GREEN AUDIT REPORT 2019-21

St. Andrew's College of Arts, Science & Commerce, St. Dominic Road, Bandra (W), Mumbai– 400 050.

Green Audit Conducted By
Archdiocesan Office for Environment (AOE), Mumbai

Technical Expert: Mr. Avick Sil (Regional Director),
Environment Policy and Research India (EPRI)

Report by: Ms Deepika Singh, Secretary
Archdiocesan Office for Environment (AOE), Mumbai
& Team

ACKNOWLEDGMENT

The overall objectives of a Green Audit (GA) of a campus are an assessment of the environmental sustainability of its current policies and practices, identification of opportunities to improve and make the campus environment-friendly as possible, while raising awareness on environmental issues and sustainable practices among the campus community. Keeping these objectives in mind, AOE along with ICOR and Samuchit Enviro Tech, Pune had developed the tool for Green Audit in 2014. Thereafter the colleges and campuses audited comprises of Nirmala Niketan College of Home Science and Polytechnic, Churchgate, Mumbai in 2014, 2019, St Andrew's College of Arts, Science & Commerce, Bandra, Mumbai in the year 2015, In 2016, green audit of Poona Diocesan Corporation Bishop's House Campus (comprising of 11 institutions on the Campus) was conducted with an aim to assist in "greening the Campus". The Green Audit of Symbiosis College of Arts and Commerce, Pune was also completed by November 2016. Green Audit of Vinayalaya, a spiritual centre was undertaken in 2020 but due to Pandemic situation it was kept on hold and which one will soon completed.

This green audit process of St Andrew's College of Arts, Science & Commerce, Bandra, Mumbai in 2021 meant the involvement and collaboration of many organizations and individuals to whom we are grateful. At the outset, we are grateful to Dr. Marie Fernandes, the Principal of the College who has taken much interest in the Green Audit of the College in spite of her hectic schedule.

A number of people have been responsible for this audit. Due to the pandemic situation and Covid 19 protocol, almost all work has shifted to the online mode and a special thanks to the Heads of all the departments, the admin staff and the coordinating team of the of St Andrew's College for this green audit exercise could not have been completed without their support and cooperation in providing data as well as their valuable inputs and feedback.

We thank Ms. Deepika Singh who was responsible to coordinate the Green Audit exercise and was responsible for sharing the updated tool, to initiate the audit exercise, data compilation and analysis, sharing the draft report, finalizing and delivering the final report to the College.

One person who needs special mention is Mr. Avick Sil, Regional Director at Environment Policy and Research India (EPRI) ENVIRO POLICY RESEARCH INDIA PVT LTD who is our consultant and technical expert and who is always willing to extend support and guidance to the audit team for the green audit projects.

We are thankful to Ms. Juliet Maben and Rosabell Anamma for their assistance in finalizing the report and Viveka Anand Singh, (*Intern*) a Btech in Electronics and communication, Third year

(6th semester) from Birla institute of technology, BIT Mesra, Jaipur Rajasthan for the help in editing the report.

Our final thanks to the management of the St. Andrew's College of Arts, Science & Commerce, Bandra for entrusting AOE with conducting this green audit of the College.

Bishop Allwyn D'Silva

Bishop in Charge: Archdiocesan Office for Environment (AOE)
Chairperson: CCBI Commission for Ecology
Coordinator: FABC 50
EX: Exec Secretary: FABC (Federation of Asian Bishops Conferences)-CCD (Climate Change Desk) & OHD (Office for Human Development)

September, 2021

LIST OF CONTENTS

CHAPTER 1

Green Audit: The Concept

The Preamble

The challenge of the 21st century is to devise developmental pathways that would have zero or minimum impact on the environment. This is no longer an option, but a necessity in view of the natural disasters impacting humanity that are a direct consequence of human action. From this perspective, it is imperative to understand the implications of our lifestyle choices, as well as resource and energy use patterns for the environment. This understanding will also lead us to find ways and means of reducing the adverse impact on the environment. Environmental audit is a useful tool from this perspective, similar to financial audit; environmental audit also depends on systematic and objective documentation and periodic evaluation.

The decision to focus on educational institutes for conducting green audit was mainly because an educational institute bears "a profound moral responsibility to increase in the youth the awareness, knowledge, skills and values needed to create a just and sustainable future" (Essex Report, 1995: 5). This exercise is also an opportunity to have an overview of the policies and practices of an institute. The tool not only helps audit the environmental impact (including energy, water and materials use) of any institute, educational campus or residential locality but also guides the management regarding what data needs to be maintained in order to improve the auditing process itself. It is expected that iterations of the audit process will bring out a clearer and more accurate picture of the environmental impact, and will therefore help in identifying specific action strategies for maximum positive outcomes.

Background

AOE has been working on awareness-building and education on environmental issues and climate change since inception. In the process of engaging with communities and educational institutes basically with the college youth creating environmental consciousness, we have designed and experimented with various training modules and projects.

We have networked with various partners who are working engaged with various eco-systems based vulnerable communities building their capacities through studying, analysing, discussing the local issues and engaging through community work or advocacy work. AOE has also been successful in many innovative collaboration such as greening initiatives undertaken at Our Lady of Nazareth parish and school at Bhayander under "Green Parish" which included several activities like "terrace gardening", environmental syllabus for all classes, green saving, healthy and nutritious food in the school canteen, etc.

Green initiatives were also launched at St. John the Baptist Church in Thane. These initiatives included training workshops for Christian community leaders and formation of an Eco-Club in

the parish. Initiated a student-driven environmental activity named “Green Audit” with an aim to educate and provide an opportunity to college youth to understand and evaluate environmental practices and policies of various institutions. It helps them learn about environmental degradation, the impact of lifestyles on the environment and sustainability issues.

Rather than just acquiring procedural knowledge of an audit, it was more about understanding how various human practices impact the environment, how concepts of ecological sustainability play out in the "real" world by seeing just how much energy, water, paper and other materials and resources a home, institute or office building consumes daily and how much garbage and global warming it produces. It was an exercise basically oriented to educating students, which helped them see for themselves in concrete terms what have mostly been abstract concepts about global warming, pollution, garbage, energy efficiency, etc. and the connections to politics and economics as a bottom line.

Thus the concept of Green Audit has basically emerged from our engagement with the communities from various eco systems, faith communities, educational institutes and the youth. Engaging the institute’s key personnel’s in the entire green audit exercise is one of the main features making the audit a participatory exercise from the start. The De-briefing /concluding session for sharing of the draft report is a friendly discourse which highlights good practices and offers recommendations to reduce the ecological footprint of the campus.

The aim is to help the institute/campus to become a “Model Green Campus”, guiding and enabling students, communities and institutions to adopt environmentally transformative behaviours. The main Auditor Ms Deepika Singh is also the project coordinator of Climate Change Desk (CCD) /Office of Human Development (OHD) of The Federation of Asian Bishops Conference (FABC), a platform which connects with the whole of Asia with specific reference to Climate Change - impacts as well mitigation, adaption actions, and initiatives in the region.

Future Plans

AOE engages with educational institutions, diverse faith communities and youth on climate change and issues around environmental concerns with a major focus on reducing ecological footprint. AOE is the nodal agency for carrying out the “Greening of the Archdiocese” which was announced in September 2018. We also plan to continue offering internships to students of higher education and capacity enhancing services to educational institutes, faith based communities and interested individuals for the assessment of their own environmental practices and policies, and to facilitate and minimize their ecological footprints. Further, we also aim to build a network which can offer services to members in attaining higher levels of “greening” their homes, campuses and localities.

CHAPTER - 2

Green Audit: The Process

Pre-Audit Process

As mentioned earlier that an overall objectives of a Green Audit (GA) of a campus are an assessment of the environmental sustainability of its current policies and practices, identification of opportunities to improve and make the campus environment-friendly as possible, as well as raising awareness on environmental issues and sustainable practices among the campus community. Towards this end AOE has been engaging with the educational and other campuses with a very its unique and interesting project namely "green audit". The tool was developed in 2014 following which about 13 (+1 under process) have been conducted.

The above mentioned list of education and other campuses also includes St Andrews College, Bandra, Mumbai; the green audit was conducted in the year 2015. Therefore in the current green audit 2021 it is important also to review if the recommendations of the previous green audit were helpful for the College in greening the campus.

Step 1: Initiating Green Audit*: March- April 2021*

In month of March 2021 communication between AOE and Dr Marie F the Principal of the St Andrews College, Bandra (*henceforth referred to as the College*) was initiated regarding conducting the green audit of the college.

The green audit team had a telephonic discussion as everything is still being operated from an online mode. It was decided that the green audit team will comprise of the following: Mr. Avick Sil: Regional Director at Environment Policy and Research India (EPRI) ENVIRO POLICY RESEARCH INDIA PVT LTD: will be the consultant, technical support and provide guidance to the audit team as and when necessary in conducting the Green Audit.

Ms. Deepika Singh is the coordinator for the Green Audit exercise and will be responsible for sharing the updated tool, to initiate the audit exercise, data compilation and analysis, sharing the draft report, finalizing and delivering the final report to the College.

Ms Viveka Anand Singh an engineering student (an intern) would be responsible to edit the draft report and continue assisting the audit team as and when required. The Audit Team is responsible in compilation of data, data analysis, preparing draft and final report.

After basic discussions with the College final decision was made and a formal request was received from the College in month of May to initiate the green audit process. Accordingly an updated tool for gathering data was shared with the College.

This being an initial step in conducting the audit the focus was on clarification of concerns from the staff on the questionnaire and the green audit exercise. The questionnaire for the audit was shared with the College with the request to share issues or concerns if any for further clarification.

The updated tool consisted of the following areas under consideration for the audit exercise and data collection:

- Energy Management
- Water Management
- Material Management – Consumables
- Waste Management
- Pollution Management
- Travel and Transport Management
- Knowledge Management
- Ecology Management
- Disaster Preparedness

Step 2: Data collection: *May –June2021*

As a participatory approach it is mandatory to orient and engage various stakeholders such as HOD's and students teams in conducting the green audit. Due to Covid 19 protocol the site visit, face to face discussions with HODs and engaging student's team was not possible. However the updated tool was shared with the College with request for personal study to identify issues or concerns if any for further clarification and initiating the data collection process. The data collection was initiated in month of May itself and gathered data was shared with the audit team in month of June

Step 3: Data compilation, Analysis & Draft Report: *July-September 2021*

The gathered data was collated; missing data identified, data analysed and the draft report was prepared by mid-September 2021

Step 4: Sharing draft report and recommendations: *September -October 2021*

The green audit 2021 draft report was shared with the College by mid-October. The purpose of sharing the draft report was to share the findings and recommendations as well as to identify missing or misrepresented data, if any.

Step 5: Finalization of report and recommendations based on feedback received from the College: *September-November 2021*

Final Report was shared with the College by end of December 2021.

