Green Campus Audit Report

SWARRNIM
STARTUP & INNOVATION
UNIVERSITY
WHERE IDEAS COME ALIVE

INDIA'S FIRST UNIVERSITY FOR STARTUP

GREEN CAMPUS AUDIT REPORT

SWARRNIM START UP AND INNOVATION UNIVERSITY

Bhoyan Rathod , Near ONGC WSS Gandhinagar , Gujarat - 382422

May 2023

ACKNOWLEDGEMENT

The Environmental Engineering and Environmental Science Department are thankful to Principal Dr. Jayant Shekhar, Academic Dean Dr. Kavita Kshatriya, Registrar Dr. Upendra Patel, Provost Dr. Ragin Shah, Vice President Mr. Adi Jain, and President of Swarrnim Group Mr. Rishabh Jain Sir. We also express our gratitude to all staff of Swarrnim Startup and Innovation University for their kind cooperation and support during the Green Audit work. I appreciate the courtesy and cordiality extended to the team.

- Dr. Savan Tank

Disclaimer:

This report includes the findings of assessment carried out at Swarrnim Startup and Innovation University Gandhinagar, Gujarat on **3rd May 2023** for barrier free built environment for persons with disability. This report is issued within the scope of contract, documents submitted and does not perpetuate into compliance to any statutory regulations and / or codes of any country/region. The discussion of facts, as determined by the investigator, and the views expressed in the report do not assume and are not intended to establish the existence of any duty at law on the part of Swarrnim Startup and Innovation University, their employees or agents, contractors or any other party. This report neither determines nor implies liability. All the information provided in this report is based on the condition of site as on the date of audit/inspection and the information and access provided to the auditor. This report neither determines nor implies liability. All the information provided in this report is based on the condition of site as on the date of audit/inspection and the information provided to the auditor. This report is only a third-party observation and is not a certificate of safety nor an assurance to any party regarding the future condition of the site. Under no circumstances shall it's employees or the auditor shall be in any way responsible or liable for any accidents, incidents, damage to life, property or any other legal issue arising out of the site mentioned in this report directly or indirectly.

Table of Contents

List of Table

List of Figure

CHAPTER-01

INTRODUCTION

1.1 Introduction of Green Audit

Green Audit is a process of systematic identification, quantification, recording, reporting, and analysis of components of the environmental diversity of an institute. It aims to analyze environmental practices within and outside of the concerned place, which will impact the eco-friendly atmosphere. The green audit is a valuable means for a University to determine how and where they are using the most energy or water or other resources. The University 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 with a better understanding of the green impact on campus. If self-inquiry is a natural and necessary outgrowth of quality education, it could also be stated that institutional self-inquiry is a natural and necessary outgrowth of a quality educational institution. Thus the University must 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 the local, regional, and global levels have led to several environmental and ecological crises. In 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. Moreover, it is part of the Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

Figure 1: Details of Green initiative

1.2 Introduction of University

Swarrnim Startup and Innovation University, Gandhinagar located in Gandhinagar, Gujarat, India, which Design- Centric Learning at Swarrnim Startup and Innovation starts with engaging the learners to confront challenges. The learners will solve these challenges through analysis, reflection, ideation, synthesis, prototyping, and testing the impact. As the academic program progresses, these challenges change in terms of their scale, complexity, and ambiguity involved. Learners invest energy, time, and effort into these tasks. This approach leads them to ask questions and seek answers by reflection, collaboration, and interaction. The faculty members act as facilitators and collaborators in this endeavor, Learning at Swarrnim Startup and Innovation is just-in-time and not just-in-case.

Swarrnim Startup and Innovation University, Gandhinagar is a private university located in Gandhinagar, Gujarat (15 kms from Ahmedabad) **23.21265N Latitude and 72.57285E Longitude.** The University established in 2017. The University is recognized by the University Grants Commission (UGC).

1.3 Green Steps Taken by University

Today, it's a noticeable fact that environmental science lessons are implemented beyond the classrooms and are practiced in our day-to-day lives. And leading from the front is our university campus. The climate of university is Tropical Wet and Dry. Nestled on a lush, green 64-acre campus in Gandhinagar, sustainability is a priority at Swarrnim Startup and Innovation. Everyone on campus has a part to play in green initiatives for improving our built environment and natural ecology.

Along with educational and technological evolution, Swarrnim Startup and Innovation University acknowledges the significance of an inspiring environment and puts in

continuous efforts to build a Sustainable Campus. The University has successfully adopted and implemented best practices in the areas of sanitation, hygiene, waste management, water management, energy management, and greenery management.

To instill the values of social, economic, and environmental responsibility and make a meaningful impact, the university takes the following action steps:

- Develop 9 acres of green space within the campus and implement sustainable maintenance
- Promoting the use of a sustainable mode of transportation
- Water conservation and rainwater harvesting for use on the campus
- Developing a separate land, 'Swarrnim Startup and Innovation Herbal Farm' for 20% of organic food produce
- Use of vermin compost to enhance soil fertility physically, chemically, and biologically
- Raise awareness of plastic pollution

1.4 Objective of the Green Audit

In recent times, 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 the framework of Environment Sustainability in compliance with the applicable regulations, policies, and standards. The main objectives of carrying out Green Audit are:

More efficient resource management

1 To provide a basis for improved sustainability
2 To maintained green campus
3 To enable waste management through reduction of waste
4 Generation, solid- waste and water recycling
5 To create plastic free campus and evolve health consciousness among the stakeholders
6 Recognize the cost saving methods through waste minimizing and Managing
7 Point out the prevailing and forthcoming complications
8 Authenticate conformity with the implemented laws Empower the organizations to frame a better environmental performance
9 Enhance the alertness for environmental guidelines and duties
10 Impart environmental education through systematic environmental Management approach and improving environmental standards

11 Financial savings through a reduction in resource use
12 Development of ownership, personal and social responsibility for the University and its environment
13 Developing an environmental ethic and value systems in youngsters
14 Green auditing should become a valuable tool in the management, And monitoring of environmental and sustainable development Programs of the University.

1.4.1 Pre-Audit Stage

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the audited and deal with any concerns. It was held at Swarrnim Startup and Innovation University, Gandhinagar on 3th & 4th May, 2023. The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance of the audit itself. In Swarrnim Startup and Innovation University, Gandhinagar pre- audit meeting was conducted Successfully and necessary documents were collected directly from the University before the initiation of the audit processes. Actual planning of audit processes were discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the University man Swarrnim Startup and Innovation University, Gandhinagar. The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. The audit team worked together, under the leadership of the lead auditor, to ensure completion within the brief and scope of the audit.

1.4.2 Management's Commitment

The Management of the University has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the environment, campus farming, planting

More trees on the campus etc. after the green auditing. The management of the University was willing to formulate policies based on green auditing report.

1.4.3 Methodology

The purpose of the green audit 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.

1.4.4 Duration of the green Audit

The Green audit field carried out the data collection was carried from 03th & 05th may , 2023

CHAPTER-02

GENERAL OVERVIEW OF THE CONCEPT OF LAND USE

2.1 Site Overview of the Land USE

Land use refers to man's actions and the numerous uses that land supports and yields. Viewing the planet from space is now critical in man's actions with natural resources. In conditions of fast land use change, observations of the Earth from space provide information on human activities and landscape utilization. Remote sensing and GIS technology now offer new capabilities for improved land use mapping and planning. The collection of remotely sensed data enables synoptic assessments of earth system functioning, patterns, and change at the local, regional, and global scales over time. Satellite photography is very useful for creating land use maps.

Figure 2: Swarrnim Startup and Innovation University, Gandhinagar Satellite View

2.2 Methodology Adopted for Land Use Mapping

Three types of data that are GPS points, field survey data and Google earth data for Geo referencing have been used in this study. Land use map of the study area have been prepared using the above three types of data with the help of Arc GIS Pro software.

