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## **GREEN AUDIT REPORT**

Darjeeling Govt. College Lebong Cart Road, Richmond Hill, Darjeeling West Bengal-734101



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Date: 04.03.2022

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#### **Executive Summary**

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development. Darjeeling Govt. College is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Campus Policy. The methodology included: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit were to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health and learning college operational costs and the environment. The green audit was based on the guidelines, rules, acts, and formats set by the Government of India, Ministry of Environment and Forest, New Delhi, and Central Pollution Control Board, New Delhi.

#### 1. Introduction

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Green audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

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#### 1.1About the College

#### 1.1a Location

Darjeeling Government College is a co-educational government-funded college established in 1948 in Darjeeling, West Bengal, India. The College is situated at an elevation of 2134 meters on Jalapahar-Lebong ridge. The college area extends between 27° 3′ 13.45″ and 27° 3′ 18.27″ north latitudes and 88° 15′ 26.90″ and 88° 15′ 31.29″ east longitudes (Pic1 & Fig1). Its near Padmaja Naidu Himalayan Zoological Park and the Himalayan Mountaineering Institute.It offers postgraduate courses in Botany, Zoology, English and Nepali and undergraduate courses in Nepali, English, Bengali, History, Hindi, Economics, Modern Tibetan, Geography, Political Science, Philosophy, Physics, Chemistry, Mathematics, Botany, Zoology, Microbiology and Commerce.



Pic 1- Google Earth Pro satellite image showing location of Darjeeling Govt. College.

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## Land Use Map of Darjeeling Government College

Lebong Cart Road, Darjeeling 88°15'32"E 88°15'26"E Woodland Shrub Gate No.3 THE THE PARTY OF T Shrub Rhododendron Plantation Bamboo groves onnecting Stairs lwo Wheeler Parking Car Parking Meters 10 20 40 60 Prepared by Dr. Sonam Lama, Assistant Professor, Dept. of Geography.

Data Source- Google Earth Pro satellite image coupled with GPS field survey. Prepared in ArcGIS 10 4.1 software on 20.06.2024. Area-3.45 acres (approx.)

Fig. 1 Land use map of Darjeeling Govt. College campus.

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88°15'26"E





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#### 1.1bWeather and Climatic Conditions

The average annual rainfall ranges from 2000 mm to 3400mm, 90% of which happens during four-five months of the high-sun season (May–September) whereas very little precipitation happens during the low-sun season. During winter, average temperature ranges between 5° C to 7° C which occasionally plummets below freezing point inducing rare snowfall. During monsoon and winter, the campus area often remains shrouded in mist and fog.

Table-1 Average weather data recorded at Darjeeling Govt. College AWS for 2023

Months	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Min. Temp. (Degree Celsius)	1.2	4	7	6.9	10.8	15.5	16.2	16.2	14.2	11	9.2	5
Max. Temp. (Degree Celsius)	17.2	16.6	18.4	22.5	22.6	22.5	23.3	22.1	22.8	21.1	17.8	15.9
Mean Rainfal (mm)	0	0	3.4	1.4	1.7	15.8	9.8	16	11.4	5.4	0	0.16

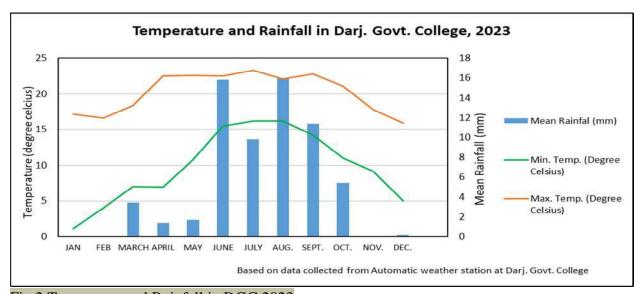


Fig 2 Temerature and Rainfall in DGC,2023

#### 2. Goals and Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The prime long term goals and interim objectives are focused to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

Goal of the Green Audit: -

- Identification and documentation of green practice followed by the college
- Identification of the strength and limitations of the green practices.

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- To introduce and aware students and stakeholders to real concerns of environment and its Sustainability.
- Encourage the stakeholders for optimized sustainable use of available resources.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use of 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 requiring high cost.
- To bring out a status report on environmental compliance.
- In pursuance of the Green Campus Policy of the Institution the Green Audit oversees and assesses the college's initiative and recommends measures for improvement.
- The reports of this will be made available to all stakeholders shall serve as a basis for continuous improvement and further sustainability initiatives.
- It shall also offer the institution an opportunity to take the lead in redefining its environmental culture through instilling environmental ethics and values among the students and staff.

The main Objective of Green Audit: -

- To map out the geographical Location of the Institution
- To document the floral and faunal of the college.
- To analyze the metrological parameters of Darjeeling, where the institute is located.
- To document the ambient environmental condition of weather, air water and noise in the college campus.
- To assess and document the waste disposal system.
- To report the green initiative during the last five years.

#### 3. Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summaries the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management







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#### 4.Observations and Recommendations

#### 4.1Water Use and Conservation

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

#### a) Observations

Being situated in a hilly terrain at an elevation of 2000 m, water is very precious in Darjeeling. Thus, the optimal use of it without any wastage is of utmost importance. College strives to minimize its dependence on piped water supply from Darjeeling Municipality through yearround awareness campaigns among its stakeholders, reducing its water usage, reducing water wastages through leakages and maximum use of rain water through rain water harvesting. The study observed that the Darjeeling Municipality connection and rainwater harvesting are major sources of water in college and the hostels. College has water harvesting tank of 27,184 liters capacity. Water is used for drinking purpose, toilets and gardening. The waste water from the RO water purifier is used for gardening purpose. Water usage depends on season - March-April (entirely with Municipality supply-30,000 ltrs/week approx.), April- August (Municipality supply 18000 ltrs/week -, and rest with Rainwater Harvesting), August-December (Municipality supply -20000 ltrs/week, rest Water Harvesting) and during winter (late December to late February-) college closes for winter vacation. Only College office remains open during winter and thus water usage from Municipality connection drops to 10,000 liters/week approx. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 3,000 liters /day, which include 2800 liters /day for domestic, laboratory purposes and 200 ltrs/day for drinking purpose. Rain water harvesting units are also functional for both reuse of water and recharging ground water level as well.

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Pic 2-NSS volunteers cleaning surroundings of Water Harvesting site.

#### b) Recommendations

- In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.
- Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage are regularly serviced.
  - Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using drip/sprinkler irrigation system to minimize water use.

#### **4.2Energy Use and Conservation**

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

**Note-** A separate energy audit has been conducted for the institution. Hence details of observation and recommendation can be found there.

#### 4.3 Waste Generation

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling,

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repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

#### a) Observations

Being located in a hilly terrain of 2000 meters elevation and fragile ecosystem, college always aware its stakeholders and strive to generate minimal waste. The idea of "consume less to handle lesser waste" is the moto with which College handles its waste problem. Plastics in particular is very detrimental to hilly regions and therefore use of plastics especially single use plastics is almost prohibited inside the campus. All the stakeholders are directed to use alternatives to plastics during events, programs and functions in the college. Still some number of plastics get into the campus which are collected monthly or bi-monthly by NSS volunteers and they prepare Eco-Bricks out of plastics and pet bottle collected.

