (M.Tech. and M.Sc.) and Ph.D. levels in Engineering and Technology, Science and Humanities.

The admission to different integrated certificate programs in the institute is accomplished by conducting all India Entrance Examination (SLIET Entrance Test, SET) by the Institute. The admissions to the B. Tech. programs run by the institute are based on Joint Entrance Examination Main (JEE Main) conducted across India. Admissions to the M.Tech. programs are by the GATE exam conducted by the IITs and IISc and in M.Sc. program through CCMN. The postgraduate admission is based on research and interviews by the appropriate screening committees. For foreign students, admissions are done through Direct Admission of Students Abroad (DASA) scheme.

4. OVERVIEW OF THE INSTITUTE

Sant Longowal Institute of Engineering & Technology (SLIET) has been established by the Government of India and it is Centrally Funded Technical Institute (CFTI), which provides technical education in emerging areas of Engineering & Technology. It caters to the requirement of technical manpower at various levels by adopting the concept of modular system in imparting technical education with emphasis on practical training in industry. The institute was set up in 1989 under Rajiv Gandhi-Longowal accord with an aim to fulfill the cherished dreams of Late Sant Harchand Singh Longowal.

The Institute has carved for itself a niche amongst the professional institutes and universities of the country and is fully funded by Ministry of Human Resource Development, Government of India. It is well known as "Modern Gurukul" of Technical Education due to lush green campus situated on 447 acres in the Longowal, Sangrur district, Punjab, India. SLIET is fully funded by the Ministry of Human Resource Development, and is an autonomous body controlled by the SLIET Society. Educational opportunities include technical and practical training in the fields of engineering and technology. The Institute initiated certificate and diploma programmes in 1991, and the degree programme in 1993. Post graduate courses in four disciplines were initiated in 2003. All degree programmes were accredited in 2003 by the All India Council for Technical Education, and an impact assessment and review were conducted by Educational Consultants India in 2004. The institute was previously affiliated to Punjab Technical University. However, the Institute has acquired the status of DEEMED- TO- BE -UNIVERSITY in the year 2007 (Notification No.F.9-42/2001-U.3). Currently, all the undergraduate courses of different disciplines are being accredited by NBA for a period of three years.



5. VISION

“SLIET shall strive to act as an international podium for the development and transfer of technical competence in academics through formal and non-formal education, entrepreneurship and research to meet the changing need of society”

MISSION

- Non-formal, flexible, modular, multipoint entry programmes in engineering and technology and in the areas like rural development, educational planning, information and management sciences.
- Education and training in modern technology areas.
- Promotion of self-development among the students.
- Extension services to industry working population, passed-out students, social organizations and institutions of research and higher learning.
- Close interface with the industry to conduct research on the basis of manpower requirements leading integrated educational planning curriculum development and instructional material preparation in technology and inter-disciplinary areas.
- Promotion of institute-institute linkages for sustainable development of academic and research.

GREEN ‘SLOGAN’

“One day is not enough to green our earth. Planting caring and love is also expecting our earth from us. Do it, It will heal not only the land but also your body and mind.”

SLIET GREEN ‘MISSION’

“An overall CAMPUS abeyance with creation of clean and green environment full of fragrance, curiosity, passion and care for nature”

6. GREEN AUDITING

The university has adopted the 'Green Campus' system for environmental conservation and sustainability. There are main three pillars i.e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO₂ emission, energy, and water use, while creating atmosphere where students can learn and be healthy.

7. LAND USE ANALYSIS (AS ON DATE)

7.1 LOCATION

- SLIET is located 19 kilometers (12 miles) east of Sangrur. It is situated on 447 acres (183 Ha) of land provided by the Punjab government. The property is landscaped and well maintained to provide for an aesthetically pleasing environment.

7.2 TOPOGRAPHY

- Longowal is a town with municipal council in Sangrur district in the Indian state of Punjab. Longowal is unique in the history of East Punjab.
- Longowal is located at (Location: 30°21'67" N AND 75°69'33" E). It has average elevation of 232 meter.

7.3 LAND USE (BUILT-UP AREA ANALYSIS)

The total area of SLIET, Longowal is 18,09,000 m² out of which the built up area (including roads) is 14.3 % (i.e. 2,58,308.64 m²) and plantation area is 85.7 % (i.e. 15,50,691.36 m²).

- The northern region of SLIET is having Main Administrative Block: Administrative Blocks & Auditorium.
- Central region has Academic block consisting of Electronics & Communications Engineering, Mechanical Engineering, Electrical Engineering, Computer Engineering, Chemical and Food Engineering, Central Workshops, Health Center etc.
- The southern region comprises of: Faculty Flats, Shops etc.
- The western region has hostels, & Gurdwara sahib.
- The eastern region has forest area , irrigation canal, etc

<i>CATEGORIES OF LAND USE</i>	<i>AREA (m²) (%)</i>
PLANTATION AREA	15,50,691.36 (85.70)
BUILT UP AREA (INCLUDING ROADS)	2,58,308.64 (14.30)
TOTAL AREA	18,09,009.00 (100.00)

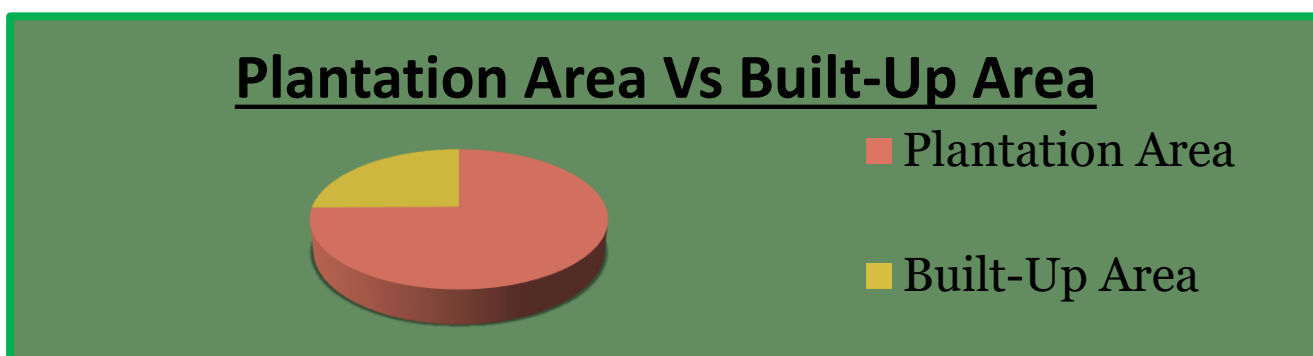


TABLE-1 AREA OCCUPIED BY VARIOUS BUILDINGS AT SLIET, LONGOWAL

SR. NO	NAME OF BUILDING	NUMBER OF FLOORS	AREA (M2)
1.	Administrative Block (Main building)	03	2,710.00
2.	Academic Block	03	54,148.64
3.	Auditorium	01	2,375.00
4.	Hostel Buildings	03	62,064.15
5.	Residential Buildings	03	38,995.37
6.	Other Buildings	03	7,015.48
7.	Roads	01	91,000.00
		TOTAL AREA	2,58,308.64

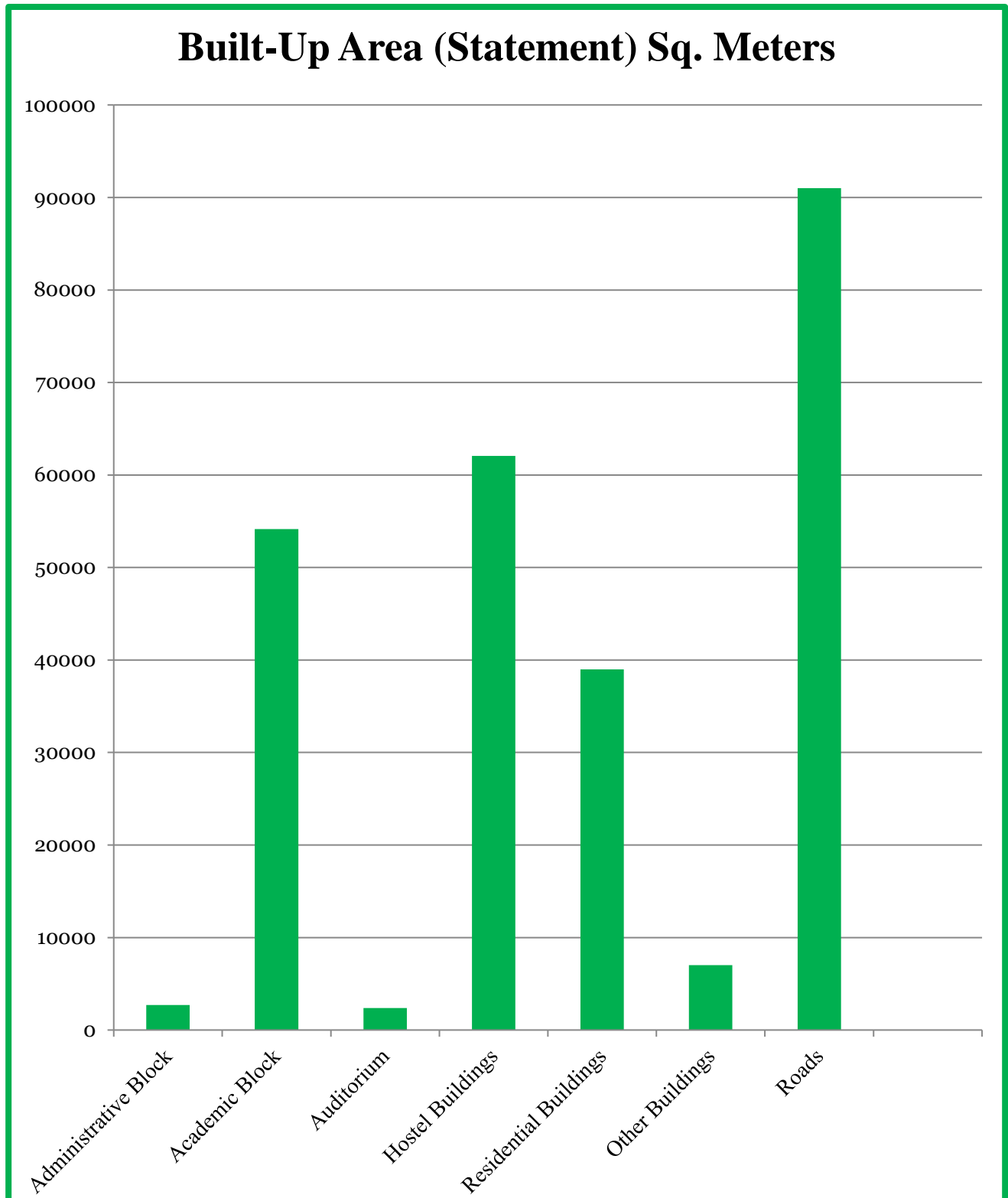


FIGURE-1 BUILT UP AREA OF SLIET CAMPUS

8. GEOGRAPHICAL LOCATION

The college has a sprawling pollution-free campus spread over 447 acres of land. Located in the region known as Malwa in agricultural state of Punjab.

The Google aerial views of College Campus have been shown below.



FIG-2 GOOGLE AERIAL VIEW OF CAMPUS

9. TREE DIVERSITY OF SLIET, LONGOWAL, PUNJAB

SLIET is within the geo-position between latitude 30°21'67" N and longitude 75°69'33" E in Longowal, Punjab, India. It encompasses an area of about 447 Acres. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programme organized by the authority and have become an integral part of the college.

The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer.

Many species of birds are dependent on these trees mainly for food and shelter. Nectar of flowers and plants is a favorite of birds and many insects. Leaf – covered branches keep many animals, such as birds and squirrels, out of reach of predators. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colours. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees give them a monument – like quality. They also remind us the glorious history of our institution in particular. We often make an emotional connection with these trees and sometime become personally attached to the ones that we see every day.

A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms. Thus, the college has been playing a significant role in maintaining the environment of the entire Longowal town in its surrounding areas. The following are the tree species with whom we are being attached.

9.1 OUR NATURAL HABITATS (PLANTS & TREES) FLORA

The campus which is a naturally developed green and clean campus is housing a variety of natural flora & fauna along with habitat of residential and migratory birds. Nearly 71,000 plants of medicinal and non-medicinal are there at SLIET Campus, Longowal plants & trees.

TABLE-2a: LIST OF TREE SPECIES OF SLIET, LONGOWAL, PUNJAB

S.No.	Common Name	Botanical Name	Family	Remarks
1	Mango	Mangifera indica	Anacardiaceae	Trees/plants are regularly planted year wise and maintained by Horticulture wing of estate. This reserve is considered as an asset to the SLIET University and is proudly being considered as a contributory in maintaining the green cover.
2	Alstonia	Alstonia scholaris	Apocynaceae	
3	Crape jasmine	Tabernaemontana divaricata	Apocynaceae	
4	Christmas Tree	Araucaria heterophylla	Araucariaceae	
5	Chandni	Tabernaemontana	Apocynaceae	
6	Amla	Phyllanthusemblica	Phyllanthaceae	
7	Bahera	Terminaliabelirica	Combretaceae	
8	Gulmohar	DelonixRegia	Royal poinciana	
9	Ashoka	Saracaasoca	Fabaceae	
10	Phali	Callindria	Legumes	
11	Sat Patti	Alstonia	Apocynaceae	
12	Shree	Varun	Capparidaceae	
13	Kaner	Oleander	Dogbanes	
14	Tamarind	Tamarindusindica	Fabaceae	
15	Aaroo	Peach	Rosaceous	
16	Pomegranate	Punicagranatum	Lythraceae	
17	Jungle jalebi	Pithecellobiumdulce	Legumes	
18	Champa	Magnolia champaca	Magnolia	
19	Bottle brush	Callistemon	Myrtle	

20	Tun	Toonaciliate	Meliaceae
21	China Palm	Livistonachinensis	Palm
22	Golden Bottle brush	Callistemon	Myrtaceae
23	Harsingar	Nyctanthes arbor-tristis	Olives
24	Koylas	S. oleosa	Sapindaceae
25	Manchi Palm	Arecales	Areaceae
26	Ficus	Ficus	Mulberry
27	Guava	Psidium	Myrtaceae
28	Gular	Cluster Fig	Mulberry
29	Suhanjna	Moringaoleifera	Moringaceae
30	Araucaria	Araucaria araucana	Araucariaceae
31	Bottle Palm	Hyophorbelagenicau	Palm
32	Naurangi	Citrus X sinensis	Rutaceae
33	Silver Oak	Grevillearobusta	Proteaceae
34	Ber	Ziziphusmauritiana	Rhamnaceae
35	Pears	Prunuspersica	Rosaceous
36	Nakh	Pyruspyrifolia	Rosaceous
37	Aloo Bukhara	Prunusbokharensis	Rosaceous
38	Rose	Rosa	<i>Rosaceous</i>
39	Lemon	Citrus limon	Rutaceae
40	Mausambi	Citrus limetta	Rutaceae
41	Curry Leaf	Murrayakoenigii	Rutaceae
42	Poplar	Populus	salicaceae
43	Litchi	Litchi chinensis	Sapindaceae
44	Maulsari	Mimusopselengi	Sapotaceae

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S.No.	Common Name	Botanical Name	Family	Remark
45	Kinnow	Citrus Reticulata	Rutaceae	SLIET green cover maintaining asset
46	Loquat	Eriobotrya japonica	Apple	
47	Neem	Azadirachta indica	Meliaceae	
48	Kesiya Jawaniya	Benguet Pine	Pinaceae	
49	Mahua	Madhuca longifolia	Madhuca	
50	Pandoli Asoka	Saraca asoca	Caesalpinioideae	
51	Tahli	Dalbergia sissoo	Dalbergia	
52	Chiri Phool	Hibiscus	Malvaceae	
53	Jamun	Syzygium cumini	Myrtaceae	
54	Anjeer	Ficus carica	Moraceae	
55	Sita Phal	Annona squamosa	Annonaceae	
56	Rubber Plant	Ficus elastica	Moraceae	
57	Shahtoot	Morus alba	Rubus	
58	Litchi	Litchi chinensis	Sapindaceae	
59	Kathal	Artocarpus heterophyllus	Moraceae	
60	Koylas	Solanum surattense	Solanaceae	
61	Peepal	Ficus religiosa	Moraceae	
62	Sharifa	Annona squamosa	Annonaceae	
63	Samer	Astrophytum myriostigma	Cacti	
64	Arjun	Terminalia arjuna	Terminalia	
65	Banana	Musa acuminata	Musaceae	
66	Maulishree	Mimusops elengi	Sapotaceae	
67	Sukhchain	Milletia pinnata	Pongamia	
68	Date	Phoenix dactylifera	Arecaceae	
69	Tunna	Toona ciliata	mahogany	
70	Lemon	Citrus limon Osbeck	Rutaceae	
71	Chakrasia	Chukrasia tabularis	Meliaceae	
72	Phoenix canariensis	Phoenix canariensis	Arecaceae	
73	Amaltas	Cassia fistula	Fabaceae	
74	Safeda	Eucalyptus	Myrtaceae	
75	Hibiscus	Hibiscus rosa-sinensis	Malvaceae	
76	Karunda	Carissa carandas	Apocynaceae	
77	Sita Ashok	Saraca asoca	Leguminosae	

TABLE-2b Detail (Number) Of Trees & Shrub Plants at SLEIT LONGOWAL

SR. NO.	NAME OF TREE	QTY.
1.	Ficus	700
2.	Casuarina	150
3.	Farmah	150
4.	Arjun	3000
5.	Sukhchain	17000
6.	Jamun	7000
7.	Kachnar	500
8.	Sohanjna	100
9.	Raisin	150
10.	Harsingar	200
11.	Bottlebrush	600
12.	Gul-e-cheen	200
13.	Chandni	1300
14.	Neem	6000
15.	Kassod	200
16.	Aamltas	600
17.	Peepal	100
18.	Bargad	50
19.	Balina	10
20.	Kaner	1500
21.	Alstonia	1500
22.	Rubber Plant	10
23.	Pilkhan	60
24.	Guava	1200
25.	Mango	250
26.	Moulsari	200
27.	Sheesham	1800
28.	Gulmohar	100
29.	Jacaranda (Blue)	70
30.	Bahera	250
31.	Mulberry	1200
32.	Chakresia	7000
33.	Babool	700
34.	Dharek	1300
35.	Siris	2200
36.	Bel Patra	150
37.	Amla	100
38.	Sagwan	300
39.	Eucalyptus (Safeda)	500
40.	Silver oak	250
41.	Rosewood	50
42.	Jatropha	300
43.	I-Length	300
44.	Sumbal	250
45.	Kadam	200
46.	Kusam	250
47.	Beri	600

SR. NO.	NAME OF TREE	QTY.
48.	Poplar	3000
49.	Reru	02
50.	Ashoka	500
51.	Bamboo	50
52.	Gular	60
53.	Lemon	200
54.	Terminalia	10
55.	Karonda	50
56.	Hamelia	10
57.	Hibiscus	3000
58.	Kalendra	20
59.	Harad	20
60.	Patranji	200
61.	Tamarind	100
62.	Casia Semiya	150
63.	Nasuda	10
64.	Falsa	30
65.	kathal	03
66.	Rahuda	02
67.	Kher	200
68.	Kanakchapa	50
69.	Chakotra	20
70.	Araucaria	10
71.	Anjeer	30
72.	Jungle Jlebi	50
73.	Mauaa	07
74.	Plum	20
75.	Peach	30
76.	Rukbajni	200
77.	Sugar Apple	20
78.	Dheu	04
79.	Foxtile	20
80.	Pomegranate	150
81.	Tun	100
82.	Bottlepalm	20
83.	Mousmi	70
84.	Fishtail	10
85.	Jand	20
86.	Ban	15
87.	Rerru	01
88.	Golden Bottle Brush	07
89.	Apple	01
90.	Curry Leaf	100
91.	Dhak	50
92.	Bougainvillea	2000
93.	Rose	500

TOTAL PLANTS - 71722

Table-3 List of various varieties of Herbal trees available in SLIET, Longowal

- Arjun Terminalia Arjuna
- Baheda Terminalia Billerica
- Simbal Bombax ceiba.
- Banyan/ bargad Ficus Benghalensis
- Desibabool/ desikikar Acacia nilotica
- Desi Kadamb / desikadam Mitragyna Parviflora
- Desi mango Magnifera indica
- Dhak / Palash Butea monosperma
- Gular Ficus racemosa
- Harde / Harar Terminalia chebula
- Jamun Syzygium cumini
- Khejri/Jhand/Shammi Prosopis cineraria
- Mahua Madhuca longifolia
- Neem Azadirachta Indica
- Peepal Ficus Religiosa
- Pilkhan / Pilkan Ficus virens
- Rajain / Papdi
- Sheesham Dalbergia Sissoo
- Suhanjana Moringa concanensis
- White siris Albizia procure
- Amaltas Cassia fistula
- Ber Ziziphus Mauritiana
- Harsingar/ pari jat
- Karanj / Sukhchain Pongamia pinnata
- Khair/ Katha Acacia catechu
- Lasora Cordia dichotoma
- Tota Erythrina Indica
- Aak Calotropis procure
- Anar Punica Granatum
- Mehndi Lawsonia Inermis
- Motia Jasminum Sambac
- Falsa Grewia asiatica
- Karunda Carissa Carandas

- Khatta Citrus Aurantium
- JharBer Ziziphus Nummelaria
- Ashwangandha Withania Somniferous
- Jangle FalsaGrewiaTenex
- Garna/ Jangli Karunda Carissa Spinarum