CHAPTER 3

Green Audit: Data Analysis

Basic Information

St .Andrew's College of Arts, Science & Commerce (referred to as the College) is affiliated to the University of Mumbai. The College is located at St. Dominic Road, Bandra (W), Mumbai – 400 050. Telephone No.: 26428684 / 26401657, E-mail address: **info@standrewscollege.ac.in**
College Web Site: http://standrewscollege.ac.in

The College campus has two main institutions as given under

1. St. Andrew's Junior College offering courses in Arts, Commerce and Science.
2. St. Andrew's Degree College offering three year bachelor degree courses in Arts, Commerce, and several self-financed courses.

Following are the main courses conducted by the College:

JUNIOR COLLEGE:

- Arts & Commerce

DEGREE COURSES:

- Bachelor of Arts
- Bachelor ofCommerce

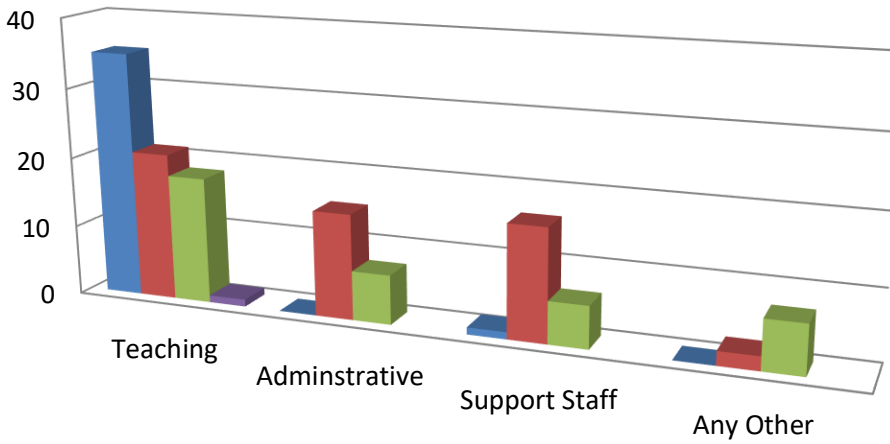
Other Courses (SELF FINANCE COURSES

- Bachelor of Management Studies
- Bachelor of Accounts& Finance
- Bachelor of MassMedia
- Bachelor of Science(Information Technology)
- Bachelor of Science (Hospitality Studies)
- Bachelor of Banking &Insurance
- Master of Commerce

The Green Audit was carried out for the entire campus including both colleges, and considering processes under various departments, both academic and administrative. The facilities are shared among the departments.

The year 2020 is known for the Pandemic, in India the lockdown was announced on 20th March 2020 and almost everything moved to an "online" mode. As the classes are being conducted online even until now (August 2021) the College Campus is least utilised. Hence the data from March 2019 to April 2020 is reviewed for the Green Audit and the data of Travel and Transport Management, Knowledge Management and Ecology Management are taken from the year 2021. The data collection was undertaken by a team from the College. Due to lockdown scenario physical visit by green audit team for data verification was no possible. Therefore the available data has been analysed for this report.

Graph 1 show the data of Employees for the April 2019-March 2020

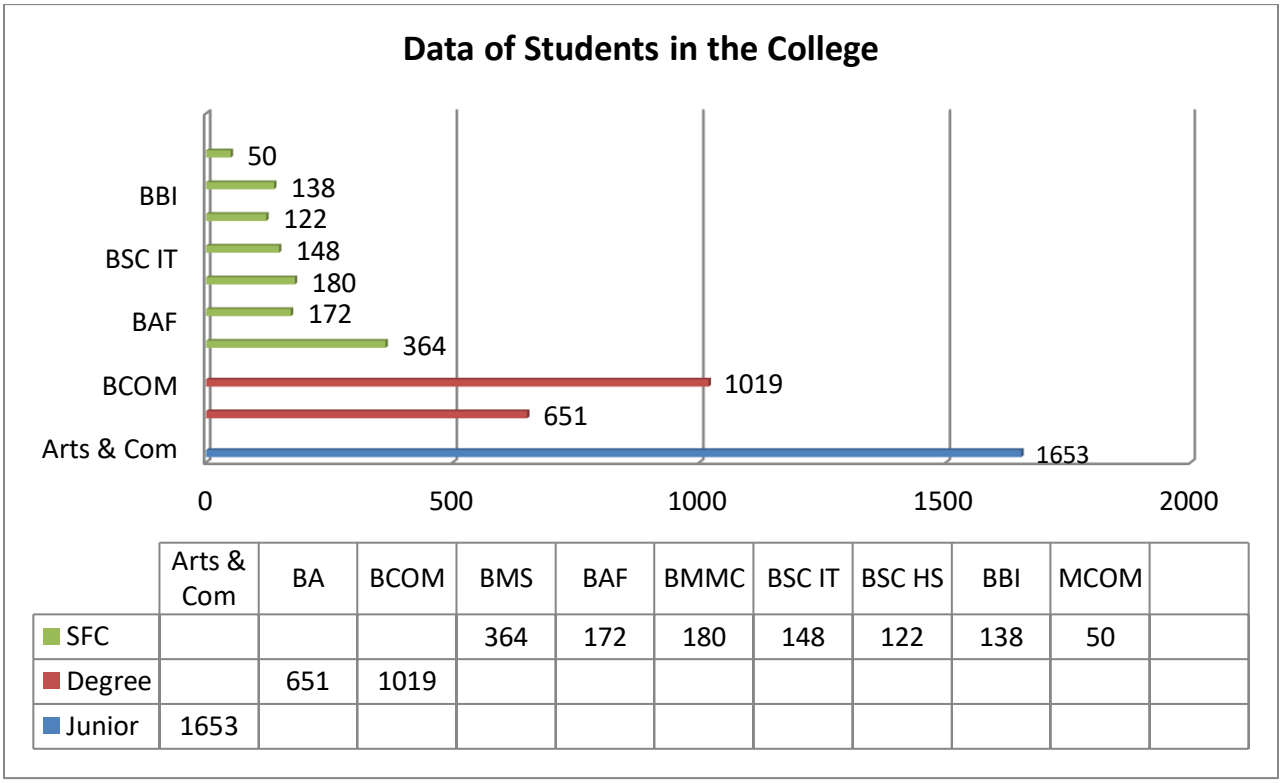


	Teaching	Adminstrative	Support Staff	Any Other
Junior	35	0	1	0
Degree	21	15	16	2
SFC	18	7	6	7
Any other	1			

Graph 1: Number of Employees in the College

Graph 1 indicates the department wise distribution of the total 129 staff which comprises of teaching, administrative and support staff (IT technicians, peons & attendants) of the of the College.

Graph 2, indicates the number of students on Campus for *April 2019-March 2020*



	Arts & Com	BA	BCOM	BMS	BAF	BMMC	BSC IT	BSC HS	BBI	MCOM	
SFC				364	172	180	148	122	138	50	
Degree		651	1019								
Junior	1653										

Graph 2: Number of students in the Junior and Degree Colleges

Total number of students on Campus for *April 2019-March 2020* in all courses at the Junior and Degree College is 4497 as shown in Graph 2.

Graph 1 and Graph 2 indicates that there are total 129 employees comprising of teaching, administrative and support staff (IT technicians, peons & attendants) in the College and total 4497 students are on the Campus which includes Junior, Degree and Self-Financed courses.

Hence total 4516 people were utilizing the College campus for April *2019-March2020.*

CHAPTER 4

Areas Reviewed for Green Audit

A. Energy Management

The College primarily uses energy in the form of electricity provided by Adani Electricity.
For a proper analysis of energy consumption, we need to understand the electricity consumption over at least one academic year, and ideally three previous years. However, in this case we were able to obtain one year energy bills.

The following tables and graphs show the electricity consumption data.

Electricity consumption data:

Consumer Name: St Andrew's College of Arts, Science and Commerce

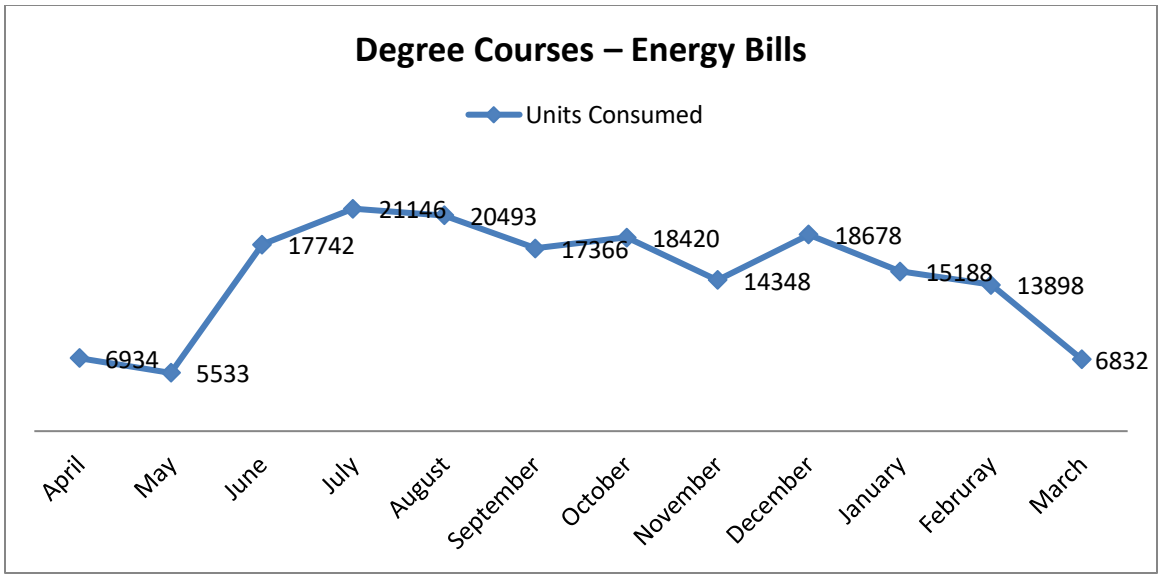
Consumer no: (Degree Courses): 100189961, 151552768, (Self-Finance Courses): 100189920, 100189975, 100194014, 152132421

Year: April 2019-March 2020

Consumer No	Month	Units Consumed		Total	Bill amount		Total
		Degree	SFC		Degree	SFC	
	April	599	6335	***6934***	7480	73950	81430
	May	536	4997	***5533***	6670	58410	65080
	June	11727	6015	***17742***	344080	70800	414880
	July	13723	7423	***21146***	155720	86820	242540
	August	13186	7307	***20493***	149590	85600	235190
	September	11057	6309	***17366***	125410	74060	199470
	October	11072	7348	***18420***	125630	86020	211650
	November	10376	3972	***14348***	117670	47050	164720
	December	11559	7119	***18678***	131100	83090	214190
	January	9904	5281	***15185***	113040	61710	174750
	February	9712	4186	***13898***	109330	49910	159240
	March	5073	1759	***6832***	--	---	---
	Total	**108524**	**68051**	***1,72,575***	**1385720**	**777420**	**2163140**

