

## CHAPTER – 1


### INTRODUCTION

#### **1.1 Green Audit**

Environmental or Green Audit is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices adopted to meet the environmental requirements (EPA, 2003). In other words, it is a management tool comprising of systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with Institutional policies, which would include regulatory requirements and standards applicable.

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kind now recognize the importance of environmental matter and accept that the environmental performance will be scrutinized by a wide range of interested parties.

Considering the present environmental problems of pollution and excessive use of natural resources, Honorable Prime Minister, Shri. Narendra Modi has declared the Mission of Swachh Bharat Abhiyan. Also, University Grants Commission has mentioned the "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. 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.

  
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## 1.2 Why Green Audit

- To ensure that the performance of the institution with respect to environmental activities is in compliance with existing laws and regulations.
- To check the functionality and their operating success including water supply, energy Related matters and other similar matters that are related to green operations in the campus
- To formulate or update the institution's environmental policy, if warranted.
- To measure the environmental impact of operational process related to green activities in the campus.
- To measure the performance of each green related operation sandactions in the campus.
- To generate a database of green activities for continuous monitoring to assess the success of each of them.
- To identify future potential liabilities.
- To align the institution's developmental and day to day activities with the stated vision, mission, strategies.
- To identify possible ways to reduce expenditure and running costs on equipments, appliances etc. or try enhance revenue income.
- To improve process and materials efficiency, and in response to stakeholder requests for increased disclosure.

## 1.3 Goals of Green Audit

University has conducted a green audit with specific goals as:

- Assess facility of different types of waste management.
- Increase environmental awareness throughout campus.
- Identification and documentation of green practices followed by university.
- Identify strengths and weaknesses in green practices.
- Conduct a survey to know the ground reality about green practices.
- Analyze and suggest solutions for problems identified from the survey.
- Identify and assess environmental risk.
  
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.
  
- To motivate staff or optimized sustainable use of available resources.



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#### 1.4 Objective of Green Audit

The general objective of green audit is to prepare a baseline report on biodiversity and other resources, measures to mitigate resource wastage and improve resource quality and sustainable practices. The specific objectives are:

- To prepare a checklist off Flora and fauna diversity in and around the University campus.
- To suggest measures to improve biodiversity within the University campus.
- To monitor the energy consumption pattern of the University.
- To assess the quantity of water usage within the University campus.
- To suggest sustainable energy usage and water conservation practices.
- To find out various sources of organic and solid waste generation and mitigation possibilities.
- To inculcate values of sustainable development practices through green audit mechanism.

#### 1.5 About Criteria 7 of NAAC

National Assessment and Accreditation Council (NAAC) is a self-governing organization that rated the institutions according to the scores assigned at the time of accreditation of the institution. Green Audit has become a mandatory procedure for educational institutes under Criterion VII of NAAC. The intention of the green audits is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like water and wastewater accounting, energy conservation, waste management, air, noise monitoring, etc. for making the institution eco-friendly.

Students are the major strength of any academic institution. Practicing green action in any educational institution will inculcate the good habit of caring for natural resources in students. Many environmental activities like plantation and nurturing saplings and trees, Cleanliness drives, Rainwater harvesting, etc. It will make the students good citizens of the country. Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.



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### *1.6 Benefit of Green Audit to an Educational Institute*

There are many advantages of green audit to an Educational Institute.

- It would help to protect the environment in and around the campus.
- Recognize the cost-saving methods through waste minimization and energy conservation.
- Empower the organization to frame a better environmental performance.
- It portrays a good image of the institution through its clean and green campus.
- More efficient resource management.
- To create a green campus.
- To enable waste management through reduction of waste generation, solid and waste.
- To create plastic-free campus and evolve health consciousness among the stakeholders & students.
- Recognize the cost-saving methods through waste minimizing and managing.
- Authenticate conformity with the implemented laws.
- Empower the organizations to frame a better environmental performance.
- Enhance the alertness for environmental guidelines and duties.
- Impart environmental education through systematic environmental management approach and improving environmental standards.
- Benchmarking for environmental protection initiatives.
- Financial savings through a reduction in resource use.
- Development of ownership, personal and social responsibility for the University and its environment.
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.
- Finally, it will help to build a positive impression through green initiatives for the upcoming NAAC visit.