TABLE-4 DETAIL OF HEDGE PLANTS AT SLIET LONGOWAL

SR. NO.	NAME OF PLANT	QTY.
1	Murraya	2300
2	Boxwood	300
3	Aliar	300
4	Mehndi	5000
5	Coleus	4000
6	Gardenia	15000
7	Chandni Dwarf	4100
8	Duranta	10000
Total		41000

TABLE-5 HERBAL PLANTS RAISED IN INSTITUTE NURSERY

SR. NO.	NAME OF PLANTS	BOTANICAL NAME
1.	Aloe Vera	Aloe Barbadensis Miller
2.	Aak	Caliotropis Gigantea
3.	Turmeric	Curcuma Longa
4.	Datura	Datura Stramonium
5.	Lajwanti	Mimosa Pudica
6.	Suhanjna	Moringa Oleifera
7.	Tulsi	Ocimum Tenuiflorum
8.	Shyama Tulsi	Ocimum Sanctum
9.	Amla	Phyllanthus Emblica
10.	Ashwangandha	Withania Somniferous
11.	Amaltas	Cassia Fistula
12.	Pomegranate	Punica Granatum
13.	Bel Patra	Aegle Marmelos L.
14.	Bahera	Terminalia Billerica
15.	Dhak	Butea Monosperma
16.	Lemongrass	Cymbopogon
17.	Shamak Namoli	Solanum nigrum
18.	Arandi	Ricinus Communis
19.	Puthkanda	Achyranthes Aspera
20.	Bhumi Amla	Phyllanthus Niruri
21.	Ratti	Abrus Precatorius
22.	Tamarind	Tamarindus Indica
23.	Sugar Apple	Annona Squamosa
24.	Arjun	Terminalia Arjuna
25.	Guava	Psidium Guajava
26.	Neem	Azadirachta Indica
27.	Mango	Mangifera Indica
28.	Harsingar	Nyctanthes Arbor-Tristis
29.	khair	Senegalia catechu
30.	Dheu	Artocarpus lacucha

9.2 ACTIVITIES UNDERTAKEN ON ROUTINE BASIS IN SLIET CAMPUS BY ESTATE AND THEIR OUTCOME

A. UNDER GO-GREEN, ENVIRONMENTAL PROTECTION AND PUBLIC AWARENESS PROGRAM

For the purpose twice, ever year in the SLIET campus and in the Hostels, plantation is being carried out to create awareness among SLIET residents including students for environmental protection and clean and green environment which has shown a positive impact on Campus wellbeing, outlook and stability. Various activities undertaken are depicted subsequently along with their impact (Outcome):

B. PLANTATION DRIVE 2019 : "One Student One Tree"

Referring to Hon'ble HRD Minister Dr. Ramesh Pokhriyal "Nishank" of launching a new campaign "One Student One Tree" on 20th July 2019. This initiative is in line with the Honorable Prime Minister's idea of a green and healthy environment. The SLIET took part in Plantation drive initiative and planted more than 500 trees in different locations including Hostel premises, road sides and others areas by involving the newly admitted students of ICD, Degree, M. Tech. On 15th of August, 2019, Director SLIET, along with Ms. Vidya Sagri (DFO, Sangrur), Deans, HODs, Estate Officials, Faculty & Staff, residents and newly admitted students planted trees under the Plantation Drive programme being initiated in the SLIET.



C. HORTICULTURE ACTIVITIES UNDERTAKEN IN (2019-20)

- (i) **FLOWER EXHIBITION (2019):** From the year 2019 onwards the Horticulture wing of the estate organizes flower exhibition/show cum competition from the day of Convocation and continues during the flower season. Different varieties of flowers have been grown in pots and in nursery grounds, including Dog flower, Sand flower, Dahlia, Verbena, Petunia, Gazania, Kel, Dahlia double, Salvia, Dianthus, Calandria, Marigold, Stone flower.



FIG-3 FLOWER EXHIBITION (2019)

OUTCOME: The nursery is regularly visited by faculty, staff and SLIET residents, Guests, including students and work is appreciated in the direction of preserving flora and fauna and natural diversity. Flower exhibition as a competitive and participation activity during convocation adds an activity for visitors during convocation along with chief guests and other dignitary and created interest and enthusiasm among public in general and SLIET in particular.

- (ii) **FLOWER EXHIBITION (2020):** A flower show has been exhibited by the Horticulture wing of Estate in SLIET Nursery, which was formally inaugurated by the Director SLIET on dated 14/02/2020. Different varieties of flowers have been grown in the pot and in nursery ground including Dog flower, Sand flower, Dahlia, Verbena, Petunia, Gazania, Kel, Dahlia double, Salvia, Dianthus, Calandria, Marigold, Stone flower. The nursery is regularly visited by faculty, staff and SLIET residents including students and work is appreciated in the direction of preserving flora and fauna and natural diversity.



FIG-4 FLOWER EXHIBITION (2020)

- (iii) **HERBAL PARK:** Inauguration of Herbal Park by the Director SLIET on 15th August, 2020. Herbal plants like Tulsi, Aloe Vera, Gotu Kola, Calendula, Basil, Rosemary, Lavender, Sage, Peppermint, Globe Artichoke, Ashwagandha, Lemon Grass, Khus, Sagargota, Bonduc nut, Stevia, Marsh Mallow, Bael, Babul, Neem, Bargad, Peepal, Arjuna, Amla, Harad, Audumbar, Drumstick Tree, Turmeric, Mulathi, wheat grass, lemon grass, Behera, Giloy etc. are being planted as per requirement, availability and growing conditions.



FIG-5 HERBAL PARK (2020) ACTIVITY PICTURES

OUTCOME: Awareness among SLIET residents about herbal plants and trees and availability for use. Many herbal varieties were distributed to SLIET residents and consumed during COVID-19 pandemic.

(iv) **PLANTATION DRIVE:** Referring to Hon'ble HRD Minister Dr. Ramesh Pokhriyal "Nishank" of launching a new campaign "One Student One Tree" and the initiative is in line with the Hon'ble Prime Minister's idea of a green and healthy environment, every year plantation is being carried out in SLIET Campus during the period from July-Aug and Feb-March. Accordingly from 15th of August, 2020, plantation drive was initiated in the campus by the worthy Director along with SLIET residents and around 1000 plants of different varieties including fruit trees (Sukhchain, Kaner, Guava, Jaman, Habicus, Chandni, Mango, Neem, Amaltas, etc.) were planted at different locations and also along road sides to maintain the green cover and flora and fauna.



FIG-6 PLANTATION DRIVE (2020) ACTIVITY PICTURES

OUTCOME: Fruit are made available for SLIET residents including students' consumption along with creating a tree bank for different varieties of plants and tree nearly having approx. 20 different species of plants/trees/shrubs/decorative.

D. HORTICULTURE ACTIVITIES (UNDERTAKEN IN 2021)

“Since the EARTH laughs in FLOWERS”

(i) **FLOWER EXHIBITION (2021):** As per the previous year practice, on the day of 23rd Convocation i.e. 05.03.2021 a flower show/Exhibition and competition show (Flower Exhibition cum Competition-II) outside the Auditorium building at around 11:00 AM was organized. For the purpose entries from hostel system, employees, and Residents of SLIET were invited. Different varieties of flowers in pot plants were displayed and put on show for competition including Dog flower, Sand flower, Dahlia, Verbena, Petunia, Gazania, Kel, Dahlia double, Salvia, Dianthus, Calandria, Marigold, Stone flower etc. Judges from SLIET evaluated the competitor’s collection based on program specific criteria, various winners have been selected category wise who have been given prizes.

<u>Participation</u>	<u>Criteria</u>
<p>Participation of hostels, residents and employees will be made as per the following category</p> <ol style="list-style-type: none"> 1. Entries from Hostels (both boys and girls) 2. SLIET employees (individual/Jointly) 3. Departmental Entries 4. Entries from Types- I/II/III/IV/V (separately) 	<ol style="list-style-type: none"> 1. Competition, based on the collection and variety of flowers being displayed by each category collector(s). 2. Participants can bring their pot plants/flowers 3. Collections displayed on the spot competition and exhibition. 4. SLIET residents/ employees and participants are requested to visit as well as bring their collections



FIG-7 FLOWER EXHIBITION (2021)

- (ii) **PLANTATION DRIVE:** Referring to Hon'ble HRD Minister initiative and in line with the Hon'ble Prime Minister's idea of a green and healthy environment, every year plantation is being carried out in SLIET Campus during the period from July-Aug and Feb-March. Accordingly from 15th of August, 2021, and Van Mahotsav plantation drive was initiated in the campus by the worthy Director along with SLIET residents and around 1000 plants of different varieties including fruit trees (Arjun, Neem, Ashoka, Sukhchain, Kaner, Guava, Jaman, Habicus, Chandni, Mango, Neem, Amaltas, etc.) were planted at different locations and also along road sides to maintain the green cover and flora and fauna.

(iii) HERBAL PARK EXTENSION AND TREE PLANTATION DRIVE :

- In the 1st Phase and area of 3100 Sq meter has been developed for the herbal plants planted in the Instiute campus.
- In the 2nd Phase and area of 2200 Sq meter has been proposed to be developed in the second phase and the development of herbal is in progress.

1.	Herbal Park	250' x 132' = 33,000 in Sq. feet (Phase-I)
		Developed (Approx. 3100 Sq. Meter)
		180' x 132' = 23,760 (Phase-II)
		In Progress (Approx. 2200 Sq. Meter)



FIG. 8 HERBAL PARK EXTENSION AND TREE PLANTATION DRIVE (2021) ACTIVITY PICTURES

E. INSTITUTE NURSERY

i) Raising of pot plant, Hedge, other plants, Manure composite etc. The Institute has developed nursery for raising the trees, plants, pot plants, pots, hedge, lawn grass in order to meet the requirements of whole campus. Different varieties of hedges (Boxwood, Dwarf Chandni, Bougainvillea, Gardenia, Emerme, Coleus, Hibiscus, Mendhi etc), pot plants to full fill the requirements during Institute, departmental or hostel events/programs) and to decorate the buildings/premises. The plants and trees which are grown in the nursery are planted in campus. The institute has also developed Herbal-park and the herbal plants requirement is also met through nursery.



FIG.9 INSTITUTE NURSERY PICTURES

Table-6 Detail of Plants raised in Nursery at SLIET Longowal, for the Year-2021

Sr. No.	Name of Plant	Quantity (No.)	Market Value (Rs)
1	Bougainvillea	250	5000/-
2	Rose	250	12500/-
3	Euphorbia	100	5000/-
4	Dracaena	110	5500/-
5	Jade	60	3000/-
6	Zebrine	100	4000/-
7	Neem	100	1000/-
8	Kaner	100	2000/-
9	Mehndi	1000	20000/-
10	Jamun	150	1500/-
11	Coleus	1200	18000/-
12	Gardenia	3000	60000/-
13	Chandni Dwarf	200	5000/-
14	Duranta	500	10000/-
15	Drumstick Tree (Suhanjna)	300	4500/-
Total		7420	IRG/Total Value Rs. 1,57,000/-

Table-7 Detail of Plants raised in Nursery at SLIET Longowal, for the Year-2020

Sr. No.	Name of Plant	Quantity (No.)	Market Value (Rs)
1	Bougainvillea	200	4000/-
2	Morepankhi	200	6000/-
3	Euphorbia	100	5000/-
4	Pulmeria	100	20000/-
5	Chandni	50	1000/-
6	Raat Rani	50	2500/-
7	Dracaena	30	1500/-
8	Farmah	50	1000/-
9	Hibiscus	200	4000/-
10	Gardenia	2000	40000/-
11	Neem	50	500/-
12	Mehndi	400	8000/-
13	Ficus	100	5000/-
14	Sukhchain	200	3000/-
15	Duranta	600	12000/-
16	Chandni Dwarf	1200	30000/-
17	Coleus	500	7500/-
Total		6030	IRG/Total Value Rs. 1,51,000/-

Table-8 Detail of Plants raised in Nursery at SLIET Longowal, for the year-2019			
Sr. No.	Name of Plant	Quantity (No.)	Market Value (Rs)
1	Coleus	400	6000/-
2	Chandni Dwarf	750	18750/-
3	Duranta	400	8000/-
4	Gardenia	1750	35000/-
5	Neem	300	3000/-
6	Ficus	250	12500/-
7	Kachnar	150	3000/-
8	Sukhchain	400	6000/-
9	Kaner	125	2500/-
10	Jamun	100	1000/-
11	Pulmeria	75	15000/-
12	Cactus	50	2000/-
13	Euphorbia	50	2500/-
14	Hibiscus	400	8000/-
15	Mehndi	700	14000/-
16	Bougainvillea	150	3000/-
17	Guldaudi	200	4000/-
18	Arjun	200	3000/-
19	Saplera	10	400/-
20	Rose	40	2000/-
21	Chandni	100	2000/-
22	Morepankhi	100	3000/-
23	Guava	75	3750/-
24	Murraya	100	2500/-
Total		6875	IRG/Rs. 1,60,900/-

Sr. No.	Name of Plant	Quantity (No.)	Market Value (Rs)
1	Gardenia	1500	30000/-
2	Sukhchain	500	7500/-
3	Duranta	800	16000/-
4	Mehndi	500	10000/-
5	Hibiscus	500	10000/-
6	Guldaudi	500	10000/-
7	Ficus	300	15000/-
8	Coleus	200	3000/-
9	Lemon	25	2500/-
10	Murraya	75	1875/-
11	Jamun	300	3000/-
12	Bougainvillea	100	2000/-
Total		5300	IRG/Rs. 1,10,875/-

OUTCOME

GRAND TOTAL OF IRG GENERATED DURING THE LAST 4 YEARS IS RS. 5,79,775/-

F. COMPOST-MANURE PRODUCTION

- Compost is a mixture of ingredients used to fertilize and improve the soil. It is commonly prepared by decomposing plant and food waste and recycling organic materials. The resulting mixture is rich in plant nutrients and beneficial organisms. Compost improves soil fertility in gardens, landscaping, horticulture, and organic farming. The benefits of compost include providing nutrients to crops as fertilizer, acting as a soil conditioner, increasing the humus or humic acid contents of the soil, and introducing beneficial colonies of microbes that help to suppress pathogens in the soil. It also reduces expenses on commercial chemical fertilizers for recreational gardeners and commercial farmers alike. Compost can also be used for land and stream reclamation, wetland construction, and landfill cover.
- The decomposition process is aided by shredding the plant matter, adding water, and ensuring proper aeration by regularly turning the mixture in a process that uses open piles or "windrows." Composting is an important part of waste management since food and other compostable materials make up about 20% of waste in landfills and these materials take longer to biodegrade in the landfill.
- Compost/Manure is prepared in the Institute for the last 4 years from the waste material of forest litters etc. The same is used in the horticulture activities.



FIG 10 PICTURES OF COMPOSITE MANURE PRODUCTION

OUT COME: The total volume and cost of manure produced is
a) Volume: 250 cum and b) IRG: Rs. 2,50,000/-

G. PARKS (DEVELOPMENT AND MAINTENANCE)

The purpose of development of public parks is to create human friendly environment in a residential campus. Different parks as detailed below are developed and maintained for public use. The impact of this development makes the residents to use the parks for morning or evening walk, sun bath which paved the way for their recreation and health well being.

Table-10 Area under Parks & Lawns: Academic & Administrative Buildings

S. No	Location	Area Covered	Out Come
1.	Science Block	97' x 50' = 4850	Lawns are being used by the Faculty/Staff and students of Institute. The lawn area is being maintained regularly by deploying outsourced workers.
		60' x 55' = 3630	
		110' x 55' = 6050	
2.	ME Block	77' x 50' x 4235	
		130' x 31' = 4030	
		80' x 70' = 5600	
		237' x 48' = 11376	
		65' x 35' = 2275	
3.	Work Shop	160' x 42' = 6720	
		110' x 52' = 5720	
4.	Food Block	120' x 356' = 4200	
		84' x 38' x 3192	
		134, x38' = 5092	
		93, x 48, = 4464	
5.	Plaza	360' x 235' = 84600	
		360' x 110' = 39600	
6.	Computer Block	100' x 125' = 12500	
		195' x 26' = 5070	
		433' x 55' = 23815	
7.	Library	217' x 138' x 29940	
		43' x 39' = 1677	
		110' x 50' = 5500	
		250' x 45' = 11250	
8.	Estate Office	88' x 37' = 3256	
		135' x 75' = 10125	
		73' x 50' = 3650	
9.	Swimming Pool	197' x 52' = 10244	
		270' x 90' = 24300	
10.	Faculty Club	270' x 152' = 41040	
		270' x 160' x = 43200	
11.	Health Centre	183' x 48' = 8784	
		138' x 23' = 3174	
		105' x 52' = 5460	
		160' x 40' = 6400	

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S. No	Location	Area Covered	Out Come
12.	KV School	185' x 165' = 30525	
13.	SAC	105' x 110' = 11550	
14.	Guest House	160' x 40' = 6400	The lawn area is well maintained keeping in view the importance of visit of VIP's.
		177' x 160' = 28320	
		175' x 50' = 8750	
		238' x 84' = 19992	
		419' x 45' = 18855	
15.	NEW EIE Building	65' x 22' = 1430	
		55' x 48' = 2640	
		150' x 40' = 6000	
		50' x 40' = 2000	
16.	Administrative Block	129' x (135+84/2) = 1425	
		$\Pi/4 \times 84' \times 84' = 5539$	
		100 x (72+88/2) = 8000	
		105 x (70+86/2) = 8190	
		$\Pi/4 \times (100) = 31400$	
17.	Auditorium	110' x 27' = 2790	
		38 x (63+17/2) = 1520	
		336 x (321+272/2) = 99624	
		167x (55+23/2) = 6513	
		200' x 110' = 22000	



FIG 11 PICTURES OF ACADEMIC & ADMINISTRATIVE BUILDINGS PARKS

TOTAL LAWN AREA 7,81,368 SQ. FT OR 72,617 SQ. MTR. (APPROX.)

Table-11 Area under Parks & Lawns: Residential Area

S No	Location	Area Covered (Sq. Feet)	Out Come
1.	Type-II Qtrs.	50' x 152' = 7600	Lawns are being used by the Residents of Institute. The lawn area is being maintained regularly by deploying outsourced workers.
		72' x 191' = 13752	
2.	Type-II Qtrs. New	50' x 60' = 3000	
		100' x 120' = 12000	
		170' x 123' = 20910	
		115' x 400' = 46000	
3.	Type-III Qtrs.	100' x 50' = 5000	
		133' x 150' = 19950	
		150' x 150' = 22500	
		146' x 100' = 14600	
		322' x 150' = 48300	
4.	Type-IV Qtrs.	140' x 110' = 15400	
	Type-IV Qtrs. along road	760' x 75' = 57000	
5.	Type-V Qtrs.	150' x 160' = 24000	

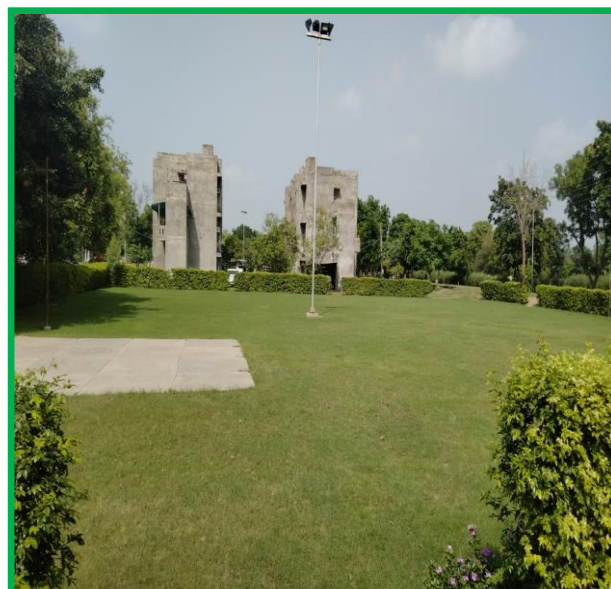


FIG 12 PICTURES OF RESIDENTIAL AREA PARKS
TOTAL LAWN AREA 307012 SQ. FT OR 28532 SQ. MTR.

Table-12 Area under Parks & Lawns: Hostels

S. No	Area	Area Covered (Sq. Feet)
1	Boys Hostel No. 01	80' x 80' = 6400
		35' x 180' = 6300
		110' x 150' = 16500
		400' x 100' = 40000
2.	Boys Hostel No. 02	35' x 100' = 3500
		400' x 100' = 40000
		80' x 80' = 6400
		100' x 150' = 16500
3.	Boys Hostel No. 03	200' x 325' = 65000
		250' x 80' = 20000
		200' x 70' = 14000
		268'' x 140' = 37520
4.	Boys Hostel No. 04	350' x 200' = 70000
		250' x 100' = 25000
		200' x 70' = 14000
		340' x 160' = 54400
5.	Boys Hostel No. 05	120' x 270' = 32400
		100' x 80' = 18000
		75' x 70' = 5250
		50' x 300' = 15000
6.	Boys Hostel No. 06	60' x 350' = 21000
		74' x 150' = 11100
		120' x 180' = 21600
		100' x 80' = 8000
7.	Boys Hostel No. 07	2 x 200' x 95' = 38000
		86' x 90' = 7740
		250' x 45' = 11250
8.	Boys Hostel No. 08	95' x 260' = 24700
		300' x 45' = 13500
		86' x 90' = 7740
9.	Boys Hostel No. 09	415' x 140' = 58100
		150' x 350' = 52500
		100' x 90' = 9000
		80' x 30' = 2400
10.	Boys Hostel No. 10	110' x 325' = 35750
11.	Girls Hostel no.01	280' x 100' = 28000
		145' x 140' = 20300
12.	Girls Hostel no.02	250' x 115' = 28750
		100' x 40' = 4000
		70' x 50' = 3500
13.	Girls Hostel no.03	190' x 50' = 9500
		50' x 70' = 3500

TOTAL LAWN ARE 926100 SQ. FT OR 86068 SQ. MTR.