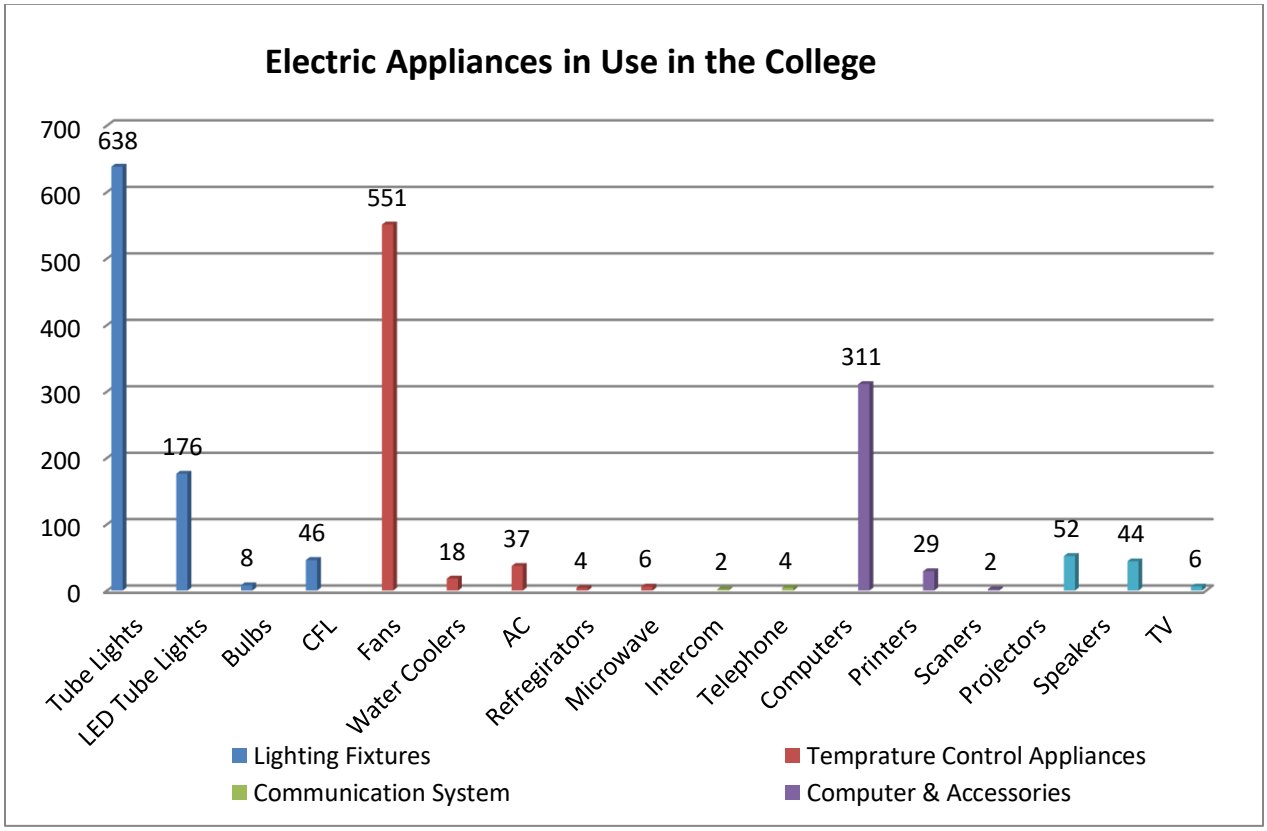
Table 1: Summary of one year Energy Bills

From these bills a summary of the electricity consumption data for one year are presented below in Graphs 3.



Graph 3: Summary of one year Electricity Consumption

The trend generally seen is as expected for any academic institute. The electricity consumption drops to minimal during vacation period, is low during winter months, and is highest during summer months.



Graph 4: Electric Appliances in use in the College

The main electric appliances in the college are lighting elements, fans, computers, Air Conditioners, LCD projectors, computers and accessories. There is good number of lighting elements which are LED based. The refrigerators and air conditioners are 3 and above star rated. All the other appliances are in reasonably good condition. Individual teaching staff regularly reminds the students to ensure switching off of the fan and lights.

Summary of the electric appliance in use in the College are given in Graph 4

Following opinions by the data collection teams, HOD's are shared with the audit team to be considered by all for opportunities for energy saving practices on the Campus:

a) Each stakeholder taking up responsibility to ensure that they save energy in every possible way.
b) Ensuring that the light and fans are not switched on in any corner of every classroom, staffroom, office and library unnecessarily.
c) Upgrade to energy efficient LED lighting in the classrooms.
d) Unplugging unused devices which are generally not practised.
e) Installing motion sensor lights where lighting is not required throughout (e.g., in the toilets)
f) Painting class rooms with soft tones like off-white colour will make it appear brighter and help in saving energy.
g) Upgrading to energy efficient electric devices used in the campus.
h) Switching to renewable energy by installing solar panels to generate electricity for use in the campus.

Following suggestions were made for ensuring the energy conservation practices on the Campus:

a) Having student scout to monitor and stop unnecessary use of electricity during break time.
b) Assigning a peon on each floor the task to ensure that lights, fans and projectors are switched off after lecture hours.

Good practices in the College

In all sections of campus the lecture rooms, office rooms, staff rooms etc. are airy, having proper natural light and ventilation to great extent. Hence actual requirement energy consumption in lightening is minimal. The air conditioners, refrigerators & micro waves are 3 and above star rated. The air conditioners in the management chamber or in Principal Chamber are not always in use avoiding unnecessary use of the energy. Switching to LED tube lights are some of the Green Practices on the Campus besides the life which is utilised only for staff. However most staff takes the stairs instead of lift.

Auditors Comments

Audit team commends the College for its efforts in implementing the recommendations of the previous green audit (2015) switching to LED, from 15 tube lights during the last green audit to 176 LED tube lights now and for taking a note on the age of the electric appliances and choosing the 3 and above star rated refrigerators (4), air conditioners (37) and micro waves (6).

Recommendations

It is commendable that the college has already shifted to good number of LED light fixtures. We recommend that the same approach may be pursued for other electric appliances, particularly fans, ACs, and LCD projectors. Regular and periodic servicing and cleaning will help these appliances operate at the maximum efficiency. It is also important to replace the appliances when they reach the end of their recommended lifespan. While replacing appliances, the most efficient option available in the market at the time should be invested in, rather than going for the least expensive one.

Architecturally the building has much natural lighting and the classrooms and other areas require only about 50% of artificial lighting.

The college should explore the possibility of roof top solar PV installation for electricity generation. However even then further way for reducing environmental impact of electricity consumption is to explore the possibility of generating the power from renewable resources. The current government policy regime is also supportive of such efforts on part of institutions and therefore possibility of technical/financial support from local or state government as well as the option of feed in tariff (which will allow excess electricity to be sold to the grid) may be explored.

B. Water Management

This auditing indicator addresses water consumption, water sources, appliances and fixtures. In survey water used at bathrooms, toilets, laboratory, garden, shower and as well as leakages is also been evaluated. The data collected from all the sections is examined and verified.

The College uses two sources of water, namely a bore well at the campus and water supplied from the (BRIHANMUMBAI MAHANAGAR PALIKA) the Municipal Corporation of Greater Mumbai (MCGM) Water and Sanitation department.

Water Consumption Practices based on the water bills for one year (April 2019- March 2020) were analysed to understand water consumption patterns and water management in the college.

Water Consumption data

The following table 2 and graphs 5 & 6 show the water consumption and water utilization data

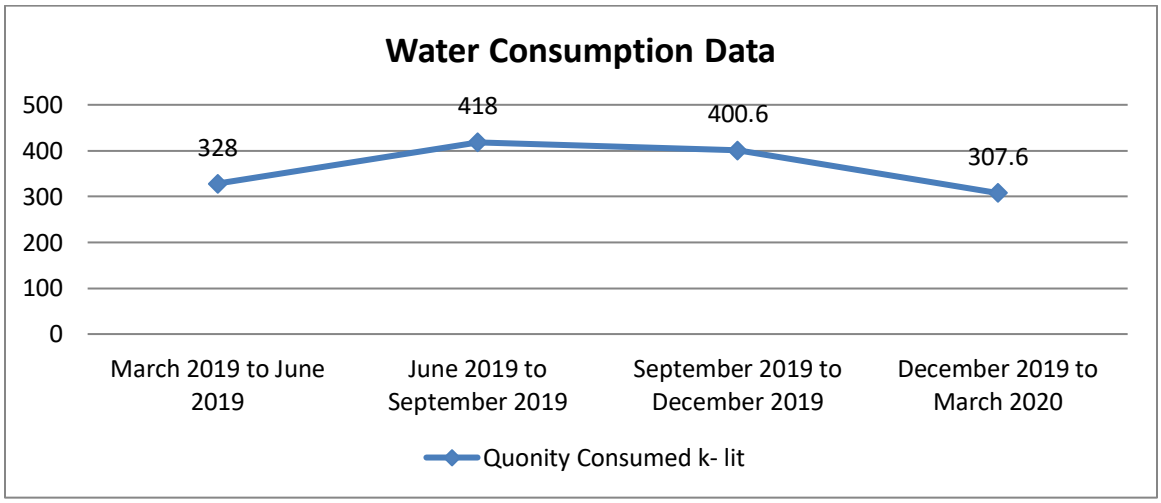
Consumer Name:

St Andrew's College of Arts, Science and Commerce (DEGREE & SELF – FINANCE COURSES)

Year: April 2019-March 2020

Source	QUATERLY	Consumed quantity (k-lit)	Cost
BRIHANMUMBAI MAHANAGAR PALIKA	Mar 2019 to June 2019	328	Rs. 9273/
BRIHANMUMBAI MAHANAGAR PALIKA	June 2019 to Sept. 2019	418	Rs. 11819/
BRIHANMUMBAI MAHANAGAR PALIKA	Sept. 2019 to Dec. 2019	400.6	Rs. 11486/-
BRIHANMUMBAI MAHANAGAR PALIKA	Dec. 2019 to Mar. 2020	307.6	Rs. 9045/-
	Total	1454.2	41622

Table 2: Summary of one year Water Bills

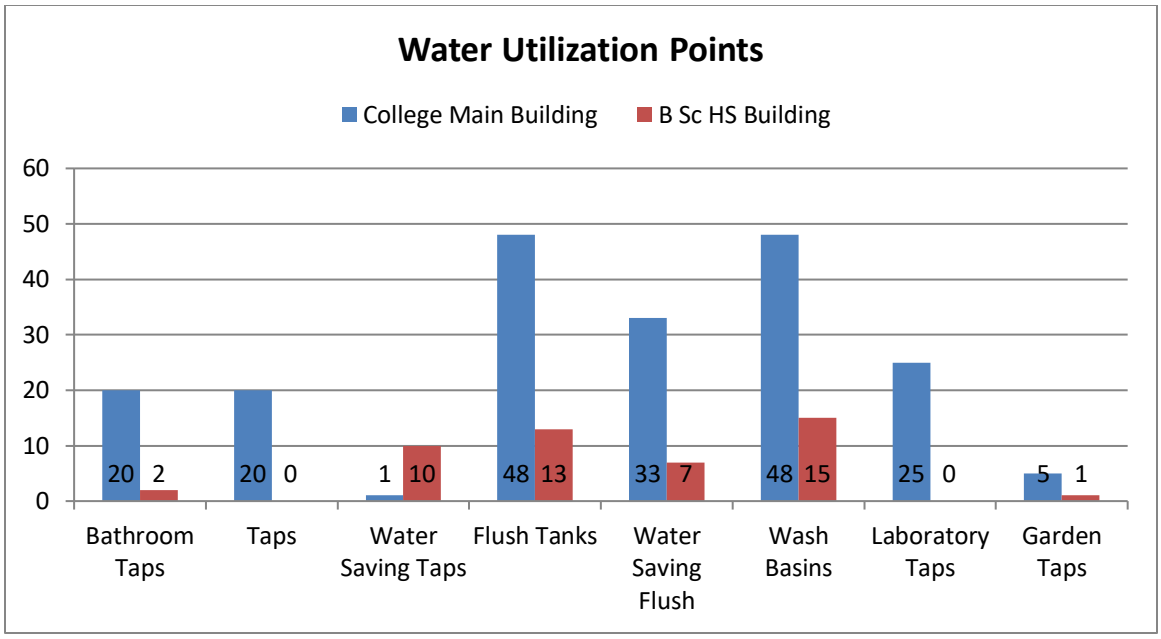


Graph 5: Summary of one year Water Consumption

The above table and graph shows the trend of water consumption on the Campus. The data of staff and students indicated that there were total 4516 people utilized the Campus in the given year therefore it is evident that the bills paid and water utilized for the year was bear minimum therefore it also indicate the water conservation practices on the campus.