  
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### 1.7 Introduction of Auditing Firm


Name of Firm	M/s. Sonar Bharat Environment & Ecology (P) Ltd.
Address	35, C. R. Avenue, 3 <sup>rd</sup> floor, Kolkata - 700012
Contact details	033-40031179

### Details of team Member

Sr. No.	Name	Designation/ Technical	Technical Experience Qualification
1	Shri Parimal Sarkar	Legal Expert	<ul style="list-style-type: none"><li>➤ M.Sc. in Disaster Management</li><li>➤ Post Graduate Diploma in Environmental Law from National Law School, Bangalore</li><li>➤ Lead Auditor in ISO 14000 (Environmental Management)</li></ul>
2	Shri Subrata De Sarkar	General Manager	<ul style="list-style-type: none"><li>➤ General Manager in Central Public Sector undertaking.</li><li>➤ 12 years experience in Environmental Auditing</li><li>➤ Lead Auditor in ISO 50001:2011</li></ul>
3	Shri Suman Chchattaraj	Environmental Specialist	<ul style="list-style-type: none"><li>➤ M.Tech in Environmental Science</li><li>➤ 20 years experience in Environmental Impact Studies</li></ul>

### Energy audit team

SN	Name	Designation/Qualification	Experience
1	Shri Suvra Majumdar	<ul style="list-style-type: none"><li>➤ Post Graduate Diploma in Energy Management (MBA)</li><li>➤ B.Tech (Electrical Engineering)</li></ul>	<ul style="list-style-type: none"><li>➤ 15 years experience of Energy audit</li></ul>
2	Shri Gautam Ghosh	<ul style="list-style-type: none"><li>➤ Diploma in Mechanical &amp; Electrical Engineering from Calcutta Technical School</li></ul>	<ul style="list-style-type: none"><li>➤ 27 Years experience of working in electrical engineering department in different industries.</li><li>➤ 12 years experience in independent electrical auditing</li></ul>

  
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### 1.8 List of Instruments

Following are the instrument used at the time of the Energy Audit.

Sr.	Instrument	Make/Sr.No.
1	Digital LUX Meter	HTC/2222600
2	Digital Micro OHM Meter	Innova I-259
3	Digital Multi Meter	KusamMeco/162180630
4	Digital Clampmeter	Waco/1910149152
5	Meget	Waco/307421
6	Load analyser	Waco/2954563

### 1.9 List of Laboratory Instruments for Environmental Monitoring

Sl. No.	Name of Equipment	Make	Model
1	GAS CHROMATOGRAPH WITH FID, TSD	VARIAN	CP3800
2	GAS CHROMATOGRAPH MASS SPECTROMETER WITH ECD	VARIAN	CP 3800 SATURN 2200
3	GAS CHROMA TOGRAPH WITH FID for Air	DANI	Master GC
4	ION CHROMATOGRAPH	Thermo Fisher Scientific	DIONEXICS 1100
5	H.P.L.C.	VARIAN	SERIES 200
6	FTIR	Thermo Fisher Scientific	Nicolet IS10
7	ATOMIC ABSORPTION SPECTROPHOTOMETER	VARIAN	AA 2406TA 120
8	MERCURY ANALYSER	EC	MAS 5840
9	FLAME PHOTOMETER	LOWERANCE & MAYO	381
10	SPECTRO PHOTOMETER	VARIAN	CARY 50
11	BOD INCUBATOR	MULTISPAN	DIGITAL
12	ELECTRONIC MICRO BALANCE	Citizen	CMSF