FIG 13 PICTURES OF RESIDENTIAL and HOSTEL AREA PARKS

Table-13 Area under Parks & Lawns: PUBLIC PARKS

S. No	Location	Area Covered (Sq. Feet)	Out Come
1.	Near Health Centre	48' x 174' = 8352	Lawns are being used by the Residents and students of Institute. The lawn area is being maintained regularly by deploying outsourced workers.
2.	Lawn near CBI Bank	192' x 144' = 27648	
3.	Lawn near Restaurant	215' x 592' = 127280	
4.	Community Centre	220' x 322' = 70840	
5.	Lawn OHT-1	350' x 210' = 73500	
6.	Nursery	380' c 150' = 57000	
		146' x 36' = 5256	
		170' x 140' = 23800	



FIG 14 PICTURES OF PUBLIC AREA PARKS

TOTAL LAWN AREA 393676 SQ. FT OR 36586 SQ. MTR.

10. WATER CONSERVATION

- The Institute is having rainwater harvesting arrangement in various building such as Director Residence, Guest House, Transit Accommodation, Student activity Centre, Swimming Pool, Administrative block and Auditorium etc. along with open field provisions. There is also provision for canal water irrigation through water courses, which irrigates the lawns, fields and trees.
- The treated wastewater is also being recycled through 400meter long Non pressure water line for watering SLIET Campus locations. There are two big water bodies one near the sewerage plant and one near nursery which is supporting the wildlife in the campus including fish, migratory birds, other birds. The various species of migratory birds are found near the water bodies all around the year. An open oxidation plant for the treatment of the wastewater and the use of wastewater for irrigation of forest area of the Institute has been build and working since the inception of the SLIET.



**FIG 15 A PICTURES OF RAIN WATER HARVESTING
RAIN WATER HARVESTING PITS. = 13 NOS.**

OUTCOME: Irrigation through use of water other than ground water, water conservation and maintenance of Natural habitats including flora and fauna

CANAL WATER

	Water Course No.01	5330 (R. Ft.)
	Water Course No.02	3570 (R. Ft.)
	Water Course No.03	1000 (R. Ft.)
	Total Length	9990 R ft. Or 3017 Rmt.



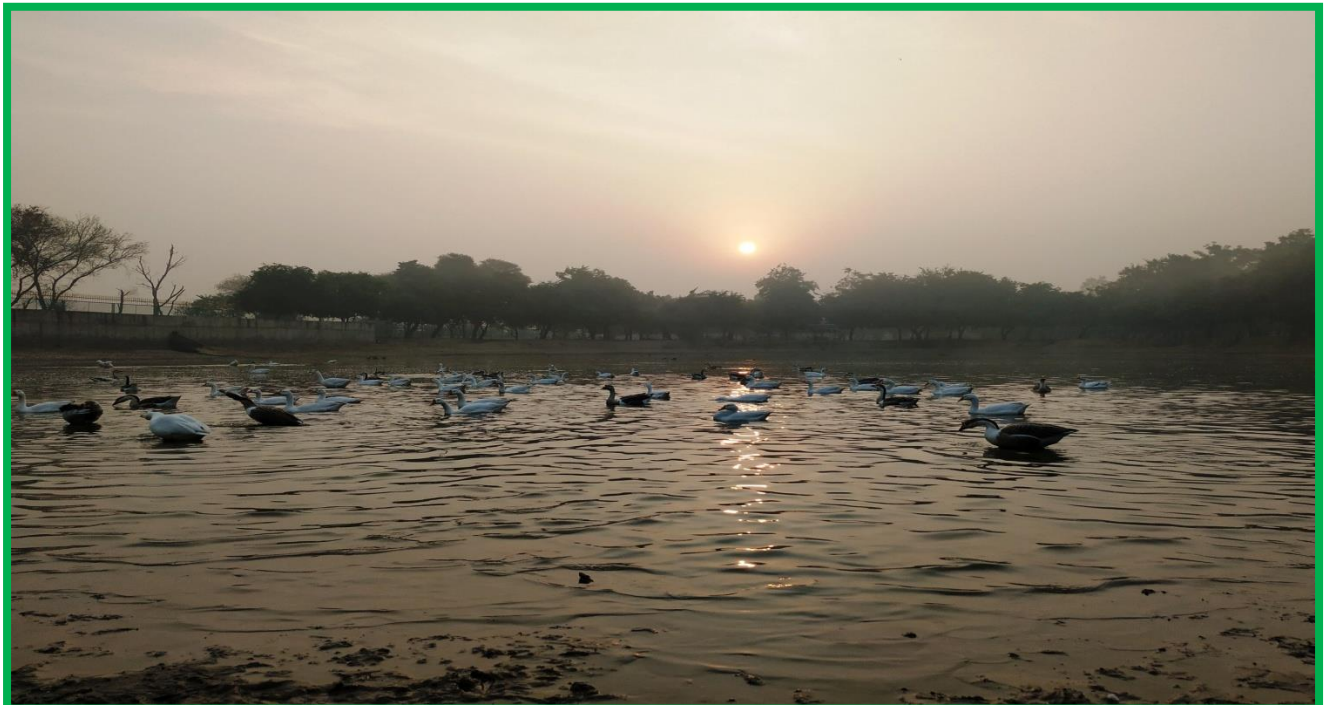
FIG 15 B PICTURES OF CANAL WATER

11. FAUNAL DIVERSITY IN SLIET CAMPUS:

SLIET is located in Longowal District of Punjab. Longowal is an industrial city known for hosiery, cycles and sewing machines. It has got extreme climates. The highest temperature is recorded 47 C just prior to the onset of monsoon (around May- early June). Summer rain is normal, and is principally caused from late July to August by the moisture-laden South-West Monsoon, on striking the Himalayan foothills of the north. The climatic condition of the Longowal district as a whole and SLIET in particular is very suitable for a wide variety of flora and fauna to support its rich biodiversity. The faunal Diversity of SLIET campus has been studied and documented as below:

Table-14: Common and Scientific names of birds and animals of Campus

S. No	Common Name	Scientific Name
1.	Common Myna	Acridotheres Tristis
2.	Bank Myna	Acridotheres Ginginianus
3.	House Sparrow	Passer Domesticus
4.	House Crow	Corvus Splendens
5.	Cuckoo	Cuculidae
6.	Snake	NajaNaja
7.	Yellow Wasp	Ropalidia Marginata
8.	Butter Fly	Danaus Genutia
9.	Common Woodshrike	Tephrodornis Pondicerianus
10.	Pied Myna	Gracupica Contra
11.	Red-Vented Bulbul	Pycnonotus Cafer
12.	Skylark	Aluda Gulgula
13.	Garden Tiger Moth	Arctia Caja
14.	Little Owl	Athene Brama
15.	Oleander Moth	Syntomeida Epilais
16.	Slender Skimmer	Orthetrum Sabina



(LAKE - DUCKS)

FIG 16 COURTESY: PHOTOGRAPHY CLUB, SLIET



(LAKE - DUCKS)

FIG 16 COURTESY: PHOTOGRAPHY CLUB, SLIET



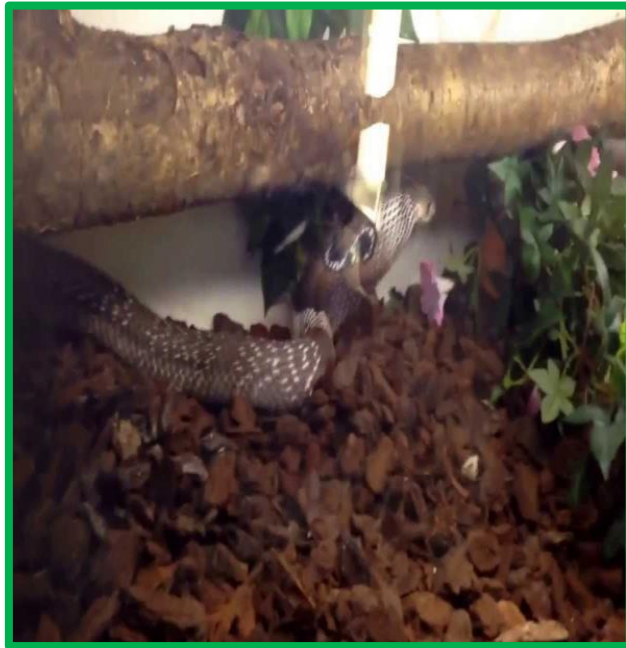
COMMON MYNA (ACRIDOTHERES TRISTIS) HOUSE SPARROW (PASSER DOMESTICUS)
COURTESY: PHOTOGRAPHY CLUB, SLIET



HOUSE CROW (CORVUS SPLENDENS)

CUCKOO (CUCULIDAE)

FIG 17 COURTESY: PHOTOGRAPHY CLUB, SLIET



SNAKE



YELLOW WASP (ROPALIDIAMARGINATA)

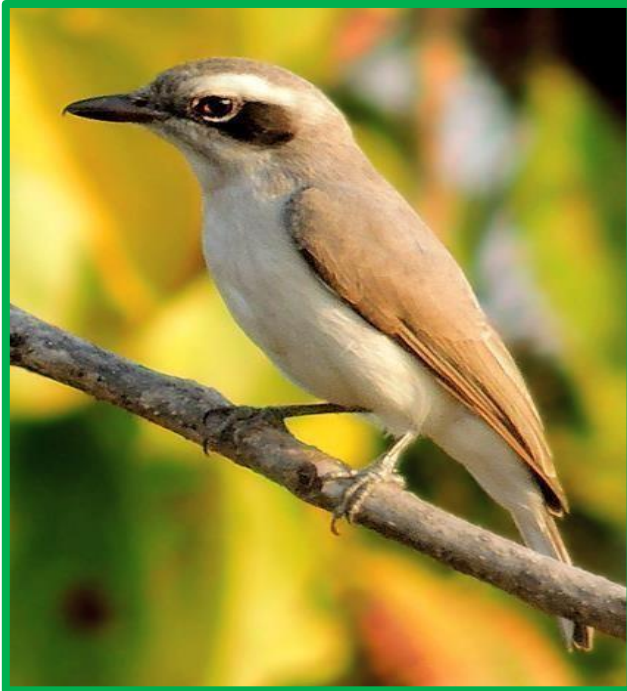


BUTTER FLY (DANAUS GENUTIA)



BETLE INSECT

FIG 17 COURTESY: PHOTOGRAPHY CLUB, SLIET



COMMONWOODSHRIKE



PIED MYNA (GRACUPICACONTRA)



RED-VENTED BULBUL (PYCNONOTUSCAFER)



SKYLARK (ALUDAGULGULA)

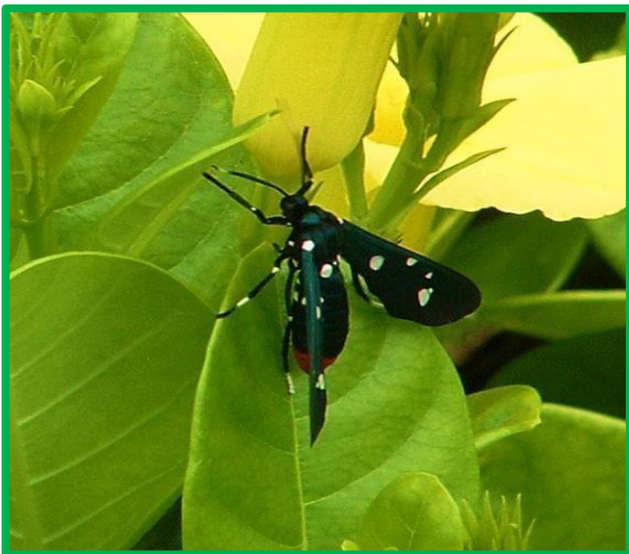
FIG 17 COURTESY: PHOTOGRAPHY CLUB, SLIET



GARDEN TIGER MOTH (ARCTIACAJA)



LITTLE OWL (ATHENE BRAMA)



OLEANDER MOTH (SYNTOMEIDA EPILAIS)



SLENDER SKIMMER (ORTHETRUM SABINA)

COURTESY: PHOTOGRAPHY CLUB, SLIET

FIG. 17 BIRDS, INSECTS, OTHER CREATURES AND ANIMALS OF CAMPUS

12. WEATHER DATA OF LONGOWAL AND SLIET

Station: Longowal (INDIA (STATIONS NORTH OF LATITUDE 20~N))

Location: 30°21'67" N AND 75°68'33" E in Longowal, the climate is warm and temperate. The summers are much hotter and the winters are colder in Longowal. The highest temperature in Longowal is 47.8 °C in June & July. The driest month is generally April and May. The greatest amount of precipitation occurs in July, August and September. The lowest temperatures in the year occur in December and January, when it is around 6-7 °C.

Table-15: WEATHER DATA MONTH WISE Longowal (Source: Google)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Record high °C	29.0	33.3	41.1	46.1	48.3	47.9	47.8	44.4	41.7	40.0	35.8	29.4
(°F)	(84.2)	(91.9)	(106.0)	(115.0)	(118.9)	(118.2)	(118.0)	(111.9)	(107.1)	(104.0)	(96.4)	(84.9)
Average high	18.9	21.0	26.0	34.6	38.8	39.6	34.9	32.9	33.4	32.0	26.4	20.7
°C (°F)	(66.0)	(69.8)	(78.8)	(94.3)	(101.8)	(103.3)	(94.8)	(91.2)	(92.1)	(89.6)	(79.5)	(69.3)
Daily mean	12.8	14.8	19.4	26.7	31.1	33.0	30.5	28.8	28.5	24.9	19.0	14.1
°C (°F)	(55.0)	(58.6)	(66.9)	(80.1)	(88.0)	(91.4)	(86.9)	(83.8)	(83.3)	(76.8)	(66.2)	(57.4)
Average low	6.7	8.5	12.8	18.8	23.3	26.2	26.1	24.8	23.4	17.7	11.6	7.4
°C (°F)	(44.1)	(47.3)	(55.0)	(65.8)	(73.9)	(79.2)	(79.0)	(76.6)	(74.1)	(63.9)	(52.9)	(45.3)
Record low	-2.2	-1.1	1.4	7.1	11.7	18.0	17.4	18.0	15.2	9.4	0.3	-1.1
°C (°F)	(28.0)	(30.0)	(34.5)	(44.8)	(53.1)	(64.4)	(63.3)	(64.4)	(59.4)	(48.9)	(32.5)	(30.0)
Average precipitation mm	21	39	31	20	20	60	229	189	85	5	13	21
(inch)	(0.8)	(1.5)	(1.2)	(0.8)	(0.8)	(2.4)	(9.0)	(7.4)	(3.3)	(0.2)	(0.5)	(0.8)
Average precipitation days (≥ 1.0 mm)	2.8	3.6	4.5	1.9	2.3	4.7	11.6	9.6	4.5	0.5	1.4	2.1

However a lot of irrigation and environmental changes have made the land viable for wheat cultivation. The climatic conditions bear a strong resemblance with the other cities in the northern part of India. The summers are usually very hot and the winters are very cold. The summers are prevalent during the months of April to September with June, July, August being the hottest months. The winter is prevalent from the month of November till February. There is onset of Monsoon in the month of July to September.

13. AIR QUALITY IN LONGOWAL AND SLIET:

An Air Quality Index (AQI) is used by the government agencies to communicate to the public how polluted the air currently is. Public health risks increases as the AQI rises. The ambient air quality data for Longowal and SLIET for the last one year shows that there are very less polluted particles in ambient air; AQI for SO₂ & NO_X parameters are within the range of Indian living standards, there are a number of factors responsible for this cleanliness, calmness and serenity in this area. Firstly, population which is most responsible for all the problems and hurdles in smooth living is lowest here of all the districts of Punjab. Secondly, in the institute more than 70,000 trees have been planted as compared to other cities. Furthermore, no air polluting industry is established near here. Therefore, the ambient air quality of Longowal Area falls in between moderate to rich quality state. The Punjab Pollution Control Board is pondering over the various possibilities to reduce the air pollution for the improvement of ambient air quality with respect to AQI is concerned. There are six AQI categories namely, Good, Satisfactorily, Moderately Polluted, Poor, Very poor and Severe. Good (0-50), Satisfactorily (51-100), Moderately polluted (101-200), Poor (201-300), Very Poor (301-400) & Severe (401-500)

13.1 AIR QUALITY DETERMINATION

Table-16: Satisfactory Air quality index (OVERALL=58) in Longowal, Punjab India on dated 25th September 2021:

Parameter	Result (Range)
NO ₂	25.4 µg/m ³ , AQI 26 Very Good
NO	10.09 µg/m ³ , AQI 10 Good
O ₃	31.49 µg/m ³ , AQI 31 Good
PM _{2.5}	28.13 µg/m ³ , AQI 28 Good
PM ₁₀	77.2 µg/m ³ , AQI 79 Satisfactory
CO	35.0 µg/m ³ , AQI 18
Humidity	56.0 %
Barometric Pressure	1013 millibar or hPa
Wind Speed	10-15 m/s
Wind Direction	28.0013 degrees
Sun Rise	06:28 AM
Sun Set	05:56 PM
Moonrise	07:05 PM
Moonset	07:31 AM

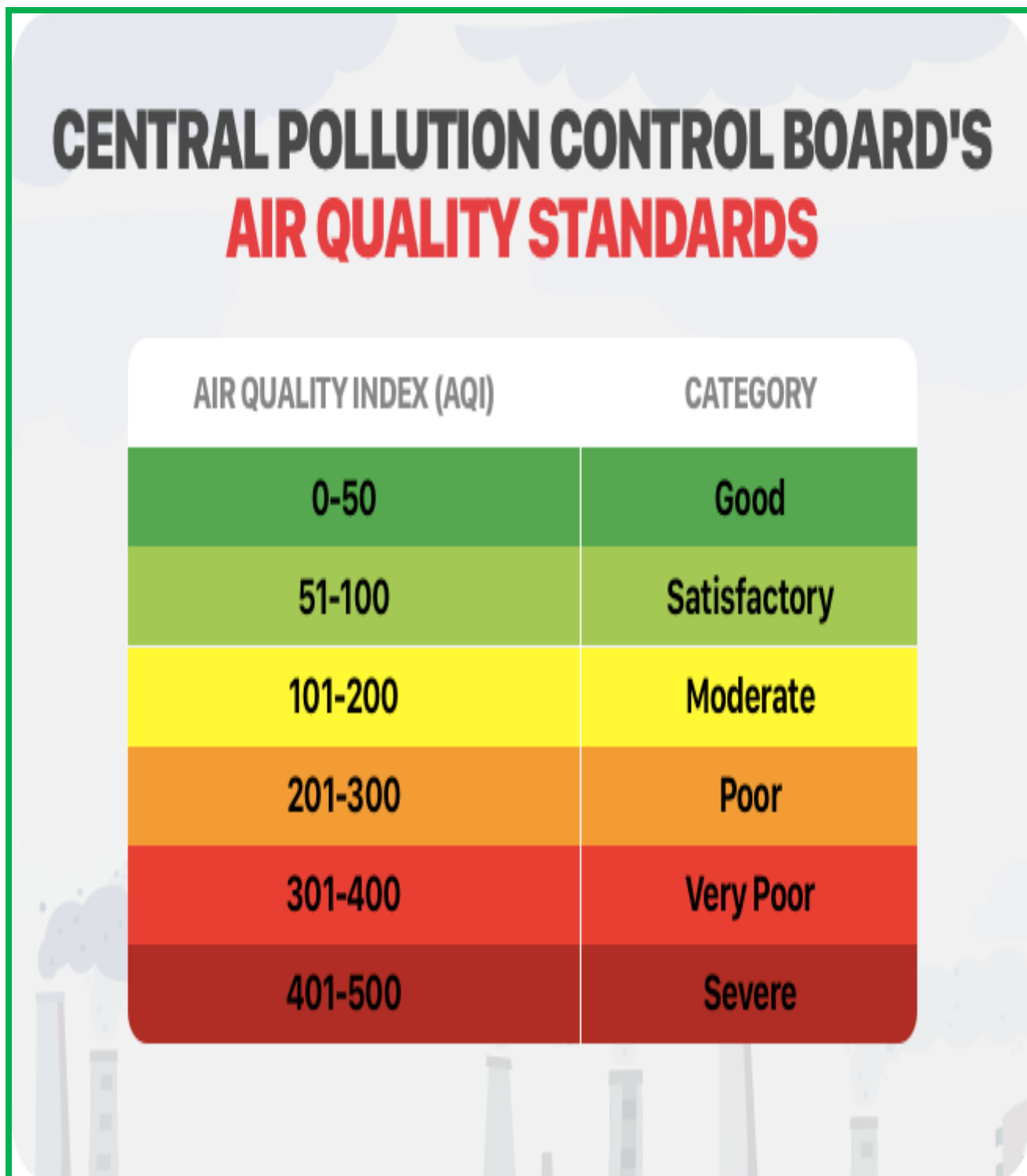


FIG.18 CPCB AIR QUALITY STANDARDS

14. WATER AUDIT & ANALYSIS

- Water is an important natural resource and is available naturally depending on the climate and topographic features. All organisms are dependent on water for their living. Although water is available in nature, portable water is not available freely for human consumption. There have been many practices to conserve water so that it can be readily available for human use. It has been noticed that due to unsustainable use of water resources there is contamination and depletion of the ground water and also water which is available in various reservoirs like lakes, ponds, streams etc which is becoming more alarming. Therefore it becomes increasingly important to conserve protect and manage the water resources availability and usage so that it is sustainably used within the university campus. Water auditing is conducted to evaluate the quality, availability and usage of water; the facilities available and methods adopted to revitalize and use it so that the resources are intact without leading to deterioration.
- The university is presently dependent on borewell for feeding the Over Head Tank to supply the drinking water to the campus. There are 2 Nos. of OHT provided in the campus. Water audits provide decision making tools to utility managers and operators. i.e., knowing where water is being used in your system. Water audits allows how to efficiently reduce water losses in the system. It creates awareness among water users i.e., customers can see and understand that the utility is taking proactive steps to manage wasted water and save for the future.