However the graph also indicates that the water consumption is higher in the summer months then the winter months.

Graph 6 presents the Data on Water Utilization



Graph 6: Water Utilization Points

Suggestions of the data collection team on better water management on campus

a) There are frequent incidents of tap leakages being observed. This has to be monitored periodically and fixed as and when required to save water.
b) Bringing about an attitudinal change in the cleaning staff by instructing them not to keep the tap running throughout when cleaning is in process.
c) Fix dripping taps
d) Installing aerators to conserve water
e) Upgrading to automatic water faucet.
f) Upgrading to dual flush/high efficiency toilets
g) Staff rest rooms: every staff who notices a leaky tap may report it to the staff secretary who can then take up the matter to the concerned authority.
h) Student's rest rooms: a male and female cleaning staff may be assigned the responsibility to check and report for leakages in the boys and girls restrooms respectively.

Good Practices on Campus

There are total 4516 people on the Campus and quantity of water consumed was 1454.2 K-Lit while water bills paid to the BRIHANMUMBAI MAHANAGAR PALIKA was Rs. 41622 which can be considered as bear minimum utilization and cost of fresh water for that particular year.

The green practice on the Campus is switching to 11 water saving taps and 40 water saving flush.

Auditors' Comments

Audit team commends the College for utilising 11 water saving taps and 40 water saving flush. The utilization of bore well also reduces the stress on the fresh water supply on the Campus which is reflected on the water cost and consumption in the water bills for the year.

Reviewing the water management it is not possible to estimate the exact quantity of water used by different departments, however the highest consumption of water is most likely happening in toilets and the food lab and in view of the escalation of water scarcity in Mumbai, We recommend that the following basic steps be carried out to optimize the water utilization at the college level, which will also contribute in further efficient water management:

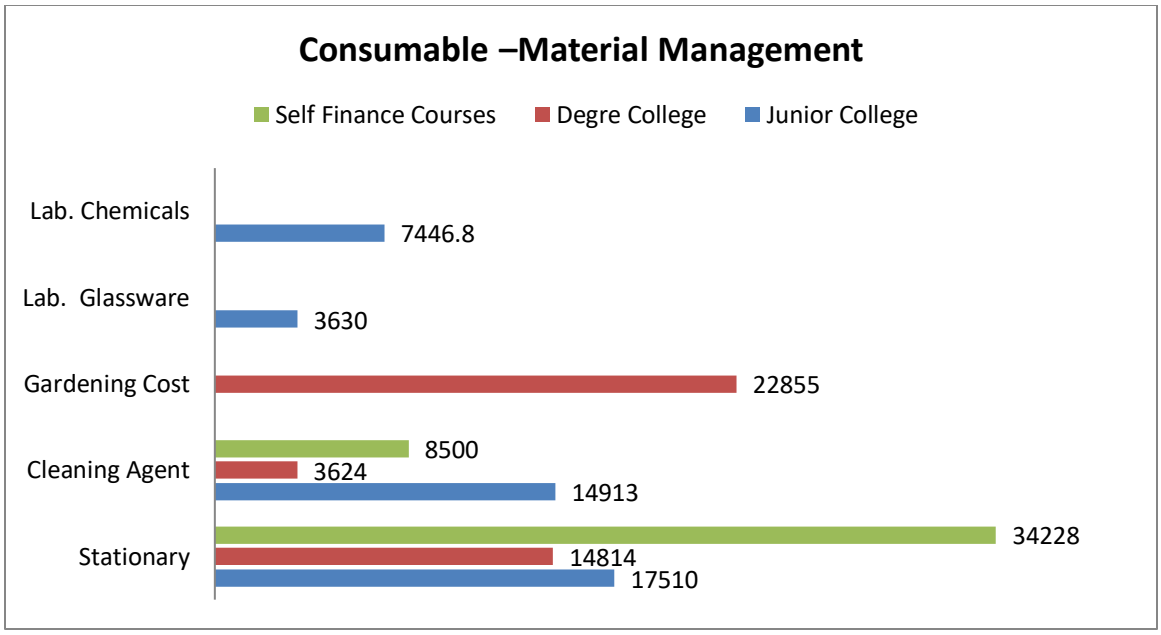
a. Putting up notices in all washrooms and near all water coolers about the need for saving water, and simple tips like ensuring all the taps are properly closed, leakages are immediately brought to the notice of the management, etc.
b. Respective floor cleaning staff could be given the responsibility to keep a check on every floor if any taps are open or leaking. Training to the cleaners in economical use of water for cleaning purposes and a system in place for immediate response when issues of water leakage are observed so that water losses are prevented.
c. An in-house or easily available plumber in case of any urgent repair will be of great needs. It may perhaps be more useful if the plumber is assigned the task of periodic maintenance checks.
d. In the long run, the option of replacing all existing water taps with water saving taps may also be considered.

We suggest that College explore the feasibility of installing water flow meters, self - closing taps or sensor based taps on all the floors and treatment of waste water (STP). The (STP) treated water can be used for flushing and gardening, which will result in about 33% of reduction in fresh water consumption, could check the possibility for use of excess treated water by neighbouring buildings or gardens, to achieve Zero Liquid Discharge for green building approach (or no discharge in municipal sewer lines).

C. Material Management – Consumables

In order to obtain data the audit team sought Information on utilization of office stationery, lab chemicals, food items, and other consumables along with the practice of reduce, reuse, or recycle from all the departments. This data has been obtained from the office as well as the Heads of the departments.

Table 3 and Graph 7 indicate variety of consumable materials in use in the college.



Graph 7: Consumable –Material Management

	Stationary	Cleaning Agent	Gardening Cost	Lab. glassware	Lab. chemicals	
Junior	17510	14913		3630	7446.8	43499.8
Degree	14,814	3624	22855			41293
SFC	34228	8500				42728
	66552	27036		3630	744.8	1,20,817.8

Table 3: Consumable –Material Management

The total expense on consumable items at the college was Rs. 1, 20,817.8 for the year 2019-20. The overall consumables data is maintained by the college administrative office. There is a variety of consumable materials in use in the college, including stationery materials (papers, pens, pencils, markers, files), as well as materials like cleaning agents, laboratory glassware, Laboratory chemicals and gardening cost which includes 12 month stipend of gardener and garden supplies. The annual quantity purchased is well documented however; it was difficult to obtain accurate data on the quantity consumed for that year.

Good practices on the campus

The college is taking several steps to ensure judicious and responsible use of consumables. The college has moved towards increased digitization making efforts towards going 100% paperless endeavor with the help of Onfees.

Recycling of used papers (blank side of the single-side printed papers) has become a practice in the office since 2017-18. The administrative staff and the faculty continually reuse old files and make optimal use of one-sided paper.

All the teaching staff members are given a white board marker and duster right at the beginning of each academic year reducing dependency on blackboard chalks i.e. calcium carbonate/calcium sulphate. The markers are refilled with ink and used over and over in the office.

Use of resources such as papers, pens, pencils, markers, files, etc. is documented in a register in the college office to track the usage.

The degradable waste is recycled into excellent fertilizer and used for gardening thus much of the fertilizer required for the plants in the campus is generated in the campus itself through composting the degradable waste.

Also, overall reasonably good waste management systems are in place, as discussed separately.

Auditors' Comments

We commend the college for its efforts in efficiently managing the use of consumables by documenting department wise purchases, existing practices for reducing the use of paper, for making its operations paperless to the maximum extent possible and creating a behavioral change in reusing waste paper in the office. While paperless administration has several environmental benefits, it is also noteworthy that increasing reliance on electronics and IT leads to increase in generation of electronic waste. The move towards paperless operation should therefore also be accompanied by putting in place practices and processes for proper e-waste management.

The inventory of consumables purchased is maintained department wise. Those departments that reduce the use of consumables compared to their baseline consumption levels may be suitably honored, encouraging all the departments to create their own best practices.

D. Waste Management

Various types of waste generated on the campus can be categories as: solid waste, liquid waste, garden waste and e-waste. The Solid waste comprises of dry & wet, dry waste includes plastic, glass, paper, metal, garden waste and others. The wet waste comprises of food waste (mostly from the lunch boxes, food labs and others).