Waste generation leaf litters, is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Single sided used papers reused for writing and printing in all departments and recently both side printing is carried out as per requirements. The waste generated by newspapers 70 kg/year, magazine 50 kg/year and of cartons is 20kg/year. Very less plastic waste (0.1Kg/day) is generated by the department, office, garden etc. but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The solid waste is collected by the municipal corporation and disposed by their methods. -degradable wastes are turned into manure through composting inside the campus area only. The college laboratories do not use very hazardous Chemicals and radioactive elements and hence the wastes from the laboratories are negligible. Other less hazardous chemicals waste is disposed under the supervision of the teachers of the concerned department.

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**Pic 3**Placard showing plastic free zone. Special talk on Micro-plastics by Prof. Yuvraj Gurung, Assistant Professor of Zoology during WED, 2023.

#### b) Recommendations

- Reduce the absolute amount of waste that is produced from college staff offices.
- Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Important and confidential papers after their validity to be sent for pulping.
- Vermicomposting should be adopted on at least 300 sq. ft. of land.

#### 4.4 E-Waste Generation

E-waste can be described as consumer and business electronic equipment that is near or at the end of its life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

#### a) Observations

E-waste generated in the campus is very less in quantity. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E-waste







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and defective item from laboratories and officeare being stored properly in a separate room. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.



Pic 4 E-waste collected is stored in a separate room.

#### b) Recommendations

- Recycle or safely dispose goods, computers and electrical appliances.
  - Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and available.



**Pic 5**NSS, DGC organized an AWARENESS PROGRAM on Electronic waste (E-Waste) By All India Women's Conference (AIWC), Darjeeling In Collaboration with HULLADEK (Hungry for waste) on 18.11.2022.

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#### 4.5 Green Area

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

#### 4.5.1 Observations

Main Campus has a total area of 3.45 acreswith 1.65 acresbuilt-up area (47.8%). Thus, it has a green area of 52.2%. College campus is surrounded by protected forest of PNZP from three sides and thus has thick green both inside and in the vicinity. The campus has great variety of trees and plants. Every year Various tree plantation programs are being organized at college campus and surrounding villages through NSS (National Service Scheme) unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various type of indigenous species of ornamental, flowering, medicinal, wild orchids, climbers etc.

The campus is situated at Richmond hill near the famous Padmaja Naidu Himalayan Zoological Park and the Himalayan Mountaineering Institute. Darjeeling Government college is surrounded by thick green canopy of reserved forests of PNHZP (north, east and south) and hence experience very quiet and peaceful, whereas Darjeeling-Jorethang road demarcates its western boundary. Further a PWD parking lot is situated in front of the main gate. This makes the main entrance quite chaotic and western part of the college bit noisy but it was observed that within the campus main building and classrooms, the noise from the nearby public space has no adverse effects on the teaching – learning process and no major treats of noise pollution was recorded. There have been no complaints on the noise emanating from nearby public space.

Notably college has installed an automatic weather station since March, 2021 to monitor local weather parameters. It records hourly data of six weather parameters namely Air temp. Avg, Humidity. Avg, Radiation. Avg, Wind Dir. Avg, Wind Spd. Avg, rainfall.

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**Pic 6**. Darjeeling Govt. College campus being surrounded by thick green canopy of reserved forests of PNHZP from three sides (north,east and south).



Pic 7 Automatic weather station being operational since March, 2021.

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#### 4.5.2 BIODIVERSITY OF THE CAMPUS

The lush green campus of DGC is very rich in biodiversity hosting mostly Himalayan floral and faunal species. The existing Forested, grassland and aquatic ecosystems diversity boost the specific diversity along with genetic diversity by allowing balanced ecosystem within the campus. The species richness in various plantation areas shows high species diversity whereas other natural patches showing significant diversity. The campus is rich with various plants groups including flowerings plants, Gymnosperms, ferns, mosses and different fungal species.

#### 4.5.2a Floral Diversity

Darjeeling Government College is situated in the Birch Hill in the northern part of Darjeeling town, at an altitude of 2100 mAMSL and is extended over an area of 3.45 acres. About 52.2% of the campus is covered lush green vegetation. Being a part of Darjeeling Himalaya which is an important and significant portion of Eastern Himalaya, the IUCN Recognized Hotspot of Biodiversity Conservation, our college campus is very rich and diverse in floral elements.

In a recent survey more than 204species of higher plants belonging to 173genera and 83 families were recorded including 174 species of angiosperm, 8 species of gymnosperms and 22 species of Pteridophytes. The diversified floral of the campus is an assemblage of almost all the habit groups of plants – trees, shrubs, herbs, climbers, epiphytes, parasite, annual, biennial, perennial, ephemeral etc. Huge numbers of medicinal plants, food, fodder, timber yielding plants, ornamental, ethno-medicinal and ethno-religious plants, rope and cordage, broom, that ching plants, aromatic plants etc are categories of plants on the basis of their utility and usage. Following tables (table 1 to 6) represent some of the components of rich flora of our college campus

Table 2: List of Tree species available in the campus

SL.	Species	Family	Local
No.			Name
01	Magnolia doltsopa (BuchHam.ex	Magnoliaceae	Champ
	DC.) Figlar		
02	Camellia sasanquaThunb.	Theaceae	Camellia
03	Saurauianapalensis DC.	Actinidiaceae	Gagoon
04	Elaeocarpus sikkimensis Mast.	Elaeocarpaceae	Bhadrase
05	Evodia fraxinifolia (Hook.) Benth.	Rutaceae	
06	Hovenia dulcis Thunb.	Rhamnaceae	
07	Acer laegatum Wall.	Sapindaceae	
08	Rhus succedanea Linn.	Anacardiaceae	

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09	Platanus acerifolia (Aiton) Wall.	Platanaceae	Kapase
10	Erythrina arboresenceRoxb.	Leguminosae	Faledo
11	Eriobotrya petiolataHook.f.	Rosaceae	
12	Exbucklandiapopulnea (R.Br. ex Griff)	Hamamelidaceae	Peepul
	R.Br.		
13	Brassaiopsis mitis C.B. Clarke	Araliaceae	
14	Symplocos lucida (Thunb.) Siebold	Symplocaceae	
	&Zucc		
15	Pyrularia edulis (Wall.) A.DC.	Santalaceae	
16	Macaranga dentriculata (Blume) Mill.	Euphorbiaceae	Sindure
	Arg.		
17	Glochidion acuminatumMill.Arg.	Euphorbiaceae	
18	Ficus nerifolia Sm.	Moraceae	
19	Ficuselastica Roxb. ex Hornem.	Moraceae	
20	Debregeasialongofolia(Burm.f.)	Urticaceae	
	Wedd.		
21	Alnus nepalensisD.Don.	Betulaceae	Utis
22	CastanopsishystrixHook.f. T. ex A.DC.	Fagaceae	Katus
23	Salix babylonicaLinn.	Salicaceae	
24	Trachycarpusmartianus(Wall.ex.Mart.)	Arecaceae	
	H.Wendl.		
25	Rhododendron arboreumSm.	Ericaceae	Guras
26	Machilus edulis King ex Hook.f.	Lauraceae	Kawlo
27	Perseaodoratissima(Nees) Kosterm	Lauraceae	

