

GREEN AUDIT

STUDY PERIOD (TWO YEARS) 2021 – 2022 & 2022 - 2023

Sustainability study
AUDIT REPORT

Studied for
**Dolphin (PG) Institute of
Biomedical and Natural Sciences**

VPO Manduwala, Chakrata Road,
Dehradun – 248007,
Uttarakhand, India

Studied in the capacity of
Accredited and Certified GBP



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Disclaimer

The Audit Team has prepared this report for the **Dolphin (PG) Institute of Biomedical and Natural Sciences** located at VPO Manduwala, Chakrata Road, Dehradun – 248007, Uttarakhand, India based on input data submitted by the Institute analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the internal team. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Developing Healthy and Sustainable Environments

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Acknowledgement

The Audit Assessment Team extends its appreciation to the **Dolphin (PG) Institute of Biomedical and Natural Sciences, Uttarakhand** for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are extended are due to everyone from the Management.

Our heartfelt thanks extended to Chairperson of entire process **Dr. Shailja Pant**, (Principal) for the valuable inputs.

We are also thankful to Institute's Task force who have played a major role in data collection.

- Teaching members – **Dr. Shruti Shama**
- Non-teaching staff members – **Mr. Gaurav Bhatia**

We appreciate the cooperation of the **entire Teaching, Non-teaching, and Admin staff** for their support while collecting the data.

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1. Introduction

1.1 About the Institute

1.1.1 Vision

The Institute proposes "To create an educated and ethical society by imparting quality education with holistic development and empowering the youth to achieve global competence."

1.1.2 Mission

The College adheres and focuses towards:

- To empower youth with academic excellence
- Maintain high standards in extracurricular activities
- Holistic development of the youth
- To provide Skill based education with entrepreneurship proficiency
- Research and Innovation
- To serve humanity as socially responsible global citizens

The Institute's department portfolio includes:



Plate 1: Department portfolio of the campus

1.2 Assessment of the Institute

1.2.1 Affiliations

The courses provided by the College have received their affiliation through the **H.N.B. Garhwal Central University**, Srinagar, Garhwal, Uttarakhand

1.2.2 Recognitions

The College has achieved:

- Recognition under section [2 \(f\) of the UGC Act, 1956](#) by University Grants Commission, New Delhi
- Approval of [National Council for Teacher Education \(NCTE\)](#), New Delhi
- Approval of [Govt. of Uttarakhand, Indian Association of Physiotherapists \(IAP\)](#)

2. Overview

2.1 Summarised Populace analysis for 2021-2022

2.1.1 Students data

The data (shared by the Institute) shows there were **2,315 students**.

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	108	46	154
2	Teaching staff	47	32	79
3	Non-Teaching staff	18	01	19
Total Staff Members		173	79	252

Table 1: Staff data of the Institution for 2021-2022

The staff data shows the Institute premises **252 Staff Members**.

2.2 Summarised Populace analysis for 2022-2023

2.2.1 Students data

The data (shared by the Institute) shows there were **2,021 students**.

2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	106	46	152
2	Teaching staff	44	31	75
3	Non-Teaching staff	17	01	18
Total Staff Members		167	78	245

Table 2: Staff data of the Institution for 2022-2023

The staff data shows the Institute premises **245 Staff Members**.

3. Research

3.1 About the Green Building Study

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

3.2 Analysis of the Green Building Study

The procedure included detailed verification as follows:

- Investigation
- Technical
- Observations
- Inferences

3.3 Strategy adopted for Green Building Study

The strategies included data collection from the admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collection, and preparation of the Report.

3.4 Site Area

The Institute spread over **4.172 acres** of land with multiple blocks and landscape areas comprising of **15,36,021.86 sq. ft.** built-up area.

3.5 Establishment

The Institute established and began its operations in **2002**.

3.6 Operation and Maintenance of the premises

The Institution is open from **Monday to Saturday between 09:30 to 16:30 hours**.