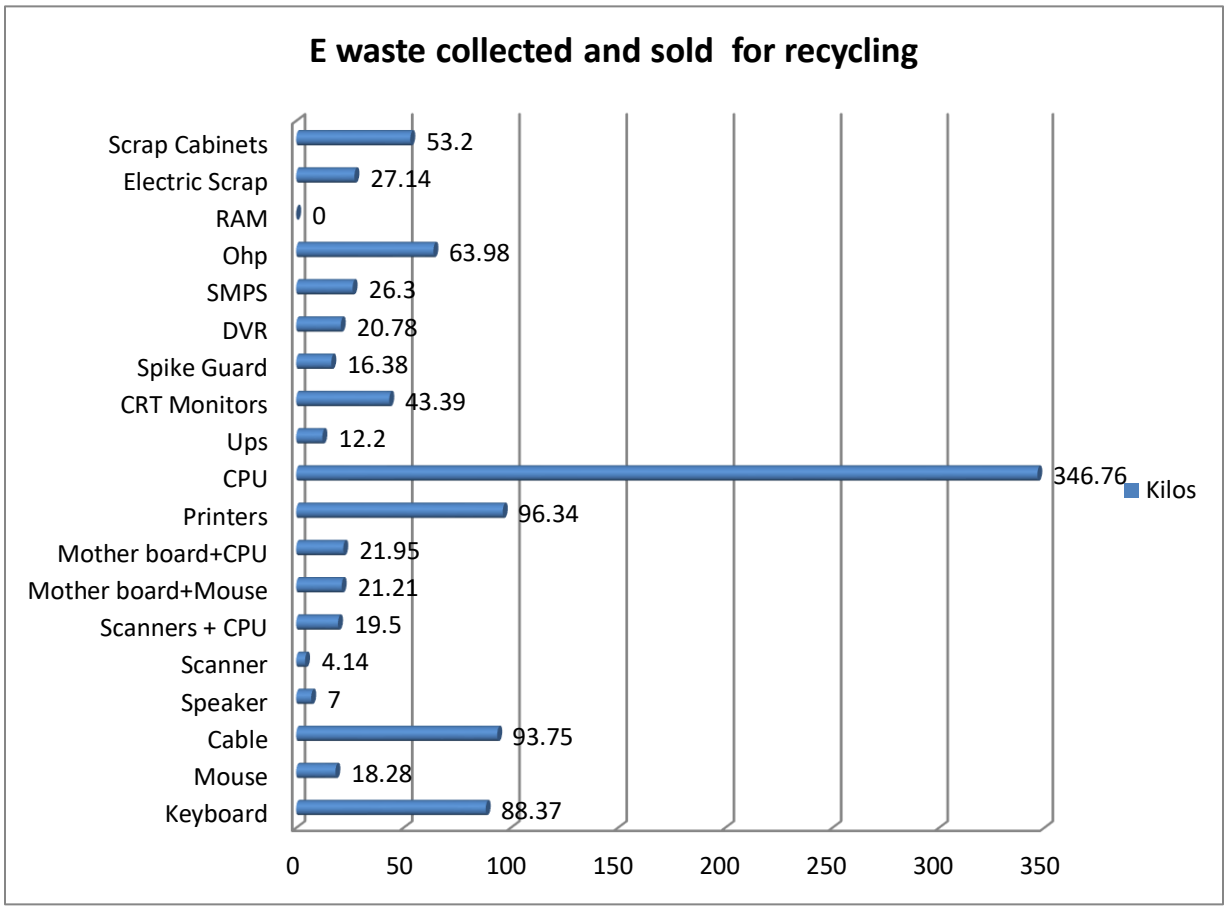
Total 10663.3 kg organic wet waste and 698.164 inorganic dry wastes are generated daily on the Campus. The e waste comprises chips, bulbs, circuit boards, motherboards, computers, batteries, switches and others. Total 1004 Kilos of e waste was collected in the Campus.

Waste collection

The solid waste from respective floors is collected by the cleaning staff and Robert Sequeira is mainly responsible for emptying the collected waste from the Campus to the waste management unit, he segregates and keeps record of the wet and dry waste, takes care of

composting and drying the cultured waste. The e waste is collected and sold out to the recyclers by the respective team responsible to handle the e waste.

Graph 8 and table 4 indicates that total of 1004kgs e waste was collected which was sold to the recyclers for Rs. 5020 @ Rs5/- per kg.



Graph 8: Data of e waste collection

Waste management system

The waste management practices on the campus are in continuation of the "Zero Waste" campus project imitated in 2014 which was then partially funded by the UNDP in collaboration with Stree Mukti Sanghatna (SMS). Therefore the waste management on the campus is an ongoing process and has been efficiently managed by a team in compliance with the BMC mandate. The team consists of Mr. Robert Sequeira and other nine cleaning staff Luiza Gaikwad, Sandeep Waghela, Bhavna Solanki, Hansa Waghela, Rajesh Waghela, Owen Gonsalves, Victor Fernandes, Prashant Zimane and Yogita Waghela.

The wet waste is processed into manure and used for the plants in the campus. The dry waste collected is further segregated and stored as plastic, paper, PET bottles and tetra pack and sent

for recycling at adequate intervals. Total 267.14 kg compost (158.295kgs on 3.11.2020 & 108.845kgs on 7.11.2020) was produced by the waste management unit.
E waste is collected and sent to recycling companies.

E waste Disposal/ Management	
Item	Kilos
Keyboard	88.37
Mouse	18.28
Cable	93.75
Speaker	7.00
Scanner	4.14
Scanners + CPU	19.500
Motherboard + Mouse	21.21
Motherboard + CPU	21.950
Printers	96.34
CPU	346.76
Ups	12.2
CRT Monitor	43.39
LCD Monitor	18.84
Spike Guard	16.38
DVR	20.78
SMPS	26.30
Ohp	67.98
RAM	0.400grm
Electric Scrap (T3 Lab – 10 units)	27.14
Scrap Cabinets	53.2
TOTAL = 1003.91Kgs , but Rounded to Rs. 1004kgs @Rs.5/- per kg Amount = Rs. 5020/-	

Table 4: E waste collected and given to recyclers

Several efforts are going on towards minimizing the use of paper in the College – Though not completely paperless, the office staff have been provided with adequate computers and commendable part of the official records are maintained through soft copies. The college is equipped with various software for admission and fee payment.

Good Practices on Campus
Several steps are taken by the College for reduction, elimination and efficient management of the solid waste on the campus. Some of them are as given under:

Waste management in the College has become an ongoing process which has been managed by one main person who is supported by a team of cleaning staff. Managing solid waste is in continuation to the "Zero Waste" campus project initiated in 2014 which was then partially funded by the UNDP in collaboration with Stree-Mukti Sanghatna (SMS). PET bottles and tetra packs are

collected and segregated into separate bins on campus and are sent for recycling. The College has been conducting the e waste collection drive and disposal by selling it to the recyclers periodically. The college canteen has substituted plastic spoons with degradable spoons. Most teachers bring their own cups to the college for drinking tea or coffee.

It is an achievement to manage a behavioural change among the office staff in recycling the used papers and among the teaching staff in utilizing the newspapers for exam papers instead of envelops has been.

Auditors Comments

We commend the College for its continues efforts towards making the campus environmentally sustainable to the best extent possible through various good practices and efforts to regulate waste generation as well as management and for achieving a behavioural change among the office and teaching staff in recycling and reusing whatever possible on the campus. The waste management process is in continuation of the "Zero Waste" campus project initiated in 2014. It was then partially funded by the UNDP and was in collaboration with Stree Mukti Sanghatna (SMS).

We applaud the College for convincing the college canteen to replace the plastic spoons with the biodegradable ones and the College staff for using their own cups instead of the canteen cups. These steps though small will not only reduce huge amount of plastic waste on the campus but will also foster an eco-friendly mind set among the students and others.
However the audit team recommends for additional initiatives to initiating behavioural change among the students and making the campus truly zero waste, such as:

a) Eliminate or reduce to minimum the use of plastic on the campus. A phase wise ban on use of "plastic" could be of help in completely eliminating the use of plastic on the campus. A team consisting of HOD's, staff and students could work on a detail plan to implement these plans which might need to create a list of the types of plastics which will be banned on the campus, could frame a policy document. Certain fines could be employed on failing to abide by the policy of the College which could be introduced during the admission of the student. The policy document also could have the provision of the delegation/appointment of the team.

b) Depositing wet and dry waste in appropriate bins in the class rooms by the students could be monitored strictly. Teams like "Clean up Marshals" from among the students could be formed to monitor classroom wise waste practices in the College.

E. Pollution Management

The college doesn't experience busy traffic or other noise pollution from outside as the college is situated far away from the main market and surrounded by the residential area. As per the information received, the college regularly undertakes noise monitoring and tries its best to

adhere to the guidelines issued by the regulatory authorities from time to time to complying with the time limit permitted by MPCB. There is no air, water and noise pollution problem on the college campus. However no data is available of noise, water and air pollution testing done on the campus.

Some of the steps suggested by the data collection team to achieve pollution free campus are, promotion of vehicle pooling, monitoring of day today activities to reduce noise pollution and rewarding students for their gestures of responsibility such as offering a small discount on cafeteria cost if students bring their own cups/spoons, ban on the use of single use/use and throw plastic items on campus towards pollution free campus.

Auditors Comments

The team of auditors commend the College for its regular practice of noise monitoring and efforts to complying with the time limit permitted by Maharashtra Pollution Control Board.

However it is recommended that the college administration track regularly data on the air, water and noise pollution and raise awareness about these on the campus. Air pollution detectors are now available in the market. The college may install a detector, to track real time data on air pollution on the campus. Similarly tracking noise pollution is also a possibility by installing a decibel meter.

Most students and staff travel by public transport however the college can also focus on reducing the contribution of its own community to the air and noise pollution through efforts towards reducing the number of individuals coming to the college in private vehicles with single occupancy.

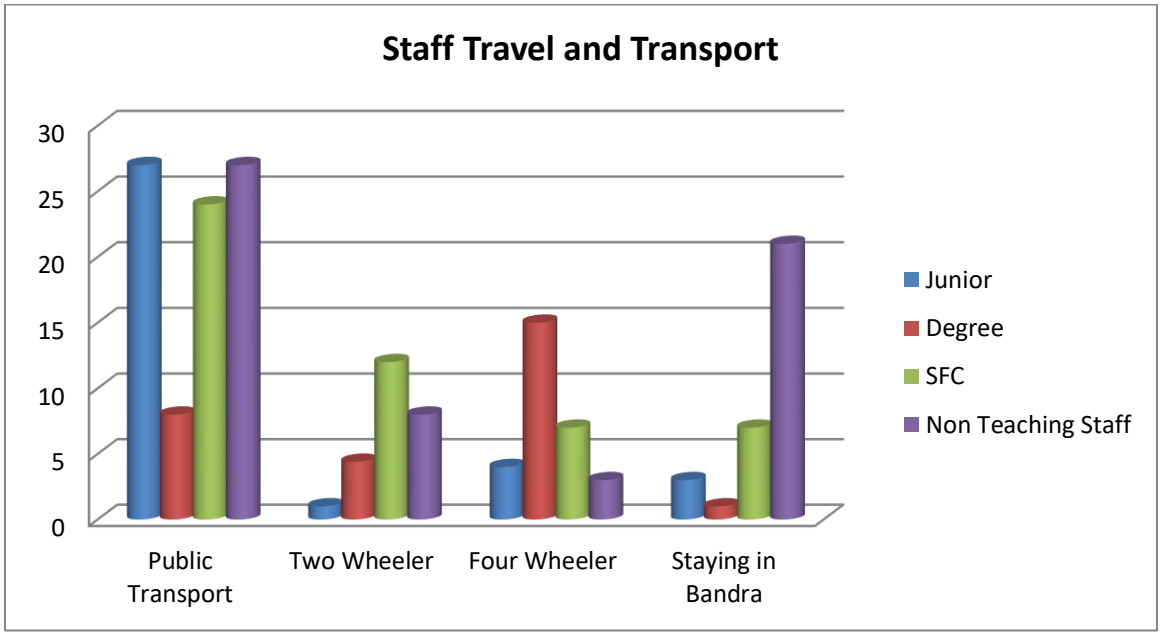
F. Travel and Transport Management

Table 5 and Graph 9 show the staff data of travel and transport (2019-21)

Type of transport	**Junior College**	**Degree College**	**Self-Finance Course**	**Non-Teaching Staff**	**Total**
By public transport (Train)	27	08	24	27	86
By Two wheeler	01	----	12	08	21
By Four wheeler	04	15	07	----	26
Staying within Bandra	03	01	07	21	32
Total	35	24	50	56	165

Table 5: Mode of commuting to the College

There are 9 people (a security person, his family members and two students) residing on the campus.