**Table 3: List of Shrubby Species** 

SL.	Species	Family
No.		
01	Mahonia nepalens DC. Ex Dippel	Berberidaceae
02	Hypericum uralumBuchHam. Ex	Hypericaceae
	D.Don.	
03	Abutilon pictum (Gillius ex Hook.)	Malvaceae
	Walp.	
04	Rubus ellipticus Smith	Rosaceae
05	Hydrangea heteromallaD.Don.	Hydrangeaceae







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06	Fuchsia corymbiflora Ruiz & Pav.	Onagraceae
07	Azalea pontica Linn.	Ericaceae
08	Vaccinium vacciniaceum(Roxb.)	Ericaceae
	Sleumer	
09	Buddleja asiatica Lour.	Buddlejaceae
10	Brugmansia suaveolens(Humb. &Bonpl	Solanaceae
	ex Willd) Bercht. & J. Prels.	
11	Cestrum aurantiacumLindl.	Solanaceae
12	Cestrum fasciculatum(Schltdl.) Miers	Solanaceae
13	Cestrum nocturnumLinn.	Solanaceae
14	Cyphomandrabetacea(Cav.) Sendtn.	Solanaceae
15	Solanum donianum Walp.	Solanaceae
16	Acanthus illicifoliusLinn.	Acanthaceae
17	Aconogonum molle (D.Don.) H.Hrar	Polygonaceae

**Table 4: List of herbaceous species** 

Sl	Name of the species	Family	Habitt
No.			
01	Anemone polyanthesD.Don	Ranunculaceae	Perennial
			Herb
02	Anemone tetrasepalaRoyle	Ranunculaceae	Perennial
			Herb
03	Clematis buchananiaDC.	Ranunculaceae	Perennial
			Herb
04	Papaver macrostomumBoiss.	Papaveraceae	Annual Herb
	&A.Huet		
05	Brassica juncea(Linn.) Czern.	Brassicaceae	Annual Herb
06	Capsella bursa-pastoris (Linn.)	Brassicaceae	Annual Herb
	Medik.		
07	Cardamine hirsutaLinn.	Brassicaceae	Annual Herb
08	CerastiumglomeratumThuill.	Caryophyllaceae	Annual Herb
09	Drymaria cordata (Linn.) Willd. Ex	Caryophyllaceae	Annual Herb
	Schuld.		
10	Sagina japonica(Sw.) Ohwi	Caryophyllaceae	Annual Herb











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11	Stellaria media (Linn.) Vill.	Caryophyllaceae	Annual Herb
12	Stellaria uliginosaMurray	Caryophyllaceae	Annual Herb
13	Geranium nepalenseSweet	Geraniaceae	Perennial
			Herb
14	Oxalis corniculataLinn.	Oxalidaceae	Perennial
			Herb
15	Oxalis latifolia Kunth	Oxalidaceae	Perennial
			Herb
16	Tropaeloum majus Linn.	Tropaeolaceae	Perennial
			Herb
17	Impatiens arguta Hook.f& Thomson	Balsaminaceae	Perennial
			Herb
18	Impatiens gracilifloraHook.f.	Balsaminaceae	Annual Herb
19	Tetrastigmaserrulatum(Roxb.)	Vitaceae	Perennial
	Planch.		Herb
20	Crotalaria cytisoidesDC	Leguminosae	Perennial
			Herb
21	Parochetus communis D.Don	Leguminosae	Perennial
			Herb
22	Trifolium repens Linn.	Leguminosae	Perennial
			Herb
23	Duchesnea indica (Jacks.) Focke	Rosaceae	Perennial
			Herb
24	Fragaria nubicola (Lindl. Ex Hook.f.)	Rosaceae	Perennial
	Lacaita		Herb
25	Astilbe rivularisBuchHam. ex D.	Saxifragaceae	Perennial
	Don		Herb
26	Bergenia ciliata(Haw.) Sternb.	Saxifragaceae	Perennial
			Herb
27	Saxifraga stolonifera L.f	Saxifragaceae	Annual Herb
28	EdgariadarjeelingensisC.B.Clarke	Cucurbitaceae	Annual Herb
29	Sechium edule (Jacq.) Sw.	Cucurbitaceae	Annual Herb
30	Trichosantheslepiniana(Naudin)	Cucurbitaceae	Annual Herb











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31	HydrocotylejavanicaThunb.	Apiaceae	Perennial
			Herb
32	HydrocotylesibthorpiodesLam.	Apiaceae	Annual Herb
33	Oenanthe thomsoniiC.B.Clarke	Apiaceae	Annual Herb
34	Hedera helix Linn.	Araliaceae	Perennial
			Herb
35	GaliummollugoLinn.	Rubiaceae	Annual Herb
36	GaliumrotundifoliumLinn.	Rubiaceae	Annual Herb
37	OphiorrhizatreutleriHook.f.	Rubiaceae	Annual Herb
38	Rubia cordifolia Linn.	Rubiaceae	Perennial
			Herb
39	Artemisia vulgaris Linn.	Asteraceae	Perennial
			Herb
40	Bidens pilosaLinn.	Asteraceae	Annual Herb
41	Crassocephalumcrepidioides(Benth.)	Asteraceae	Annual Herb
	S.Moore		
42	Dichrocephala integrifolia (Linn.f.)	Asteraceae	Annual Herb
	Kuntze		
43	Erigeron bellidioides(BuchHam. ex	Asteraceae	Perennial
	D. Don) Benth. Ex C.B.Clarke		Herb
44	Erigeron canadensis Linn.	Asteraceae	Annual Herb
45	Eupatorium adenophorumSpreng.	Asteraceae	Perennial
			Herb
46	Gnaphalium affine D.Don	Asteraceae	Perennial
			Herb
47	Gynura cusimbua (D.Don) S.Moore	Asteraceae	Perennial
			Herb
48	Phlomoideshamosa(Benth.)	Asteraceae	Annual Herb
	Mathiesen		
49	SiegesbeckiaorientalisLinn.	Asteraceae	Annual Herb
50	Sonchus asper (Linn.) Hill	Asteraceae	Annual Herb







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51	Spilanthesacmella(Linn.) Linn.	Asteraceae	Annual Herb
52	Youngia japonica (Linn.) DC	Asteraceae	Annual Herb
53	Campanula pallida Wall.	Campanulaceae	Perennial
			Herb
54	Lobelia nummulariaLam.	Lobeliaceae	Annual Herb
55	Lysimachia japonicaThunb.	Primulaceae	Annual Herb
56	Primula malacoidesFranch.	Primulaceae	Annual Herb
57	Ipomoea indica (Burm.) Merr.	Convolvulaceae	Perennial Herb
58	Ipomoea purpurea (Linn.) Roth	Convolvulaceae	Perennial Herb
59	Nicandra physalodes(Linn.) Gaertn.	Solanaceae	Annual Herb
60	Solanum americanumMill.	Solanaceae	Perennial Herb
61	Calceolaria mexicanaBenth.	Scrophulariaceae	Annual Herb
62	CymbalariamuralisP. Gaertn.,	Scrophulariaceae	Annual Herb
	B.Mey. & Scherb.		
63	Lindenbergia grandiflora (Buch	Scrophulariaceae	Perennial
	Ham. ex D. Don) Benth.		Herb
64	Lindenbergia muraria (Roxburgh ex D.Don) Bruhl	Scrophulariaceae	Annual Herb
65	Mazus pumilus (Burm.f.) Steenis	Scrophulariaceae	Annual Herb
66	Mazus surculosusD.Don	Scrophulariaceae	Annual Herb
67	Torenia fournieri Linden ex E.	Scrophulariaceae	Annual Herb
	Fourn		
68	Veronica japonica Steud.	Scrophulariaceae	Annual Herb
69	Aeschynanthus parviflorus(D.Don)	Gesneriaceae	Perennial
	Spreng.		Herb
70	Achimenes longiflora DC.	Gesneriaceae	Perennial
			Herb
71	Chirita pumila D.Don	Gesneriaceae	AH
72	Hypoestestriflora(Frossk.) Roem. &	Acanthaceae	Perennial