4. Evidence



Plate 2: Investigation of the systems and facilities



Plate 3: Seminar on subject related to Sustainability for the stakeholders

Note: The text mentioned in this type of font (red colour, bold and italics style) determines a suggestion

5. Documentation

5.1 Green Practices Audit

The increasing global warming and climate change have made us realise that apart from the enormous strategies the individual small efforts need to be taken by individuals and Educational Institutes as the younger generations are the future of the world and once they are taught about these practices only then can we assume a better future.

5.1.1 Green practices

We observed the following points during the Site investigation and data verification of the premises; these are common for all the Buildings in the premises.

- **Plants as a gift** - *As a kind gesture, the guests visiting the premise are handed over a sapling as token of appreciation and continued efforts towards sustainability*
- **Cleanliness Campaign** - *The Swachha Bharat Abhiyan is carried out on Institute premises as well as off-premises.*
- **Fresh environment** – *The Institute provides an eco-friendly ambience with fresh air and soothing environment which helps to maintain a physical and mental balance. This kind of a space it a must for an educational institute is inviting and gives the stakeholders an opportunity to explore indoor and outdoor learning to a great extent.*
- **Universal design** – *The Institute premises has special provisions such as ramps, lifts for the specially abled.*
- **Signages on the plants mentioning scientific names** - *The practice of having the names of each plant and tree is executed by the Institute and is very beneficial.*
- **Eco club** – *The Institute has an active Eco Club which is one of its kind program, through this the club undertakes a lot of initiatives.*
- **Garden committee** – *The Institute has a distinguished garden committee who is responsible for the beautification for the premises.*

5.1.2 Community development

The details of **extension initiatives** under various heads in Institute are documented below:

S. No.	Type	Since	Coordinator name
1	National Service Scheme (NSS)	2014	Dr Manoj Bansala. Dr Richa Agarwal
2	National Cadet Corps (NCC)	2018	Rohit Maithani

Table 3: Details of the extension initiatives by the Institute

The details of the **environmental activities** conducted as part of the extension initiatives by the Institute documented below:

S. No.	Initiative	Particulars	Type	Date
Academic year 2021-2022 (June 2021 to May 2022)				
1	Tree sapling donation	Keeping our commitment to make Doon green for which our students sow and contribute saplings every year. This year too despite the pandemic lockdown some th students of B.Sc. Forestry 4 year took the brave initiative in sowing and cultivating around 500 saplings of various tree and ornamental species like Acacia catechu (Khair), Dalbergia sissoo (Shisham), Morus alba (Mulberry), White Hibiscus and rose in the College nursery. These were eventually donated to the Civil Defiance Corps Organization.	21-22	07-Jul-21
2	Farmers Day Celebrations	To celebrate the day the faculty and students of the Department of Agriculture organized a mega interactive event with local farmers on 22nd December in the College premises. A total of fifty farmers along with the members of Sahkari Samiti from nearby villages namely Jhajhra, Singhniwala, Kainchiwa-la, Kandoli, Kanswali, and Dhoolkot participated in the deliberations. Farmers showed	2021-22	6/52022

		great interest in Mushroom cultivation, Vermicompost preparation and cultivation of off-season vegetables in Poly Houses.		
3	World Environment Day	World Environment day celebrated with the theme of ONLY ONE EARTH for creating awareness among the students and staff towards the environment	2021-22	05-Jun-22
4	Cleanliness Drive	D.S.W.C. undertook a cleanliness drive in adjoining Manduwala village to promote rural social entrepreneurship and community engagement under SESREC. A voluntary cleanliness campaign near the institute was undertaken on 5th February 2021 by the Social Entrepreneurship Social Rural Engagement Cell, under the auspices of Mahatma Gandhi National Council of Rural Education, Ministry of Education, Govt. of India. The program was arranged under the guidance of DSW Shri Vipul Garg, and team, and 55 DSWC students.	2021-22	5-Feb-21
Academic year 2022-2023 (June 2022 to May 2023)				
1	World Earth Day	A guest lecture was organized to celebrate "World Earth Day" on the theme "Invest in Our Planet" on 22nd April, 2023. Dr. Sas Biswas, Head, Department of Forestry was the invited speaker on this occasion. The session was started with an introduction of Dr. Sas Biswas, followed by his presentation on topic "Recent Perspectives in earth's Ecology with Changing Times for Livelihood and Well being". He emphasized upon various ecological aspects and also on methods by which we can invest in our planet. It was followed by an interactive session with the audience and think tank members from across the world (online). The lecture was highly informative for both students and faculty members. The session ended with vote of thanks by Dr. A. K. Pundir. Also, a Ritha (Soap nut	22-23	22-Apr-23