### 1.10 List of Field Equipments in Environment Department

Sl. No.	Name of Equipment	Make	Model
1	Field Dust Sampler	Envirotech/LataEnvirotech	APM – 550, PM 2.5 & 10
2	Respirable Dust Sampler	Envirotech/LataEnvirotech	APM-460BL
3	Stack Kit Sampler	Envirotech/LataEnvirotech	APM-620, PM-602
4	Sound Level Meter (AUTOMEDTIC)	Envirotech	SLM-101
5	Sound Level Meter	Lutron	SLM-4001
6	Local Air Quality Sampler	Vayubodhan	APM-414
7	Auto Metric Whather Monitor	Spectrum Technology	WM-272
8	Depth Sampler	NA	NA

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*1.11 General steps involved in Green Audit*

1. Systematic and exhaustive data collection.
2. Evidence based documentation of activities.
3. Regular monitoring.
4. Provide standards and methods for improvement by establishing cost effective Green action plan.



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## CHAPTER – 3

### GREEN AUDIT METHODOLOGY

#### *3.1 Pre Audit stage*

A pre-audit meeting provided an opportunity to re-inforce the scope and objectives of the audit and pre-audit discussions were held on the basis of green initiatives taken and the current scenario of the University campus. The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself.

#### *3.2 Objectives of Green audit*

The basic objective of green audit is to promote environment management and conservation in the University campus. Purpose of the audit is to identify, quantify, describe and prioritize the framework of environmental sustainability in compliance with the applicable regulations, policies and standards. Major objectives of carrying out green audit are:

- To introduce an awareness among the students regarding real concern so environment and its sustainability
- To secure the environment and cut down the threat supposed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.
- To enhance the carbon foot print in the locality and reduce pollution for sustainable environment.

#### *3.3 Audit stage*

Green Audit was done with the help of co-associates involving different student groups, teaching, and non-teaching staff. The green audit began with the teams walking through all the different facilities at Swami Vivekananda Institute of Science & Technology (SVIST), determining the different types of appliances and utilities as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency, or general characteristics of certain appliances. Data collection was done in these sectors such as Energy, Waste, Green Area, Carbon footprint, and Water use. Records and documents were verified several times to clarify the data received through survey and discussions.



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### *3.4 Methodology*

In order to perform green audit, methodology included different techniques such as physical inspection of the campuses, observation and review of the documentation, interviewing key persons and data analysis, measurement of the present status of environment management in the campuses:

- Water quality assessment, consumption and management
- Air quality assessment and management
- Electricity consumption and management
- Sound pollution monitoring
- Waste management
- Bio diversity status of the campus
- Land use and land coverage
- Rain water Harvesting
- Use of alternate energy

### *3.5 Survey by Questionnaire*

Baseline data for green audit report preparation was collected by questionnaire survey method. Questionnaires are prepared to conduct the green audit in the campus based on the guidelines, rules, acts, and formats prepared by the Department of Environment, Government of West Bengal and other statutory organizations. Therefore, using these guidelines and formats, combinations, modifications, and restructuring were done and sets of questionnaires were prepared for land use, energy, water, air, sound, and waste management.

### *3.6 Onsite visit observations*

Personal observations were made during the onsite visit. All the amenities were clubbed in, as per their similarities and differences, which makes the survey and further analysis easier. After the collection of secondary data, the reviews related to each environmental factor were taken by the green audit team. The data were tabulated, analyzed and graphs were prepared. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. Finally, all the information was compiled in the form of the Green Audit Report.

### *3.7 Data analysis and final report preparation*

The filled questionnaires of the survey from each group were tabulated as per their modules, in Excel spreadsheets. The tabulated data is then used for further analysis. A graphical representation of these results was made to give a quick idea of the status. Interpretation of the overall out comes was made which incorporates all the primary and secondary data, references, and inter relations within. Final report preparation was done using this interpretation.