2.3 Data Processing and Analysis

Land use map preparation is executed through the following steps: Geo-coding and Geo referencing of satellite imageries by extracting the ground control points. Supervised classification was carried out with the aid of ground truth data collected during field survey. Scanning and digitization of maps and editing of all the Geo referenced maps were done using GIS. Data manipulation and analysis and linking the spatial data with the attribute data for creation of topology was carried out using GIS software. Creation of GIS output in the form of land use map showing various land use have been prepared. Therefore, attempt has been made in this study to map land use for Geography Department of with a view to detect the land consumption in the built-up land area using both remote sensing and GIS techniques.

2.4 Geographical Location with Campus Map is Scale

The University has a sprawling pollution-free campus spread over 24.31 acres of land in the heart of District. Swarrnim Startup and Innovation University is located in the city of Gandhinagar in India (Gujarat). The University was established in 2017 as a Private University vide Private Universities Act 41 of 2019 and operates from a single campus. The University campus has state of the art infrastructure and modern amenities

The present study revealed that the SSIU campus has a total of land of which 9.72 acres has green cover. It is found that a total of about 14 acres (~60% of total) are under the built-up category, of which academic departments administrative units and canteen form a significant part

Figure 3: *Swarrnim Startup and Innovation University, Gandhinagar*

Table 1: Area Description Campus

Details of Built-up area

Total built-up plinth area **1476000**

Details of Open area Particulars	Sq.Ft.
Volley Ball Court	3960
Garden cum Students Canteen	15456
Garden 1	14563
Garden 2	19740
Paved road.	49065

The Ratio Of Open Space Area To Total Area

Ratio of open space to total area: 60 %

Table 2: Open space Area Description

Space Name	Total area
Total Land Area	68056.0 m^2
Green Cover Area 38.4	9180.0 m^2
The built-up category, of which academic departments administrative units and canteen forms a significant part	12073.0 m^2

CHAPTER-03 PLANTATION

3.1 Plantation for Sustainability

University was established in the year 2017, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 40% of the total area is occupied by open land and plantation that generates a better and sustainable campus environment.

3.2 Flora Status of the Institution

The Swarrnim Startup and Innovation University is located in around 24.31 acres of Land in the heart of Clean and green city of Gandhinagar. Swarrnim Startup and Innovation University campus is surrounded by lush green scenic vegetation. Majority area is covered with landscaping and planted vegetation. After deducting the built-up area along with playgrounds, the projected area available to develop various types of flora is 2.3 acres. Floristic-Diversity is to enlist and enumerate the plant diversity of University campus

Figure 5: Indian trees for best oxygen generation

Planted Vegetation: Swarrnim Startup and Innovation University

Figure 6: Total Area On Campus Covered In Planted Vegetation

- **This is a continuous process and helps in the maintenance and conservation of the flora of campus.**

  Many trees, herbs, shrubs and grasses are present in the campus which maintain the biodiversity. In addition to angiosperm plants other plant groups as lower plants, pteridophyta and gymnosperm. There are various kind of plantation programs are being organized at University campus. These kind of program helps in developing ecofriendly environment which provides pure oxygen to the nature and institute. The plantation program includes various types of indigenous species of ornamental and medicinal plants. Seed balls were also prepared and planted by students of the University.

a) Floral and Faunal Biodiversity in the Campus

Banyan Tree

SCIENTIFIC NAME: Ficus Benghalensis

LOCAL NAME: vad

CommonFig Tree

SCIENTIFIC NAME : Ficus Carica

SCIENTIFIC NAME: Ficus Amplissima

Neem Tree

SCIENTIFIC NAME:

Azadirachta Indica

LOCAL NAME: Limbo

Basswood Tree

SCIENTIFIC NAME: Tilia

Americana

Java Plant

SCIENTIFIC NAME:

Syzpium Cumini

Eastern Cottonwood Tree

SCIENTIFIC NAME:

Populus Deltoids

River Tamarind

SCIENTIFIC NAME:

Leucaena Leucophala

CucumberTree

SCIENTIFIC NAME:

Magnolia Acuminata

Cavendish Banana

SCIENTIFIC NAME: **Musa**

Acuminata CavendishSubgroup

Piscidia Piscipula

SCIENTIFIC NAME: PiscidiaPiscipula

American Hophornbeam

SCIENTIFIC NAME: Ostrya Virginiana

Hopbush

SCIENTIFIC NAME:

Dodonaea

Silver MapleTree

SCIENTIFIC NAME: Acer

Saccharinum

Moringa

SCIENTIFIC NAME:

Moringa Oleifera

Oak Tree

SCIENTIFIC NAME:

Quercus Robur

Black Oak Tree

SCIENTIFIC NAME:

Quercus Veluntia

apodilla

SCIENTIFIC NAME:

Manikara Zapota

LOCAL NAME: Chiku

Eastern Hemlock

SCIENTIFIC NAME:

Vachllia Nilotica

LOCAL NAME: Bawal

Red Pine Tree

SCIENTIFIC NAME: Pinus resinosa

PonderosaPine Tree

SCIENTIFIC NAME: Pinus

Ponderosa

Prosopis Velutina

SCIENTIFIC NAME:

Prosopis Veluntia

Indian Almond

SCIENTIFIC NAME:

Terminalia Catappa

LOCAL NAME: Badam

CombretumGlutinosum

SCIENTIFIC NAME:

Combretum Glutinosum

Monsoon Longifolium

SCIENTIFIC NAME:

Polyathia Longifolia

COMMON NAME:

Ashopalav

SCIENTIFIC NAME- Saraca Asoca

LOCAL NAME: Ashopalav

Hancornia Speciosa

SCIENTIFIC NAME: HancorniaSpeciosa

Bamboos

SCIENTIFIC NAME:

Bambusa

Millettia

Giant Calotrop

SCIENTIFIC NAME: Giant Calotrop

LOCAL NAME - Aakdo

Coconut palm Tree

SCIENTIFIC NAME: Cocos Nucifera

Albizia Lebbeck

SCIENTIFIC NAME: Albizia Lebbeck

PeppermintTree

SCIENTIFIC NAME: Agonia Flexuosa

Scientific name: Ficus Religiosa

Arborvitae

SCIENTIFIC NAME: Theya Accidentalis

Night Flowering Jasmine

SCIENTIFIC NAME:

Nyctanthes Arbor Tristis

Saptaparni

SCIENTIFIC NAME:

Alstonia Scholars

Paper Mulberry HoneyLocust

SCIENTIFIC NAME-

Gledistia Trisealthos

BauhiniaPicta

SCIENTIFIC NAME:

Bauhinia Picta

Persian SilkTree

SCIENTIFIC NAME: Albizia Julibrissin

B

SCIENTIFIC NAME: Robinia Pseudoacacia

Agar

SCIENTIFIC NAME:

Balanties Aegyptiaca

Indian Labernum

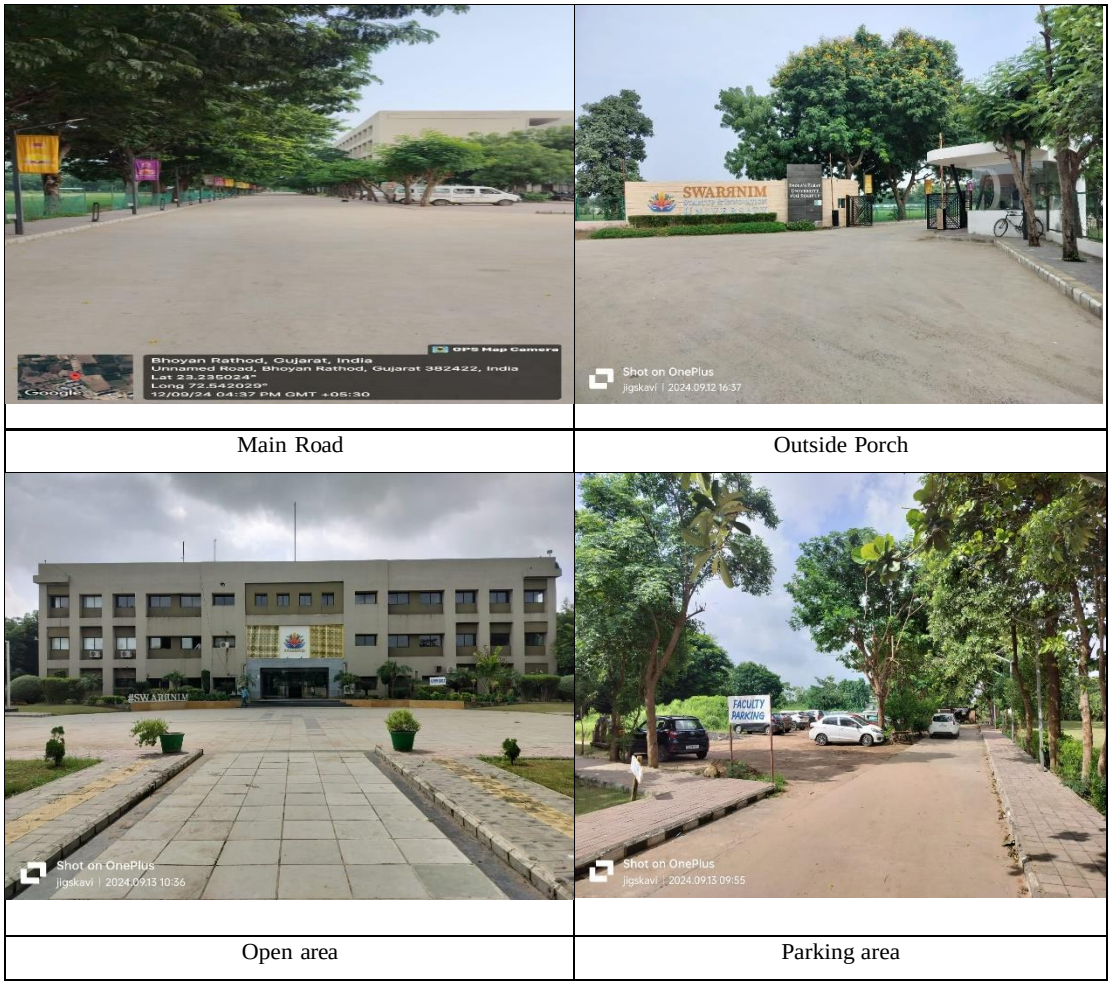
SCIENTIFIC NAME: Cassia Fistula

Palash

SCIENTIFIC NAME: Butea Monosperma

b) Forest And Planted Vegetation.

Example of Total area on campus for water absorption besides the forest and planted vegetation.



Main Road	Outside Porch
Open area	Parking area

Figure 7*:* Total Area On Campus for Water Absorption Besides The Forest

c) Herbal garden with various plant and herbs

Safron farming by aeroponics

Plants in Herbal Garden

Herbal Garden

Plants in Herbal Garden

Figure 8: Plants in Herbal Garden

Trees like *Anacardium occidentale, Artocarpus heterophyllus, Cassia siamea, Mangifera indica* and *Sapindus mukorossi* possess interesting qualities like size, high sequestration potential and better aesthetical values, making them good candidates for landscape designing. Overall, tree planting has helped to transform the area into a verdant green campus The campus is enriched with various plants of different habitats. The largest collection of trees on the campus may help to reduce the ambient temperature and keep the environment clean.

The floral diversity of different species groups is listed in the table. The list is based on the studies carried out by the Horticulture department of Swarrnim Startup and Innovation University

SWARNIM STARTUP & INNOVATION UNIVERSITY INDIA'S FIRST UNIVERSITY FOR STARTUP	AARIHANT HOMOEOPATHIC MEDICAL COLLEGE & RI

SWARNIM STARTUP & INNOVATION UNIVERSITY

HOMOEOPATHIC PHARMACY

LIST OF PLANTS WITH SPECIES

Sr No	Scientific Name Of Plant	Number Of Plants/Species
1.	Allium Cepa	6
2.	Carica Papaya	6
3.	Calendula Officinalis	6
4.	Allium Sativa	4
5.	Pilocarpus	3
6.	Jonosia Asoka	6
7.	Lycopersicum Esculentum	3
8.	Agel Folia	2
9.	Anacardium Orientale	1
10.	Andrographis Penniculata	2
11.	Casia Sophara	1
12.	Cinchona	1
13.	Cocculus Indicus	2
14.	Coffea Cruda	1

Aarihant Homoeopathic Medical College & RI
Bhoyan Rathod.

Principal
Aarihant Homoeopathic Medical College & RI
Bhoyan Rathod, Gandhinagar.

15.	Colocynthis	3
16.	Crocus Sativus	2
17.	Croton Tigrinum	6
18.	Cyndylondectylon	3
19.	Ficus Religeosa	4
20.	Holerrhenaantidystrensica	2
21.	Hydrocotyleasoatoca	2
22.	Justisiaadhavasaka	3
23.	Lobelia Inflate	2
24.	Nux Vomica	1
25.	Occimum Sanctum	6
26.	Opium	2
27.	Raulfiaserpentina	3
28.	Centaureabenedicta	3
29.	Saracaindica	3
30.	Cullen Corylifolium	3
31.	Stramonium	5
32.	Vinca Minor	5
33.	Witheiasomnifera	2
34.	Aloe Socotrina	6
35.	Andrographispenniculata	2
36.	Avena Sativa	3
37.	Azadirachtaindica	3
38.	Berberis Vulgaris	2

Aarihant Homoeopathic Medical College & R.I. SSIU
Bhoyan Rathod.

Principal
Aarihant Homoeopathic Medical College & R.I.
Bhoyan Rathod, Gandhinagar.

39.	Boerhaaviadiffusa	2
40.	Calotropisgigentia	3
41.	Cannabis Indica	3
42.	Cannabis Sativa	3
43.	Capsicum Annum	5
44.	Cardusmarinus	3
45.	Chamomilla	3
46.	Circutavirosa	4
47.	Cinnamomum_	5
48.	Colocynthis	3
49.	Digitalis Purpurea	2
50.	Gymnemasylvestre	3
51.	Hypericumperforatum	3
52.	Ipecacuanha	6
53.	Jatrophacurcas	4
54.	Lathyrussativus	2
55.	Lobelia Inflate	3
56.	Melilotus Alba	2
57.	Menyanthestrifoliata	1
58.	Millefolium	2
59.	Physostigmavenenosum	2
60.	Plantgo Major	3
61.	Rutagraveolens	3
62.	Sanguinara Canadensis	1