		or Washnut) sapling was planted by Dr. Shailja Pant, Principal, Dolphin Institute at the reception to commemorate Earth Day.		
2	World Environment Day	, World Environment Day was organized in the institute on 5th June, 2023 with this year's theme "Beat Plastic Pollution" and various programs were organized & coordinated by ECO Club, DIBNS. A cleanliness drive was organized by the NSS Unit which was carried out. In order to make Dolphinites aware of our environment and its conservation, an oath on "Lifestyle for the Environment Pledge" was taken by all the members of Dolphin Institute in the Dolphin Ground. In order to make students aware about the aforesaid aspects, an Interdepartmental Poster Competition on the topic, "Solutions to Plastic Pollution" was organized in which students from all the departments participated.	22-23	05-Jun-23
3	Homing Sparrow and Birds	In this activity sparrow houses and bird nests were placed at different locations in the campus so as to provide suitable nesting places for birds. Students were explained the necessity of the conservation of birds and their nesting habitats. Principal, Dr. Shailja Pant, DIBNS encouraged the students for conservation practices during this event.	22-23	09-Jan-23
4	Swachhta Pakhwara	The Swachhta Pakhwada launched by the government of India, is a fortnight program observed to ensure mass participation of citizens in swachhata activities and to truly transform our country. The various departments in the institute organised programs and cleanliness drives in the nearby areas.	2022-23	1-15 Sept 2022

Table 4: Details of the environmental initiatives undertaken by Institute

The study suggests that the current practices can be increased.

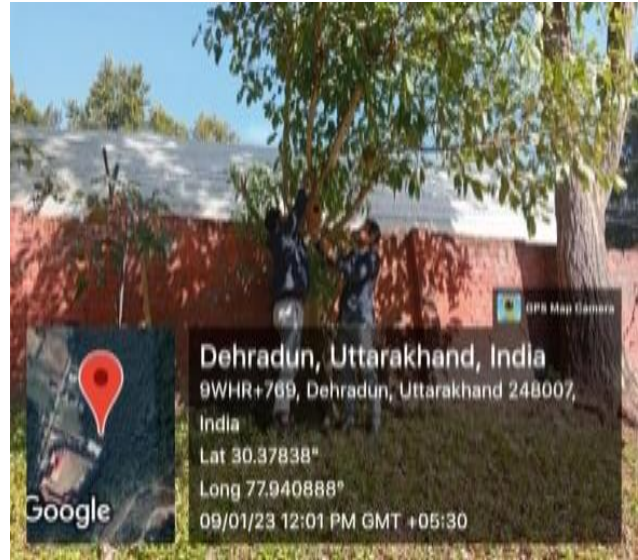


Plate 4: World Earth Day and Homing Sparrow and Birds programme

DETAILED REPORT

5.2 Waste Audit

Waste is an inevitable part of our lives. Over the years the awareness about waste management techniques has given a rise to rethink how the waste can be avoided being sent to the landfills. The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, and waste management strategies that are implemented in addition to the newer ways that can be adopted aiming to make the premise clean and sustainable.

5.2.1 Waste produced

There are 160 dustbins in indoor areas and 7 in outdoor areas (large bins).