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## CHAPTER - 4

### LAND USE ANALYSIS

#### **4.1 GENERAL OVERVIEW OF THE CONCEPT OF LAND USE:**

Land use refers to man's activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape.

#### **4.2 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 field survey

#### **4.3 CLASSIFICATION SCHEME FOR LAND USE ANALYSIS OF BUILT UP AREA**

Level-I	Level-II
1. Built- up land area	1.1 Dense 1.2 Moderate 1.3 Sparse

Therefore, attempt has been made in this study to map land use for Swami Vivekananda Institute of Modern Science with a view to detect the land consumption in the built-up land area.

### **LAND USE DATA OF UNIVERSITY OF SWAMI VIVEKANANDA INSTITUTE OF MODERN SCIENCE**

CATEGORIES OF LAND USE	AREA IN SQ METRES
OPEN SPACE AND PLANTATION	1154.51
Ground Coverage	11067.00
TOTAL AREA	12221.51

Ground coverage of 90.55% ( i.e 11067 sq. mtr.) consists of the buildings.



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## CHAPTER - 10

### BIODIVERSITY STATUS

#### *10.1 Introduction*

Swami Vivekananda Institute of Science & Technology (SVIST) campus is very rich in the term of biodiversity. To conserve this biodiversity, our first need is to learn about the existing diversity of the place. Unless we know whom to conserve, we will not be able to plan proper conservation initiatives. Also, it is important to have an understanding of the biodiversity of an area so that the local people can be aware of the richness of biodiversity of the place they are living in and their responsibility to maintain that richness.

#### *10.2 Objective*

The main objective of this study is to get a baseline data of bio-diversity of the area which will include:

1. Documentation of the floral diversity of the area: its trees, herbs, shrubs, climbers and aquatic vegetations, submerged & floating aquatic plant.
2. Documentation of the major faunal groups like mammals, reptiles, amphibians, birds and among the insects, butterflies and dragonflies.

#### *10.3 Method of Study*

**Brief methodology for the floral and faunal survey is given below:**

01. Sampling was done mostly in random manner.
02. Surveys were conducted for the maximum possible hours in daytime.
03. Tree species were documented through physical verification on foot and photographed each species as much as possible.
04. The total area was surveyed by walking at daytime.
05. For faunal species we emphasized mainly on the direct sighting. Also call of various birds and amphibians and nesting of some faunal species were considered as direct evidences.



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06. Observing mammals depend critically on the size of the species and its natural history. Diurnal species are common and highly visible. Nocturnal species, however, are rare and difficult to detect. Small mammals like the field rats were found near their burrows, particularly during their entry or exit times in or out from their burrows respectively. In some cases, deposits and footprints were also observed that served as a potential clue for the presence and absence of the concerned species. The secondary evidences were all noted with time and space coordinates.
07. Birds are often brightly colored, highly vocal at certain times of the year and relatively easy to see. Sampling was done on the basis of direct sighting, call determination and from the nests of some bird species.
08. Reptiles were found mostly by looking in potential shelter sites like crevices of building, logs, tree hollows and leaf litter and also among and underneath the hedges. Sometimes some species, particularly the garden lizards were also observed in open spaces (ontwigs and branches and even on brick constructions) while they were basking under direct and bright sunlight.
09. Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were searched near pond, road beside wetland and in other possible areas. Diurnal search operations are also successful.
10. Active invertebrates like the insects require more active search. For larger winged insects like butterflies, dragonflies and damselflies, random samplings were carried and point sampling was also done.
11. The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or microhabitat. Searching was carried out under stones, logs, bark, crevices in the walls and rocks and also in leaf litter, dung etc. slugs and snails are more conspicuous during wet weather and especially at night when they were found using torch.