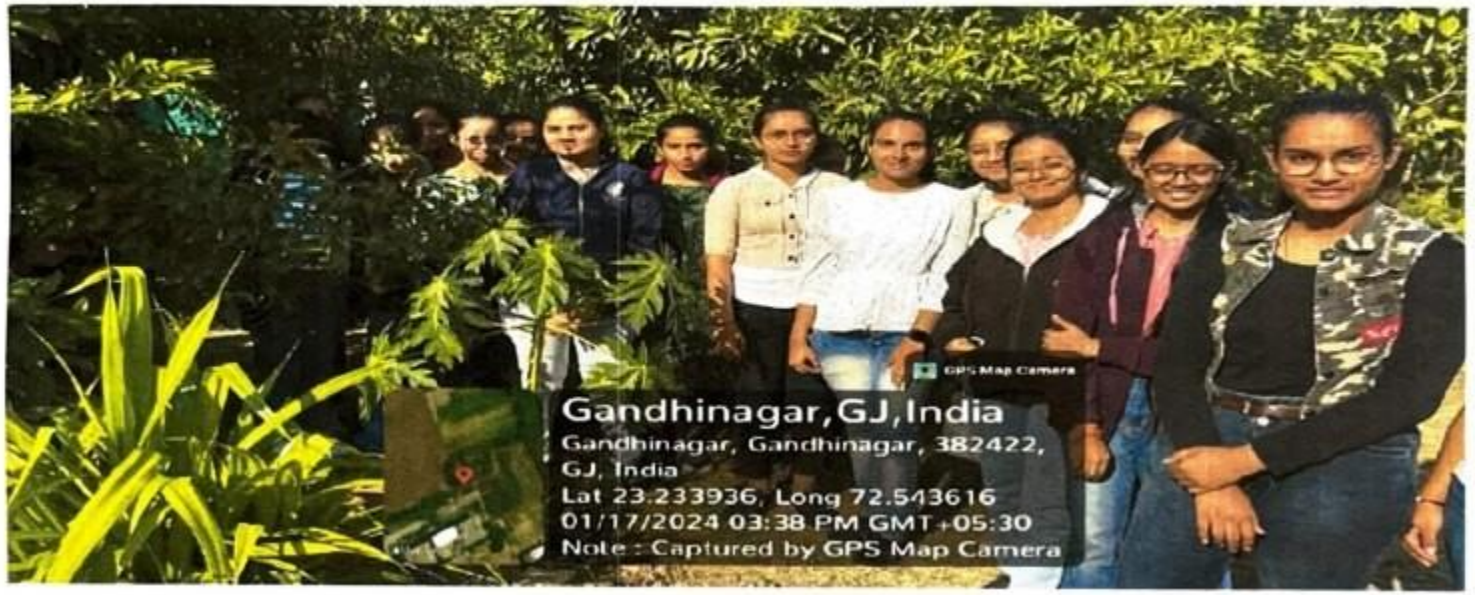
Aarihant Homoeopathic Medical College Bhoyan Rathod.

Principal
Aarihant Homoeopathic Medical College & R.I.
Bhoyan Rathod, Gandhinagar

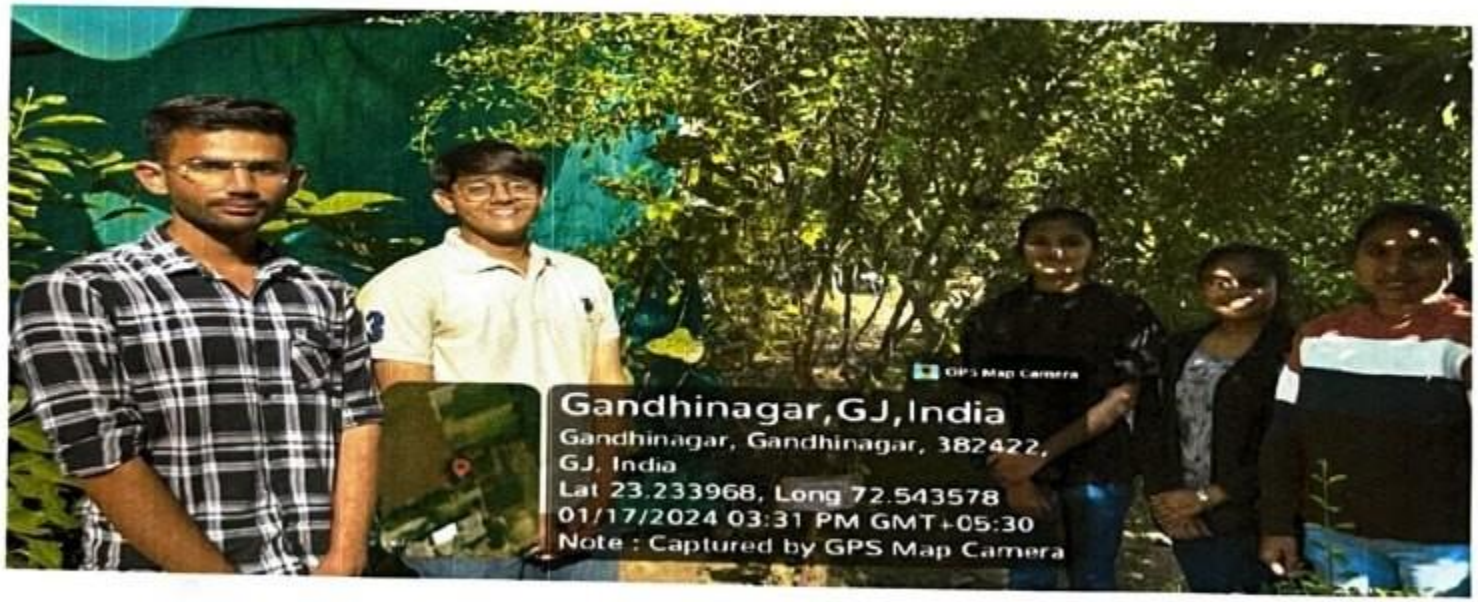
63.	Secelecornatum	4
64.	Terminaliaarjuna	4
65.	Tinosporacardifolia	2
66.	Tribulusterrestris	2
67.	Valerianaofficinalis	2
68.	Verbascum Thapsus	3
69.	Emblica Officinalis	2
70.	Bacopa Monniera	2
71.	Punica Granatum	4
72.	Viola Tricolor	2
73.	Rosa Cafina	1
74.	Thuja	1
75.	Total	220


HERBAL GARDEN


GPS Map Camera
Gandhinagar,GJ,India
Gandhinagar, Gandhinagar, 382422, GJ, India
Lat 23.234083, Long 72.543686
01/17/2024 03:41 PM GMT+05:30
Note : Captured by GPS Map Camera


GPS Map Camera
Gandhinagar,GJ,India
Gandhinagar, Gandhinagar, 382422,
GJ, India
Lat 23.233936, Long 72.543616
01/17/2024 03:38 PM GMT+05:30
Note : Captured by GPS Map Camera


GPS Map Camera
Gandhinagar,GJ,India
Gandhinagar, Gandhinagar, 382422,
GJ, India
Lat 23.233935, Long 72.543598
01/17/2024 03:39 PM GMT+05:30
Note : Captured by GPS Map Camera


GPS Map Camera
Gandhinagar,GJ,India
Gandhinagar, Gandhinagar, 382422,
GJ, India
Lat 23.233968, Long 72.543578
01/17/2024 03:31 PM GMT+05:30
Note : Captured by GPS Map Camera

for
Dr Megha Parmar
K.N. Prajapati.

Aarihant Homoeopathic Medical College & R.I.
Bhoyan Rathod.

Principal
Aarihant Homoeopathic Medical College & R.I.
Bhoyan Rathod, Gandhinagar

3.3 Tree Diversity and Carbon Stock In Swarrnim Startup and Innovation University Campus

Trees are the prevalent component of a terrestrial ecosystem. They provide benefiting function by accumulating atmospheric carbon. A total of 51 tree species with 2107 individuals were identified from Swarrnim Startup and Innovation University campus. The dominant family was Swarrnim (n=622) followed by Teak (n=285) and Terminalia mantaly (n=110). The total carbon sequestered in the entire area is 63.21 T as 6 T ha-1. Swarrnim is emerged as the highest biomass contributor due to its higher number of individuals. The study shows that the tree species found in the campus make an important contribution in conserving diversity and helps to maintain the carbon stock in the University Campus.

The study concluded that tree species richness of the campus is important as it is playing vital role in carbon management.