S. No.	Type	Current practice	Proposed practice
1	Solid waste (Toilets)	Solid waste from the toilets is disposed off in to the Soak pits	<i>Biogas plant can be proposed</i>
2	Organic waste (Regular)	Organic waste from the Kitchen is given away for cattles and the organic waste from the gardens is processed to manufacture vermicompost in the pits.	Continue with the current practice, no changes
3	Liquid waste (Toilets, wash basins)	Liquid waste is disposed off in to the soak pits.	<i>Waste water treatment plant can be set up as there is space and resources availability</i>
4	Chemical waste from laboratories	Chemical waste is disposed off into the soak pits.	<i>Neutralize the liquid waste before letting into storm water drains or soak pit</i>
5	Toxic waste from laboratories	Very negligible toxic waste is released from laboratories	<i>Dig up a pit 20' away from Institute building to dispose toxic chemicals if any</i>
6	E-waste	The Institute has made arrangements for disposal of E-waste through a certified vendor for recycling.	Continue with the current practice, no changes
7	Plastic waste	-	<i>Tie-up with Bisleri's Bottles for change, undertake eco-walls project and other</i>

			<i>practices</i>
8	Paper waste	Recycling of the paper waste generated in collaboration with scrap merchant.	Continue with the current practice, no changes
9	Bio-waste (Sanitary)	Biomedical waste management committee of the Institute monitors the proper segregation of the biomedical waste in colored Bins and proper disposal through Medical Pollution Control Committee as per biomedical waste management rules - 2016 amended 2018.	Continue with the current practice, no changes
10	Construction waste, reuse	As per observation this is under practice so no changes proposed	

Table 5: Details of the waste management practices



Plate 5: Vermicompost area within the premises

The study suggests that the area and quantity is fine, however a manual on display that highlights details about the process would add on to stakeholder sensitization.

The study suggests that the area should be demarcated as 'E-waste zone' and documentation about the same should be done in the form of monthly reports uploaded on Institutes website.

5.3 Water Audit

Water is one of the basic needs. Pure drinking water is a resource that needs to be preserved efficiently. A water audit helps to identify the sources of water consumption, and the water requirement by the premises is met by these sources. The effective usage of water without any wastage should be a mandatory practice. Understanding the techniques as per site context to increase water conservation in terms of awareness and practice can be identified and executed as part of this exercise.

5.3.1 Water availability and consumption

5.3.1.1 Source of Primary water supply

The Institute requires water from the Local Municipality for drinking water purposes. The facilities available include:

S. No.	Type	Size	Capacity (litres)	Nos.
1	Underground	1600 cft	24,000	1
2	Underground	1300 cft	19,500	1
3	Overhead	1000lts	18,000	18
4	Fire tank	4536 cft	70,000	1
5	Rain water harvesting tank	2400cft	50,000	1

Table 6: Primary sources of water



Plate 6: Overhead water tank in the premises

The study suggests that the space requires of tanks can be documented with Mention of size; Capacity usage; Institute name; Colour coding; Last maintenance date mentioned on each facility

5.3.1.2 Source of Secondary water supply

The Institute uses the following sources of water supply for secondary usages such as watering plants, kitchen, toilets, and wash basins and other spaces.



Plate 7: Bore well in the premises

5.3.1.3 Source of Tertiary water supply

The tertiary source of water is the source of water harvesting. There are recently developed water pits available in the premises in 4 nos.



Plate 8: Rain water harvesting pits in the premises

5.3.1.4 Source of Reusing waste water

This initiative is not practiced.

The study suggests that keeping the site context and constraints in mind the waste water treatment plant can be explored.

5.3.2 Areas of water usage

Based on the inventory done and data shared by the staff we found that the premise has the facilities such as:

- ➔ General toilets for male
- ➔ General toilets for female
- ➔ Taps for gardens and toilet facilities
- ➔ Drinking water cooler

The study suggests that daily documentation of water supply should be undertaken.

5.4 Health and Hygiene Audit

The hygiene is a part and parcel of our daily life. It is extremely essential to keep the surroundings clean in the same manner as we would want our houses to be.

Educational Institutes have a bigger role to play in order to affect the young minds in the positive manner through better hygienic practices.