Drinking water indicators. The following is a list of indicators often measured:

- Alkalinity
- Color of water
- pHvalue
- Taste and odor (geosmin, 2-Methylisoborneol (MIB),etc.)
- Dissolved metals and salts (sodium, chloride, potassium, calcium, manganese, magnesium)
- Microorganisms such as fecal coliform bacteria (*Escherichia coli*), *Cryptosporidium*, and *Giardia lamblia*; see Bacteriological wateranalysis
- Dissolved metals and metalloids (lead, mercury, arsenic,etc.)
- Dissolved organics: colored dissolved organic matter (CDOM), dissolved organic carbon(DOC)
- Heavymetal



(OVERHEAD TANK-1)



(OVERHEAD TANK-2)

Fig.19 SLIET OVER HEAD WATER TANKS FOR DOMESTIC SUPPLY

14.1 WATER QUALITY ASSESSMENT

- Water quality testing is important because it identifies contaminants and prevents water-borne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment.
- Water samples (01 & 02) from two different locations were collected and analyzed for its quality parameters. The samples collected are the main water source of the campus. The samples were collected, preserved and transported to chemical engineering department and analyzed for various physio-chemical parameters. The major parameters analyzed include dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, conductivity, total dissolved solids and salinity. The results are presented in the Table 1. The results are comparable with the values of drinking water standards prescribed by different agencies.

TABLE-17 Water Quality Assessment Report of SLIET

PARAMETERS	SAMPLE -1	SAMPLE -2	STANDARD VALUE (BIS)
Dissolved Oxygen (mg/l)	7.3	7.6	6-8
Acidity (mg/l)	22	10	200
Alkalinity (mg/l)	22	35	200
Chloride (mg/l)	36.72	27.78	250
Hardness (Total)	57	70	200
Conductivity (µs)	99	95	
pH	6.7	6.9	6.5-8.5
Total Dissolved Solids (ppm)	127	99	500
Salinity (ppt)	0.118	0.067	
Total coli form	0	0	0
Fecal coli form	0	0	0
Taste/Odour	Ok	Ok	Ok

15. NOISE LEVEL IN THE SURROUNDING OF SLIET:

- The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound:
- Loudness and
- Frequency.
- Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 140 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz.
- Frequency is defined as the number of vibration per second. It is denoted as Hertz (Hz).

TABLE-18 NOISE Quality Assessment Report of SLIET

Area	Noise Limit, Leq, dB(A)	
	Day Time	Night Time
Silence zone	50	45
Residential area	55	45
Commercial area	65	55
Industrial area	75	65

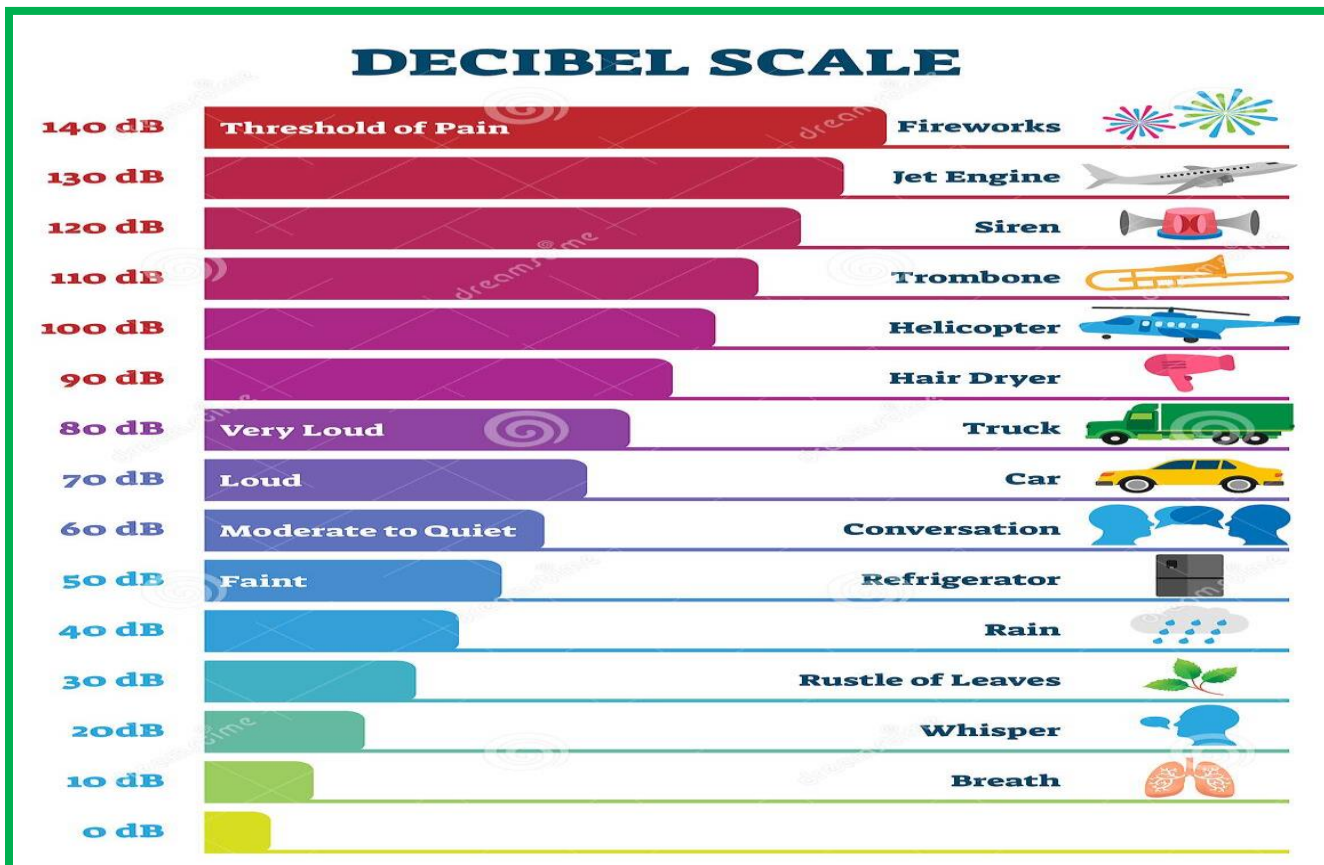
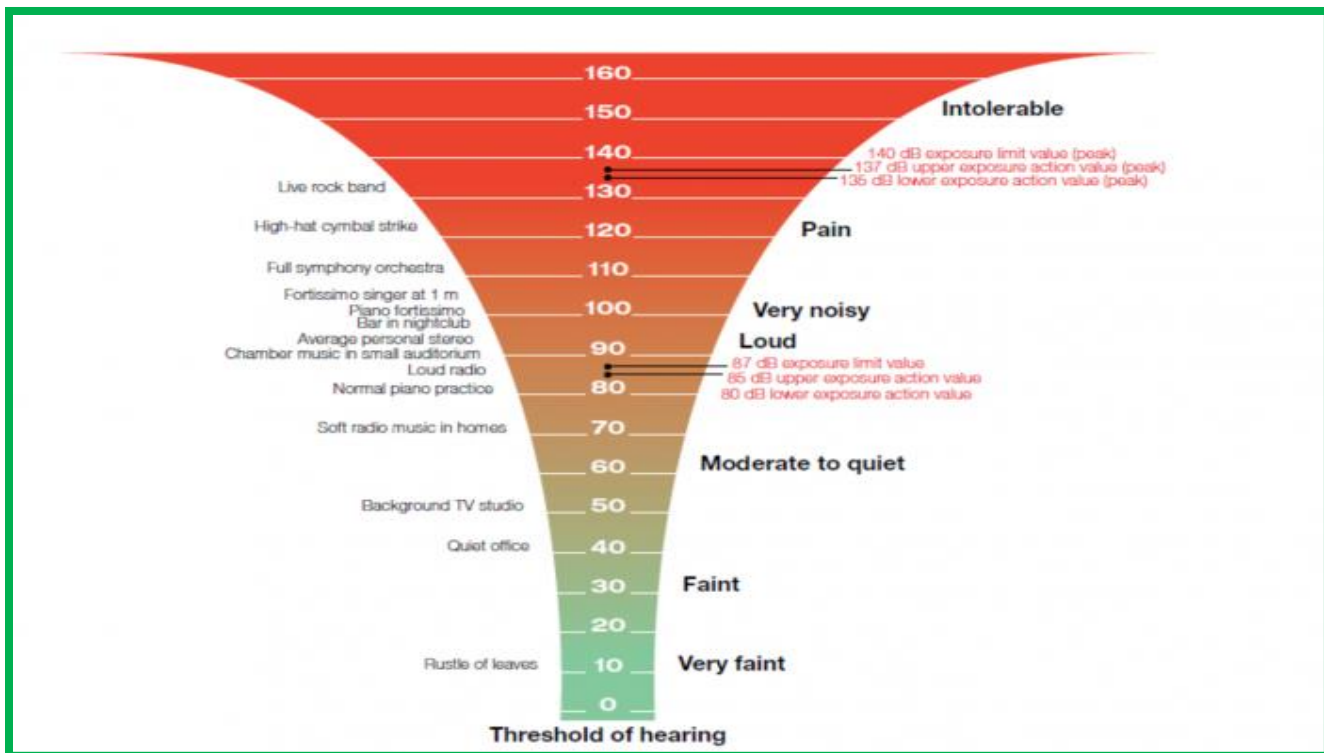


FIG 20 INDIAN STANDARDS FOR NOISE LEVELS

15.1 MATERIALS, STUDY AREA & METHODS

Noise level meter or noise measuring app, Apple watch noise meter App was used to measure the noise level. It detect any noise, music or sound in your surroundings. It will tell you maximum, minimum and average decibels.

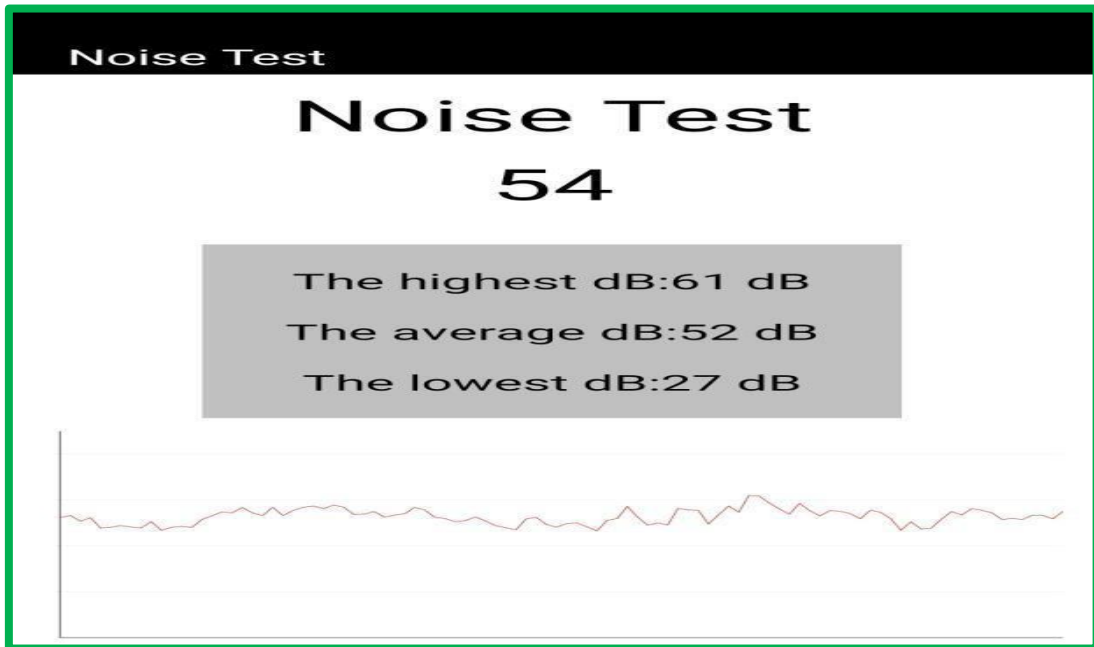


FIG. 21: NOISE MEASUREMENT BY APPLE WATCH

15.2 DESCRIPTION OF THE INSTITUTE SITE

The site of the SLIET is bounded to the North/East by Kunara Village, Open Irrigation Fields & Duggan Village and to the South/West by Longowal Village, waste open Canal Channel and Tehsil Office.

15.3 MEASUREMENT PROCEDURE

The noise level was recorded at the different Important Locations of SLIET, LONGOWAL. At each spot, the measurements were taken for 60 seconds during day time (6 AM- 6 PM) and noted down the measurements. Screen shots of the measurements of noise were taken immediately on the app at the time of 60th second of each measurement.

15.4. RESULTS

The results of the experiments at different places have been tabulated in the following table:

Table 19: Measurements of Noise in and around SLIET:

PLACE	MEASUREMENT (Duration in Sec.)	MINIMUM (dBA)	Maximum (dBA)	AVERAGE (dBA)
Canteen	60	74	90	85
Library	60	51	85	65
Mechanical Dept Area	60	27	54	48
Mechanical Lab	60	45	89	72
CSE Dept Area	60	50	81	73
CSE Lab	60	66	85	76
EE Dept Area	60	66	87	76
EE Lab	60	40	87	68
ECE Dept. Area	60	63	82	76
ECE Lab	60	65	85	78
Auditorium	60	27	61	44
Workshop	60	66	90	78
Faculty Flats	60	35	80	69
Staff Flats	60	49	71	65
Guest House	60	50	77	67
Boys Hostel	60	54	68	62
Girls Hostel	60	52	90	68

16. WASTE MANAGEMENT OF SLIET:

Waste disposal are the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process.

The waste from all around the college is separated daily as wet and dry waste in different bags which are disposed separately. Dry waste includes paper, cardboard, glass tin cans etc. on the other hand; wet waste refers to organic waste such as vegetable peds, left-over food etc. Separation of waste is essential as the amount of waste being generated today causes immense problem. The material was composted and evaluated as a fertilizing material. Disposal of these waste results in the production of good quality organic manure that can be used as soil amendments and source of plant nutrients.

With smart initiatives like “Think Green Campus Model”, waste management is helping colleges and universities to achieve a higher level of environmental performance. By reusing or recycling we are contributing to the conservation of natural resources, saving energy, helping to protect the environment, reducing landfill. We will also reduce our impact on the environment by minimizing the carbon emissions associated with both disposing of old products and obtaining new ones. SLIET adopts environment friendly practices and takes necessary actions such as – energy conservation, waste recycling, carbon neutral etc. The biological reusable waste are processed as organic manure for the plants available in the campus and the other solid waste generated in the university campus is taken for recycling and disposal as manure and vermicompost.

16.1 WASTE DISPOSAL AUDIT

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and public health.

Solid waste can be categorized into three types: biodegradable, non-biodegradable and hazardous waste.

- Bio-degradable wastes include food wastes, canteen waste, trees leaves, decomposed plants.
- Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc.
- Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

Unscientific management of these wastes such as dumping in pits or burning them may cause the harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the campus. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable University. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

16.2 STATUS OF SOLID WASTE GENERATION IN THE CAMPUS

Each and every department, hostel, residential complex, shopping complex of SLIET as well as administrative offices collect the waste and dumped in small waste bin located in the department.

Each building several dust bins are placed from where housekeeping staffs take the wastes. From the small bin wastes are dumped in big bin/dipsoal brickwork structures by the housekeeping staffs regularly. From the big waste structure the solid waste are transferred through the Institute tractor and Sanitation Workers to the Isolated area in the campus .

Further, the tree leaves, plants, grass and other green waste is transported through Institute tractor by the Horticulture workers to the Isolated area in the campus . The solid waste is than used for the manure and vermicompost production by the horticulture wing.



FIG 22 SOLID WASTE GENERATION IN THE CAMPUS

The organic wastes filled in the pits are subjected to composting which forms a best practice in the campus. In addition to the organic waste generated from different units, large sources of organic wastes other than kitchen wastes (University canteen, house hold) like leave litter, terrestrial weeds etc that are generated from maintain and cleaning the campus are collected during different periods of the year. These organic wastes are used for the manure and vermicompost production by the horticulture wing.

16.3 VERMICOMPOSTE

Vermicomposting is the technology where with the use of locally available appropriate species of composting earthworms (*Perionyx excavatus*), huge amount of plant biomass produced in the University campus is reduced into available plant nutrient rich organic manure within a short time span. The organic wastes to be processed by earthworms are chemically analysed to know their nutrient values. All the different types of wastes are mixed thoroughly and precomposted for 2-3 weeks. After precomposting precomposted substrates are loaded in the cemented vermicomposting tanks. Locally available earthworms, *Perionyx excavatus* are then introduced in the composting tanks. Following inoculation, the earthworms (*Perionyx excavatus*) through their feeding, burrowing and casting activities convert the organic wastes into manure called vermicompost within 45 days.



FIG 23 VERMI COMPOSITE GENERATION IN THE CAMPUS

16.4 LIQUID WASTE MANAGEMENT:

Liquid waste is generated from departments, laboratories, Hostels, Residential quarters and canteen etc. Liquid wastes generated by the university is of detailed below:

Sewage waste including toilet, washrrom, kitchen, canteen , residential complex etc.

The liquid wastes are mainly drained to improve the ground level of water.

- The collection chamber to collect raw sewage has been provided for collection of dirt, solid waste and screening of waste etc.
- An open oxidation pond has been provided for the treatment of waste water. Oxidation ponds, also called lagoons or stabilization ponds, are large, shallow ponds designed to treat wastewater through the interaction of sunlight, bacteria, and algae. During the process of photosynthesis, the algae releases the oxygen needed by aerobic bacteria. Algae helps the bacteria break down the sewage and effluent. The wind helps with the evaporation of the water and serves to get oxygen into the water. This helps in water getting cleaned.
- The waste water is used for irrigation of forest area of Institute and the informal garden in the campus near BH-08. Oxidation pond of the campus has is handling 5,00,000 litres/day.

16.5 RECYCLING OF WASTE WATER:

The waste water of the university campus is used for watering of forest area of Institute and the informal garden in the campus near BH-08.



OXIDATION POND



OXIDATION POND



FIG 24 RECYCLING OF WATER IN THE SLIET

16.6 BIOMEDICAL WASTE MANAGEMENT:

In SLIET, the bio medical waste is produced through Health Center. Though the amount of waste is very negligible. The waste is handed over to Longowal Municipal Council for Biomedical waste management

16.7 E-WASTE MANAGEMENT:

SLIET has very efficient mechanism to dispose E wastes generated from various sources. E-wastes are generated from computer laboratories, electronic labs, Physics Labs, Chemistry Lab, Biotech Labs, Academic and Administrative Offices.

The e-waste includes out of order equipments or obsolete items like lab instruments, circuits, desktops, laptops and accessories, printer, charging and network cables, Wi-fi devices, cartridges, sound systems, display units, UPS, Biometric Machine, scientific instruments etc. All these wastes are put to optimal use.

All such equipment's which cannot be reused or recycled is being disposed off through Notice Inviting Quotation or E-tender by the Store & Purchase department. Also, in view of new procurement policy, Buy-Back option is preferred for technology upgradation.

16.8 HAZARDOUS WASTE

In India, the Ministry of Environment, Forest and Climate Change, Government of India; is the agency to promulgate the Hazardous Waste (Management and Handling) Rules, 1989, under the provision of the Environment Protection Act, 1986. These rules were amended and new rules entitled "**Hazardous waste (Management, Handling, and Trans-boundary Movement) Rules, 2008**" were promulgated, which was further amended in the years 2009 & 2010 for proper management and handling of hazardous waste in the country (CPCB, 2010-2011). These regulations sometimes require detailed knowledge of the constituents and properties of waste streams so they can be managed properly.

SLIET, do not generate hazardous waste and can be classified as conditionally exempt small quantity generators

- Most departments do not generate large quantities

17. VEHICULAR MOVEMENTS

- Transportation is the fastest growing major contributor to global climate change, accounting for 23% of energy-related carbon dioxide (CO₂) emissions. Many experts foresee a three- to five-fold increase in CO₂ emissions from transportation in Asian countries by 2030. This is driven by the anticipated six- to eight-fold increase in the number of light-duty vehicles and a large increase in the number of trucks, which could overwhelm even the most optimistic forecasts of improvements in vehicle fuel efficiency. It was estimated that on an average around 500 nos. of two wheelers and 300 nos of four- wheeled vehicles (including vehicles coming to Bank & Post Office) visited SLIET Campus in general days per month during 2019-20 excluding the vehicles of campus dwellers. The University has designated parking places at several locations. The Institute is located in between village Longowal, Kunran and Duggan. Therefore, to reduce the vehicle movement in the campus, the bye pass road has been constructed to restrict the movement of vehicles visiting the campus.
- Hence, there has been reduction in carbon emissions due to construction of bye pass road connecting Kunran village to Duggan village in the year 2017-2018 due to reduction of vehicle movement in the campus.