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	Schult.		Herb
73	Craniotome furcata(Link) Kuntze	Lamiaceae	Annual Herb
74	Clinopodiumumbrosum(M.Bieb.) Rchb.	Lamiaceae	Perennial Herb
75	Plantago major Linn.	Plantaginaceae	Perennial Herb
76	Chenopodium album Linn.	Chenopodiaceae	Perennial Herb
77	Fagopyrum esculentum Moench	Polygonaceae	Perennial Herb
78	Fallopiapterocarpa(Meisn.) Holub	Polygonaceae	Annual Herb
79	Persicaria capitata (BuchHam. ex D. Don) H.Gross	Polygonaceae	Perennial Herb
80	Persicaria chinensis (Linn.) H. Gross	Polygonaceae	Perennial herb
81	Polygonum runcinatumBuchHam. ex D. Don	Polygonaceae	Annual Herb
82	Rumex nepalensisSpreng.	Polygonaceae	Perennial Herb
82	Peperomia tetraphylla (Forst.f) Hook & Arnott	Piperaceae	Perennial Herb
84	ChamabainiacuspidataWight	Urticaceae	Perennial Herb
85	Elatostema sessile J.R.Frost. & G.Frost.	Urticaceae	Annual Herb
86	Girardiniadiversifolia(Link) Friss	Urticaceae	Perennial Herb
87	Pilea umbrosaBlume	Urticaceae	Perennial Herb
88	Pouzolzia hirta Blume ex Hassk.	Urticaceae	Perennial Herb
89	Urtica diocaLinn.	Urticaceae	Perennial











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			Herb
90	Urtica parvifloraRoxb.	Urticaceae	Perennial
			Herb

**Table 5: List of Monocotyledonous Species** 

Sl.	Name of the species	Family	Habit	Remarks
No	rame of the species	ranniy	Habit	Kemai Ks
1.	Agrostophyllum callosum Rchb.f.	Orchidaceae	Perennial Herbs	Epiphytic
2.	Coelogyne nitida (Wall. Ex D.Don) Lindl.	Orchidaceae	Perennial Herbs	Epiphytic
3.	Coeolgyne cristata Lindl.	Orchidaceae	Perennial Herbs	Epiphytic
4.	Epigeneiumrotundatum (Lindl.) Summerh.	Orchidaceae	Perennial Herbs	Epiphytic
5.	Eria coronaria (Lindl.) Rchb.f.	Orchidaceae	Perennial Herbs	Epiphytic
6.	Otochilus albus Lindl.	Orchidaceae	Perennial Herbs	Epiphytic
7.	Phalaenopsis taenialis(Lindl.) Christenson & Pradhan	Orchidaceae	Perennial Herbs	Epiphytic
8.	Pleione praecox (Smith) D.Don	Orchidaceae	Perennial Herbs	Epiphytic
9.	Cautleya spicata (Smith) Baker	Zingiberaceae	Perennial Herbs	Epiphytic and terrestrial
10.	<i>Globbahookeri</i> C.B.Clarke ex Baker	Zingiberaceae	Perennial Herbs	Chasmophyte
11.	Hedychium spicatum Smith	Zingiberaceae	Perennial Herbs	Chasmophyte
12.	Musa sapintumLinn.	Musaceae	Perennial Herbs	Terrestrial
13.	Canna indica Linn.	Cannaceae	Perennial Herbs	Terrestrial
14.	Chlorophytum	Liliaceae	Perennial	Terrestrial







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	nepalense(Lindl.) Baker		Herbs	
15.	Hemerocallis fulva (Linn.)	Liliaceae	Perennial	Terrestrial
	Linn.		Herbs	
16.	Ophiopogon	Liliaceae	Perennial	Terrestrial
	intermediusD.Don		Herbs	
17.	Ophiopogon clarkeiHook. f.	Liliaceae	Perennial	Terrestrial
			Herbs	
18.	ZephyranthescarinataHerb.	Liliaceae	Perennial	Terrestrial
			Herbs	
19.	CommelinasikkimensisC.B.	Commelinaceae	Perennial	Terrestrial
	Clarke		Herbs	
20.	Cyanotisvaga(Lour.) Schult.	Commelinaceae	Herb	Terrestrial
	&Schult.f			
21.	StreptolirionvolubileEdgew.	Commelinaceae	Herb	Terrestrial
22.	Trachycarpusmartianus(Wall.	Arecaceae	Tree	Terrestrial
	ex Mart.) H. Wendl.			
23.	Arisaema concinnumSchott	Araceae	Perennial	Terrestrial
			Herbs	
24.	Arisaema costatum(Wall.)	Araceae	Perennial	Terrestrial
	Mart.		Herbs	
25.	Arisaema tortuosum (Wall.)	Araceae	Perennial	Terrestrial
	Schott		Herbs	
26.	Gonatanthuspumilus(Don) E.	Araceae	Perennial	Terrestrial
	& Krause.		Herbs	
27.	Philodendronbipinnatifidum	Araceae	shrub	Terrestrial
	Schott ex Endl.			
28.	Zantedeschia aethiopica	Araceae	Perennial	Terrestrial
	(Linn.) Spreng.		Herbs	
29.	Carex indica Linn.	Cyperaceae	Perennial	Terrestrial
			Herbs	
30.	Cyperus rotundusLinn.	Cyperaceae	Perennial	Terrestrial
			Herbs	
31.	Cynodondactylon(Linn.) Pers.	Poaceae	Perennial	Terrestrial
			Herbs	







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32.	Oplismeusburmanii(Retz.) P.	Poaceae	Perennial	Terrestrial
	Beauv.		Herbs	

**Table 6: List of Gymnosperms** 

Sl.	Name	Family	Habit
No.			
1.	Cycas pectinataBuchHam.	Cycadaceae	shrub
2.	Abies densaGriff.	Pinaceae	Tree
3.	Araucaria columnaris(G. Forst.)	Araucariaceae	Tree
	Hook.		
4.	Cryptomeria japonica (Thunb. Ex	Cupressaceae	Tree
	L.f.) D.Don		
5.	Chamaecyparis pisifera (Siebold	Cupressaceae	Tree
	&Zucc.) Endl.		
6.	Cupressus cashmeriana Royle ex	Cupressaceae	Tree
	Carrière		
7.	Thuja occidentalis Linn.	Cupressaceae	Tree
8.	Taxus baccataLinn.	Taxaceae	Tree