Fertilizers and organic sprays used for maintenance of lawn and garden per year is approximately 660 kg and 52.5 l per year, as per the data provided by SSIU for the year 2023- 2024. It is recommended to use Organic compost instead of NPK, Micronutrients, UREA etc. as fertilizers**.**

Observations

- Fascinating characteristic of the Swarrnim Startup and Innovation University Campus is its lush green environment with rich floral and faunal diversity.
- Exotic species were observed
- Planted courtyards were observed along the campus
- Water quality for irrigation is to check periodically
- Fully automated irrigation system for entire landscape is done

Suggestions and Recommendations

- Geo tagging of all trees should be done.
- Students should be assigned plants to take care for.
- Each and every tree should be well documented.
- The ecosystem of the campus should be managed properly for a better environment.
- Proper landscape and long-term plan of the vegetational distribution/area is required for sustainable management of the trees and other vegetation in PU campus

3.4 Fauna Status of the university

Biodiversity is the part of the campus. A rich biodiversity not only provides the shelter to many species around the college but also take us closer to the nature and for a student it is very important to connect to nature at every level. The Swarrnim Startup

and Innovation university is home to many different species around the campus. It has a very rich biodiversity. It consists of the following different animals in the campus-

a) **Family Bufonidae**
   i. Common Toad (Duttaphrynus Melanostictus)
b) **Family Dicroglossidae**
   i. Common Bull Frog (Hoplobatrachus Tigrinus)
   ii. Common Skittering Frog (Euphlyctis Cyanophylictis)
   iii. Burrowing Frog (Sphaerotheca Braviceps)
c) **Family Rhacophoridae**
   i. Common tree frog (Polypedates maculatus)
d) **Lizard Family**
   i. House wall lizard (Hemidactylus flavivirids)
   ii. Common Bark Gecko (Hemidactylus leschenaultia)
   iii. Brahmini (Lygosoma punctata)
   iv. Many keeled grass skink (Eutrophics carinata)
   v. Goh or Goyra or Monitor lizard (Varanus bengalensis)
   vi. Girgit or Garden lizard (Calottes versicolor)

e) **Reptiles Family**
   i Indian Rat Snake – (Ptyas Mucosa)
   ii Cobra – (Serpentis)

f) **Birds in the Campus**

Various type of birds are also present in the campus. The faunal diversity under different species groups is mentioned below:

Table 6: List of Fauna

1.	**Scientific Name:** *Tinea sp.* **Common Name:** - Cloth Moth **Classification:** **Phylum-**Arthopoda **Class-** Insecta **Order-** Lepidoptera **Genus-***Tinea*	

2.	**Scientific Name:** *Papilio sp.* **CommonName:-** Butterfly **Classification:** **Phylum-**Arthopoda **Class-** Insecta **Order-**Lepidoptera **Genus-***Papilio*	
3.	**Scientific Name: –** *Helix sp.* **Common Name:-** Gardensnail **Classification:** **Phylum-**Mollusca **Class-**Gastropoda **Order-**Stylommalophora **Genus-***Helix*	
4.	**Scientific Name:** *Rana sp.* **Common Name:** Frog **Classification:** **Phylum-**Chordata **Class-**Amphibia **Order-**Anura **Genus-***Rana*	

5.	**Scientific Name: –** *Calotes sp.* **Common Name:-** Bloodsucker **Classification:** **Phylum-** Chordata **Class-** Reptilia **Order-**Lepidoptera **Genus-***Calotes*	
6.	**ScientificName:–** *Hemidactylussp.* **Common Name: -** Wall lizard **Classification:** **Phylum-** Chordata **Class-** Reptilia **Order-** Lepidoptera **Genus-***Hemidactylus*	
7.	**Scientific Name: –** *Passer sp.* **Common Name:-**House sparrow or Gauriya **Classification:** **Phylum-**Chordata **Class-**Aves **Order-**Passeriformes **Genus-***Passer* .	

8.	**Scientific Name: –** *Columba sp.* **Common Name:-** Bluerock pigeon or Kabutar **Classification:** **Phylum-**Chordata **Class-**Aves **Order-**Columbiformes **Genus-***Columba*	
9.	**Scientific Name: –** *Psittacula sp.* **Common Name: -** Hiramantota **Classification: Phylum-**Chordata **Class-**Aves **Order-**Psittaciformes **Genus-***Psittacula*	
10.	**Scientific Name: –** *Corvus sp.* **Common Name: -** Crow or Kag **Classification:** **Phylum-**Chordata **Class-**Aves **Order-**Passeriformes **Genus-***Corvus*	

11.	**Scientific Name: –** *Pteropus sp.* **Common Name: -** Fruit bat or Chamgadar **Classification: Phylum-** Chordata **Class-** Mammalia **Order-** Chiroptera **Genus-***Pteropus*	
12.	**Scientific Name:** *Funambulus sp.* **Common Name:** Gilhari **Classification: Phylum-** Chordata **Class-** Mammalia **Order-**Rodentia **Genus-***Funambulus*	
13.	**Scientific Name:** *Rattus sp.* **Common Name: -** Black rat **Classification: Phylum-**Chordata **Class-** Mammalia **Order-** Rodentia **Genus-***Rattus*	

Faunal diversity

The faunal diversity under different species groups is listed in Table 7

Table 7: Faunal diversity

Sr.no	Particular
Birds	
1	Acridotherestristis
2	Corvussplendens
3	Spilopeliachinensis
4	Athenebrama
5	Psittaculakrameri
6	Pycnonotusjocosus
7	Halcyon smyrnensis
8	Dendrocittavagabunda
9	Pycnonotuscafer
10	Columba livia
11	Dicrurusmacrocercus
12	Orioluskundoo
13	Eudynamysscolopaceus
14	Milvusmigrans
15	Passer domesticus
16	Ariadne merione
Butterflies	
17	Tirumalalimniace
18	Euthaliaaconthea
19	Mycalesisperseus
20	Melanitisleda
21	Euremahecabe
22	Papiliopolytes
23	Elymniashypermnestra
24	Delias eucharis
25	Euchrysopschejus
26	Danauschrysippus
Ants and wasps	
27	Camponotuswasmani
28	Crematogastersp.

29	Meranoplus bicolor
30	Solenopsisgeminata
31	Plagiolepislongipes
32	Oecophyllasmaragdina
33	Ropalidiaartifex
34	Odynerusfistulosus
35	Scoliaobscura

Observations and Recommendations:

- Biodiversity of the campus is very rich.
- Maximum possible animals should be identified.
- All the identified animals should be well documented.
- Students should be aware about the fauna diversity of the college
- Natural treatment is required for water and wastewater

CHAPTER-04

ENERGY AND CLIMATE CHANGE

4.1 Energy and Climate change

Swarrnim Startup and Innovation University aims to utilize energy efficient appliances. All the lights in the University campus are LED lights thereby maximizing energy efficiency. Street lights are also energy efficient. Exhaust fans installed at various locations too are energy efficient. Being a green building effort have been taken to maximize use of solar energy. University campus is spread into an area of 19.1 acres.

4.2 Renewable Energy Sources in Campus

Solar power plant 230 KW has been recently installed in the campus of the University. All building design are very good for natural light in the room and corridor and other area to minimize the energy load. air ventilation is best in all the building and campus.

1. Solar energy panels are installed over the buildings.
2. Solar Energy Panels is also Installed at the roof of the building that producing clean energy.

Table 9: EnergyEfficient Appliances

Appliance	Percentage
LED Light	100%
Solar power plant	10%
Energy efficient Street light	100%
HVAC	**40%**

4.3 Smart building and Implementation

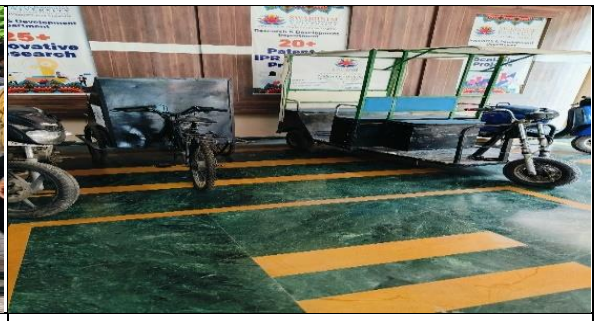
Six requirements for each building:

1 Automation
2 Safety
3 Energy
4 Water
5 Indoor Environment
6 Lighting

Note: One building could be classified as a smart building if it has a minimum of 5 features. Please add the total smart building area from buildings which are classified as smart buildings. The total electricity usage of the Swarrnim Startup and Innovation Campus is **1153160** kWh. Electricity is used for cooling and use of appliances/machinery in main building as well as in the workshops/studios.