FIG 25 VEHICULAR MOVEMENTS IN THE SLIET

One day (Friday) is observed as vehicle free day i.e. “ No Motor Vehicle Day” in the Academic Area of the Institute. This has resulted in reduction in carbon emissions due to restrict in movement of vehicles in the campus. The students are encouraged to use cycles, two wheelers rather than four wheelers which leads to fuel saving and also the contribution of pollutants to atmosphere is less.



Host.
SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL – 148 106, DISTT. SANGRUR (PUNJAB)
(DEEMED TO BE UNIVERSITY)
OFFICE OF THE DIRECTOR

Ref. No. SLIET/DIR/ 889

Dated: 19-08-2020

CIRCULAR

NO MOTOR VEHICLE DAY

With reference to earlier circular no. SLIET/Dean(SFW)/884 dated 23.11.2017, SLIET/DIR/2725 dated 25.02.2018, SLIET/DIR/2528 dated 29.01.2019, SLIET/DIR/20 dated 03.04.2018, SLIET/DIR/1182-84 dated 29.07.2019, SLIET/DIR/1473-75 dated 28.08.2019; the institute is observing “**No Motor Vehicle Day**” on every Friday.

The cooperation extended by you all in this regard is highly appreciated.

The Academic Area will remain “**Vehicle Free Zone**” on “**EVERY FRIDAY**” by putting barricades near Central Library, Mechanical Block, Hostel No. 9 and 10 side entry points, w.e.f. 28th August 2020.

All the SLIETians are requested to park their vehicles as per designated parking for the purpose.

Cooperation from all is highly solicited.

Copy to:

1. All Deans
2. Registrar
3. All HODs/ Section Incharges – for circulation
4. EO/ FI (Security)- for necessary arrangements.

Pls circulate to all

Bel

24/08/2020

Sh. Mandeep Singh - For necessary arrangements

19/08/2020
Director

561
21/8/2020

“Proud To Be Part of Team SLIET”

18. ENERGY AUDIT REPORT

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18.1 ENERGY AUDIT

18.1.1 INTRODUCTION

An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In the Institute, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints. An energy audit in general includes identification and evaluation of the of the energy systems for their improvements in term of their energy efficiency through energy conservation measures. A detailed analysis of the various activities is as listed below.

Energy audit is an effective tool in defining and pursuing comprehensive energy management programmes. It has positive approach aiming at continuous improvement in energy utilization in contrast to financial audit which stresses to maintain regularity. Energy audit provides answer to the question what to do, where to start, at what cost and for what benefits?

Energy audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating and maintenance practices of the system. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply, decision on appropriate energy mix, decision on using improved energy conservation equipment, instrumentations and technology.

It has been established that energy saving of the order of 15 to 30% is possible by optimizing use of energy by better housekeeping, low cost retrofitting measures and use of energy efficient equipment at the time of replacements. Indian industry consumes more energy as compared to its counter parts in the developed countries.

18.1.2 METHODOLOGY

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programme.

As per the Energy Conservation Act, 2001, Energy Audit is defined as “the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption”.

18.1.3 NEED FOR ENERGY AUDIT

In any industry, the three top operating expenses are often found to be energy (both electrical and thermal), labour and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about the ways energy and fuel are used in any industry and help in identifying the areas where waste can occur and where scope for improvement exists.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc.

In an institute, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a “benchmark” (Reference point) for managing energy in the organization and provides the basis for planning a more effective use of energy throughout the organization.

18.1.4 TYPE OF ENERGY AUDIT

The type of Energy Audit to be performed depends on:

- Function and type of industry / institute
- Depth to which final audit is needed, and
- Potential and magnitude of cost reduction desired

Thus, Energy Audit can be classified into the following two types.

- Preliminary Audit
- Detailed Audit

18.1.4.1 PRELIMINARY ENERGY AUDIT METHODOLOGY

Preliminary energy audit is a relatively quick exercise to:

- Establish energy consumption in the organization.
- Estimate the scope for saving.
- Identify the most likely (and the easiest areas for attention).
- Identify immediate (especially no-/low-cost) improvements/ savings.
- Set a 'reference point'.
- Identify areas for more detailed study/measurement.
- Preliminary energy audit uses existing, or easily obtained data

18.1.4.2 DETAILED ENERGY AUDIT METHODOLOGY

A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems. This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges. Detailed energy auditing is carried out in three phases: Phase I, II and III.

- Phase I - Pre-Audit Phase.
- Phase II - Audit Phase.
- Phase III – Post Audit Phase

18.1.5 OBJECTIVES OF ENERGY AUDIT

The energy audit provides the vital information base for overall energy conservation programme covering essentially energy utilization analysis and evaluation of energy conservation measures.

- Assessing present pattern of energy consumption in different cost centres of operations
- Relating energy inputs and production output
- Identifying potential areas of thermal and electrical energy economy.
- Highlighting wastage in major areas
- Fixing of energy saving potential targets for individual cost centres
- Implementation of measures of energy conservation and realization of savings.

18.2 ELECTRICAL POWER CONSUMPTION IN SLIET

18.2.1 POWER CONSUMPTION

At present, a single bulk supply electricity connection is provided by PSPCL (Punjab State Power Corporation Ltd.) through 11 KV independent feeder for the institute. There are 4 x 500 KVA + 3 x 250KVA distribution transformer installed at various locations in the Institute for all Academic, Administration and Hostel buildings. The electricity connection details are as follows.

- Connected load: 2127 KW
- Sanctioned load contract demand: 2364 KVA

In case of power failure from PSPCL, 2 x 500 KVA diesel generator set are available to meet out emergency power needs. Further, the residential area is directly fed by PSPCL through their own distribution system.

Bill analysis for consumer SLIET, Longowal vide account number 3007509804 is presented in Table 2.1 for the year 2020-21.

Table-20 Electric Power Consumption in FY 2020-21

Period	kWh Unit	Max Demand (KVA)	Energy Charges (Rs.)	Fixed Charges (Rs.)	Power Factor	Bill Amount (Rs.)	Unit/Rate (Rs.)
18.03.2020-16.04.2020	108420	265.2	764014	143916	0.97	781890	7.2
16.04.2020-15.05.2020	107280	282.6	736434	143916	0.97	883250	8.2
15.05.2020-18.06.2020	162180	516.6	1103492	202227	0.96	1321490	8.1
18.06.2020-15.07.2020	148500	561.6	1007318	184238	0.96	1206000	8.1
15.07.2020-17.08.2020	178830	586.2	1174029	225179	0.99	1415940	7.9
17.08.2020-16.09.2020	153180	528	1006534	204708	0.99	1225670	8.0
16.09.2020-14.10.2020	158520	586.2	1091946	191061	0.95	1298610	8.2
14.10.2020-16.11.2020	142710	282	955796	225179	0.97	1194700	8.4

16.11.2020-16.12.2020	150120	388.2	1016916	204708	0.96	1236190	8.2
16.12.2020-16.01.2021	209010	490.8	1427327	211532	0.96	1626370	7.8
16.01.2021-15.02.2021	200790	450	1361700	205269	0.96	1525820	7.6
15.02.2021-15.03.2021	151110	358.8	1042384	191585	0.95	1202600	8.0
Average	155888	441	1057324	194460	0.97	1243211	8.0

18.2.2 ELECTRICITY BILL

The average electricity bill for the year 2020-21 is Rs.1243211/-. The graphs of the kWh, power factor, bill amount and maximum demand for the year 2020-21 are presented below.

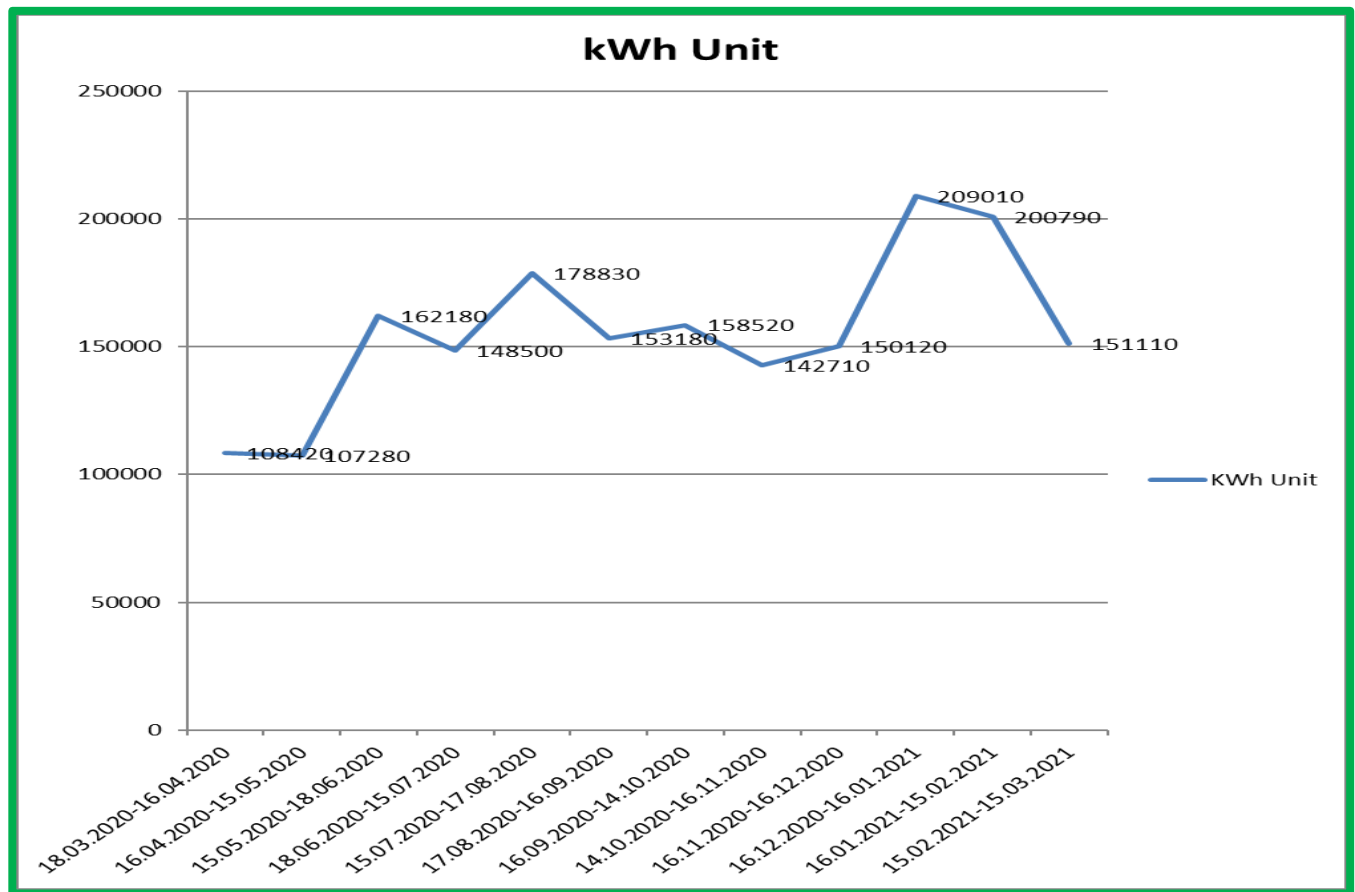


FIG. 26 ELECTRIC POWER CONSUMPTION IN FY 2020

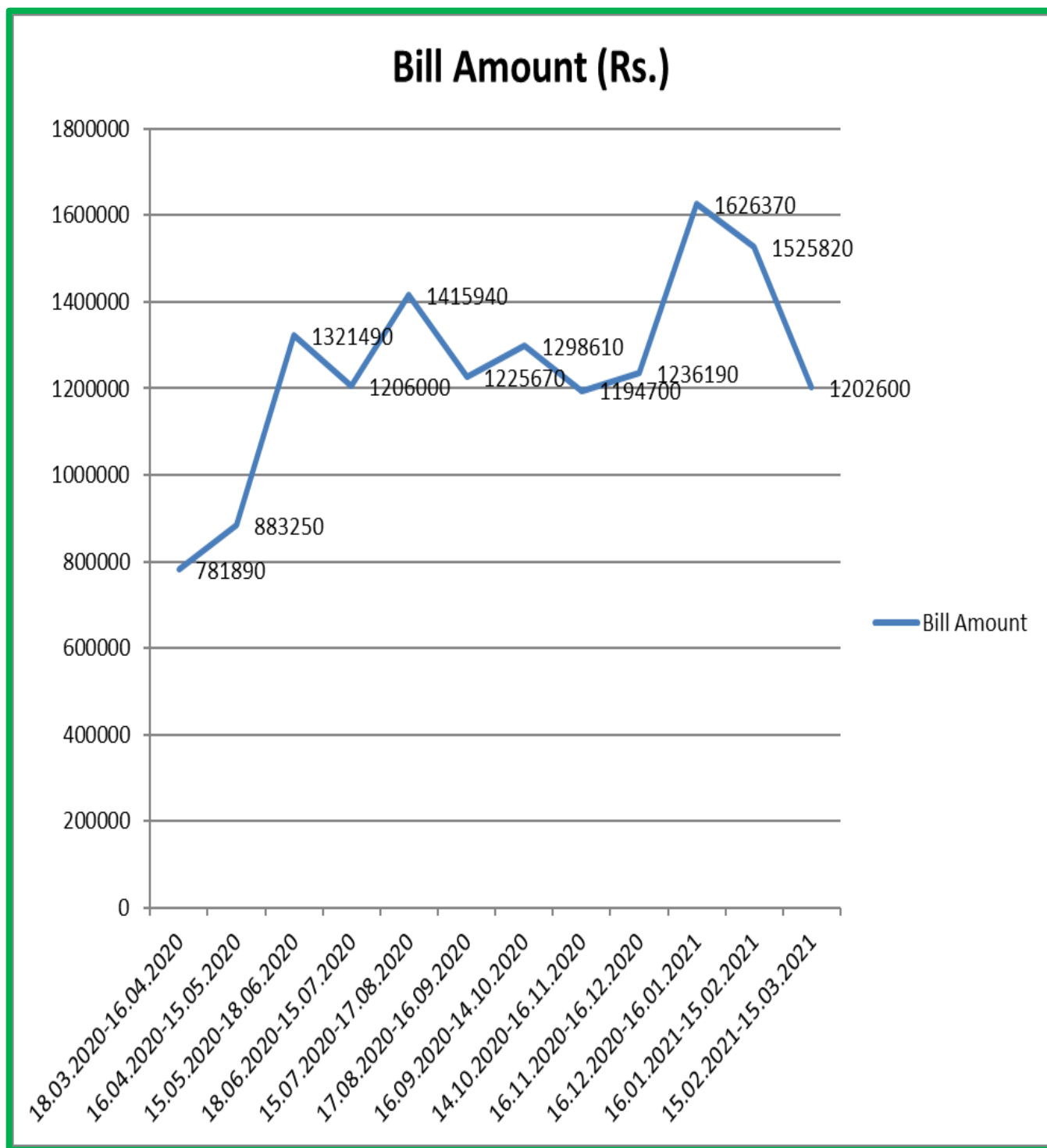


FIG. 27 MONTHLY BILLED AMOUNT IN FY 2020-21

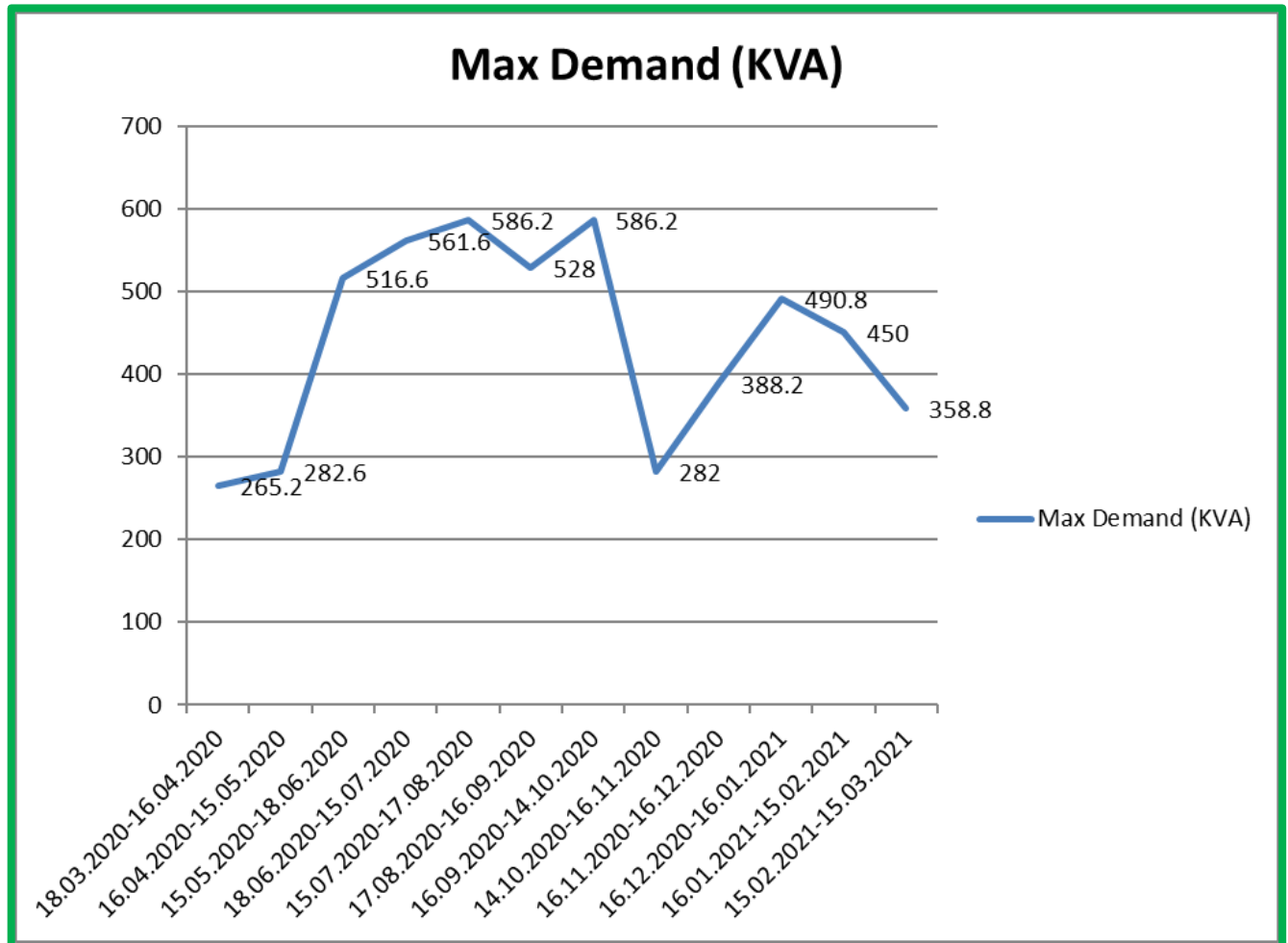


FIG.28 MAXIMUM DEMAND TREND IN FY 2020-21

From the above analysis, following are the observations.

- Monthly average energy consumption is 155888 kWh
- Monthly average power factor is 0.97
- Monthly average maximum demand is 441.35 kVA
- Monthly average electricity bill is Rs.1243211/-
- Avg. unit rate cost to SLIET is 8.00Rs./kWh

18.3 METHODS APPLIED FOR ELECTRICAL POWER CONSERVATION

18.3.1 REACTIVE POWER MANAGEMENT

The objective of reactive power management is improvement of power factor, or “Power Factor Correction”. The principle of “Power Factor Correction” (or “Reactive power compensation”) is to generate the reactive power close to the load, so that the supply source could be relieved, when connected with the loads. Capacitors banks are most used in electrical network to supply reactive power.

There are 4 automatic power factor correction controller relay (APFCR) panels installed in indoor 11 kV sub-station at Electrical Sub-station I and II. Out of four two are of capacity 2 x 160 kVAR installed in the year of 2009-10 at ESS-I and ESS-II and 2 x 200 kVAR APFCR panels installed in the year of 2014-15 and 2020-21 respectively. Apart from this, individual and dedicated capacitor bank has been installed on the submersible pump set, non-clog pump set and street light feeder panels. Hence, all these installations have improved the power factor of the Institute. Due to improvement in power factor, following are the major benefits:

- i. Reduced kVA (Maximum demand) charges in utility bill. Utility power bills are typically reduced by 5 % to 10 %
- ii. Reduced distribution losses within the system network.
- iii. Better voltage is available at distribution network. Hence there is improved performance of the motors and other electrical gadgets.
- iv. A high power factor eliminates excess demand charges imposed when operating with low power factor.
- v. Investment on system facilities such as transformers, cables, switchgears etc. for delivering load is reduced.
- vi. Due to improved power factor, the life of all the electrical gadgets enhanced.
- vii. Availability of more energy at utilities ensures in the reduction of total CO₂ emissions for a sustainable future.