**Table 7: List of Pteridophytes recorded for the campus** 

S1.	Name	Family	Ann
No.			
1.	Huperzia pulcherrima (Wall. ex Hook. &	Lycopodiaceae	Perennial
	Grev.) Pic. Serm.		hrerb
2.	Huperziahamiltonii (Spreng.) Trevis.	Lycopodiaceae	Perennial
			hrerb
3.	Selaginella monospora Spreng.	Selaginellaceae	Annual
			herb
4.	Selaginella chrysocaulos (Hook. et Grev)	Selaginellaceae	Annual
	Spring.,	·	herb
5.	Equisetum diffusumD. Don.	Equisetaceae	Annual
			herb







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6.	Dennstaedtiaappendiculata (Wall. ex	Dennstaedtiaceae	Annual
	Hook) J. Sm		herb
7.	Pteris wallichiana J. Agardh	Pteridaceae	Annual
			herb
8.	Pteris quadriaurita Retz.	Pteridaceae	Annual
			herb
9.	Cheilanthesformosana Hayata	Pteridaceae	Annual
			herb
10.	Vittariaflexuosa Fee.	Pteridaceae	Annual
			herb
11.	Asplenium ensiforme Wall. ex Hook.	Aspleniaceae	Annual
	&Grev.		herb
12.	Asplenium yoshinagae Makino.	Aspleniaceae	Annual
			herb
13.	Depariaboryana(Willd.) M. Kato.	Woodsiaceae	Annual
			herb
14.	Deparia petersenii (Kunze) M. Kato.	Woodsiaceae	Annual
			herb
15.	Athyrium foliosum T. Moore ex R. Sim.,	Woodsiaceae	Annual
			herb
16.	Thelypteris auriculata (J. Sm.) K. Iwats	Thelypteridaceae	Annual
			herb
17.	Dryopteris juxtaposita Christ.	Dryopteridaceeae	Annual
			herb
18.	Polystichumlentum (D. Don) T. Moore.	Dryopteridaceeae	Annual
			herb
19.	Oleandrawallichii (Hook.) C. Presl	Oleandraceae	Annual
			herb
20.	Lepisoruscontortus (Christ) Ching.	Polypodiaceae	Annual
	<u>-</u>		herb
21.	Microsorum membranaceum (D. Don)	Polypodiaceae	Annual
	Ching.		herb
22.	Polypodiodeslachnopus (Wall. ex Hook.)	Polypodiaceae	Annual
	Ching.		herb







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#### **4.5.2b Exotic Foral Elements:**

Flora of Darjeeling is an excellent amalgamation of native and exotic elements of which some species grow very aggressively and are invasive in nature. They easily can replace the native species, disturb the distort the balance of plant community and ecosystem. Likewise, campus flora also have considerable number of exotic plants and they are quite aggressive. Most of them are ornamental and escaped from cultivation. Following table represent few of the exotic species found in the college campus.

Table 8: List of some exotic species from college campus

	<u> </u>	
Sl.No.	Species	Family
1	Mahonia nepalens DC. Ex Dippel	Berberidaceae
2	Eupatorium adenophorumSpreng.	Asteraceae
3	Ipomoea purpurea (Linn.) Roth	Convolvulaceae
4	Nicandra physalodes(Linn.)	Solanaceae
	Gaertn.	
5	Calceolaria mexicanaBenth.	Scrophulariaceae
6	Achimenes longiflora DC.	Gesneriaceae
7	Canna indica Linn.	Cannaceae
8	Araucaria columnaris(G. Forst.)	Araucariaceae
	Hook.	
9	Cryptomeria japonica (Thunb. Ex	Cupressaceae
	L.f.) D.Don	
10	Chamaecyparis pisifera (Siebold	Cupressaceae
	&Zucc.) Endl.	

#### 4.5.2c Threatened Species and their conservation:

Darjeeling Govt. College Campus is also home for two Threatened species of plants-(i) *Cycas pectinata*Buch.-Ham. of family Cycadaceae, which is an ornamntal gymnosperm and enlisted as 'Vulnerable' in the IUCN Red List and (ii) *Taxus baccata*Linn. of Taxaceae enlisted as 'Least Concern' species by IUCN. This is also a gymnosperm species, commonly known as European yew and of great economic value due to its anti-cancerous property and other medicinal value. Another Endemic cucurbit, *Edgariadarjeelingensis* C.B. Clarke, which is restricted to Darjeeling hill only, is also available in this campus.

Conservation of these threatened species is one of the topmost priorities of the college authority and thus several conservational measures have been taken such as creating awareness among the

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Officer-in-Charge



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students regarding their importance and need for the conservation, regular monitoring and maintenance of good heaths of these plants, preventing them from anthropogenic disturbances by fencing, etc. Moreover, the campus has a single plant of *Platanus acerifolia* (Aiton) Wall. of Platanaceae, which is locally Rare and only 2 to 3 individuals are available in Darjeeling and surrounding areas.

**Table 9: List of Medicinal plants** 

Sl	Name of the species; Family	Habitt	Medicinal use
No.	Name of the species, Family	Habitt	Wieurchiai use
	D	A 1	TDI
01	Drymaria cordata (Linn.) Willd. Ex	Annual	Throat pain, sinuses, and
	Schuld.; Caryophyllaceae	Herb	tonsillitis.
02	Oxalis corniculataLinn.;Oxalidaceae	Perennial	antioxidant, anti-cancer,
		Herb	anthelmintic, anti-
			inflammatory,
			antimicrobial
03	Astilbe rivularisBuchHam. ex D.	Perennial	Bone fracture,
	Don; Saxifragaceae	Herb	dislocation, cough, cold
			and body pain.
04	Bergenia ciliata (Haw.) Sternb.;	Perennial	Cough and cold
	Saxifragaceae	Herb	
05	Saxifraga stolonifera L.f;	Annual	Boils, abscesses, and
	Saxifragaceae	Herb	snake bites
06	EdgariadarjeelingensisC.B.Clarke;	Annual	Antioxidant, anti-
	Cucurbitaceae	Herb	cancerous,
			ethnoveterinary use
07	Sechium edule (Jacq.) Sw.;	Annual	Asthma, bronchitis,
	Cucurbitaceae	Herb	cancer, constipation,
			diabetes, jaundice
08	Trichosantheslepiniana(Naudin)	Annual	Laxative
	Cogn.; Cucurbitaceae	Herb	
09	HydrocotylejavanicaThunb.;Apiaceae	Perennial	Whole plant is used as a
		Herb	blood purifier and
			stomachic
10	Ophiorrhiza treutleri Hook.f.;	Annual	Snakebites, ulcers, skin
	Rubiaceae	Herb	disorders
	110010000	11010	GIDOIGOID