4.3 Green House Gas Reduction Program

1. Shuttle Service (Swarrnim Startup and Innovation University, Gandhinagar, India)



2. Renewable energy vehicles(Swarrnim Startup and Innovation University, Gandhinagar, India)

Figure 9: Green House Gas Reduction Program

- Shuttle service for employees and students to reduce usage of vehicles on campus.
- Use of bicycle inside the campus for commuting.

4.4 Number of Innovative Programs in Energy and Climate Change

- At Swarrnim Startup and Innovation University we use Biometric enabled door opening system which enables us to maintain the indoor temperature efficiently.
- Plants are planted in every floor of the University building to ensure that there is proper oxygenation inside.
- In place of solid walls, glass partitions are available to maximize the use of natural light.

Indoor plants for maintaining the oxygen level and promoting sustainability Glass partitions throughout building to save energy and maximize natural light resource and natural cooling

Figure 10: Number of Innovative Programs in Energy and Climate change

CHAPTER-05

WASTE MANAGEMENT & RECYCLING PROGRAM

5.1 Impactful University Program(s) on Climate change

Waste cannot be avoided in any environment. Wastes can be classified as Biodegradable and No biodegradable wastes. Biodegradable wastes include food wastes; which can be easily decomposed by the bacteria in the soil. But no biodegradable wastes are those which cannot be degraded by any Organism and remain as such for many years. Much amount of waste is generated from the college campus.

a) **CANTEEN:** The food waste generated from the canteen and Hostel is collected and sent to the composting pit for the generation of fertilizer.The plastic waste generated is collected by staff of and disposed responsibly by the Gandhinagar Municipal Corporation

b) **LIBRARY:** The most generated waste is paper waste. It is taken for recycling.

c) **OFFICE:** Paper waste generated is recycled and reused.

d) **GARDEN:** Plastic and paper waste is comparatively less but the gardne waste is collected and sent to the composting pit for generation of fertilizer.

e) **AUDITORIUM:** The wastes are collected after each program to collected and given to M.C.I. Vehicles

f) **BATHROOM:** The wastes are collected in dust been and collected and picked by GMC regularly

g) **CLASSROOMS:** Paper Wastes are collected in the wastebasket and recycled.

h) **LABORATORY:** The broken glass wastes and useless instruments are disposed of for recycling after thorough washing.

i) **COLLEGE PREMISES:** Plastic waste generated is usually less. But paper waste is generated in a larger amount by students.

5.2 Recycling Program for University waste

- Swarrnim Startup and Innovation University has an organic waste recycling program, all the organic waste is converted into compost using vermiculture technique.
- Dry and wet waste segregation is done, and the waste is disposed off accordingly.

- At various locations, red dustbins are installed. The e-waste is reuse by students for the assemble of computer or for the repairing purpose, remaining E-Waste which have been not used in future is sent to the E-waste recycling company named E-Coli Waste management Pvt. Ltd.

Separate dustbins for Wet and Dry Waste

Dustbin for bio-medical waste

Figure 11: Recycling Program for University's Waste

5.3 Program to Reduce the use of Paper and Plastic on Campus

- Swarrnim Startup and Innovation University is technology friendly and uses technological interventions in majority of its operations. Attendance is monitored through using Quel Campus Software application thereby reducing the need for maintaining physical attendance registers.
- Swarrnim Startup and Innovation University advocates paperless systems. Majority of the communications take place through Slack communication channel and via emails thereby avoiding unnecessary printing and wastage of paper.
- The University strategic plan too has sustainability goals incorporated in it.

5.4 Organic Waste Treatment

At Swarrnim Startup and Innovation University, Organic waste is produced from the cafeteria, garden and mess. This organic waste is collected, segregated at source and sent it to the Composting pit located in the campus for the production of fertilizer. this fertilizer is then used for the gardening purpouse of the university campus.

5.5 Inorganic and Toxic Waste Treatment

- Red dustbins are used for e-waste segregation at Swarrnim Startup and Innovation University. The e-waste is then disposed appropriately.
- Swarrnim Startup and Innovation University as such does not produce any toxic waste products, however the waste from power backup unit is collected and handed over to local municipal corporation to be disposed off appropriately.

5.6 Sewage Disposal

Sewage treatment plant is installed at Swarrnim Startup and Innovation University, the sewage water is passed through various treatment processes and the treated water is then used for gardening. It helps to control water pollution at University campus and by recycling water polluted water we reduce consmption of the fresh water for the gardening purpose.

5.7 Water Conservation Program implementation

- Swarrnim Startup and Innovation University is situated in Central India in the state of Gujarat and has ample amount of rainfall. The rainwater thus collected on terrace top is collected in pits with the help of pipe system.
- Swarrnim Startup and Innovation University has approximately 07 recharge pits at various locations in the campus for increasing the ground water table.
- At various locations, ponds have been constructed in order to conserve water. These ponds also serve as a water source for migratory birds.

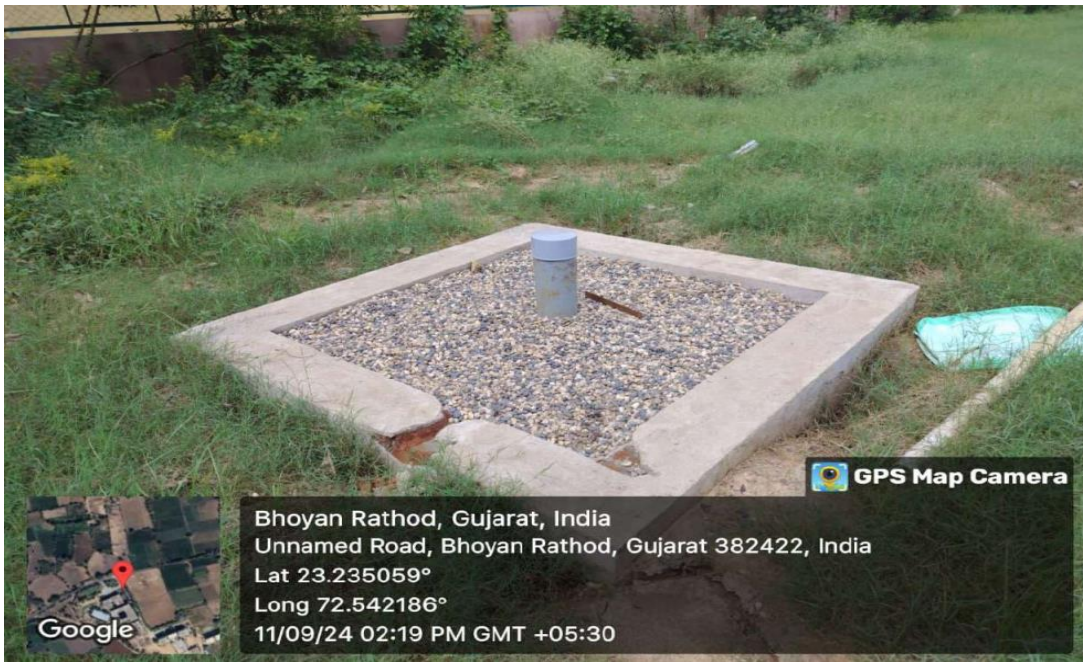


Figure 15: Rain Water Harvesting

5.8 Water Conservation appliances usage

At Swarrnim Startup and Innovation University Campus Automatic flush system is installed in the urinals for saving water and hand water taps are also conserve water.