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#### 10.4 Plant diversity of the Institute

Swami Vivekananda Institute of Modern Science premises having about 3.02 acres of land have unique plant diversities. These include flowering plants, leafy trees, medicinal herbs and innumerable wild bushes. There are valuable trees like Bamboo, Jackfruit, banana, Mango, Guava etc.



Figure 9 : Plant diversity of institute

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## List of the Major Plants of the Garden

SL. NO.	COMMON NAME	SCIENTIFIC NAME
1	Jackfruit	<i>Artocarpusheterophyllus</i>
2	Bamboo	<i>Bambusa Tulda Roxb</i>
3	Papaya	<i>Carica Papaya</i>
4	Guava	<i>Psidium Guava</i>
5	Devil's Ivy	<i>Epipremnum aureum</i>
6	Lemon	<i>Citrus aurantium</i>
7	Jamun	<i>Scyvgiumcumini</i>
8	Mahogany	<i>Swietenia</i>
9	Pata Bahar	<i>Soleus Scutellario ides (L) Benth</i>
10	Banana	<i>Musa Paradisiacum</i>
11	Aubergine	<i>SolanumbMelongena</i>
12	Mango	<i>Mangferabundica</i>
13	Rice	<i>Oryza</i>
14	Karela	<i>Momordica Charantia</i>
15	Avocado	<i>Persea</i>



Figure 10 : Major Plant diversity of the institute

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SL. NO.	COMMON NAME	SCIENTIFIC NAME	USES
1	Ghratakumari	<i>Aloevera</i>	Skin, Hair, Blood Sugar
2	Haldi	<i>Turmeric</i>	Skin, Wounds
3	Tulsi	<i>Ocimum sanctum</i>	Leaf
4	Green Chiretta	<i>Andrographis paniculata</i>	Liver
5	Kulephara	<i>Hygrophila schull</i>	Whole plant
6	Grikumari	<i>Aloe vera</i>	Leaf
7	Thankuni	<i>Cantella asiatica</i>	Leaf
8	Nayantara	<i>Catharanthus roseus</i>	Whole Plants
9	Neem	<i>Azadirachta indica</i>	Bark, Leaf, Young Stem, Unrippedfruit, Seed Oil
10	Basak	<i>Adhatodavasika</i>	Leafd, Flower, Bark, Root
11	Thankuni	<i>Cantella asiatica</i>	Leaf



Figure 11 : Medicinal Plant of the institute

  
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### 10.5 Checklist of Reptiles

Sl. No.	Common name	Scientific Name	Bengali Name
1	Checkered Keelback	<i>Xenochrophis piscator</i>	Joidhora
2	Buff Striped Keelback	<i>Amphisma stolatum</i>	Hele
3	Rat Snake	<i>Zamenis longissimus</i>	Darash
4	Skink	<i>Lampropholis sp.</i>	Anjani
5	Oriental Garden Lizard	<i>Colotes versicolor</i>	Girgiti
6	Common House Gecko/Gekko	<i>Hemidactylus frenatus</i>	Tikkli
7	Monitor lizard	<i>Varanus indicus</i>	Gosap



Figure 12: Images of Reptiles

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## BIRD Species

SL. NO.	Scientific Name	COMMON NAME
1.	<i>Columba livia</i>	Rock dove
2.	<i>Dendrocitta</i> Sp.	Rufous Treepie
3.	<i>Copsychus</i> Sp.	Oriental Magpie Robin
4.	<i>Centropus sinensis</i>	Crow Peasant
5.	<i>Chrysocolaptes</i> Sp.	Greater Flameback
6.	<i>Corvus macrorhynchos</i>	Jungle Crow
7.	<i>Amaurornis phoeniceus</i>	White-breasted Waterhen
8.	<i>Lonchura punctulata</i>	Scaly Breasted Munia
9.	<i>Pycnonotus Jocosus</i>	Shipoy bulbul
10.	<i>Hierococcyx varius</i>	Common Hawk Cuckoo
11.	<i>Dicrurus</i> Sp.	Black Drongo
12.	<i>Treron phoenicoptera</i>	Yellow Footed Green Pigeon
13.	<i>Passer domesticus</i>	House sparrow
14.	<i>Turdoides striatus</i>	Jungle babbler
15.	<i>Merops orientalis</i>	Green Bee-eater
16.	<i>Upupaepops</i>	Hoopoe
17.	<i>Milvus</i> Sp.	Black kite