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11	Rubia cordifolia Linn.;Rubiaceae	Perennial	Skin problem
		Herb	
12	Artemisia vulgaris Linn.; Asteraceae	Perennial	Skin infection
		Herb	
13	Eupatorium adenophorumSpreng.;	Perennial	To stop bleeding
	Asteraceae	Herb	
14	Spilanthesacmella(Linn.) Linn.;	Annual	Throat infection
	Asteraceae	Herb	
15	Plantago major Linn.; Plantaginaceae	Perennial	Antimicrobial, antiviral,
		Herb	and anti-inflammatory
			effects, and have wound-
			healing properties
16	Chenopodium album Linn.;	Perennial	Anthelmentic
	Chenopodiaceae	Herb	
17	Fagopyrum esculentum	Perennial	Weekness, stomach
	Moench;Polygonaceae	Herb	problem
18	Girardinia diversifolia (Link) Friss;	Perennial	Bodyache, Bone fracture,
	Urticaceae	Herb	high blood pressure
19	Urtica diocaLinn.; Urticaceae	Perennial	Bodyache, high blood
		Herb	pressure
20	Urtica parvifloraRoxb.; Urticaceae	Perennial	Bone fracture, high blood
		Herb	pressure







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Figure 1: a-Patch of Rhododendron forest, b- Platanus acerifolius, c- Rhododendron arboreum, d- Camellia sp., e-Lyonia ovalifolia, f- Taxus buccata, g- epiphyes on Rhododendron, h- T. buccata, i- Araucaria sp., j- Cycas pectinate, k- Thuja occidentalis. l- Dracaena sp.

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Figure 2: Some of Ferns, Mosses and Orchids of college campus







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Figure 3: Some aroids, medicinal herbs and Wild flowers

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#### 4.5.2d Faunal Diversity

The most vulnerable and hazardous environments in the world are hills or mountains, harboring rich repositories of biodiversity. In the year 2010, mountains were recognized as important ecosystems by the Convention on Biological Diversity (CBD) and its special program on 'mountain biodiversity' which aims to reduce the loss of biological diversity in the mountains at global, regional, and national levels. Darjeeling Hills covers a variety of ecosystems in India and is the main source of the country's economy as it provides a site for ecotourism and an important habitat of many valuable floral and faunal species.

The faunal diversity of the campus includes a good number of birds, a large number of insects, and also few mammalian species. In a recent survey, more than 32speciesof insects belongingto6 orders were recorded including 5 species of butterflies and 8species of moths. 48 bird species were recorded including migrants and local migrants. Seven mammalian species including Hodgson's Common Giant Flying Squirrel and Himalayan yellow-throated marten were also recorded within our college campus.

#### 4.5.2eAvifaunal diversity within the College Campus (Table-10)

Order	Family	Sl. No.	Name	Status
Falconiformes	Falconidae	1.	Common Kestrel (Falco tinnuunclus)	Resident
Columbiformes Columbidae		2.	Oriental Turtle Dove (Streptopella orientalis)	Resident & mig
		3.	Wedge-tailed green pigeon (Treron sphenurus)	Resident
Cuculiformes	Cuculidae	4.	Large Hawk Cuckoo (Hierococcyxsparverioides)	Resident & part
Strigiformes	Strigidae	5.	Asian Barred Owlet (Glacidiumcuculoides)	Resident
Piciformes	Ramphastidae	6.	Great Barbet (Megalaima virens)	Resident
	Picidae	7.	Darjeeling Woodpecker (Dendrocoposdarjellensis)	Resident

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		8.	Lesser Yellownape	Resident
		0.	(Picuschlorolophus)	Resident
Passeriformes	Oriolidae	9.	Maroon Oriole	Resident
1 assertionines	Orionaac	<b>)</b> .	(Oriolustraillii)	Resident
	Rhipiduridae	10.	White-throated Fantail	Resident
	Kinpiduridac	10.	(Rhipidura albicollis)	Resident
	Corvidae	11.	Yellow-billed Blue Magpie	Resident
	Corvidae	11.	(Urocissaflavirostris)	Resident
		12.	Grey Treepie	Resident
		12.		Resident
		12	(Dendrocittaformosae)	D: 14
		13.	Large-billed crow (Corvus	Resident
	75. 17	1.4	macrorhynchos)	B 11
	Paridae	14.	Green-backed Tit (Parus	Resident
			monticolus)	
	Aegithalidae	15.	Black-throated Tit	Resident
			(Aegithalos concinnus)	
	Hirundinidae	16.	Barn Swallow	Widespread Re
			(Hirundo rustica)	
	Pycnonotidae	17.	Striated Bulbul (Pycnonotus	Resident
			striatus)	
		18.	Himalayan Bulbul	Resident
			(Pycnonotusleucogenys)	
		19.	Mountain Bulbul	Resident
			(Ixosmcclellandii)	
		20.	Black Bulbul (Hypsipetes	Resident
			leucocephalus)	
	Sylviidae	21.	Sulphur-bellied Warbler	Local migrant
			(Phylloscopusgriseolus)	
		22.	Grey-hooded Warbler	Resident
			(Phylloscopusxanthoschistos)	
		23.	Chestnut-crowned Warbler	Resident
			(Seicercuscastaniceps)	
	Timaliidae	24.	Pygmy Wren Babbler	Resident
			(Pnoepygapusilla)	
		25.	Rusty-cheeked Scimitar	Resident
			Babbler	
			(Pomatorhinuserythrogenys)	
		26.	Coral-billed Scimitar Babbler	Resident
			(Pomatorhinusferruginosus)	
		27.	Chestnut-crowned	Resident
			Laughingthrush	

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		(Garrulax erythrocephalus)	
	28.	Red-billed Leiothrix	Resident
		(Leiothrixlutea)	
	29.	Bar-throated Siva (Siva	Resident
		strigula)	
	30.	Red-tailed Minla	Resident
		(Minlaignotincta)	
	31.	Rufous-winged Fulvetta	Resident
		(Pseudominlacastaneceps)	
	32.	White-browed Fulvetta	Resident
		(Fulvettavinipectus)	
	33.	Rufous Sibia	Resident
		(Malaciuscapistratus)	
	34.	Whiskered Yuhina	Resident
		(Yuhinaflavicollis)	
Sittidae	35.	White-tailed Nuthatch	Resident
		(Sittahimalayensis)	
Sturnidae	36.	Common Hill Myna	Resident
		(Graculareligiosa)	
Turdidae	37.	Blue Whistling Thrush	Resident
		(Myophonuscaerulus)	
	38.	Scaly Thrush	Local migrant
		(Zootheradauma)	
Muscicapidae	39.	Himalayan Bluetail	Resident
-		(Tarsigerrufilatus)	
	40.	Large Niltava (Niltava	Resident
		grandis)	
	41.	Grey Bushchat (Saxicola	Resident
		ferreus)	
	42.	Verditer Flycatcher	Local migrant
		(Eumyiasthalassinus)	
	43.	Grey-headed Canary	Resident
		Flycatcher	
		(Culicicapaceylonensis)	
Chloropseidae	44.	Golden-fronted Leafbird	Resident
		(Chloropsiscochinchinensis)	
Dicaeidae	45.	Fire-breasted Flowerpecker	Resident
		(Dicaeumignipectus)	
Nectariniidae	46.	Green-tailed Sunbird	Resident
		(Aethopyga nipalensis)	
Passeridae	47.	House Sparrow	Widespread res







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		(Passerdomesticus)	
Fringillidae	48.	Dark-breasted Rosefinch	Resident
		(Carpodacusnipalensis)	

Note: all the birds encountered within the college campus are of least concern under IUCN status.

