MARATHA VIDYA PRASARAK SAMAJ'S

K. P. G. ARTS, COMMERCE AND SCIENCE COLLEGE IGATPURI, DIST.-NASHIK

A Green Audit Report 2019-2021

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One tree produces nearly 260 pounds of Oxygen each year.

One acre of trees removes up to 2.6 tons of ***Carbon dioxide*** *each year.*

Trees lower air temperature by evaporating water in their leaves.

Tree roots stabilize soil and prevent erosion.

'Nature is a gift of the Earth to us'

'Kadamba'Vriksha: ShriKrishna's Favourite

CONTENTS

A FOREWORD BY THE PRINCIPAL

It provides me an immense pleasure to convey a few words about the college campus and its beautification through some environmental activities. The flora, fauna and the replenishing activities have been the contributions towards the national call for the 'Clean India, Healthy India' by safeguarding of environment. The college campus has been augmented with the tree plantations, botanical garden, shrubs and creepers and tanks for aquatic plants. The windmill, solar energy plant and the energy generator have been the energy renovation and sustainability. It is the moment to acknowledge the efforts and system functioning behind it. It is also the moment to retrospect and to buck up ourselves for further enhancement of the evergreen diversified landscapes on the campus.

To bring greenery on the impenetrable rocky surface, the management of the MVP Samaj and the local managing committees especially Er Bhausaheb Khatale, a member of Executive council of MVP Samaj have been the stakeholders and torch bearers to have the holistic development of the college. To observe the motto– बहुजन हिताय बहुजन सुखाय 'For the Welfare and Wellbeing of the Masses' the Institute 'Maratha Vidya Prasarak Samaj has always been focusing on the social commitments; and reforestation is one of the aims of the movement inevitably ever attempted. Therefore, to be part of the movement, we converted the barren land into the place for suitable for the plantations. The provision of irrigation and drinking water have been made available with the valuable support of the parent institute by digging a well and siphoning water over here from the well. We manage throughout the year with the rain water harvesting, water storing tanks and the dripped watering system.

The hands-on work is of the NSS Volunteers, the NCC Cadets, the participants in the Earn and Learn Scheme, and some hired fellows. The assistance of the supporting staff is for watering and overseeing the activities. As a result, we are sure that as our parent institute so we have been properly contributing to the national urge for maintaining the earthly properties by practicing the environmental activities within and outside the college campus. The NSS volunteers and the NCC cadets visit the nearby villages and the hilly areas for making the villagers aware of the natural resources and importance of tree plantation and use of vermin- compost manure for the organic farming; they carry out the campaigns of tree plantation and preservation. The Department of Zoology has been conducting the Apiculture Project for the students of B Sc since the flowery plants and creepers on the campus attract the bees. Prof Chourasiya has been a snake friend who established the snake-protecting culture; so we never kill snakes though they prevail freely in large number. The Department of Chemistry has its activity of soil testing and community guidance workshops. There are some MOUs with some organizations like Samsonite Company, the Red Ribbon Association and PHC Ghoti. All kinds of social works for creating the eco-friendly atmosphere have been continued for years; it also helps to establish the national integration and fraternity. Not only the college campus but the community places in the villages have been cleaned and beautified by the college volunteers.

Some notable environmental activities are quite mentionable. The prominent one of them is the Botanical Garden that we recently planted and developed with --- varieties of medicinal and useful herbs, fruits and flowery plants. The tanks for the aquatic plants and circumvents of some creepers and could

attract the viewers on the campus. There are – trees and plants covered the area of 3.5 acres of land excluding the building and Extension shades as parts of the infrastructural facilities. Some newly constructed blocks for the Gymkhana and NCC /NSS units will be encircled by the greenery surrounding which may be comfortable sports and parade grounds. The naturally available background

of the mountain and its forestation has been the nature's boon to us. As an evidence, I would like to quote the incidence that a monkey and its kid stayed on the campus for fortnight during the summer only because they got whatever their requirements at the sanctuary for wild animals in the forest.

We keep the pollution free campus by collecting dried tree leaves and used for the vermi-compost unit; the plastic free campus is a promise for us and so we have dustbins placed all over the building premises and students have been persuaded to use them to keep the premises clean and comfortable. Thus, we manage the waste management and energy saving gadgets like solar energy and the generator for power supply. Due to solar plant, we pay one tenth of total charges of electric bills.

In our view, in coming a few years, there wouldn't be vacant space for any plantation; and the whole of the campus will be eco-friendly covered with tall trees and creepers. Even the nearby farmers would get advices or guidance regarding the advanced farming and newly developed varieties of rice and other crops.