5.9 Consumption of RO Treated Water

- Swarrnim Startup and Innovation University has a huge Reverse Osmosis Water treatment plant.
- Treated water is used for drinking purposes by faculty/staff and students.
- Water coolers and tanks are installed on every floor of the University building as well as the hostels and cafeteria.

CHAPTER-06

SUSTAINABLE TRANSPORTATION

6.1 Sustainable Transportations and Carbon Footprint

The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method traveled between home and University every day. Our University is exposed to various atmospheric pollutants from vehicles as well as by other external means

a) Vehicles

On the days of data collection, there were 34 cars and 110 bikes in our campus, which in turn proves us that these vehicles may contribute to high carbon dioxide emission.

Table 11: Total Number of Vehicles

No.	Vehicle	Total Number
1	Car managed by the university	30
2	Cars entering the university	30
3	Motorcycles entering the university	150
	Total	210

The total number of vehicles (cars and motorcycles) divided by total campus' Population= 210/900 = 0.23

i. E-Vehicles:

- Swarrnim Startup and Innovation University staff use of E-Vehicle and E-Golf cart within the campus. This promotes lesser carbon footprint as well as makes green campus. All pathways are pedestrian as well as cycle friendly.
- Events such as International Bicycle Day are regularly observed on campus.

6.2 Use of Public Transport

Swarrnim Startup and Innovation University campus is 15kms away from the hustle and bustle of the Gandhinagar city. The University operates 3 shuttle services from the city till the campus. Shuttle service is also available for students to run errands in the city. Most of the students use conveyance for travelling since the school is well connected by conveyance secrecies as local bus company use of Bicycles and conveyance is inspired by the institute amongst the scholars, faculty members, office staff residing nearby are encouraged to return by bicycles, or conveyance which helps in reducing the discharge of carbon- dioxide within the campus.

Parking area

Figure 16: Parking Area at Swarrnim Startup and Innovation Campus

6.3 Program to Limit or Decrease Parking Area on Campus for the Last 3 Years (2021 to 2024)

- Shuttle service is provided for faculty and students thereby decreasing the use of more vehicles.
- Free Bicycles are provided for in campus commuting thereby promoting good health.
- Carpool facility is there amongst faculty thereby decreasing the use of more vehicles.

Figure 17: Program to limit Parking Area at Swarrnim Startup and Innovation

6.4 Pedestrian Path Policies on Campus

- Well-developed pedestrian pathway from entrance to all buildings.
- walking track for maintaining health.
- Well-lit campus with LED street lights for night pedestrians.

CHAPTER-07 WATER MANAGEMENT

7.1 Details Water Management

A water audit is an onsite survey and assessment to determine the water use and improving the efficiency of water use. Conducting a water audit involves calculating water use and identifying simple ways for saving water in the institution on Home. Details of borewell and storages tank is given below

Table 12: Total Number of borewell

Borewell Details				
Borewell SL No	**Location**	**Capacity**	**UOM**	**Quantity**
1	Main Gate	20	HP	1
2	Near Hospital	20	HP	1

Tank Details -2022				
S L NO	**QUANTITY**	**CAPACITY**	**UOM**	**TYPE**
1	09	5000	liters	sintex

Swarrnim Startup and Innovation university with a student and staff population is estimated to consume 650 KLD or 195 million liters annually (as per NBC guidelines-45lpcd). As per the data provided by the Swarrnim Startup and Innovation university, total water consumption in a campus is 350 KLD for academic and 150 KLD for irrigation. It is reported that the water tanks are filled once a day.

The wastewater generated in the University campus is treated in campus and the treated water is used for watering of garden area .

Ideas regarding Water Saving University is:

1 By Tap water leakage control.
2 Use of minimum water needed for daily use.
3 Open the tap less while washing hands.
4 Turn off the taps after use closely & lightly.
5 Install rainwater tanks.
6 Use of water ball for water tanks to prevent overflow of water.
7 Use of solar pumping system so as to save fuel and electricity to save water
8 Saving water helps to reassure our environment. It reduces the energy required to process and deliver water which helps in counseling resources.

8.1 Key Finding

Main water uses in the campus

1 Garden
2 Lab
3 Drinking
4 Cleaning
5 Washing
6 Toilets
7 Hostel
8 Canteen
9 Staff Question Reasons for water wastage
10. Leakages from taps
11. Overuse of water
12. Overflow of water tanks
13. Gardening with pipe instead of sprinkle system

9.1 Observation & Recommendation

- There is no water consumption monitoring system in the University campus.
- The University does not have sufficient wastewater treatment plant for water waste, generated from laboratories, canteen, Hostels.
- There is no rain harvesting system in building. Need of more system in every building of university.
- Automatic switching system is not installed for pump sets used for overhead tank filling.
- Display board against the misuse of water & water leakage
- It is suggested to install following water efficient fixtures in the buildings to save domestic water consumption. Overall, 15-20% domestic water consumption will be reduced by installing and maintaining suggested fixtures:

- **Retrofit flow restrictors in hand washing taps and other taps**: Retrofit high flow rate hand washing taps with 'aerators and flow restrictors' so as to have 3-5 lpm flow rate in hand washing taps and 7 lpm flow rate in pantry and other taps in the buildings.
- **Stop use of tap water in toilet flushing, instead use recycled, treated wastewater.** It is suggested to use low quality water for flushing instead of good quality filtered water.
- **Install 'Tank Bank (For Flush Tanks)' or install with Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks** – In toilets filtered groundwater is used for flushing and about 7-10 litres of freshwater is flushed per flush. To reduce the flushing water per flush, it is suggested to install scientifically designed easy to

install ‘Tank-Bank’ in the existing flush tanks. By just placing tank bank in the flush tank, we displace and save water equal to the space occupied by the tank bank for every flush. This will save about 20% of flush water in toilets. However, the existing 7-10 litres flush tanks can also be replaced by Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks to save water. This will save about 40% of the flush water in toilets.

- Remove damage taps and install sensitive taps if possible
- Drip irrigation for gardens and vegetable levitation can be initiated.
- Water treatment system for Lab water.
- Awareness program on water conservation to be continue.
- Install display boards to control over exploitation of water.
- Sensors should be fitted in all taps.

CHAPTER-08 SOLAR POWER PLANT

9.1 Solar Power Plant:

The survey has been completed there are available sufficient area on main building roof and hostel roof area in premises of institute, and it is suggested to install 230 kW solar plant on building roof area.

Currently there is Roof Top Solar provisions at the college campus. The secrecies as local bus company use of Bicycles and conveyance is inspired by the institute amongst the scholars, faculty members, office staff residing nearby are encouraged to return by bicycles, or conveyance which helps in reducing the discharge of carbon- dioxide within the campus.

Swarrnim Startup and Innovation University has installed capacity is 230 Kw it has generated 1.25 lacs units It contribute 10 % of electric consumption. The Swarrnim Startup and Innovation University has ~7252.48 Sqm of roof area. Assuming even 7-10 % of the roof is dedicated to SPV, there is a potential to install nearly 400 kWp of roof top grid connected SPV. This has a potential to generate about 1000 units every day or nearly 100000 kWh monthly.

This can almost bring Swarrnim Startup and Innovation University to a net zero consumer, as per demand is increase by almost 40%. The Swarrnim Startup and Innovation University make a five-year plan to achieve this, The Swarrnim Startup and Innovation University make a next year plan to go for 330 Kw solar power will contribute 25% of exiting use.