**Reference: "Birds of the Indian Subcontinent"** by Richard Grimmet, Carol Inskipp, Tim Inskipp.

#### 4.5.2f Mammals

The following mammals are observed inside the college campus:

Order: Eulipotyphla

Family: Soricidae (Table-11)

Sl. No.	Common Name	Scientific name
1.	Grey Musk Shrew or House	Suncus murinus
	Shrew	

Order: Rodentia Family: Sciuridae

Sl. No.	Common Name	Scientific name
2.	Orange-bellied Himalayan squirrel	Dremomyslokriah
3.	Hodgson's Common Giant Flying Squirrel	Petauristamagnificus

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# Family:Muridae

Sl. No.	Common Name	Scientific name
4.	House Mouse	Mus musculus

Order: Carnivora Family: Canidae

Sl. No.	Common Name	Scientific name
5.	Golden jackal	Canis aureus

### Family:Mustelidae

Sl. No.	Common Name	Scientific name
6.	Himalayan yellow-throated marten	Martes flavigula
7.	Yellow-bellied Weasel	Mustela kathiah

Note: All the mammalian species encountered within the college campus are of least concern under the IUCN category.

Reference: "Indian Mammals: A Field Guide" by Vivek Menon.

#### 4.5.2fInsects

The following insects are found inside the college campus: (Table-12)

<b>Insect Order</b>	Common Name	Scientific Name
Mantodea	The false garden mantis	Pseudomantisalbofimbriata
	Praying mantis	Mantis religiosa
Mecoptera	Scorpion Fly	Panorpa communis
Diptera	Black flies	Similium sp.
	Housefly	Musca domestica
	Nonbiting midges	Chironomus sp.
Lepidoptera	Tortoiseshell butterfly	Aglosisspp







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	Bispot royal butterfly	Ancemaspp
	Autumn leaf butterfly	Doleschalliaspp
	Tailed rustic butterfly	Vagransspp
	Red spot Jezebel butterfly	Delias decombesi
	Grey double-bristled hawkmoth	Notonagemiaanalis
	Lesser cream wave moth	Scopula ferrineata
	Vine bud moth	Ampelophagathomasi
	Bivinicula moth	Bivinicula spp
	Palpita moth	Palpitaspp
	Hydrilla moth	Paraponyxspp
	Nola moth	Nolaspp
	Psyra moth	<i>Psyra</i> spp
Coleoptera	Stag beetle	Odontolabisalces
	Click beetles	Cardiophorus flexus
	,,	Conoderuslongipenis
	,,	Melanotusfuscus
	-	Phorocardiusmoorii
Hymenoptera	Bumblebee	Bombus haemorrhoidalis
	-	Bonbusorientalis
	Flavescent Bumble Bee	Bombus flavescens

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Orange-legged Bumble Bee	Bombus eximius
Asian honey bee	Apis cerana
Rock bee or giant honey bee	Apis dorsata
Western honey bee or European honey bee	Apis mellifera
Stingless bee	Trigona sp.

**References:** "Encyclopaedia of Insects" by Resh and Carde.

"The Insects: An Outline of Entomology" by Gullan and Cranston.

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Pic 8 Types of birds that visit the campus.











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#### 4.5.3Green Initiatives taken by the college.

• NSS, DGC organized an Interactive Session with Zero Waste Himalaya and Nat Geo Peer Educators for its stakeholders on 10.03.2022.



Pic 9 Interactive Session with Zero Waste Himalaya and Nat Geo Peer Educators on 10.03.2022

NSS, DGC observed Himalayan Cleanup in the campus on 27.05.2022. In this event 35 volunteers actively participated. They collected wastes from the parking lot opposite to the college, brought it to college campus and did waste auditing



Pic 10 Waste auditing under Himalayan Cleanup in the campus on 27.05.2022.

• Ban on use of Plastic - Since the college is declared as a plastic free zone, the use of plastic bags is discouraged within the campus. Even with such awareness some plastic waste enters into college these plastics are collected weekly by the volunteers of NSS and NCC and are handed over to the Municipal Vehicle. The NSS every year makes Eco-Bricks from the plastic pet bottle collected in and around the campus

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Pic 11Students regularly working for plastic free campus.

Landscaping with trees and plants- The College every year organizes various Plantation
programs in the College Campus. The Plantation Program plants various indigenous species
of ornamental, flowering, medicinal, wild Orchids, climbers and fruits trees. The college
students during regular cleaning and plantation drives landscape trees and plants which
makes the college clean and tidy. The NSS and NCC Unit of the college organizes and
participates in various plantation drives outside the college in collaboration with local
organizations and community.





Pic 12 Landscaping with trees and plants

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• NSS Units in collaboration with NCC Unit of the college organized a hiking cum plastic waste collection at and around Tiger Hill, Senchel Temple area on 11.12.2021. Around 45 volunteers along with Program officer actively participated in said event (Pic13).



Pic 13Hiking cum plastic waste collection at and around Tiger Hill, Senchel Temple area on 11.12.2021.



Pic 14 Glimpses of activities during hiking cum plastic waste collection at and around Tiger Hill, Senchel Temple area on 11.12.2021.

• NSS, DGC observed Himalayan Cleanup in the campus on 27.05.2022. In this event 30-35 volunteers actively participated. Our volunteers cleaned up the Multilevel Car Parking lot Area, opposite to the college, brought it to college campus and did waste auditing

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Pic 15cleanup and waste auditing under Himalayan Cleanup in the campus on 27.05.2022.

 SWACHHATA RALLY- The N.S.S Unit of the college participated in the Swachhata Rally from Darjeeling Railway station to Southfield College and attented the seminar on 'Swachhata Action Plan', jointly organised by NSS Salesian College and Southfield College.



Pic 16 Swachhata Rally

• volunteers from the college participated in two days' residential workshop on the theme ZERO WASTE HIMALAYA at Mirik Busty, 4<sup>th</sup>-5<sup>th</sup> August,2018 jointly organised by Zero Waste Himalaya and WWF (Pic 1a-b).

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Pic 17- Group Photograph with the entire team in the workshop (a). One of our volunteers, Miss Sumitra Darjee, Dept. of Botany presenting her findings and observations in the workshop (b).

On 9<sup>th</sup> August 2018 volunteers participated in the event on the theme "PLASTIC FREE DARJEELING" and rallied around the town carrying placards with messages. On next day i.e. 10<sup>th</sup> August,2018 five NSS volunteers from our college gave presentation at St. Josephs' College, Darjeeling on the theme "Growing level of pollution in Darjeeling".



Pic 18 Volunteers alongwith program officer, Dr. Sonam Lama in an awareness program on Plastic pollution under "Plastic Freedom Challenge" at Chowrasta - 9/08/2018.

• AWARENESS PROGRAMME ON ELECTRONIC WASTE- An awareness programme on electronic waste (E-Waste) by All India Women's Conference (AIWC) Darjeeling in collaboration with Hulladek (Hungry for waste) was organized by Seminar and Conference Committee in association with NSS, Darjeeling Government College on 18.11. 2022. The Resource person was Ms. Arati Sharma. Both the NSS Units participated in the programme.