For the sake of green audit, the team of the faculty and the supporting department has tried to present themselves with their efforts and contributions to maintain the eco-friendly atmosphere on the campus. Hope that we shall make an addition to enhance the scenery and healthy atmosphere.

Dr. P.R.Bhabad

Principal

GREEN AUDIT COMMITTEE	
Prin.Dr.P.R.Bhabad	*Chairman*
Shri.S.S.Pardeshi	*IQAC Co-Ordinator*
Shri.L.D.Dede	*Co-ordinator*
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Shri.G.W.Gangurde	*Member*

INTRODUCTION

A committee has been formed to monitor the proper conservation and plantation of the plants in the campus. As per the suggestions made by IQAC, Botany department has been given the responsibility of green audit with cooperation of the environmental experts. A report of green audit has been prepared by Green Audit Committee K.P.G. Arts, Commerce and Science College. Igatpuri. This college was established in 1981 in fine tune with the motto of our parent institution Maratha Vidya Prasarak Samaj, Nashik. The College accredited with Grade B by NAAC, Bengaluru. The total area of the college campus is 8.5 acres, of which 65 percent is covered by herbs, shrubs and trees, including valuable medicinal flora. The plants have been systematically identified by the green audit committee. There are more than 966 total number of plants were audited Out of these 59 plant species are grown. The green audit report has been discussed with environmental expert's suggestions to increase greenery on the campus. Extra efforts have been taken by the college to create environment consciousness amongst students. One major step in this regard is the extensive plantation program organized by NSS. NCC, Garden Committee etc. Plantation is encouraged by principal and faculties of all departments to increase greenery and reduce carbon emission effects, Renovation of the garden at the entrance was done with financial support from Mother Institute Maratha Vidya Prasarak Samaj Nashik. Existing gardens are also maintained by the garden committee of this college.

Resolute to ensure green ambience on the campus, the department of Botany initiated a green Audit in the academic year 2019-2021. The enterprise involved multiple phases of analysis to deliberate on issues pertaining to environment and its related concerns on the college campus. The study has been proven effectual and efficacious as it helped pride into the realms that need emendations. The green auditing was also embarked on an exhaustive review of the resources available in the campus. The pragmatic solutions and suggestions put forward by the Audit will be beneficial and apposite for the college in its stride towards excellence.

- **AIM**

To analyse environmental practices within college campus, which will have an impact on the Eco-friendly ambiance.

- **SCOPE**

The scope of green audit can range from an assessment of all environmental aspects. To a focused assessment of a small components and activity

- **OBJECTIVES**

In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems.

The college has been putting efforts to keep our environment clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

- **METHODOLOGY**

The purpose of the green audit of our college is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The methodology includes collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

- **OBSERVATIONS**

There are 59 different types of species of plants, Tree, Shrub, Climber and Creeper in the college campus. The total number of plants is 966. The collage emphasizes on green campus program through which tree plantation programs are regularly practiced in monsoon seasons of each Academic year. The college has beautifully flourished Botanical Garden spread in an area of 9041.68 sq.ft. The most important thing about this botanical garden, is that the Institute has contributed their economic support of Rupees 100000/- toward the establishment of the garden. The plants in the college campus are named scientifically with name plates on every plant.

The college is not just focusing on its campus, but it organizes tree plantation programs in the nearby villages, especially eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.

AREAS COMPRISED IN GREEN AUDIT

Physico Geographical Perspective

❖ Geographical Location

- Latitude Coordinates: - 19°, 42', 1"
- Longitude Coordinates: - 73°, 36', 3"
- Altitude - Average 300M
- Rainfall: - Average 2750 to 2900 mm

WATER ENVIRONMENT

- The K.P.G. campus is with a high potential for the Rain Harvesting. Due to large dug well as well as the open surfaces.
- Based on the geotechnical survey of the campus area, K.P.G. college may choose to recharge the ground water table with the rainwater. If the recharging of ground water table is not feasible then storage of rainwater can be opted. This would satisfy part requirement of the campus in the monsoon season and thus reducing freshwater intake during rainy days.
- In order to use the treated wastewater for flushing a separate plumbing system is prepared.
- It is recommended that liquid chemical waste from the laboratories have been disposed.

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.

OBSERVATIONS

The Campus is located in the contiguity of approximately 966 types of trees & shrubs. Various tree plantation programmes are being organized during the month of July and August on the college campus and surrounding villages by NSS & NCC unit. This programme helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation programme includes various type of indigenous species of ornamental and medicinal plant species. There are 4 Green spots of the College Campus.

RECOMMENDATIONS

- Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records.
- Give scientific names to the trees. Promote environmental awareness as a part of course work in various curricular areas like community service.

- Create awareness of environmental sustainability and takes 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 more green.