5.4.1 Facilities available

The Institution has washroom facility, hand wash, drinking water and dustbin facilities. There is attached with 200 bedded Multi Speciality Hospitals in Dehradun, namely Dolphin Jan Kalyan Multi Specialty Hospital and Synergy Institute of Medical Sciences

5.4.2 Hygiene aspects

The investigation conducted physically states that the campus was extremely spic and span, clean with minor odour issues.

The study suggests that the current practices are good enough and requires no major suggestions.

6. Suggestion

6.1 Section-wise suggestions

The following suggestions are to be considered as a ***first priority*** for implementation. These **should be executed within the next 2.5 years from the date of Report submission.**

➔ Water tanks in all areas

- Include the information about size, capacity and usage
- Paint the tank in light blue colour
- Add signboards about the usage such as 'Drinking' or 'Secondary'
- Add signboard and map about the process/ system in practice

➔ Carpets

- Green carpets could be placed outside drinking water and toilet blocks.
- This will add to hygiene areas and keep the water spillage under control.

➔ Awareness displays

- E-waste management chart can be displayed in spaces that have computers such as offices and laboratories.
- Going paperless, Print less etc. awareness boards could be displayed.

6.2 General suggestions

The following are consolidated study related to 'entire Institute' should be considered as **second priority** once section wise recommendations are implemented.

6.2.1 Green practices audit

Environmental awareness - There can be various slogans in local and national language on the compound wall giving the message of saving the environment through the joint efforts of the students and staff thereby making the student socially and environmentally responsible citizens.

6.2.2 Waste Audit

➔ **Multi-colored waste management bins** - There should be more number of dual litter dustbins at various locations in areas such as Canteen, and open spaces. This would inculcate the awareness of waste segregation among students. Whereas a single type of dry waste dustbin should be available inside the teaching areas.



Reference suggestions 1: Twin litter dustbins in the premises

- **Plastic management for localities** – The can be frequent cloth/ paper bags distribution in local schools, slums, Institutes, medical, police stations.
- Tie up with **Bisleri International regarding their 'Bottles for change program'** also with **'Thereco'** for their waste management.
- Invite companies such as **'Thaely'** and **'Recharkha'** to undertake skill development workshops.

6.2.3 Water Audit

Manual about the functioning of the system – There should be manual such as follows to increase sensitization about the facility and its operations.

Roof Rain water Harvesting System

For irrigating the plantation in campus

Rainwater harvesting is a technique used for collecting, storing, and using rainwater for landscape irrigation and other uses. The rainwater is collected from various hard surfaces such as rooftops and/or other manmade aboveground hard surfaces. We have much potential of roof rain water harvesting from which we can collect this water and store it for different purposes. In first phase we have collected the roof water 3000 sqft.

On that basis we can estimate the annual water collection which as follows

Roof Type	Co-efficient
Slab	0.8 to 0.9

Satara City annual rainfall in mm = 1200-1500, Consider rainfall -1300 mm. **Rainfall in meter = 1.3**


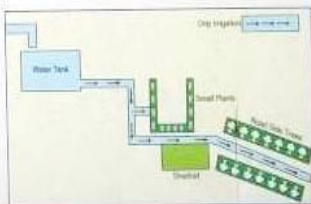
Rainwater Harvesting Potential (In Cum) = Area (in Sq.Meter) X Annual Rainfall (m) X Co-efficient X Constant Co. eff (0.80)

Rainwater Harvesting (3000 Sq.ft) = Area in Meter X Annual Rainfall (m) X Co-efficient X Constant Co. eff

278.7091	1.3	0.8	0.80
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Rainwater Harvesting (3000 Sq.ft) = 278.7091 X 1.3 X 0.8 X 0.80
 = 231.8859712 Cum
 = 231885.9712

We are using this water for irrigation plantations in campus by using drip irrigation system

Reference suggestions 2: Roof rain water harvesting system

6.2.4 Health and Hygiene Audit

- **Avoid burning waste** - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff
- **Compound wall** – The compound wall should have awareness messages about 'No Smoking' and 'No Tobacco'

7. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

- Uniform Plumbing Code – India, 2008
- IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- IGBC Green Landscape Rating system, March 2013
- BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
- Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.