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Pic 19 AWARENESS PROGRAM on Electronic waste (E-Waste) on 18.11.2022.

• NSS Unit of Darjeeling Government College collaborated with P.G. Raja NL Khan College, Midnapore, to organize an awareness rally on "Water Conservation among the tourist in Darjeeling" held on 13.04.2023 at Chowrasta, Darjeeling. (Pics-2,3,4,5)

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Pic 20 - An awareness rally on "Water conservation among the tourist in Darjeeling" with students from P.G. Raja NL Khan College, Midnapore on 13.04.2023

• NSS Unit of Darjeeling Government College in collaboration with NCC, Unit of Darjeeling Government College organized a series of programs relating to World Environment Day, 2023. All the three events planned were very successful.





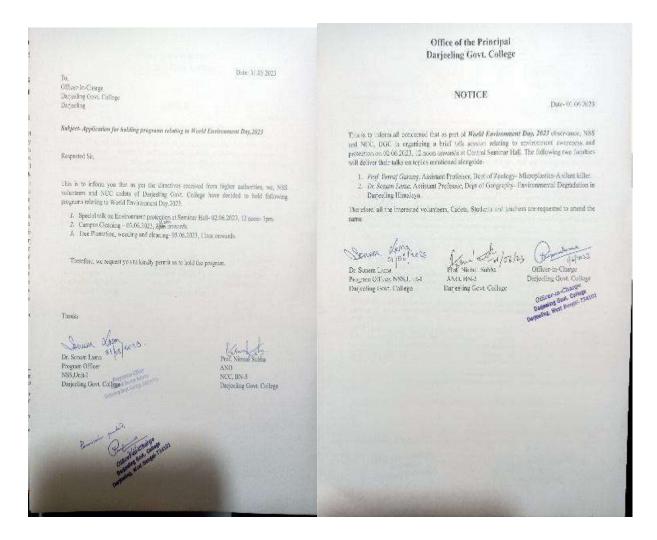


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- (a) Special Talk on environmental protection on 02.06.2023
- (b) Campus Cleaning on 03.06.2023
- (c) Tree Plantation and cleaning drive on 05.06.2023



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Pic 21Special Talk on Environment protection (02.06.2023), Campus Cleaning drive (03.06.2023) and Tree Plantation (05.06.2023)



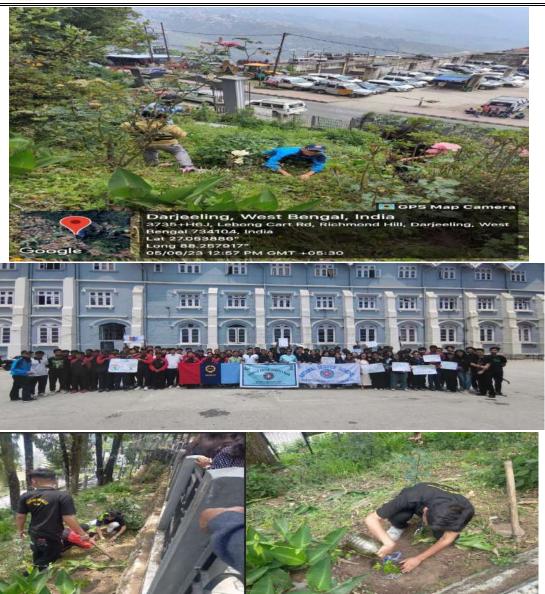




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Pic 22NCC Unit and NSS Unit of Darjeeling Government College Observing World Environment Day 2023







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Pic 23Plantation and Landscaping with trees and plants







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Pic 24Placards showing scientific and local names of trees inside the campus









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Pic 25. Compost Pit









Pic 26. Medicinal plants in the garden







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#### 4.5.4Recommendations

- Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Assign scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this, Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as 'Environment Day' and plant trees on this day to make the campus Greener.
- Indoor plantation to inculcate interest in students.
- Green library should be established.

#### 5 Conclusions

Considering the fact that the institution is the oldest higher education institute of Darjeeling Hills, there is significant environmental protection efforts by all the stakeholders of the college. The environmental awareness initiatives are substantial. The installation of weather station and rainwater harvesting system are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development.

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### External and Internal Member of the Audit Team

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2	Dr. Upakar Rai Assistant Professor Department of Zoology St. Joseph's College, Darjeeling	\$\frac{1}{2}\land{2024}
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1	Dr. Sonam Lama Assistant Professor, Dept. of Geography Darjeeling Govt. College	Assistant Professor (M)  Assistant Professor (M)  Department of Geogram  Department of Geog
2	Dr. Prabir Kr. Sen Associate Professor, Dept. of Chemistry Darjeeling Govt. College	Relin Memor Syray
3	Dr. Kishore Biswas Assistant Professor, Dept. of Botany Darjeeling Govt. College	Kuther Briston W.B.E. & 2/4/24 of Professor (W.B.E. & Department of Botal Department of Botal Department of Botal
4	Dr. Prantik Hazra Assistant Professor, Dept. of Zoology Darjeeling Govt. College	Brantik Harro 14/16/2014  Dr. Prantik Harra, W.B.E.S.  Asst. Professor in Zoology  Darjeeing Government College

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#### Recommendations

With reference to Green and Environmental Audit Process, we commend the college's efforts in implementing various activities related to cleanliness, energy conservation, waste management, water management and conservation, biodiversity conservation, and awareness initiatives. The college has taken several commendable steps towards creating a healthy and sustainable campus environment:

- The college campus, located in the Darjeeling region of the Eastern Himalaya, is contiguous with the Himalayan Biodiversity Hotspot and supports a wide variety of flora and fauna. The college administration is highly proactive in preserving this natural wealth.
- 2. The implementation of a rainwater harvesting system is particularly significant in an area like Darjeeling, where water scarcity is a persistent issue throughout the year except during the rainy season.
- 3. The college maintains a satisfactory balance between forested areas and constructed spaces on its campus.
- 4. Additionally, the campus has a biogas unit, which effectively recycles bio-waste and promotes its reuse, contributing to the overall betterment of the college environment.

While the Green and Environmental Audit Team is pleased with the college's efforts towards creating a Healthy and Sustainable Campus, we offer the following recommendations for further improvement and better management:

- Continue the conservation activities of the campus flora and fauna, with particular attention to rare plants such as Taxus baccata and Platanus acerifolia.
- 2. Enhance the management of chemical waste from the Chemistry, Zoology, and Botany laboratories.
- 3. Renovate the biogas unit as a significant step towards improving waste management.
- 4. Restrict the use of single-use plastics on campus, although it is currently under control.
- 5. Maintain and continue all existing efforts by the college administration towards a greener and cleaner campus in the future.

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Date- 21st June 2024

This is to certify that Darjeeling Govt. College has successfully conducted Green Audit on 20.06.2024 and 21.06.2024. After Physical Verification and inspection, the Auditing Team is of the opinion that the college campus is within the standard parameters.

Congratulations to all the Stakeholders of Darjeeling Govt. College for their efforts towards Green Campus initiatives.

Prof. Arnab Sen Professor

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Congratulations to all the stakeholders of Darjeeling Govt, College for their efforts towards Green Campus initiatives.

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