FIG. 29: APFCR PANEL AT ESS-I AND ESS-II

Automatic Power Factor Correction Relay (APFCR) is installed at various locations which resulted to maintain power factor of the Institute. The power factor is always more than 0.95 as shown in Fig. 18.3.1.2

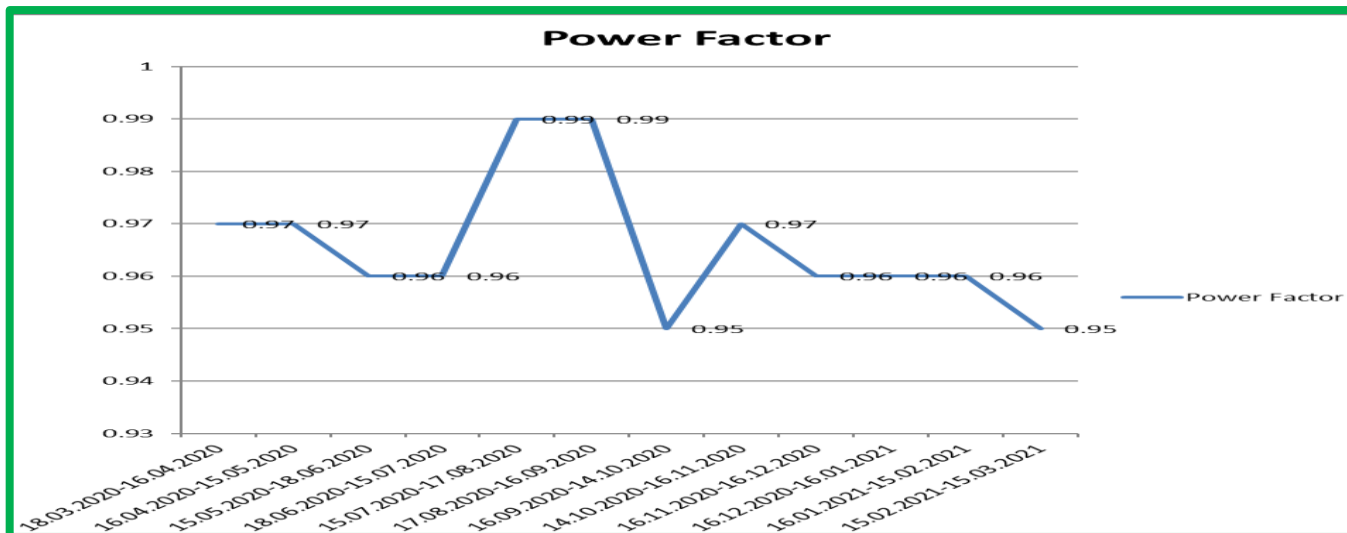


FIG. 30 POWER FACTOR TREND IN FY 2020-21

18.3.2 REPLACEMENT OF CONVENTIONAL LIGHTING SYSTEM WITH LEDS

As per policy adopted in the Institute 2017 vide circular no. F.No. 25(24)/E. Coord/2017 dated 04.08.2017 and F.No.917/05/LED/HRD-ID/2017 dated 03.11.2017 of Ministry of Finance (**Please refer Annexure A and B**) to replace the conventional lighting system by LED lighting, a large no. of conventional lighting has been replaced into LED in academic/residential area and the rest are in progress.

A. STREET LIGHTS

There are 451 street light pole having HPSV/MH Luminaries having 200/150 watt. Out of this 20% luminaries have been replaced with LED like on the road A (Longowal to Duggan gate thoroughfare), road C (from bus stand to BH-2). The same work of replacement on road B (from Longowal gate – BH 3,4-Swimming pool, BH 5,6, BH 9,10, lake - Duggan gate round about) is in process.

B. TUBELIGHTS

Apart from this, there are 6719 nos. fluorescent single and twin lights installed in the various academic and hostel buildings of the Institute. Out of this, 1997 nos. have been replaced with LED luminaries i.e. 30%. Further, there is planning to convert the entire remaining lights fixture into LED up-to 2023 to save the power. A detailed analysis of the SLIET is presented below:

Table 21 Replacement of Conventional Lighting System with LED Up to FY 2020-21

Area	Type	ReplacedQty.	On Qty.	Wattage	Daily OpHr	Load (KW)	MthlyKWh	Replacementnt with	ReplacedQty	New Load(KW)	Mthly Kwh	SavingKWh	Unit Rate(Rs.)	Saving inRs. per month	Saving inRs. per Annum	Investmentin Rs.	Paybackperiod in years	Remarks
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Street Light	HPSV Light 200 W	90	90	200	10	18	5400	Led fixture of 45 Watt	90	4	1215		8	33480	401760	220500	0.55	T o t a l q t y 4 5 1
Hostel System (BH 1,2,5,6 and9)	Fluore scent Light	468	468	55	8	26	6178	Led fixture of 18 Watt	468	8	2022	4156	8	33247	398961	95940	0.24	
Hostel System (BH 3,4,7a and8)		310	310	55	8	17	4092	Led fixture of 18 Watt	310	6	1339	2753	8	22022	264269	63550	0.24	
Acade mic Deptt.		541	541	55	8	30	7141	Led fixture of 18 Watt	541	10	2337	4804	8	38433	461192	110905	0.24	
Hostel System (GH)		260	260	55	8	14	3432	Led fixture of 12 Watt	260	3	749	2683	8	21466	257587	270920	1.05	

Table 22 Replacement of conventional lighting system with LED

Area	Type	Replaced	On Qty.	Wattage	Daily Op Hr	Load (KW)	Mthly KWh	Replacem	Replaced	New	Mthly Kwh	Saving KWh	Unit Rate	Saving in Rs.per	Saving in Rs.per Annum	Investment inRs.	Payback period in	Remarks		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S		
						Dx	Gx Fx3			I x	K x F x	H - L		M x N	O x 12 mont	J x rate of	Q / P			
Smart Class	Fluorescent Light	177	177	110	8	19	4673	Recess mounted grid ceiling led light 2'	177	7	1614	3059	8	24468	293622	556842	1.90			
Room s Hall 4,6,8																				
Sciences Block,																				
M 310 ME, E 329																				
EIE, LS 5 CSE, LC 3 FT/Chem, Digital																				
Classroom ECE Phase - I																				
LCF 4		164	164	110	8	18	4330			164	6	1496	2834	8	22671	272056	442800	1.63		
Chem,																				
LCF																				
land5/																				
FT, HS 1,5,3 Science, LC 6 CSE, E 333 ECE, LM 06 ME Phase - II																				
Admn. Department, RAC Lab, Welding, Metallurgy lab, Direct o office, committee room, computational lab of EIE, TEQIP Lab, land2, HS-2 CSE Library and various labs		77	77	55	8	4	1016		77	3	702	314	8	2513.3	30159	207900	6.89			
														Total	2379606	1969357				

It is seen from the above table that there is approximately **Rs. 23,79,606/-** saving by the replacement conventional light fixture into LED fixture in a year.

Table 23 Replacement of Conventional Lighting System With LED (22.06.2020-13.08.2021)																		
Area	Type	Replaced Qty.	On Qty.	Wattage	Daily OpHr	Load (KW)	MthlyKWh	Replacement with	Replaced Qty	New Load(KW)	Mthly Kwh	SavingKWh	Unit Rate(Rs.)	Saving inRs. per month	Saving inRs. per Annum	Investment in Rs.	Payback period in	Remarks
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
						Dx E / 1000	GxFx30 days			I x J / 1000	K x F x 30 days	H - L		M x N	O x 12 months	J x rate of item	Q / P	
All academic and Hostel system	Fluorescent Light	280	280	55	8	15	3696	Led fixture of 18 Watt	280	5	1210	2486	8	19891.2	238694	57400	0.24	
														Total	238694	57400		



FIG 31 LED FIXTURE (STREET LIGHT, ROAD-A NEAR H POLE)/ LED FIXTURE IN GIRLS HOSTELNO.1, FF (CORRIDOR) NEAR ROOM NO. 231



FIG- 32 LED FIXTURE IN ME ENTRANCE AND CENTRAL LIBRARY, FF (READING HALL)



FIG 33 LED FIXTURES IN SMART CLASSROOMS (CSE, SOFTWARE ENGINEERING AND PROGRAMMING LAB, FF) / SMART CLASSROOMS (SCIENCE HALL 4, FF)



FIG 34 LED FIXTURES IN SMART CLASSROOMS (SCIENCE HALL 4, TF)

ANNEXURE-A



Government of India
 Ministry of Finance, Department of Revenue
 Directorate General of Human Resources Development
 Customs & Central Excise
 IRCON Building, West Wing,
 Ground Floor, Plot No. C-4,
 District Centre, Saket,
 New Delhi-110017

F.No. 917/05/LED/HRD-ID/2017

Date: 3 November, 2017

To

All Principal Chief Commissioners/ Chief Commissioners of Customs

All Principal Chief Commissioners/ Chief Commissioners
 of CGST & Central Excise

All Principal Director Generals / Director Generals under
 Central Board of Excise & Customs

Sir/Madam

Sub: Mandatory installation of LED based lights in Government Buildings and Energy Efficient Equipments (Fans and Air Conditioners).

Please find enclosed copies of (i) OM F. No. O-21011/08/2017-Coord dated 28.09.2017 (with enclosures) received from the Under Secretary (Coord), and (ii) letter F. no. 296/233/2017-CX-9 dated 20.10.2017 along with copy of OM No. 13020/3/2017-GAR dated 17.10.2017 on the above subject.

2. It has been intimated that Hon'ble Prime Minister had launched the National LED programme on 5th January 2015, to facilitate rapid adoption of LED based home and street lighting across the country.

3. The programme components Unnat Jyoti by Affordable LEDs for All (UJALA) and Street Lighting National Programme (SLNP) are under implementation in 34 States and UTs. This programme along with Building Energy Efficiency Programme (BEEP) is being implemented by Energy Efficiency Services Limited (EESL), a joint venture company of four power sector Central PSUs. EESL works on Energy Services Company (ESCO) model wherein upfront investment is done by EESL and the investment is recouped on annuity basis with performance based guaranteed energy saving during the project period.

4. Pursuant to the above the Central Government has taken a decision for mandatory installation of LED based lighting and energy efficient equipments (Fans & ACs) in all Government buildings.

ANNEXURE-B

F.No. 25(24)/E.Coord/2017
Ministry of Finance
Department of Expenditure
(E.Coord)

North Block, New Delhi
Dated: 4th August, 2017

OFFICE MEMORANDUM

Subject: Economy Measures - Mandatory installation of LED based lighting in all Government buildings - regarding

The Hon'ble Prime Minister on 5th January 2015 launched the National LED programme to facilitate rapid adoption of LED based home and street lighting across the country. The programme components, Unnat Jyoti by Affordable LEDs for All (UJALA) and Street Lighting National Programme (SNLP) are under implementation in 34 States and UTs. This programme along with Building Energy Efficiency Programme (BEEP) is being implemented by Energy Efficiency Services Limited (EESL), a joint venture company of four power sector Central PSUs. EESL works on Energy Services Company (ESCO) model wherein upfront investment is done by EESL and the investment is recouped on annuity basis with performance based guaranteed energy saving during the project period.

2. Pursuant to the above the Central Government has taken a decision for mandatory installation of LED based lighting and energy efficient equipments (Fans & ACs) in all Government buildings.
3. Government buildings is a major source of energy consumption. Usage of LED based lightings and energy efficient equipments in Government buildings will lead to economy in expenditure and savings in the long run through reduction in energy consumed.
4. Keeping in view the economy in expenditure and savings that will entail, all Ministries/Departments are requested to convert the existing lightings/equipments into LED based lightings and energy efficient equipments on priority utilizing the services of CPWD/EESL.

- 1 -



ANNEXURE-B

5. The model Agreement/Contract to be entered in to between the Client Ministry/Department and EESL is enclosed for reference. The Client Ministry/Department and EESL on mutual agreement can modify/amend the provisions of the model Agreement/Contract to suit their specific requirements.

6. In respect of those Government buildings maintained by CPWD but where the electricity bill is borne/paid by the respective Ministries/Departments, CPWD (as third party) will countersign the agreement to provide comfort to the Ministry/Department as well as extending help for implementing the contract.

7. Action taken in this regard be reported to Ministry of Power and Department of Expenditure by 15.08.2017 for monitoring purposes.


4/8/17
(H. Atheli)
Director

To

All Secretaries of Ministries/Departments

Copy to

1. Cabinet Secretary, Government of India
2. Prime Ministers' Office, South Block

18.3.3 ENERGY CONSERVATION BY OCCUPANCY SENSORS

In the newly constructed building of EDP, the provision of 14 nos. occupancy sensors (motion sensor-based lightening) has been made in the washrooms. These sensors which are normally in open mode and circuit of lights is not in operational mode. However, when there is human movement or motion the circuit gets closed and lights glow. Now, as and when no human movement/motion is there again lights goes off automatically due to occupancy sensor. In this way, electrical energy is saved.



FIG 35 OCCUPANCY SENSOR INSTALLED IN THE WASHROOMS OF NEWLY CONSTRUCTED EDP BLOCK

18.3.4 REPLACEMENT OF OLD / NON STAR RATED CEILING FANS WITH ENERGY EFFICIENT 5 STAR RATED CEILING FANS

A policy has been adopted in 2012 i.e. to replace the non-efficient / star rated electrical gadgets into energy efficient / star rated electrical gadgets. At present there are 4315 ceiling fans installed in the various Academic/Hostel buildings of the Institute. As per policy of 2012, 1240 non-star rated ceiling fans have been replaced with energy efficient ceiling fans in Academic and hostel area. Further, there is emphasis to replace the old/non-working, non-star rated ceiling fans with energy efficient fans.



FIG 36 ENERGY EFFICIENT 5 STAR RATED CEILING FAN

Table 24: Replacement of Old/Non Star Rated Ceiling Fans with Energy Efficient 5 Star Rated Ceiling Fans

Area	Type	Total Qty.	On Qty.	Wattage	Daily Op Hr	Load (KW)	Mthly KWh	Replacementt with	ReplacedQty	New Load(KW)	Mthly Kwh	SavingKWh	Unit Rate(Rs.)	Saving in Rs. Permonth	Saving inRs. Per Annum	Investmentin Rs.	Paybackperiod in
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
All academic and Hostel system	Non energy efficient ceiling fan	1240	1240	80	8	99.2	23808	Energy efficient 5 Star rated Fans 40 Watt	1240	49.6	11904	11904	8	95232	1142784	1798000	1.57
													Total	1142784	1798000		

It is seen from the above table that there is **Rs. 11,42,784/-** saving in energy consumption cost in a year with the replacement of Old/non star rated ceiling fans into Energy efficient 5 Star rated ceiling Fans.

18.3.5 REPLACEMENT OF AIR CONDITIONING SYSTEM WITH STAR RATED ACS

A decision has been taken in the 11th BWC held on dated 30.08.2019 vide item no. 11.12 (A) regarding replacement of Electromechanical type (after effective life span), non star rated AC's installed on the various locations in the Institute in a phased manner with energy efficient star rated AC. Presently, there are 467 AC's installed in the Institute of various types like Window, High wall and Tower AC. The capacity of these AC's varies from 1 TON to 3.5 TON. Apart from this, there is two central AC plant available in CSE and Main Auditorium of the Institute of capacity 121 Ton and 140Ton (156 HP) respectively installed in the year of 2011 and 2016. Out of 467 AC's, 337 AC's are energy efficient, star rated and having eco-friendly refrigerant.



FIG .37 STAR RATED AIR CONDITIONING IN SMART CLASSROOMS (ME, M-117, GF)/ SMARTCLASSROOMS (HALL NO. 3, TF)

Table-25 Replacement of Air conditioning system with Star rated Air Conditioning as per BEE norms																	
Area	Type	Total Qty	On Qty	Wattage	Daily Op Hr	Load (KW)	Mthly KWh	Replacement t with	Replaced Qty	New Load (KW)	Mthly Kwh	Saving Kwh	Unit Rate (Rs.)	Saving in Rs. per month	Saving in Rs. per Annum	Investment (Rs.)	Payback period in
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
						DxE / 1000	GxFx30 days			I x J / 1000	K x F x 30 days	H - L		M x N	O x 12 months	J x rate of item	Q / P
Guest House	W/High wall AC non energy efficient 1.5 T	10	0	1900	3	19	1710	Star rated AC 1300 Watt	10	13.0	1170	540	8	4320.00	51840.00	325000	6.27
CAD CAM Lab	W AC non energy efficient 1.5 T	6	6	1900	6	11.4	2052	Star rated AC 1300 Watt	6	7.80	1404	648	8	5184.00	62208.00	195000	3.13
HOD CSE	W AC non energy efficient 1.5 T	1	1	1900	6	1.9	342	Star rated AC 1300 Watt	1	1.30	234	108	8	864.00	10368.00	32500	3.13
Numerical Lab	W AC non energy efficient 1.5 T	4	4	1900	6	7.6	1368	Star rated AC 1300 Watt	4	5.20	936	432	8	3456.00	41472.00	130000	3.13
														Total	165888.00	682500	

It is seen from the above table that there is approximately **Rs. 1,65,888/-** saving in energy consume cost in a year with the Replacement of Air conditioning system to Star rated Air Conditioning as per BEE norms. Since 2012, a policy decision has been taken to procure new AC's/other Electrical Gadgets like water heaters, ceiling fans etc. having star rating (energy efficient) as per BEE norms. Further, the AC's are being procured having eco-friendly refrigerant since 2012.

Table-26 List of Star Rated Conditioning System as per BEE Norms

Area	Type	Tonnage Capacity	Total Qty.	Wattage	DailyOp Hr Avg	Load (KW)	Mthly KWh	Remarks
ECE/EIE Block	WindowAC	1.5	24	1500	4	36	4320	
	Split AC	1.5	10	1500	4	15	1800	
CSE Block	WindowAC	1.5	8	1500	4	12	1440	
	Split AC	1.5	20	1500	4	30	3600	
Science Block	WindowAC	1.5	36	1500	4	54	6480	
	Split AC	1.5	9	1500	4	13.5	1620	
Food Block	WindowAC	1.5	21	1500	4	31.5	3780	
	Split AC	1.5	4	1500	4	6	720	
ME Block	WindowAC	1.5	42	1500	4	63	7560	
	Split AC	1.5	17	1500	4	25.5	3060	
Kendriya Vidyalaya	WindowAC	1.5	3	1500	4	4.5	540	
	Split AC	1.5	2	1500	4	3	360	
SET office	WindowAC	1	9	1000	4	9	1080	
Admn Block	WindowAC	1.5	40	1500	4	60	7200	
	Split AC	1.5	2	1500	4	3	360	
Guest House	WindowAC	1.5	14	1500	3	21	1890	
	Split AC	1.5	12	1500	3	18	1620	
Library GF	WindowAC	1.5	1	1500	4	1.5	180	
	Split AC	1.5	8	1500	4	12	1440	
EDP FF (Library)	WindowAC	1.5	5	1500	4	7.5	900	
	Split AC	1.5	15	1500	4	22.5	2700	
Estate Office	WindowAC	1.5	3	1500	4	4.5	540	
Transit Accommodation	Window AC	1.5	7	1500	3	10.5	945	
Workshop	Window AC	1.5	1	1500	4	1.5	180	
	Split AC	1.5	2	1500	4	3	360	
Faculty Club	Window AC	1.5	2	1500	1	3	90	
Hostel System	Window AC	1.5	9	1500	4	13.5	1620	
JC Bose Hall	Split AC	1.5	10	1500	1	15	450	
Main Auditorium	HVAC System	156	1	116376	1	116.376	3491.28	
Total (Rs.)			337					

18.3.6 INSTALLATION OF 1 MW ROOF TOP SOLAR POWER PLANT

Solar energy is produced by the sun's light - photovoltaic energy offers many benefits that make it one of the most promising energy.

- Renewable,
- Inexhaustible,
- Non- polluting,
- Avoids global warming,
- Reduces use of fossil fuels,
- Reduces energy imports, v
- Contributes to sustainable development.

The Ministry of New and Renewable Energy (MNRE), Govt. of India has been promoting the aim to develop and deploy New and Renewable energy for supplementing the energy requirement of the country.

The Institute signed power purchase agreement (PPA) on 21.08.2020 with M/s Sukhbir Agro Energy Limited, New Delhi (Solar Energy Corporation of India Empanelled bidder for Punjab state under Zone-3) for the installation of 1 MW Rooftop solar power project on RESCO model. The work of installation initiated in the month of December 2020 and completed in the March 2021. The term of project is 25 years and after that period the ownership of this plant will be of Institute as per Agreement. All the installation and repair/maintenance cost are on the part of SAEL as per PPA. Institute is bound to pay Rs.3.33 per KWH to SAEL which is fixed for 25 years. The Solar power plant is made operational w.e.f. 03.05.2021 i.e. 1st joint meter reading taken by Institute and M/s SAEL is locked for billing purposes. There is around Rs. 6 Lacs saving in monthly Electricity bill as per today applicability of tariff of PSPCL.

Table-27 Installed Capacity of Solar System (Building Wise)

PROJECTS	BUILDING NAME	CAPACITY
Sant Longowal Institute of Engineering and Technology (SLIET-01)	Mechanical Block	340 KW
	Workshop 2	
Sant Longowal Institute of Engineering and Technology (SLIET-02)	Science Block	340 KW
	Chemical Block	
	Workshop 1	
Sant Longowal Institute of Engineering and Technology (SLIET-03)	Boys Hostel 2	320 KW
	Boys Hostel 4	
	Electronic Block	
Total Capacity		1000 KW

The details of solar power plant energy generated and saving of last three months is as under:

TABLE-28 Energy Generated by Solar Power Plant and Saving of Last Three Months

Sr. No.	Month	Production of Solar Energy in kwh	Rate (Rs.)/Unit	Amount paid to SAEL (Rs.)	Avg. unit rate of PSPCL (Rs.)	Cost of Energy if purchase from PSPCL (Rs.)	Saving (Rs.)
A	B	C	D	E	F	G	H
						C x F	G-E
1.	May-21	127725.5	3.33	425326	8	1021804	596478
2.	Jun-21	132631.5	3.33	441663		1061052	619389
3.	Jul-21	126777	3.33	422167		1014216	592049
Average		129045		429719			602639

Further, this solar power plant abated 1450 Ton CO₂ / annum. This plant is equivalent to planting of 23809 trees (Annexure A6).