Graph 9: Staff data of travel and transport

From the table 5 and Graph 9 it is evident that majority of the staff which includes 27 non-teaching staff uses public transport to come to the college.

There were 9628 students who were granted the students railway concessions in year 2019-20 and in 2020-21 total 2361 students obtained the railway concessions for the train fair for daily commuting to the college.

Auditors' Comments

First and foremost, the data collection team must be congratulated for their efforts in collecting detailed data for this section. Collecting comprehensive data on modes of commuting used by different groups on the campus is the most challenging part of the green audit data collection process. It is also one of the most significant data points because of the contribution of vehicles to local pollution and traffic problems as well as to global climate change.

The college data clearly shows that almost all students and majority of the staff including non-teaching staff use public transport. There is 32 staff that lives within Bandra. Employing local staff also helps in reducing the travel footprint of such significant number of people. However it will be meaningful to trace their mode of travel to the College.

There is still a way that the College can be proactive in a variety of ways. Some suggestions are: Exploring carpooling, providing information on campus about bus routes for the college from various parts of the city, creating a forum to enable people to discover on a daily basis who else are traveling the same route at the same timings as themselves, and explore vehicle pooling opportunities, etc. Encouraging use of walking and bicycles by staff as well as students living

within 5 km distance of the campus. Allowing parking on college premises only for those vehicles that have a valid PUC certificate, organizing servicing camps for vehicles belonging to the staff and students, and trainings for safe and fuel-efficient driving.

G. Knowledge Management

The college has a unique and active community engaging variety of extra and co-curricular activities and projects carried out through various departments. Some of the environment focused activities conducted by the College has been undertaken under below given programs:

- Nature Club
- Environmental program by NSS
- Social out Reach Program (SOP)
- Department of Lifelong Learningand Extension (DLLE)
- Department-wise Initiatives by individual faculty members

The College has a unique and compulsory activity called ''social Out Reach Program' (SOP) for the entire second year students of Arts, Commerce and Self Finance Courses in which the student has to spend 20 hours in a socially productive activity in the entire academic session. Many of the activity under SOP are environment focused. Table 6 indicates the lists of some of the major environment focused activities carried out from 2018-21 by various departments most of them are under NSS, DLLE and the Social Out Reach Programs (SOP) of the Degree and Self Finance Course.

S no	Activity	Number of students	Department, HOD	Collaboration
1.	Mahim Beach Clean Up	60	SYBA & SYBCOM Mr Kevin Miranda	Social Out Reach (SOP)
2.	Understanding and Registry of Locality Bio Diversity	121	SYBA & SYBCOM Mr Kevin Miranda	(SOP)
3.	Family carbon calculation-Discussion on Climate Change impacts and possible action at family level	10	SYBA & SYBCOM Mr Kevin Miranda	(SOP)
4.	Climate Change and my Family SOP project reflection & action with family	1	SYBA & SYBCOM Mr Kevin Miranda	(SOP)
5.	Covid 19 and environment an online SOP	3	SYBA & SYBCOM Mr Kevin Miranda	(SOP)
6.	Environment Awareness and Tree planation (28 saplings)	44	SYBA & SYBCOM Mr Kevin Miranda	SOP
7.	Interreligious faith reflection & Tree Plantation (84 sapling)	48	SYBA & SYBCOM Mr Kevin Miranda	SOP

8.	Organising Bal Mandal for or organising slum children for children's Parliament- one of the issue was on environment	15	SYBA & SYBCOM Mr Kevin Miranda	SOP
9.	Street Play, concept and script writing and performing in the slums to generate awareness and educate people on various issues. One such issue was about ALM (Advanced Locality Management) formation. Solid waste management along with protection of environment, women's safety and communal harmony are some of the responsibilities of ALM stressed in the skit.	15	SYBA & SYBCOM Mr Kevin Miranda	SOP
10	Shram Dan for a group of poor farmers at Kasara village who were exploring capsicum cultivation.	12	SYBA & SYBCOM Mr Kevin Miranda	SOP
11	Participation in a workshop on "Plastic Pollution and Possible Action".	9	SYBA & SYBCOM Mr Kevin Miranda	
12	3 day mega beach clean-up at Dadar, Chimbai, Khar Danda and Erangal	150		NSS -Beach Warriors (NGO)
13	PLANT - A – PLANT' activity	46	Dr. Priya Shahi, Department of Lifelong Learning and Extension	DLLE
14	Earth Day' poetry competition Earth Day - Your View Matters	56	Dr. Priya Shahi, Department of Lifelong Learning and Extension	DLLE
15	SLOW THE FLOW: SAVE H2O Water day celebration	38	Dr. Priya Shahi, Department of Lifelong Learning and Extension	DLLE
16	'COMPOST IN A BOTTLE' activity	22	Ms. Vineetha Nair	Nature Club
17	WETLANDS & WATER: INSEPARABLE AND VITAL FOR LIFE, 'World Wetlands Day' presentation by students	20	Ms. Vineetha Nair	Nature Club

Table 6: Environment focused activities carried out by various departments from 2018-21

Details of some of the above given activities under Social Out Reach Program (SOP) for the SYBA & SYBCOM are as follows:

Awarenss on environment degradation & Mahim Beach Clean up

Rabia Tiwari & Indranil Sen Gupta are Mahim residents and are the main campageners of the Mahim Beach Clean up project who are deeply concerned about the coastal pollution in Mumbai which drew them to initate this campagin. Many people from education institutes, corporate sectoers and linkminded individuals volunteers to clean up the beach on every Saturady.

An awareness Session was conducted by Mr. Indranil Sen Gupta and Rabis Tiwari where in they focused on environment degradation, coastal pollution and needs for cleaning of beaches as well as organising awareness for civil society to protect their coastal areas and beaches. They also discussed in detail the Mahim beach Clean Up campaign.

60 students participated in the above mentioned awarenss session on enviromental degration, household and industrial waste, unamnged waste reaching the sea, the crisis of costal pollution and challenges faced in keeping the cost clean. The team of students were further devided into sub teams, schedule was drwan for the SOP and necessary instructions given.


Students came forward whole heartedly for the SOP and undertook beach clean up on every Saturdays which was supervised by the main team for cleaning of the beach.



The SOP was sucessfully carried out by the students. The Mahim Beach Clean Up Team was highly appreciative of the students commitment towards the beach clean up project.

A certificate of appreciation was awraded to each students to mark their sucessful completion of SOP and encourgement for volunteering for such nobel cause.

Student's Exeperince Sharing On behalf of her Group: *Pearl Fernandez, SYBA (B), Roll Number 1186:* The SOP I finally decided to sign up for, from a long list of options was "Mahim beach clean-up." It seemed like the most interesting option for me and it resonated with my love for the ocean. The SOP was about cleaning up garbage that was thrown by people on the banks of Mithi River that eventually reached the ocean, before being back ashore on the Mumbai beaches, including the beach I was cleaning at, Mahim Beach. The first trip to Mahim for my SOP was a big wake-up call to reality. I was shocked seeing the amount of garbage.



There was no end to our fun during our clean up, as we met new like-minded people, had a live band, garage sales, movie producers, professional dancers & actors and interviewers coming in to add to some clean up sessions. The instructions were simple: pick up pieces of plastic from the beach, dust off the sand from it, put it in the collection baskets & once each basket was full, carry the baskets to the main heap of garbage to be taken away to the landfills. It seemed easy but it was very difficult when we began our session in the hot sun, picking up garbage that never seemed to get over.

We were very frustrated during the first few sessions, but eventually got used to it. Sometimes there was a crowd of innumerable volunteers who came, and on those days, we struggled to find garbage to pick up. And some other times, it was just a handful of people.

We cleaned up plastics from the shallow waves that came, the rocks at the beach and the sand. I even learnt a few ways to tug plastic out of the sand that was deeply embedded.
We found all sorts of stuff on the beach. Once, a girl from our Andrean group of Beach clean-up even found a 100 rupee note!

Every time I picked up a piece of plastic from the ocean, I imagined how innocently someone had bought it, someone like me, to how it landed into the sea and now it was there in my hands to be kept with other such plastics in a land fill. I acknowledged the journey of those pieces of plastic and I hoped the same environmental effect it had on me could be realized by others.


A lot of the plastics were shredded. This is very dangerous to marine life. But the founders of Mahim Beach Clean-up Drive made provisions to the areas of people who threw their garbage

into the ocean and set up garbage bins and talked to the people about the consequences it is having on the ocean. So I hope new garbage won't be seen in the ocean. Mahim beach clean-up doesn't solve the problem of plastic consumption however, it just displaces it.

I hope in the future, people find and opt for more sustainable methods of packaging and disposal. I felt very encouraged as me and my friends cleaned up at Mahim Beach. I believed that I was finally making a difference to something I cared about, the ocean. I felt happy and satisfied though every Saturday's session of Clean-up left my body feeling sore; it felt good because I was doing something good with it.

I made 11 visits of 2 hours each to Mahim beach clean-up, even though I was only required to do 10. Many such volunteers ended up liking to clean up the beach like I did, so they keep coming. We keep coming back. It was a good experience and I have always wanted to do Social work like this. I'm thankful to the college for giving me an incentive and guide to do it.

Some of the environment focused activities (online SOP2021): **Bio Diversity Registry, Family carbon calculation-Discussion on Climate Change impacts and possible action at family level, Covid 19 and environment, Climate Change and my Family:**

The year 2020-21 is known as the Pandemic year and almost everything is shifted to an online mode so was the SOP. With much reflection several topics are created for engaging students in socially productive activities and some of the environment focused topics were as mentioned above.

The methods adopted were interviews, case studies, survey and family level actions. All these activities were planned with an objective of engaging students in environment related awareness building, actions such as locality bio diversity registry, family level discussion on their understanding of climate change causes, impacts and possible solution, conducting family carbon calculation and taking a call on the possible actions etc.

Awareness session on "Environment Protection and Tree Planation"

A workshop on Plastic Pollution was conducted in Goregaon and 9 students participated in the same. The one day workshop on Plastic Pollution comprised of input sessions by noted Experts and participants comprising of environmentalist and activists who are engaged with environmental projects and activities as well as citizens who are concerned about environment. The aim of the workshop was also to provide the participants with space to explore possible and viable environmental solutions.

A team of 9 students from SOP participated in the workshop. Plans as groups and individuals were also draw to eliminate or at least reduce the plastic pollution by complete self-announced ban on plastic consumption and finding efficient solution to eliminate completely the plastic consumption. ''Environment Awareness and - Tree Planation" The SOP titled "Green Yatra" was planned to volunteer for tree plantation drive initiated by Green Yatra NGO. Unfortunately the

NGO could not create an opportunity until November for the students to engage in tree planation as promised during the introductory discussion. Therefore an alternate plan was chalked out along with the team of SOP students and accordingly a Tree Plantation Drive was conducted in collaboration with Archdiocese Office for Environment (AOE). Two projects namely 'environment awareness and tree plantation' and 'Inter Religious Reflection on Care for Creation & Tree Plantation Drive' was conducted under SOP.