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Figure 13: Local Birds

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Figure 14 Campus Grass

### 10.8 Checklist of Mammals

Sl. No.	Common Name	Scientific Name	Bengali Name
1	Indian palm squirrel	<i>Funumbulus sp.</i>	Kathberali
2	Frugivorous bat	<i>Suborder Megachiroptera</i>	Badur
3	Insectivorous bat	<i>Suborder Microchiroptera</i>	Chamchike
4	House mouse	<i>Mus musculus</i>	Indur
5	Rat	<i>Rattus norvegicus</i>	Dhere indur
6	Dog	<i>Canis lupus familiaris</i>	Kukur
7	Cat	<i>Felis catus</i>	Biral



Figure 15: Mammals

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### 10.9 Checklist of Ferns and Seasonal Flowers

Sl. No.	Local name	Common Name	Scientific Name
1.	Ganda	Marigold	Tagetes
2.	Pituma	Petunia	Petunia hybrid
3.	Dayantaras	Pink	Dianthus
4.	Dalia	Dahlia	Dahlia
5.	Golap	Rose	Rosa
6.	Castmas	Cosmos	Cosmos
7.	Astar	Tartarian	Aster Tataricus
8.	Bel	Beli	Aegle marmelos
9.	Nayantara	Bright eyes	Catharanthus roseus
10.	Jaba	Chinese Hibiscus	Hibiscus rosa-sinensis L.
11.	Seuh	Coral Jasmie	Nyctanthes arbor-tristis
12.	Kochia	Kochia	Bassia scoparia



Figure 16: Flower

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## CHAPTER - 11

### GREEN INITIATIVES

Swami Vivekananda Institute of Modern Science aims to protect and conserve its biodiversity, fresh and clean ambience through the following green initiatives to protect and conserve nature.

#### *11.1 Plantation and Nurturing Programme*

Plantation programme of Swami Vivekananda Institute of Science & Technology (SVIST) promotes environment management and conservation in the college campus with the following objectives:

- i) To motivate the students to keep their surroundings green and clean by undertaking plantation of trees.
- ii) Promote ethos of conservation of water by minimizing the use of water.
- iii) Motivate students to imbibe habits and life style for minimum waste generation, source separation of waste and disposing the waste to the nearest storage points.
- iv) To create awareness amongst public and sanitary workers, so as to stop the indiscriminate burning of waste which causes respiratory diseases.
- v) To minimize the use of plastic bags, not to throw the in public places as they choke drains and sewers, cause water logging and provide breeding ground for mosquitoes.
- vi) Organize tree plantation programmes, awareness programmes such as Quiz, essay, painting competitions, rallies, nukkad natak etc. regarding various environmental issues and educate children about re-use of waste material & preparation of products out of waste
- vii) Organize Nature Trail in Wild Life Sanctuaries Parks Forest are as to know about the Bio-diversity.



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Figure 17. Plantation Programme

### 11.2 Green computing practice

Being an academic institution, papers are used for various purposes like exam answer sheets, circulars, notices, office work, document printing, and Xeroxing. Since the trees are cut for paper manufacturing, the sequestration of carbon is reduced increasing carbon footprint. To cut down the carbon footprint, the university administration and various departments follow paperless methods of communication by using emails, online forms submission, etc. The paperless work was helpful in reducing tons of CO<sub>2</sub>. The tons of biomass are saved by this green computing practice.