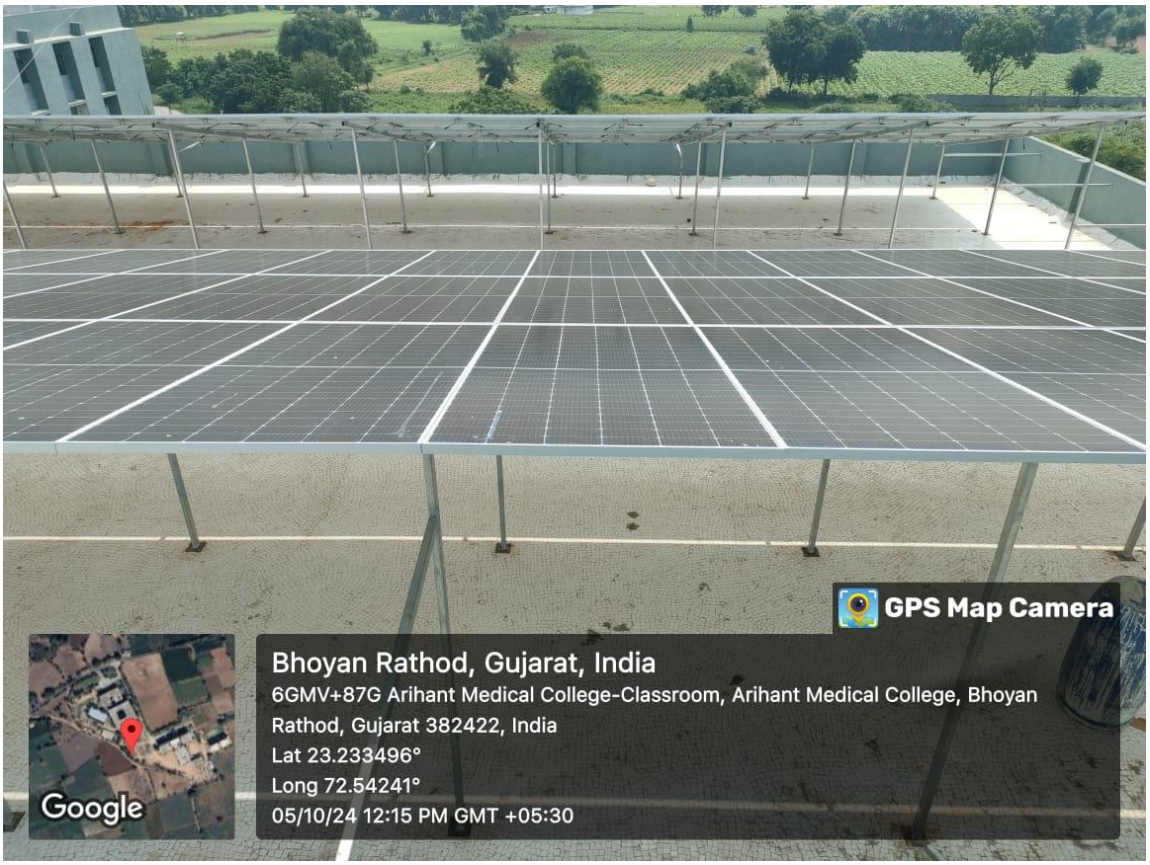
S. No.	Buildings	Recommended PV Solar plants(KW)
01	**Total Roof Top Area Required**	**61.56**

Table 14: 330 kW Solar Power Plant Available area on building roof for solar plant installation

S. No	Parameters	Unit	Value
1	Suggestion to install Capacity of Solar Power Plant	KW	61.56
2	Specific Yield	kWh /year/Kwp	1600
3	Annul Solar Power Generation	kWh /Year	98496
4	Average cost of electricity	Rs./KWh	8
5	Total saving yearly from Solar	Rs /year	679622.4
6	Payback period on investment approx..		2.63
7	Banking Charge (MSME)	Rs. / kWh	1.1

- It is advised to use direct solar pumping at various location like overhead filling , gardening

Figure 22: Solar Panel



SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Green Walk

DATE: 0 5 -06-2023

Objective of the event:

OBJECTIVE –

1. To spread awareness among people regarding adverse effect of plastic and focus on finding solutions to reduce it under thecampaign #BEATPLASTICPOLLUTION
2. To plant more tress & make the earth green.
3. To find out solution to end plastic pollution & accelerate the action towards green environment.

Flow of Event:

1. We started the rally at 10 am from our college.
2. At 10:30 am we started tree plantation.

Significance/Outcome:

1. Students learnt about environmental pollution and methods to reducepollution.
2. World Environment Day 2023 is a reminder that people's actions onplastic pollution matters.
3. They learnt the significance of green environment.

Conclusion:

On 5th June 2023 we Aarihant Homoeopathic medical college & RI organized awareness rally & tree plantation. We spread awareness regarding this year theme #BEATPLASTICPOLLUTION. We successfully planted many trees and contributed our role in making world green and healthy.


AARIHANT HOMOEOPATHIC MEDICAL
COLLEGE & RESEARCH INSTITUTE
Swarrnim Institute of Health Science
Ministry of AYUSH & NCH Approved
Bhoyan Rathod,Gandhinagar
GPS Map Camera
Bhoyan Rathod, Gujarat, India
6GMV+87G Arihant Medical College-Classroom, Arihant Medical College, Bhoyan Rathod, Gujarat 382422, India
Lat 23.232833°
Long 72.543537°
05/06/23 10:02 AM GMT +05:30
Google


GPS Map Camera
Bhoyan Rathod, Gujarat, India
Arihant Medical College-Classroom, Arihant Medical College, Bhoyan Rathod, Gujarat 382422, India
Lat 23.23295°
Long 72.543774°
05/06/23 10:54 AM GMT +05:30
Google

Ref.no.SSIU/2023-24/Report/25 **DATE:20 APRIL 2023**

A BREIF REPROT ENVIRONMENTAL Cell of Swarrnim Startup and Innovation University Has Organized A Campaign On 20th Of April to Create Awareness About The Disadvantages of Using Plastic. The Campaign Was Named As 'Say No To Plastic'.

Conveners:
Dr. Savan Tank, Dr. Sayantani Basu and Dr. Parwathi Pillai,
Department of Chemical and Environmental Engineering.

Environmental Cell of Swarrnim Startup and Innovation University (SSIU) has conducted a campaign on **say no to plastic**
Venue :- SSIU Campus,
Date:-20-04-2023, Time:- 03:00 PM – 05:00 PM
Mode:-Offline mode

Students of Environmental, Mechanical, Chemical, Civil Engineering of SIT and Ayurveda college students, Nursing college students has actively participated in the campaign, With faculty and student coordinators of SSIU they have visited many Departments and colleges in SSIU Campus and distributed the Pamphlets that are been made and collected by the students of above mentioned sections. They made the public aware of destruction caused by usage of plastic, The banner saying the negative impacts of plastic was displayed. **Head Student coordinator of SSIU Salom Shanji and Student had lead the team**. The campaign was a great success. Faculties of that given the positive feedback and students of different sections has said that they had great experience outside the campus and they were happy for the good work they did.

Dr. Savan Tank
SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Introduction
Teacher and students of AHMC & RI took the pledge to water the plant and keep the campus green.

Student's Pledge:
"I promise to take care of the plants on our herbal garden by watering them regularly and helping to maintain a green and beautiful environment. I understand that this is an important part of creating a sustainable and eco-friendly campus, and I am committed to doing my part.

"I will make sure to:
- Water the plants at least once a week
- Check the soil moisture and adjust my watering schedule accordingly
- Report any issues or concerns I have about the plants to the campus authorities
- Encourage my fellow students to join me in taking care of the plants

Teacher's Pledge:
"As a teacher, I pledge to support and encourage my students in their efforts to keep our campus green and beautiful. I will:

- Provide guidance and resources to help students learn about plant care and sustainability
- Encourage students to take ownership of their actions and make a positive impact on the environment

Conclusion
Students understood how plants plays role in our survival and health, improve air and water quality and Enhance our mental and physical well-being. So they took the pledge wholeheartedly to take care of the plants and greenify the campus.