The main objective was awareness building among the students and community on environment and tree cover protection by engaging in tree plantation in the villages. The sites for tree plantation were chosen after much discussions and reflections with the respective group so that after the plantation the trees are watered and cared sufficiently. Accordingly as mentioned above two activities were held first at Goari, through Fatima Convent in their wadi on December 20, 2019 wherein total 44 SOP students planted 28 fruit trees followed by participating in a session comprising of sharing their personal experiences, reflections and concerns on environment and related future threats to environment sustainability.

Given below are the snap shots of the 'environment awareness and tree plantation' activity held at Gorai.





The second activity was held on 20th January 2020 at Anmol Centre (Don Bosco Uttan) where by 48 students planted about 85 saplings of fruit and shared with one another giving native trees. The field activity was followed by a sharing and input session which gave students an opportunity to share their ideas, thoughts and concerns on environmental pollution and protection. Given below are the pictures of 'Inter Religious Reflection on Care for Creation & Tree Plantation Drive':



Over all feedback of the SOP on tree plantation activity from the students was very encouraging. Some of them also shared their feelings and gratitude for the "first time" ever experience of holding the pickaxe/shovel etc. digging and planting the saplings was much appreciated as this helped them engage with mother earth and soil very closely. Everyone appreciated and thanked for the wonderful experience and suggested to continue such programs for a meaningful and particle experience with Mother Earth. They also thanked the Archdiocese Office for Environment (AOE) for sponsoring this cost of saplings, snacks and lunch.

Below given photos shows the three day mega beach cleaning done in collaboration with NGO Beach Warriors by the NSS students.

PLANT - A – PLANT': by Department of Lifelong Learning and Extension (DLLE)

COMPOST IN A BOTTLE': by Nature Club

The environment focused initiatives and actions by the staff and students are shared below:
In order to capture environment focused initiatives/practices by faculty/ staff and students at home, a small survey was conducted through a Google form. There were a total of 115 responses received from both staff and students. Among the 115 respondents 27% respondents were staff members and 73% respondents were students

Management of energy: Among the respondents, 92.2% respondents were conscious about the energy utilized at home, 97.4% respondents always turned off lights and fans in unoccupied rooms, 80.90 respondents always unplugged the equipment that drains energy when not in use (e.g. cell phone charger), and 59.1% respondents did not purchase any energy star labelled product to work /study from home.

However, 65.02% respondents reported that their electricity bill increased during the lock-down which means there was an increase in the amount of energy they consumed. Some of the notable measures adopted by the respondents as recorded through the survey are as follows –

(Quote) Avoided using washing machine on daily basis, using TV, laptops and iPad on energy saver mode. Limiting usage of air conditioner, Rarely using lights during the day, all family members sitting in one room so that electricity is being saved, AC was used twice a day, before lockdown the AC was used in every rooms, however during and after lock down only one AC is used to save the energy, for cold water a chatty is used instead of fridge water, using wet bedsheet on windows to make the room cool, not using AC until its really needed, not using much of the electric appliances such as blow dryer to dry hair, TV (earlier television used to on even if no one is watching) but now it is immediately tuned off when it's not in use, reduced washing and ironing since work clothes not required as frequently, putting off all the appliances except the refrigerator for at least two hours every day while we sit in the balcony with a cup of tea in the evenings.

Few respondents had stated that the inflated energy bills were the outcome of the lockdown and could not be avoided as all the family members were at home itself working and studying from home which is an energy intensive activity.

Management of water: To have a fair idea regarding the utility of water, it was necessary to know the location of the household of the respondents. 86.1% of the respondents were from urban area and 13.9% were residents of rural area.

A major chunk of respondents 72.2% reported municipal water supply as the source of water at their households. Even though 79.1% respondents were satisfied with the quality of water supplied, it was disheartening to note that only 33% respondents had access to water 24*7, while alarming 42.8 % respondents reported water supply being available for less than 6 hours. Even though only 39.1% respondents reported that they never faced water shortage before lock down it was notable that 76.5% respondents did not face water shortage during lock down. Rating themselves for rational water utility on a scale ranging from 1 to 5 in increasing order of consciousness where 1 represents least rational use of water and 5 represents the highest level of water usage consciousness, only 14.8% respondents recorded highest level of water usage consciousness. Some of the notable measures of water consumption as reported by the respondents include using waste water from water purifier for watering the plants, ac and aqua guard water is saved, instead of throwing we use for cleaning our floors.

Management of waste: Even though 35.7% respondents owned a compost bin at their household only 26.1% reported that they composted the waste by themselves at household level. 52.7% of the respondents considered starting composting at home.

The most commendable and satisfying response regarding measures initiated to reduce the amount of waste generated at household was “at college we were taught how to make a compost and since then my family and I have beenmaking compost out of all our household waste” Other common responses included segregation of wet and dry waste, curtailing the use of plastic, and applying kitchen waste to plants.

At individual level several initiatives were undertaken by the respondents. Some of them are as follows: under the guidance of College nature club the students were guided to segregate house hold waste, clean the surroundings, plant trees, saplings and taking care of the nearby trees. Some other examples are such as started growing vegetables at home (at native place), using all the organic kitchen waste as manure for the garden, some of them have planted about 15-20 small pot saplings in the balcony and corners of their apartments, recycling used plastic food packaging boxes for growing micro greens in the balcony, made decoration of pottery food packages that was received as food packages & done mandala paintings on it, propagating and distributing oxygen rich plants, recycling scrap cloth for making masks, door mats, bags and using for cleaning.

Suggestions, views on possibilities and opportunities for creating environmentally sustainable campus: (*from data collection team of the College), The College could consider these suggestions and take them as a mandate to create* environmentally sustainable campus within five years:

The first and the foremost essential is an attitudinal and behavioural change in all the stakeholders which has already been initiated as some of the activities such as best of reducing, reusing and recycling all possible resources are already going on.

Year 1 (tentatively 2021-22): In the first year after the college resumes offline lectures, adopting strict simple practices like carrying a cup or spoon for one's personal use to the canteen, refilling water from water stations over purchasing bottled water every day, using a steel jug and set of glasses to provide water to guests rather than providing them bottled water, gifting the guest with eco-friendly things/sapling/plantable stationery etc. as token of respect rather than gifting them fancy use and throw items etc., strict conservation of water and energy, rational use of other consumable resources may help in creating a firm ground to take off. Along with these measures, steps to beautify and maintain our green patch must also be taken up.

The guidelines for implementation of these strict simple tips may be given by the concerned authority. Once the practice begins, it will sustain when practised in true spirit

Year 2 / year 3: Painting the classrooms in softer tones like off-white, blues or greens may increase the brightness of classrooms and may help in reducing the dependency on artificial energy for lighting.

Year 3/ year 4: Installation of solar panels to generate energy on campus and we become self-reliantin terms of energy

Year 5: With enormous volume of changes and continuous adherence to established norms, the St. Andrew's campus could be credited as an environmentally sustainable one.

Almost the entire year education campuses were partially or entirely closed due to COVID 19 protocols resulting in work from home for almost the entire year. Hence the environment impact on education campuses are drastically reduced therefor it is important to explore possibilities for reducing the environment impacts after off line campus activities are resumed. A list could be drawn from the above given suggestions for the entire institute to follow.

Auditors' Comments

Varied range of interesting, enthusiastic and creative activities conducted by various departments of the College over the years is highly commendable; some of the examples are activities are through Nature Club, NSS, Social Out Reach Programs (SOP) and DLLE. These activities are a great opportunity in creating eco-friendly attitudinal change and the mind-set of the students and staff.

The green audit team commends the College for conducting such programs. The detailed data of these activities and programs by the College explains the commitment and contribution of various departments in making the campus more environmentally sustainable.

Good Practices on the Campus

The second year students of BA, BCOM and Self Finance Courses are to undertake SOP as a compulsory project since 2008 and year after year it has been great success in motivating students and successfully implementing the SOP in collaboration with two implementing partners. The testimonies shared by the students at the end of the SOP indicate clearly the impact of the program on the students.

Recommendation

In 2015, all the nations including India have ratified the Paris Agreement, which now puts the onus of mitigating climate change on all countries, rather than just the developed countries. At the same time, India is also one of the most vulnerable countries for the impacts of climate change that has already happened.

The climate change mitigation & adaptation are important governing factors in the development choices of the country and will impact the youth the most hence it is crucial to facilitate process to churn out professionals with the right expertise to tackle the above mentioned issues and create an opportunity for the youth for appropriate livelihood as well helping the nation to build in facing the crisis.

H. Ecology Management

The total area of the campus is 12906.56 Sq. Meter. The total building area is 8559.46 Sq.Meter i.e. 66.32% of the total area. (Excluding the hospitality building). Hence the remaining 33.68% is open area which includes pathways, parking, area of garden & trees and sports cum recreation area.

Almost 50% of the classrooms do not require lighting during winter. In summer when the sun is strong and bright almost all classroom do not require lighting. During the monsoons about 25% of the classrooms require lighting. Air conditioning is not used in the classrooms but fans are used, mainly in the summer. Table 7, indicates the list and variety of medicinal, fruit and other trees on the campus (2019-21)

Variety	Quantity	Variety	Quantity
Banana Plant	4 plants	Coconut Plant	14
Dumb cane	6 plants	Asparagus Fern	1 pot
Aloe Vera	6 plants	Aglaonema	many
ZZ Plant	2 pots	Hibiscus pruning	2
Areca Palm	9 big & 8 small pots	Hydrangeas	2 plants
Spider Plant	10	Philodendron	9 pots
Snake plant	many small pots	Chinese Evergreen	1 pot small
Boston Fern	8 pots	Monstera	4 pots
Parijat	2 plants	Begonia Star	4 pots
Neem trees	6 plants	Sweet potatoes	2 pots
Papaya trees	7 plants	Yellow spotted plant	4 plants
Custard Apple trees	1 plant	Gulmohar	7 trees
Mango trees	11 plants	Plumeria Alba	3 plants
Water Apple trees	1 plant	Acer capillifolium	1 plant
Cordyline plants	27+	Allamanda Yellow Blanchett	3 plants
Periwinkle plant	8 plants	Yellow elder plant	1 plant
Mexican mint plants	Many	View garden plants	3
Spinach (Basella Alba)	1	Curry tree	many
Blue pea and white pea	many	Jackfruit trees	3
		Oleander plant	3

Table 7: Variety medicinal, fruit and other trees and plants on the campus

The total open area is covered with tar or concrete. Though the College has no “designated” playground of its own, it has “access to the large open playground” of the adjacent St Andrew's High School. This seems adequate.

Some of the measures the College takes to enhance the bio diversity is that a staff Ms. Mabel Rosario has been delegated with the responsibility to water, applied fertilizers frequently and regularly care for plants specially the potted plants. The college has planned to put up bird feeders and bird shelters at appropriate spots in the campus to provide water available to thirsty birds and attract them.

Regarding views on creating an ecologically sustainable campus the data collection team feels there is very limited scope to become ecologically sustainable. Being a city area human interference with the environment and carbon footprints generated on the campus is an inevitable factor that limits us in achieving ecological sustainability on Campus.