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## CHAPTER - 13

### CONCLUSION AND RECOMMENDATIONS

Green Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problem. Green Audit is one kind of professional approach towards a responsible way in utilizing economic, financial, social and environmental resources. Green audits can "add value" to the management approaches being taken by the University and is a way of identifying, evaluating and managing environmental risks (known and unknown). There is scope for further improvement, particularly in relation to waste, energy and water management. The University in recent years consider the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the University does perform fairly well, the recommendations in this report highlight many ways in which the University can work to improve its activities and become a more sustainable institution.

#### *13.1 Suggestions*

- a) Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- b) Increase recycling education on campus.
- c) Increase awareness of Environmentally Sustainable Development – Use every opportunity to raise public, government, industry, foundation, and University awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
- d) Collaborate for Interdisciplinary Approaches – Convene University faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula research initiatives, operations, and outreach activities that support an environmentally sustainable future.



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### 13.2 Recommendations

- a) General housekeeping needs to be improved. Scrap, waste materials were found scattered all over the campus. These needs to be accumulated and kept in designated place. Awareness programmes should be conducted more frequently. Inter class competition on cleanliness drive can be thought out.
- b) Noise Level Monitoring shall be done as per the guideline of "Noise Pollution (Regulation and Control) Rules 2000"
- c) The Biodiversity is to be maintained while considering the plantation in future
- d) Awareness among students and staff about green environment shall be done use tools like display boards.
- e) Parking zone of University shall be neat & clean
- f) The University campus being located on main arterial road is prone to heavy air and noise pollution which will increase over the passage of time. In order to combat, trees with broad leaves like Sal, Teak, Kadam etc. are to be planted around the boundary of the campus.

### Fire Extinguisher

- Fire extinguisher are required to be kept within the Institute campus area.
- At least two 10 kg capacity extinguisher is to be placed on each end of the floor.
- Regular refilling should be ensured and date of refilling should be clearly marked.

### Drinking Water

- Drinking water, Noise, Ambient Air quality monitoring is to be conducted through approved vendor of the West Bengal Pollutin Control Board (WBPCB).



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### Solid Waste

- Vermicompost should be installed at a designated place in the Institute.
- More dustbin should be arranged on every floor of the College

### E-Waste

- A separate enclosure needs to be made for storage of scrap and E-waste materials.
- As per the guidelines of Pollution Control Board, (P.C.B.) E-Waste is to be disposed of through approved vendors of the P.C.B.
- The College should take steps for disposal through the approved vendors.

### Rain Water Harvesting System


- The College has taken steps for Rain Water Harvesting system, it will be complete within 6 months.

### Medicinal Garden

- Medicinal Garden should be kept clean.
- Systematic plantation program should be drawn and implemented.

### Energy Consumption

- Sensor light may be fixed in the toilets for conservation of energy.
- Replace incandescent and CFL lamps with LED Light
- Replace LCD computer monitors with LED monitors.
- Cleaning of tube lights/bulbs should be done on a regular basis to remove dust.

  
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For all the assistance provided to the audit team of Sonar Bharat Environment & Ecology Pvt. Ltd.



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Date : 09.05.2023

**GREEN AUDIT CERTIFICATE**

- Name of Work Project : **Swami Vivekananda Institute of Modern Science**  
Dakshin Gobindapur, P.S. Sonarpur, Kolkata - 700 145.
- Duration of Audit : 29.11.2022 to 06.12.2022
- Period of Audit : 2022-2023
- Sonar Bharat Environment & Ecology Pvt. Ltd. has conducted Green Audit in the campus of **Swami Vivekananda Institute of Modern Science**, Sonarpur, P.S. Sonarpur, Kolkata - 700 145.
- With the cooperation of faculty members and other staff audit has been successfully completed.

*Subrata Desarkar*

**Subrata Desarkar  
(Auditor)**



*Parimal Sarkar*

**Parimal Sarkar  
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*Principal*

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