The detail of Energy consumptions after the installation of Solar Power Plant.

TABLE-29 Energy Consumption after the Installation of Solar Power Plant

Period	kvahUnit	Energy Charges (Rs.)	Fixed Charges (Rs.)	Power Factor	Bill Amount (Rs.)	Unit/Rate (Rs.)
18.05.2021-31.05.2021	16980	110879	88923	0.90	235930	7.35
31.05.2021-16.06.2021	17100	113373	124368	0.90	281480	9.17
16.06.2021-19.07.2021	80580	534444	256509	0.90	930354	8.4
19.07.2021-17.08.2021	76770	508786	225417	0.90	863180	8.30
Average	47858	316871	173804	0.90	577736	8.29

Note: It can be seen that after installation of PV solar power plant of capacity 1 MW, the average bill has been reduced by 53% i.e. from Rs. 12,43,211/- to Rs. 5,77,736/-.



FIG. 38 INSTALLED SOLAR PANEL ON THE ROOF TOP OF BUILDINGS (SCIENCE AND MECHANICALBLOCK)



FIG 39 SOLAR PANEL INSTALLED ON THE ROOF TOP OF BUILDINGS

SLIET LOGO

Solar power Plant installed and commissioned by Sukhbir Agro Energy Limited at Sant Longowal institute of engineering and Technology, Longowal-Punjab

SAEL LOGO

Project details

- Project size- 1000kWp
- Project Mode: RESCO (under SECI subsidy scheme)
- Project Tenure: 25 years
- Project Tariff Unit: Rs. 3.33/kWh
- Existing PSPCL Tariff: Rs. 6.5
- Tariff Difference: Rs. 3.17/kWh
- Total Annual Generation: 3400000 kWh
- Total Annual Saving: Rs.44.38 Lakhs
- CO2 Abated Annual: 1450 ton
- Equivalent to Planting trees: 23809

SUMMARY		
Sl.No	DESCRIPTION	QTY
1	PCS MODULE	3000
2	INVERTER (100 KW)	5
3	INVERTER (60 KW)	2
4	INVERTER (40 KW)	2
5	INVERTER (20 KW)	1
6	TRANSFORMER (100 KVA)	2
7	TRANSFORMER (20 KVA)	2

LEGEND	
DESCRIPTION	SYMBOL
WIRE	(Symbol)
CONCRETE FOUNDATION (100 KW)	(Symbol)
CONCRETE FOUNDATION (60 KW)	(Symbol)
CONCRETE FOUNDATION (40 KW)	(Symbol)
CONCRETE FOUNDATION (20 KW)	(Symbol)
CONCRETE FOUNDATION (10 KW)	(Symbol)
CONCRETE FOUNDATION (5 KW)	(Symbol)
CONCRETE FOUNDATION (2.5 KW)	(Symbol)
CONCRETE FOUNDATION (1.25 KW)	(Symbol)
CONCRETE FOUNDATION (0.625 KW)	(Symbol)
CONCRETE FOUNDATION (0.3125 KW)	(Symbol)
CONCRETE FOUNDATION (0.15625 KW)	(Symbol)
CONCRETE FOUNDATION (0.078125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0390625 KW)	(Symbol)
CONCRETE FOUNDATION (0.01953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.009765625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0048828125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00244140625 KW)	(Symbol)
CONCRETE FOUNDATION (0.001220703125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0006103515625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00030517578125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000152587890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000762939453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00003814697265625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000019073486328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000095367431640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000476837158203125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000002384185791015625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000011920928955078125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000059604644775390625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000298023223876953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000001490116119384765625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000007450580596923828125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000037252902984619140625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000186264514923095703125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000931322574615478515625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000004656612873077392578125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000023283064365386962890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000116415321826934814453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000582076609134674072265625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000002910383045673370361328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000014551915228366851806640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000727595761418342590328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000003637978807091712951640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000181898940354585647578125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000909494701772928237890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000004547473508864614189453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000022737367544323070947265625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000113686837721615354736328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000568434188608076773681640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000028421709430403838684203125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000142108547152019193421015625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000071054273576009596710578125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000355271367880047983552890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000001776356839400239917764453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000008881784197001199588822265625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000044408920985005997944111328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000222044604925029989720556640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000001110223024625149948602783203125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000555111512312574974301391640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000002775557561562874871506958203125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000013877787807814374357534791015625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000006938893903907187178767395578125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000003469446951953593589383697890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000017347234759767967946918489453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000867361737988398397345922447890625 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000004336808689941991986726122239453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000021684043449709959933630611119453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000010842021724854979966815305559453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000054210108624274899834076527797265625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000002710505431213744946703776389865625 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000013552527155618724733518881949328125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000067762635778093623667594409746640625 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000338813178890468118337972048733203125 KW)	(Symbol)
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CONCRETE FOUNDATION (0.0000000000000000000042351647361351014792224506091640625 KW)	(Symbol)
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CONCRETE FOUNDATION (0.00000000000000000000000000100974195865018764433403439014973953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000005048709793250938221672017014973953125 KW)	(Symbol)
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CONCRETE FOUNDATION (0.000000000000000000000000000000246519032873609468749996093854973953125 KW)	(Symbol)
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CONCRETE FOUNDATION (0.0000000000000000000000000000000616297582184023671874999903463673953125 KW)	(Symbol)
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CONCRETE FOUNDATION (0.0000000000000000000000000000000000601853107601585617100636716322791666673953125 KW)	(Symbol)
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CONCRETE FOUNDATION (0.0000000000000000000000000000000000150463276900396404275159178305819791666673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000007523163845019820213757958915290989453125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000003761581922509910106878979457549473953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000001880790961254955053439489972877473953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000000000000009403954806274775267197449864388673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000047019774031373876335987248321943673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000000000000002350988701568693816799362416097183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000000000000001175494350784346908399681205048683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000005877471753921734541998406025243683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000002938735876960867270999203012618183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000001469367938480433635499601506309093673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000000000000000073468396924021681774980075315454683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000000367341984620108408874989003767273673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00000000000000000000000000000000000000183670992310054204437494450188363673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000000000918354961550271022187472225094183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000000000459177480775135511093736112547183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0000000000000000000000000000000000000002295887403875677555468680562709093673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000000000000000000000000000000000000000114794370193783877773434028135454683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.00573971850968919388867172140727183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0028698592548445969443358607036354683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.0014349296274222984722167280351827183673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000717464813711149411083614017591354683673953125 KW)	(Symbol)
CONCRETE FOUNDATION (0.000358732406855574705541707037956727183673953125 KW)	(Symbol)</

18.3.7 DG SET

There are two (2) nos. of DG sets with capacity of 500 kVA each to meet out any emergency and in case of power failure and shutdown from PSPCL 66 KV sub-station Longowal. It is worth mentioning here that DG running time is very small as Institute is having 11 KV independent feeders from 66 KV sub-station Longowal. It can be seen from the facts that during last one year (18.08.2020-20.08.2021), the DG Set running period was 130 hrs. only, which is only 1.48% hrs? in a year. Further, the DG Sets having canopy and follows all norms of CPCB and Ministry of Environment and forests, GOI notification GSR No. 371(E) dated 17.05.2002

Table-30 Energy Efficiency Assessment of DG Sets

Parameter	Unit	Value		Remarks
		ESS-II	ESS-I	
DG set capacity	KVA	500	500	
Start Time		09:05 AM	11:10 AM	
End Time		11:55 AM	12:42 PM	
Running hours	Hrs	02:50	01:02	
Start meter reading	Nos	88.50	20.52	
End meter reading	Nos	91.40	21.54	
kWh generated	kWh	894	307	
Diesel consumed	Ltr.	170	67	
Average power factor		0.85	0.85	
Specific energy consumption	Kwh/ltr.	5.25	4.58	
Running load in KVA	kva	388	375	

During energy efficiency study, it was also observed that during summer season the DG set load goes beyond its rated capacity. This may result in failure of DG operation. Hence, it is suggested to run the DG at the optimum level i.e. 80-85% of its rated capacity. This will ensure the breakdown free operation of DG sets.



FIG. 40 DG SET INSTALLED IN ELECTRICAL WING AND ESTATE OFFICE

18.3.8 ENERGY CONSERVATION BY BIFURCATION OF ELECTRICAL LOAD IN ESSENTIAL AND NON ESSENTIAL CATEGORY.

A decision has been taken in the 8th BWC vide item no. 8.13 held on dated 08.12.2017 (**Annexure- D and E**) regarding bifurcation of Electrical load in essential and non essential category in a phased manner. Accordingly, the electrical load of buildings like ME, Food and Chemical, Science and EIE Block has been bifurcated into essential and non essential category.

Now, as and when there is power failure from PSPCL, the DG sets are made operational to cater the need of essential load only. In this way, consumption of fuel reduced which further lessen the abate of CO₂.



FIG 41 AC DB ATTACHED IN MECHANICAL BLOCK FOR ESSENTIAL AND NON-ESSENTIAL LOAD

(ANNEXURE-D)

MINUTES OF 8TH MEETING OF THE BUILDING & WORKS COMMITTEE OF SLIET LONGOWAL HELD ON 08.12.2017 AT 12:00 NOON

Sr. No./ Item No.	Agenda Items	Minutes of Meeting
Item No. 8.11	<p>INSTALLATION OF DB'S & DISMANTLING OF OLD PANELS IN RESIDENTIAL AREA IN A PHASE MANNER.</p> <p>As PSPCL has installed its own Feeder pillar outside of each block in every type of Residential area. So, the old panels installed near the stair case of every block has no use right now. Sometimes, snakes, reptiles etc. are seen moving in these old panels. Same can be cause of any mishappening to the residents. So, it is suggested to replace it with DB's including DP's/TPN's & the old dismantled panels will be taken in credit in the estimate. The approximate cost is Rs. 10 Lacs.</p> <ul style="list-style-type: none"> • SITC of 4 way double door TPN boxes for 124 qtrs. & dismantling of old material : 4 lacs • SITC of 2 way double door DP boxes for 381 qtrs. & dismantling of old material : 6 lacs <p>The committee is requested to consider & approve the same</p>	<p>The proposal was considered and approved.</p>
Item No. 8.12	<p>PROVISION OF 500 KVA DG SET AT ESS-II.</p> <p>The new LT panel has been installed at ESS-II which is having provision of two 500KVA DG set as a main in comer. HIT panels & 500KVA transformer has already been installed through CPWD. Presently there is one 500 KVA DG set which cannot cater the need of demand during peak summer seasons during power failure/power cut from PSPCL. The maximum load demand noted at ESS-II during peak season as on date is 600KW. In this position, this wing forcefully has cut power supply of any department to maintain the supplying power through DG set at its specified limit. Accordingly, a new DG set 500 KVA is proposed to be installed at ESS-II. It will enable to cater the need of essential load of all the departments also the new two buildings i.e. extension of ECE & EIE Block coming eminent. Also some civil work is required i.e. platform & wire mesh around the periphery of this platform. The approximate cost is Rs. 50 Lacs.</p> <p>The cost of DG set, installation etc. : 4200000.00 The cost of cabling, laying, end termination & earthing : 450000.00 The cost of platform & wire mesh around of this platform: 350000.00</p> <p>The committee is requested to consider & approve the same</p>	<p>The proposal was not considered for the time being and deferred.</p>
Item No. 8.13	<p>ADDITION & ALTERNATION ELECTRICAL WORK REQUIRED IN VARIOUS BUILDINGS KEEPING IN VIEW ESSENTIAL & NON ESSENTIAL ELECTRICAL LOAD.</p> <p>The electrical infrastructure up-gradation, addition & alternation is required to divide the load into two categories i.e. essential & non essential. As since the inception of Institute this concept was not taken into consideration. However, in the recently constructed new buildings like BH-9, BH-10 & extension of mechanical block has this concept has been taken care of. This scheme is useful to cut the power supply of non essential load during power failure/cut from PSPCL & operation of DG set.</p> <p>Hence, during operation of DG sets the power supply can be cater the need of power to all buildings, users officials having essential load. This concept will be implemented in a phased manner block</p>	<p>The proposal was considered and approved.</p>

9/20

MINUTES OF 8TH MEETING OF THE BUILDING & WORKS COMMITTEE OF SUIET LONGOWAL HELD ON 08.12.2017 AT 12:00 NOON

Sr. No./ Item No.	Agenda Items	Minutes of Meeting
	<p>wise. In 1st phase ME & Science Block may be taken. Accordingly, a fund of Rs.10 lacs may be taken in consideration. The cost of cabling, wiring, end termination etc. : 650000.00 The cost of earthing, GI strip etc. : 125000.00 The cost of DB's, MCCB's, MCB's, TPN's etc : 225000.00 The committee is requested to consider & approve the same</p>	
<p>Item No. 8.14</p>	<p>REPLACEMENT & ADDITION OF AIR CONDITIONERS IN THE GUEST HOUSE, TRANSIT ACCOMMODATION AND FACULTY CLUB.</p> <p>Recently, the renovation work of Guest House has been undertaken by Civil Wing & Completed. During this renovation, the Electrical work has been carried out through the labour of ARM & wiring for the provision of Air Conditioners has been already made. A request has been received in this office from In-charge Guest House for Replacement & Addition of Air Conditioners in Guest House, Transit Accommodation & Faculty Club.</p> <p>Presently, there is no facility available of AC rooms right now in Transit Accommodation & Faculty club. The ACs' available in some of the room of the Guest House is of window type which were installed in the year of 1994-95 & 2004-05. These ACs' are not energy efficient, electromechanical, makes noise during operation, very old & there outer body has been rusted. It is mentioned as per CPWD General Specification for Electrical Works Part-I, Internal 2013, Table-12, Sr. No (07), the expected useful life of window AC is 7 years. Also, there is no Air Conditioning available in the waiting lounge area. However, if any Qty. of dismantled ACs' found in good condition same will be installed in the rooms of Transit Accommodation after laying of its main LT cable. The lighting available in some of room of Guest House is of fluorescent type. It may be replaced with LED fixture for perfect Light, Energy efficient & compliments interiors. Hence, it is proposed to replace the old ACs', provision of LED lighting & addition of Air Conditioner in these premises. The approximate cost is Rs. 17 Lacs.</p> <p>The cost of ACs', wiring, interconnection of indoor/outdoor unit including copper pipe, wiring, nitrle insulation & packing etc.: 1280000.00 The cost of foundation, wire mesh cage, painting, installation & etc. : 195000.00 The cost of LED lightings: 225000.00 The committee is requested to consider & approve the same</p>	<p>With reference to Ministry of Finance, Department of Expenditure (E.Coord) Office Memorandum no. F.No. 25(24)/E/Coord/2017 dated 4th August 2017. Vide which Central Government has taken a decision for mandatory installation of LED based lighting & energy efficient equipments (Fans/ACs) in all Government buildings. The committee decided that the proposal for replacement of ACs in Guest House will be submitted to Energy Efficient Services Limited (EESL), Noida, where as the provision of ACs in Faculty Club and Transit Accommodation is approved. The ACS in Transit Accommodation may be provided in phased manner.</p>
<p>Item No. 8.15</p>	<p>SUPPLYING & LAYING OF MAIN LT CABLE TO ME BLOCK.</p> <p>Presently, the main LT cable supplying power to ME Block is of size 3.5C aluminum 120 sqmm is having two joints in the way. The same was laid down in the year 1996 i.e. inception of ME Block. It is also mention here that the route of this cable has been covered by the interlocking tiles. So, same cannot be dig out for repair purposes in future if fault occurs in this cable. It is mentioned as per CPWD General Specification for Electrical Works Part-I, Internal 2013, Table-12, Sr. No C (3), the expected useful life of underground cable is 20 years. Accordingly, it is proposed that a new LT cable of size</p>	<p>The proposal was considered and approved.</p>

10/20

18.4 BEST PRACTICES FOLLOWED TO SAVE THE ELECTRICAL ENERGY

To save the electrical energy and environment, following actions have been taken:

1. **NATURAL LIGHT DAY:** Institute observe NATURAL LIGHT DAY on every Thursday (notice no. SLIET/DIR/1182-84 dated 19.07.2019). Hereby every official is encouraged to use natural light in the office/labs (Refer Annexure F).
2. **NO MOTOR VEHICLE DAY:** Institute observes NO MOTOR VEHICLE day on every Friday (notice no. SLIET/DIR/1182-84 dated 19.07.2019). Hereby every official is encouraged to use bicycle/walk on foot. It helps a lot to abate CO2 emission.
3. **USE ACs ON 25°C:** Periodically circulars have been issued by the concerned Institute authorities to use AC's with a temperature set point no. 25-26 Celsius. It saves a lot of electrical energy and reduce the heat emission to the atmosphere by the Air conditioner (Refer Annexure G).
4. **Standard Practice To Use ACs:** During the COVID-19 pandemic, a circular has been issued (ref. no. SLIET/EW/EST/07/20/110-112, dated 27.05.2020) regarding modalities to use Air Conditioning facility available in offices/labs in line with GOI, CPWD O/o CE (CSEQ) (E), New Delhi vide OM No. EC.CSQ (E)/COVID-19/2020/028 dated 30.05.2020 (Refer Annexure H).
5. **Plant Trees Against Every Installed AC:** A decision has been taken in the 9th BWC held on dated 20.06.2018 vide agenda item no. 9.16 to plant 5 trees in the Institute against 1.5 Ton AC to compensate the environment (Refer Annexure I).
6. **Save Energy Display Boards:** Save energy display boards (for switch off lights/fans/AC's when not in use) are installed in the offices, labs, hostels and other academic buildings to aware the users (Refer Annexure J).

18.5 OUTCOMES OF ENERGY AUDITS

By adopting the various means of energy conservation, significant energy is saved as highlighted in earlier chapters. The average saving in kWh along with the reduction in CO₂ emission is achieved as shown in the table 5.1.

Table -31 Outcome of energy audit (Reduction in CO₂ Emission)

Sr. No.	From various sources Saving of energy inkwh	Average No. of kwh saving (monthly)	Average No. of kwh saving (yearly)	Factor	Reduction in Co₂ emission yearly (kg)	Equivalence to no. of plant	Remarks
1.	Replacement of conventional lighting system by LED	24788	297456	0.9	267710	12	
2.	Replacement of Old/non star rated ceiling fans into Energy efficient 5 Star rated ceiling Fans	11904	142848	0.9	128563	6	
3.	Replacement of Air conditioning system to Star rated Air Conditioning as per BEE norms	1728	20736	0.9	18662	1	
4.	Production of Solar Energy in kwh	129045	1548540	0.9	1393686	63	Average production by the Solar plant of 1 MW capacity in a month



SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL – 148 106, DISTT. SANGRUR (PUNJAB)
(DEEMED TO BE UNIVERSITY)
OFFICE OF THE DIRECTOR

Ref. No. SLIET/DIR/ 1122-84

Dated: 29-07-2019

CIRCULAR

“NATURAL LIGHT DAY”

To promote Energy Conservation, Institute will observe "Natural Light Day" on every "Thursday".

All the faculty, staff members, and students are requested to promote use of natural light, to the extent possible, by practicing following –

1. Keep lights of Offices/Labs/Class Rooms off, if not required.
2. Keep windows open/ remove curtains to allow natural light.

It is once again requested to please use ACs around 25-26 °C, as an effective measure of energy conservation.

Further, following committee will visit various department/ sections to increase awareness on Energy Conservation, use of ACs as per circular no. SLIET/EW/EST/Misc/19/348-54 Dated 22.05.2019:

1. Mrs. Anshuka Bansal, AsP (EIE)
2. Sh. Charanjiv Gupta, AsP (EIE) & FI (Electrical)
3. Sh. Rakesh Goyal, I/C (Electrical Wing)

Note

This is to remind all that the Institute observes every "Friday" as
"No Motor Vehicle Day"

Cooperation from all is highly solicited.


29/7/19
Director

Copy to:

1. All Deans/ HODs/ Section In-charges- With a request to circulate among all faculty and staff.
2. Registrar
3. Committee members listed above- Please arrange message display in the form of Flex at important locations.

“Proud To Be Part of Team SLIET”

ANNEXURE-G



SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL -148106, DISTT. SANGRUR, PUNJAB, INDIA
(Established by Govt. of India)
(Deemed to be University)

Ref. No. EW/EST/Misc./21/555-559

Dated: 12/8/2021

CIRCULAR

In the larger interest of the Institute, environment & to save the electricity, all the officials are requested to use the **Air Conditioning facility** available in Rooms/Labs **with a set point of not below 25°C**. Please ensure the use of Air Conditioning judiciously.

Your co-operation in this regard is highly solicited.