Auditors’ Comments

The team of auditors commends the College administration for the efforts in documenting the trees by its botanic name, this exercise should continue to update as and when a new plant is added. The list of plants could include the usage of various plants specially the medicinal plants. A team could be assigned to monitor the tree health, nutrition and care; students could be given an opportunity to take care of the trees/ plants in the Campus.

I. Resilience- Disaster Preparedness

So far there has been no history of any disaster natural or other occurring on the campus. Therefore there has been no natural disaster risk assessment carried out for campus so far nor are there any plans for any disaster preparedness training on potential environmental disasters such as flooding, water scarcity, exposure to pollution, climate change impact etc. Work through an online mode due to the pandemic and maintaining the Covid 19 protocol is one of the reason for not conducting any such programs.

Auditors Comments

We recommend that the college administration carry out an internal review of potential natural disaster risks, and explore other strategies, such as storm drain system, routine drills for quick evacuation program, etc. A team of staff and Students could be assigned with responsible tasks with periodic reporting to the management on the same.

CHAPTER 5

Conclusion and Way Forward

Main highlights of the Environmental Good Practices on campus:

1. Some good practices in energy management are in place on the college campus.

    a) Step by step switching to star rating electric appliance, as well as CFL to LED bulbs and tube light.

2. A system of waste segregation and management is in place in the College. A team of cleaning staff is made responsible to collect the waste, segregate and compost. The compost is utilized for the college garden.

    a. All the departments for following the principal of reducing the waste, recycling and reuse of the materials making optimum use of everything.

    b. The college administration is making conscious efforts to make its operations as

paperless as possible to reduce waste generation, and improve efficiency of operations. The administrative processes are going electronic and some of the examinations are being conducted online.

3. Good practices in water conservation in the College also include switching to water saving taps and flushes.

4. The commitment of the College in terms of having specific Policy for creating opportunity to the students to engage in socially productive projects is highly commendable.

    a) By Policy each student of the second year BA, Commerce and Self Finance Courses is required to spend 20 days in the entire academic cycle in socially productive activities and programs in which the students are provided opportunity through various centres, NGOs and companies to reach out to the poor and the marginalized as well as engage with environment focused activities and programs.

Summary of main Recommendations from Auditors

A number of recommendations have been made in each section in the previous chapters for motivating behaviour change among the campus community to inculcate habits of conservation of resources like energy and water.

In addition, a few recommendations require investment or other in inputs from the college management. The main recommendations of 'action points' for the management are summarized below.

1. Explore Roof Top Solar PV for in house electricity generation.

2. Explore feasibility for sewage water treatment and reuse of the treated water for flushing the toilets and gardening and similar purposes.

3. Continue the effort towards paperless administration, but with proper electronic waste management systems in place.

4. A team of students could be delegated with responsibility of taking care of the tree cover helped by an eco-sensitive landscaper occasionally to ensure proper care of all the plants an special care of the flora which are from native ecosystem. Updating the documentation of the tree cover should continue.

5. The environment-focused activities with the students, though already too many in variety and very much based on experiential learning on local environmental issues, should also focus on educating students about climate change mitigation and adaptation issues, challenges and career opportunities etc. in these emerging areas.

6. It is recommended to explore the possibility of installing monitoring devices on campus to track air pollution arising from the busy road adjacent to the college campus.

7. The college management should carry out an internal review of potential natural disaster risks, and explore possible mitigation strategies.

Suggested Next Steps:

The College is already performing considerably well on most environmental issues, however there is still scope for improvement. Some of the steps require continuous efforts for inculcating behavioural change and changes in work culture. As new students are continually entering the campus, some of the activities may need to be carried out annually/continually.

An environment policy for the ''green campus'' would be a great step towards going green and making the college environmentally sustainable campus. The policy could focus on each component of green audit for focused interventions. The policy will also include several interventions involving one time action and some capital investment will also go a long way in further improving the environmental performance of the College.

While we have made several recommendations, it is for the college management to prioritize the issues and develop a time bound action plan.

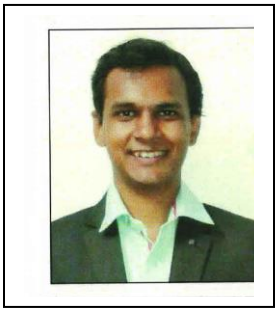
The Tools used for the green audit may be used internally for green assessments every 2 or 3 years, to track progress. Similar external audits may also be carried out periodically for validating the progress.

We encourage the College to continue nurturing and expanding the various student-centric activities on environmental awareness through various departments under programs such as SOP and "Friends on Earth Committee" and their activities under DELLE, NESS and Nature Club (Friends on Earth Committee).

We congratulate the college authorities for initiating and completing the second green audit of the campus, for successfully implementing most of the recommendations of the last green audit (2015). If the College continues with same commitment soon it will be one of the "greenest education campuses" in Mumbai.

Profile of the Main Audit Team

AVICK SIL: M. Phil (2009) – Biotechnology



Regional Director: Environment Policy and Research India (EPRI) since Amy 2014, **Guest Editor** Sustainable SWM: Perspective of urban areas in Developing Nations; Bentham Science Publisher; since June 2014, **Reviewer: T**oxicology, Elsevier since 2011.

Past: **Senior Manager:** EPRI from January 2011- April 2014, **Assistant Editor:** Earth Quest, from August 2010-February 2011, **Supervisor and Microbiologist:** Eureka Forbes Ltd., Mumbai from November 2009-Aug 2010. **Assistant (Level II):** National Environmental Engineering Research Institute (NEERI) form 2007 to 2009, **Editorial Correspondent:** SNM Events magazine from 2012 – 2014.

Research Projects: undertaken : Fish Toxicity as per USEPA, MoEF and OECD Guidelines – 3, Guideline on control of particulate matter from construction activities (Funded by MMRDA), Aluminum toxicity of Bhandup Water Treatment Plant (Funded by MCGM), Driving characteristics of waste carrying vehicles in Mumbai (Funded by Texas University), Emission from vehicles due to traffic congestion (Funded by Maharashtra Transport Forum. **Peer Review** Journals-total 11**,** Magazine Publications (Total: 22.

Conducted various Environmental Audits for MSW processing plants, Water Audit of Solvay Chemicals, Motibag and Itawari Railway station and its colony, DPR of Mahad CETP as per MoEF notifications, ESR Preparation for Bhiwandi Nizampur City Municipality. **Areas of Expertise:** Traffic air modeling, Energy modeling, Shadow analysis, Heat island, DMP and wind analysis, Corporate social responsibility, Scientific and statistical evaluation data, Physico-chemical and microbiological analysis of drinking water, wastewater, soil, solid waste, and many more, Green building formulation, EIA – SWM and Construction projects Sewage treatment plant and solid waste management formulation.

Has member ship to several NGO's and networks such as SOCLEEN, Waste to Energy Technology and Research Council, India (WTERT – India), Action Plan Group for Solid Waste Management etc.

MS DEEPIKA SINGH

Coordinator: OHD: Office of Human development *Climate Change Desk (CCD)- FABC (Federation of Asian Bishops Conference**)***
Secretary: Archdiocese office for Environment (AOE), Visiting Faculty for SOP/SRP: *St. Andrews College, Bandra,*

Past: South Asia Consultant: *Swiss league of Catholic Women, Switzerland**, Member:*** *Advisory Board of Archdiocesan Office for Environment (AOE),* ***Coordinator:*** *Institute for Community Organization Research-until Oct 2016.*

Ms Deepika Singh is a development professional/ consultant. Has Masters in Social Sciences, more than 25 years of experience working with rural and urban communities in India and South Asia on project monitoring and evaluations for impact, assessment and designing grassroots approach to development. More than 300 projects undertaken, including an evaluation of Trauma Counselling project in Sri Lanka post-civil war in 2012.

Since 2015 working with Office of Human Development (OHD) and Climate change Desk (CCD) of the Federation of Asian Bishops Conference (FABC) a network active in 25 countries of Asia.

During last 15 years, designing and conducting seminars, conferences, workshops to engage leaders, communities, college youth, educational Institutions and different communities on themes of environment and Climate Change with specific focus to community resilience building.

Designing and conducting Social Out Reach/ Social Responsibility Program for approx. 500 students of St Andrews College, Bandra since 2008. Basic idea of “Green Audit” was born during experimenting and designing education modules to engage students on environment and climate change in 2012, later a tool was developed for conducting green audit in collaboration with Samuchit Enviro Tech Pune.

She has been the main coordinator for conducting the green audits and has conducted about 13 green audits of various campuses in collaboration with technical experts.

Archdiocesan Office for Environment (AOE)

"Environment is a special area of concern for the Church in Asia and in India. The year 2010 was a successful year for Care for Creation programme in the Archdiocese of Bombay. This important and urgent service of the Church to society, to India and to Asia must be carried on and intensified: The Pastoral letter of the Archdiocesan Consultation 2013- page 1.

First A'dhoc committee meeting held on December 14, 2013, the vision and scope, areas to consider for its reach out was shot listed.

The need to make the Church of Mumbai aware of the seriousness of Climate Change causes and impacts. The model of development has to be questioned which is mainly the cause of Climate Change. A decentralized Environment Cell is important to be more effective.

The focus areas listed out were:
Reach out to faith communities, education institutes, youth, children and public at large.
To start from visible factors that touches the hearts of the people.

Promote environment sustainability; undertake research, trainings, awareness sessions, exposure trips, eco spiritual exposures, reflections, eco retreats, green events, green audits and promoting green campus.

Green Audits can be conducted in Education Campuses, Religious institutions and Homes.
The hierarchy needs to be congratulated for the interest in Environment and Climate Change.

Bishop Allwyn D'Silva: Bishop In charge of AOE, Fr Joseph Gonsalves is the Head & Ms Deepika Singh is the Secretary

Archdiocesan Office for Environment (AOE), St Pius College, Aarey Road, Goregaon E, Mumbai 63

Archdiocesan Office for Environment

To Whomsoever it may concern

This is to state that GREEN AUDIT 2019-21 of St. Andrew's College of Arts, Science & Commerce, St. Dominic Road, Bandra (W), Mumbai- 400 050 has been successfully conducted by Archdiocesan Office for Environment (AOE), Mumbai. Following areas were reviewed for the green audit:

- Energy Management
- Water Management
- Material Management – Consumables
- Waste Management
- Pollution Management
- Travel and Transport Management
- Knowledge Management
- Ecology Management
- Disaster Preparedness

The college is found to be already performing considerably well on most environmental issues. If these efforts continue in a sustainable manner this college can become one of the most ''Green Campus'' in Mumbai in the nearest future.

Joseph Gonsalves
Head
Archdiocesan Office for Environment (AOE), Mumbai.

December 5, 2021

Archdiocesan Office for Environment
St. Pius College, Aarey Road,
Goregaon (E), Mumbai-400 063.

St Pius X College, Aarey Road, Goregaon (East), Mumbai 400063. • Tel: 91-22-29270523 / 29270953
• Email: bombaydioceseenvironmentoffice@gmail.com • Website: www.icor.org.in