"ONE UNIT SAVED IS TWO UNITS GENERATED"


F.I. (Electrical)

Ends. No. EW/EST/Misc./21/555-559

Dated 12/8/2021

Copy for kind information:

1. Director Cell
2. All Deans
3. Registrar
4. All HODs'/Section In-Charges-with a request to circulate among the Faculty & Staff.
5. File copy


F.I. (Electrical)



संत लौंगोवाल अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
(मानव संसाधन विकास मंत्रालय, भारत सरकार के अधीन सम विश्वविद्यालय)
लौंगोवाल, जिला-संगरूर, पंजाब - 148106
Sant Longowal Institute of Engineering & Technology
(Deemed to be University under Ministry of Human Resource Development, Government of India)
Longowal, Distt. Sangrur, Punjab-148106

www.sliet.ac.in

संदर्भ सं/ Ref.No. SLIET/ Ew/EST/07/20/110-112

दिनांक / Date: 27/05/2020

CIRCULAR

COVID-19 infection through Air-Flow has become an issue. Summer has already started & monsoon season will begin soon. The thermal discomfort will therefore be maximum now onwards due to season changes & there can be a possibility of its spread through Air Flow. Therefore, maximum caution should be exercised to minimize the chances of spread of Corona virus through Air-Flow in enclosed spaces like residences, offices, meeting places, assembly places etc. Following general guiding principles for use of air-cooling and conditioning devices have been issued by the Government of India, CPWD, office of the Chief Engineering (CSEQ)(E) New Delhi vide OM No. EC.CSQ(E)/COVID-19/2020/028 dated 13.05.2020:-

- Y The temperature setting for all AC's should be in the range of 25°C-30°C.
 - Y Relative Humidity should be in the range of 40-70%.
 - Y Intake of fresh air should be much as possible.
 - Y Recirculation of Air should be avoided to the extent possible.
 - Y Window fitted Room cooler pad must be disinfected at regular intervals.
 - Y Cross ventilation should be adequate.
 - Y Replacement of Air by using the facility of Exhaust Fans in the nearby area.
 - Y Air Sanitization should be very frequent by regular cleaning & sanitization of filters of Indoor Unit.
 - Y Observing social distancing norms, bearing of mask, avoid direct contact of Air flow, frequent surface decontamination are to be followed compulsory.
- A copy of the guidelines issued by the CPWD, New Delhi dated 13.05.2020 is enclosed for information please. All are requested to follow these guidelines in letter and spirit.

Ray
27/05/2020
Faculty In-charge (Electrical)

Copy to :-

- 01 Director for kind information.
- 02 All Deans/HoDs/Section In-charges/Faculty In-charges- with the request to circulate among the Faculty & Staff.
- 03 Faculty In-charge (ACSS) - with the request to upload on the Institute website.

"Proud to be Part of Team SLIET"

लौंगोवाल, जिला संगरूर- 148106 (पंजाब), भारत, दूरभाष सं. + 91-1672-280057, 253100 (निदेशक), 253115 (कुलसचिव) फेक्स सं. + 91-1672-280057
Longowal, District: Sangrur-148106 (Punjab), India Phone No. +91-1672-280057, 253100 (Director), 253115 (Registrar) Fax No. +91-1672-280057

www.sliet.ac.in

ANNEXURE-I



SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL -148106, DISTT. SANGRUR, PUNJAB, INDIA
(Established by Govt. of India)

(Deemed to be University)

(e-mail- estateoffice2010@gmail.com)

Tel/Fax No. 01672-253475

ESTATE OFFICE

Ref. No. SLIET/EST/2018/838-48

Dated: 20-06-2018

REGISTERED POST

1.	Prof. Shailendra Kumar Jain, Director, SLIET, Longowal	Chairman
2.	Joint Secretary & Financial Adviser, Government of India, MHRD, Department of Higher Education, I.F. Division, Shastri Bhawan, New Delhi	External Member
3.	Deputy Secretary, Govt. of India, Ministry of Human Resource, Department of Higher Education, Section -VII, Shastri Bhawan, New Delhi	External Member
4.	Director, Technical Education & Industrial Training, Punjab, Chandigarh	External Member
5.	Superintending Engineer, Jalandhar Central Circle, CPWD, 29, Link Road, Jalandhar	External Member
6.	Superintending Engineer (Electrical), CPWD, Patiala Circle, Patiala	External Member
5.	Prof. Harish Chopra, Dean (Planning & Development), SLIET, Longowal	Member
6.	Er. Sudeep Singh, Estate Officer, SLIET, Longowal	Member
7.	Dr. Avinash Thakur, Faculty Incharge (Civil), SLIET, Longowal	Special Invitee
8.	Dr. Charanjiv Gupta, Faculty Incharge (Electrical), SLIET, Longowal	Special Invitee

SUBJECT: MINUTES OF THE 9TH MEETING OF THE BUILDING & WORKS COMMITTEE,
SLIET-REGARDING.

Dear Sir/Madam,

Please find enclosed herewith a copy of the approved minutes of 9th meeting of the Building & Works Committee, SLIET, Longowal held on 23.05.2018 under the Chairmanship of Dr. Shailendra Jain, Director, SLIET, Longowal for information and further necessary action.

With regards,

Sincerely,


Dr. Harish Chopra,
Registrar & Member Secretary
E-Mail: registrar@sliet.ac.in

Encl.: Approved Minutes (22 pages).

ANNEXURE-I



SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL -148106, DISTT. SANGRUR, PUNJAB, INDIA

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Dated: 20-06-2018

REGISTERED POST

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3.	Deputy Secretary, Govt. of India, Ministry of Human Resource, Department of Higher Education, Section -VII, Shastri Bhawan, New Delhi	External Member
4.	Director, Technical Education & Industrial Training, Punjab, Chandigarh	External Member
5.	Superintending Engineer, Jalandhar Central Circle, CPWD, 29, Link Road, Jalandhar	External Member
6.	Superintending Engineer (Electrical), CPWD, Patiala Circle, Patiala	External Member
5.	Prof. Harish Chopra, Dean (Planning & Development), SLIET, Longowal	Member
6.	Er. Sudeep Singh, Estate Officer, SLIET, Longowal	Member
7.	Dr. Avinash Thakur, Faculty Incharge (Civil), SLIET, Longowal	Special Invitee
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With regards,

Sincerely,


Dr. Harish Chopra,
Registrar & Member Secretary
E-Mail: registrar@sliet.ac.in

Encl.: Approved Minutes (22 pages).

MINUTES OF 11th BUILDING WORKS COMMITTEE MEETING HELD ON 30.08.2019

Item No.11.4	ANNUAL RATE CONTRACTS OF DISMANTLED MATERIALS OF BUILDING & SERVICES AT SLIET, LONGOWAL
	Decision: The committee decided that disposal of dismantled material/ scrap / like expired material be taken up through e-tendering and highest rates quoted be considered. E-tendering may be done every time material is to be disposed off.
Item No.11.5	PROVISION OF PATHWAY ALONG BOTH SIDE OF ROAD FROM COMPUTER BLOCK TO MECHANICAL BLOCK AT SLIET, LONGOWAL
	Decision: Approved
Item No.11.6	SITC OF OUTDOOR (DOUBLE DOOR) LT PANEL ON 250 KVA SUB STATION ECE BLOCK AT SLIET, LONGOWAL
	Decision: Approved
Item No.11.7	SITC OF INDOOR LT PANEL AT ESS-II FOR RATIONALIZATION OF ELECTRICAL LOAD AT SLIET, LONGOWAL
	Decision: Approved
Item No.11.8	SITC OF AUDIO AND VIDEO SYSTEM IN JC BOSS HALL AT SLIET, LONGOWAL
	Decision: Approved
Item No.11.9	REQUIREMENT OF ONE MORE CEILING FAN IN EACH ROOM ALONGWITH PROVISION OF SUFFICIENT TUBE LIGHTS IN BOYS HOSTEL NO.5&6 AT SLIET LONGOWAL
	Decision: Approved
Item No.11.10	SUPPLYING OF SCAFFOLDING SYSTEM OF 15 MTR HEIGHT AT SLIET, LONGOWAL
	Decision: Approved
Item No.11.11	STATUS OF ONGOING WORKS.
	Decision: Approved
Item No.11.12	AY OTHER ITEM WITH PERMISSION OF CHAIRMAN.
Item No.11.12(A)	Policy for the replacement of old ACs in the Institute.
	A large no. of ACs installed in the Institute around 15-20 years ago those are of Electromechanical type, useful expired life, non star rated as per BEE norms, with refrigerant R 22 Gas & beyond economical repair. It is also worth mention here that these ACs may cause of any untoward incident during operation like fire hazards etc. One similar incident of fire in AC has been occurred on 12.08.2019 in Room No. 17 of Guest House as informed by In-charge Guest House. Further, a committee was constituted by the Competent Authority to frame a policy for the replacement of



19. MISCELLANEOUS INITIATIVES

- i) Following initiative has been undertaken by the Institute for the perseverance of ecosystem.
1. An open oxidation pond for the treatment of wastewater.
 2. Use of waste water for irrigation of forest area of Institute.
 3. Use of polythene is banned in the Institute.
 4. Organization of seminars for providing cleaning awareness around the Institute and surrounding village area.
 5. One day (Thursday) in a week is observations natural light day, wherein minimum utilization of electric appliances is ensured in the various working place of Institute.

ii) AUCTION OF FIREWOOD

FY 2020-21 (Total Qty. = 4999.75 Quintal) and amounting to Rs 15,74,924/-

iii) SUMMERY of maintenance of lawn area, Hedge and pot plants at different locations

SR. NO.	LOCATIONS	LAWN AREA	HEDGE	POT PLANTS
1.	Hostels Buildings	926100 Sq. ft	5000 Rmt	195
2.	Academic Buildings	781368 Sq. Ft	3000 Rmt	207
3.	Residential Area	307012 Sq. Ft	3000 Rmt	--
4.	Public Park	393676 Sq. ft	1000 Rmt	--
5.	Herbal Park	56760 Sq. ft	500 Rmt	--
6.	Karnal Technology	9990 Sq. ft	--	--
7.	Nursery	--	500 Rmt	500

PHYSICAL STATUS OF PLANTS PLANTED DURING LAST 4 YEARS

Sr · no ·	Location	SPECIES														
		Garden ia	Durant a	Chand ni Dwarf	Pulmeri a	Sukhcha in	Rajai n	Bougainvill ea	Coleu s	Naagma ni	Jamu n	Nee m	Farm a	Orang e	Tikom a	Bo t t l e b r u s h
1	Administrative Block-1	1060	200	240	10	11										
2	Auditorium	200	180		12		12	100								
3	Food & Chemical Block		435	250				60								
4	Computer Block	70						410	80							
5	Science Block	220	150					26								
6	ME Block	40	200	350				50								
7	Workshop		100				1									
8	KV School	70								12	65		10			
9	Student Activity Centre	70	100			60										
10	Water Tank No.1	152	25													
11	Coffee Ground					60										
12	In front of Director's Residence				5											
13	Guest House	133	30		14		3					13		41	39	
14	Faculty Club	235														
15	Estate Office		100	55												
16	Swimming Pool											29				
17	Sports Ground						20									
18	Mango Park					18										
19	Type-IV Park-1											4				4
20	Type-IV Park-2	30														
21	Type-III Park-1															2
22	Type-III Park-2											1				3
23	Transit Accommodation		55												88	

GREEN/ENVIRONMENTAL AUDIT REPORT, SLIET, LONGOWAL

24	Health Centre to Duggan Gate (Road warm)					300		450								
25	Boys Hostel no.1							130								
26	Boys Hostel no.3				1	26			15		3			3		
27	Boys Hostel no.4		205		1			5							6	
28	Boys Hostel no.7	130														
29	Boys Hostel no.8	80														
30	Boys Hostel no.9	100	65						70		4					
31	Boys Hostel no.10	50									4					
32	Girls Hostel no.2	17						10								
33	Girls Hostel no.3					50		30								
34	Nursery							18							20	
35	Herbal Park	300				70					4					
36	Type-I Back Side					60					50					
37	Electrical Block	140														
38	Longowal Gate	25														
39	Duggan Gate	25			12											
40	Round About	170	105	30					245							
41	Library	435		220	3											
42	Informal Garden				5											
43	Bee Farm					13									18	
Total		3752	1950	1145	63	668	99	680	876	80	23	119	47	13	155	66

PHYSICAL STATUS OF PLANTS PLANTED DURING LAST 4 YEARS

Sr. no.	Location	SPECIES														
		Aamltas	Guava	Chandni	Hibiscus	Kaner	Casuarina	Kachnar	Sohanjna	Mehndi	Mango	Harsingar	Alstonia	Casia Semiya	Peepal	Galuka
1	Workshop			5											3	
2	Health Centre		2	3												
3	KV School				210											
4	Student Activity Centre							5								
5	Water Tank No.1	20														
6	In front of Director's Residence	7														
7	Guest House				120	6	9					4				
8	Faculty Club								10							
9	Estate Office		1			12			9		1					
10	Swimming Pool								3							
11	Sports Ground			27												
12	Type-III Park-1						1									
13	Type-III Park-3									100						
14	Type-III Park-4			15		25		4								
15	Type-II Park									180						
16	Transit Accommodation		3		120											
17	Health Centre to Duggan Gate (Road warm)	25		20												
18	Boys Hostel no.3		4	11	43	5				1	3					
19	Boys Hostel no.4		1			23				86	3	3				
20	Boys Hostel no.7				15	15										
21	Boys Hostel no.8					18										
22	Boys Hostel no.9		8							260		20				
23	Boys Hostel no.10	15	3			8				270						
24	Girls Hostel no.1		6							7						
25	Girls Hostel no.2		9		65			12		9	15					
26	Girls Hostel no.3		5								15		30			
27	Nursery		15					8						2		
28	Herbal Park	55	3			200		4	1000	3	7					
29	Longowal Gate			10												
30	Duggan Gate			28												
31	Informal Garden			10		15	20									
32	Type-III Boundary Wall					70										
Total		122	60	129	573	397	30	31	24	1896	24	47	20	30	2	3

PHYSICAL STATUS OF PLANTS PLANTED DURING LAST 4 YEARS

Sr. no.	Location	SPECIES														
		Plum	Apple	Gulmohar	Ashoka	Dhak	Rukhbanjni	Bottle Plum	Sugar Apple	Lemon	Anjeer	Mosmi	Pomegranate	Peach	Arjun	Amla
1	Workshop			1												
2	Health Centre								1							
3	KV School															3
4	Estate Office								2	1						
5	Transit Accommodation								1	1		1	2	1		
6	Boys Hostel no.3				87				2	1						
7	Boys Hostel no.4				74			1	1		4					
8	Boys Hostel no.8				19											
9	Boys Hostel no.10	1	1								2					
10	Girls Hostel no.1								2	3		3	3			
11	Girls Hostel no.2	1									6					
12	Girls Hostel no.3										1	4				
13	Nursery							1		2						
14	Herbal Park					3		4	4	3		4		4	4	4
15	Round About				7											
16	Library						12	8								
17	Informal Garden					30										
Total		2	1	1	187	33	12	8	6	13	11	13	12	5	5	7

PHYSICAL STATUS OF PLANTS PLANTED DURING LAST 4 YEARS

Sr. no.	Location	SPECIES														
		Ficus	Rose	Tamarind	Khair	Rind	Dheu	Bhumi Amla	Bel Patra	Bahera	Gurmar	Tulsi	Datura	Puthkanda	Lemon Grass	Aloe Vera
1	Boys Hostel no.1		10													
2	Boys Hostel no.2		10													
3	Boys Hostel no.7	2														
4	Boys Hostel no.9	15														
5	Girls Hostel no.1			4												
6	PG Hostel	15														
7	Nursery		80													
8	Herbal Park			4	4	4	3	25	4	7	20	189	7	10	42	61
9	Longowal Gate	15														
10	Duggan Gate	30														
Total		77	100	8	4	4	3	25	4	7	20	189	7	10	42	61

Sr. no.	Location	SPECIES									
		Ashwagandha	Aak	Murraya	Shankh Namoli	Ratti	Stevia	Grapes	Staver	Lechi	Jatropha
1	Herbal Park	33	19	42	21	21	8	7	12	8	19
Total		33	19	42	21	21	8	7	12	8	19

FEW PHOTOGRAPHS OF PLANTS PLANTED DURING LAST 4 YEARS



FIG 42 PHOTOGRAPHS OF DEVELOPED TREES IN SLIET CAMPUS



FIG 42 PHOTOGRAPHS OF DEVELOPED TREES IN SLIET CAMPUS

SANT LONGOWAL INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Established by: Govt. of India, Deemed-to-be-University)

Flower Exhibition cum competition

In continuation of the previous practice, this year also, on the day of convocation i.e 5th of March, 2021, the Horticulture wing of estate, SLIET has planned a **Flower Exhibition cum competition** outside the main auditorium building at around 11:00 AM. For the purpose entries from hostel system, employees and Residents of SLIET have been invited.

Participation of hostels, residents and employees will be made as per the following category

1. Entries from Hostels (both boys and girls)
2. SLIET employees (individual/Jointly)
3. Departmental Entries
4. Entries from Types-I/II/III/IV/V (separately)

There will be a competition, based on the collection and variety of flowers being displayed by each category collector(s). The participants or otherwise can bring their pot plants/flowers etc. collection for display on the spot competition and exhibition. All the residents/ employees and participants are requested to visit as well as bring their collections and help the horticulture department to make the event a grand success. Your kind cooperation and participation will boost the morale of the Horticulture persons working for the beautification of SLIET campus as a whole.

Necessary help for shifting of pot plants/information etc. can be provided by the horticulture wing. Following No. can be contacted for any help/ information please.

1. Sh. Mandeep Singh (SK Estate): 9417480765, 6283400997


3/02/2021
F/I (Horticulture)

CC:

1. Director cell for kind information of Honorable Director Please
2. Registrar for kind information
3. Dean (P&D) for kind information
4. Dean Academic for kind information
5. Dean SW for kind information
6. Dean FSW for kind information
7. All HODs/section in-charges with a request to circulate among faculty/staff
8. Estate officer for necessary arrangement please
9. Sh. Mandeep Singh (SK Estate) for n/a please
10. File copy

"Proud To Be Part of Team SLIET"

Estate Disp. No. 3327-36
Dated. 3/2/2021

Hoct.

**SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL (DISTRICT: SANGRUR) PIN – 148 106
(Established by: Govt. of India; Deemed to be University)
Office of Dean (Student Welfare)**

Ref. No. SLIET/Dean/SW/ 374-383

Dated: 12/08/2021

Circular

The Institute is going to celebrate **75th Independence Day on August 15th, 2021**. All the faculty and staff along with their family members and students are cordially invited to attend this **National Festival**. The details of programs are as under: -

S.No.	Event	Time	Venue
01.	Flag Hoisting	08.00 A.M.	Outside the Main Auditorium
02.	Parade	08.05 A.M.	
03.	Director's address	08.15 A.M.	
04.	Distribution of awards	08.30 A.M.	
05.	Sweet distribution	09.00 A.M.	Herbal park
06.	Tree plantation	09.05 A.M.	
07.	Sports activity	09.15 A.M.	

Note: - All are requested to follow social distancing & other health protocols i.e. wearing masks etc. issued time to time for prevention of COVID-19.



[Signature]
Dean (SW)
12/08/2021

Copy to: -

- 01 Director :- for kind information, please.
- 02 Registrar:- for kind information , please.
- 03 All Deans/HODs/Section In charges:- for circulation among the faculty and staff
- 04 F./Civil:- for necessary arrangements, please.
- 05 F.I. Security:- for necessary arrangements, please.
- 06 F.I. Electrical: - for necessary arrangements (Playing of National Anthem and Patriotic Songs etc), please.
- 07 F.I. ACSS:- for necessary arrangements, please.
- 08 Dr. Ajay Pal, Prof.(ECE):- for necessary arrangements, please.
- 09 F.I. Horticulture: - for necessary arrangements, please.
- 10 All Chief Wardens (Boys & Girls Hostels): - for circulation among the students & their presence.

[Signature]
13/08/21

[Signature]

[Signature]
13/08/21

Sh. Mandeep Singh
Sh. Dr. Manish

"Proud to Be Part of Team SLIET"



**SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL – 148 106, DISTT. SANGRUR (PUNJAB)
(DEEMED TO BE UNIVERSITY)
OFFICE OF THE DIRECTOR**

Host

Ref. No. SLIET/DIR/1047

Dated: 31/08/2020

CIRCULAR

HoD (EIE/ECE), HoD (FET) and HoD (Chemical) are requested to explore the possibility to initiate following activities under their supervision as departmental activity for **students learning/training, as well as possible entrepreneurship development.**

S.No.	Activity	HoD Concerned	Objectives
1	Green House Farming	HoD (EIE/ECE)	<ul style="list-style-type: none"> Promotion of precision agriculture Use of technology for Organic farming
2	Herbal Garden	HoD (FET)/ HoD (CHE)	<ul style="list-style-type: none"> Research on herbal plants for medicinal or edible use
3	Compost/ manure processing		<ul style="list-style-type: none"> Production of manure using plant waste for in house use Waste management

HoDs may assign the responsibility to interested/ specialized faculty for necessary action. **The activity may be treated as extension of departmental lab^s**

[Signature]
31/8/20
Director

Copy to:

- HoDs concerned
- All Deans/ HoDs
- EQ for extending necessary support/ facilities to concerned department

Sh. Mandeep Singh

[Signature]
31/08/2020



"Proud To Be Part of Team SLIET"

GREEN AUDIT COMMITTEE

(Dr. Nikhil Prakash)

(Dr. Raj Kumar Garg)

(Dr. Indraj Singh)

(Prof. Avinash Thakur)

(Prof. C.S. Riar)

CO-OPTED MEMBERS:

(Er. Prabhdeep Singh)

(Er. Rakesh Goyal)

(Er. Mandeep Singh)

CHAIRMAN:

(Dr. Sanjay Marwaha)