TREE PLANTATION

Tree-planting is the process of transplanting tree seedlings, generally for forestry, land reclamation, or landscaping purpose. It differs from the transplantation of larger trees in arboriculture, and from the lower cost but slower and less reliable distribution of tree seeds. Trees contribute to their environment over long periods of time by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil, and supporting wildlife. During the process of photosynthesis, trees take in carbon dioxide and produce the oxygen we breathe.

In silviculture the activity is known as reforestation, or afforestation, depending on whether the area being planted has or has not recently been forested. It involves planting seedlings over an area of land where the forest has been harvested or damaged by fire, disease or human activity. Tree planting is carried out in many different parts of the world, and strategies may differ widely across nations and regions and among individual reforestation companies. Tree planting is grounded in forest science, and if performed properly can result in the successful regeneration of a deforested area. Reforestation is the commercial logging industry's answer to the large-scale destruction of old growth forests, but a planted forest rarely replicates the biodiversity and complexity of a natural forest Because trees remove carbon dioxide from the air as they grow, tree planting can be used as a geo-engineering technique to remove CO_2 from the atmosphere. Desert greening projects are also motivated by improved biodiversity and reclamation of natural water systems, but also improved economic and social welfare due to an increased number of jobs in farming and forestry.

In developing country like India, due to globalization, industrialization and urbanization forest and biodiversity is going to decline so along with tree plantation environmental awareness is also important. There is provision of a subject of environmental awareness to every graduation. Apart from that our collage takes initiative for the tree plantation and environmental awareness. College authority forms a committee for tree plantation Programme and environmental awareness, this committee continuously worked throughout the year. College also arranged ‘Vanmohatsav’, ‘Vruksharopan’ Programme during rainy season. N.S.S. and N.C.C. students arranged ‘Vrukshdindi’ in town for the awareness of tree plantation. With the financial assistance of U.G.C., New Delhi, B.C.U.D., Savitribai Phule Pune University, Pune, college arranged several National, State level Seminar, Conferences for the conservation of forest, biodiversity. Department of Zoology and Botany arranged State level seminar on Biodiversity Conservation – Important and health.

List Of Plants In College Campus

Sr.No.	Botanical Name of the Plants	Marathi Name	Family	Habit	Quantity
1	*Acacia auriculiformis*	ऑस्ट्रेलियनबाभूळ	Mimosaceae	Tree	1
2	*Adhatoda vasaka*	अडुलसा	Acanthaceae	Shrub	2
3	*Alstonia scholaris*	सप्तपर्णी	Apocynaceae	Tree	18
4	*Areca catechu*	सुपारी	Arecaceae	Tree	22
5	*Artocarpus heterophyllus*	फणस	Moraceae	Tree	6
6	*Asparagus racemosus*	शतावरी	Liliaceae	Climber	1
7	*Bahuhinia purpurea*	कांचन	Fabaceae	Tree	1
8	*Bambusa Vulgaris*	बांबू	Poaceae	Tree	3
9	*Bauhinia variegata*	रक्तचंदन	Caesalpiniaceae	Tree	1
10	*Caesalipinia pulcherrima*	शंखासुर	Caesalpiniaceae	Shrub	16
11	*Caesalpinia bonduc*	सागरगोटा	Fabaceae	Tree	44
12	*Callistemon acuminatus*	बाटलीब्रश	Myrtaceae	Tree	1
13	*Calotropis procera*	रुई	Asclepiadaceae	Shrub	22
14	*Canna indica*	कर्दळ	Cannaceae	Shrub	2
15	*Carica papaya*	पपई	Caricaceae	Shrub	2
16	*Carrisa carandus*	करवंद	Solanaceae	Shrub	1
17	*Casuarina equisetifolia*	सुरू	Casuarinaceae	Tree	4
18	*Delonix regia*	गुलमोहर	Caesalpiniaceae	Tree	7
19	*Duranta repens*	गोल्डनडुरांटा	Verbenaceae	Shrub	63
20	*Dypsis lutescens*	अरेकापाम	Arecaceae	Shrub	6
21	*Erythriana variegata*	पांगारा	Fabaceae	Tree	1
22	*Eucalyptus globulus*	नीलगिरी	Myrtaceae	Tree	1
23	*Ficus benghalensis*	वड	Moraceae	Tree	22
24	*Ficus recimosa*	उंबर	Moraceae	Tree	12
25	*Ficus religiosa*	पिंपळ	Moraceae	Tree	2
26	*Grevillia robusta*	सिल्व्हरओक	Proteaceae	Tree	65
27	*Hibiscus rosa-sinensis*	जासवंद	Malvaceae	Shrub	39
28	*Hymenocallis littoralis*	लिली	Amaryllidaceae	Shrub	1
29	*Hyophor belagenicaulis*	बाटलीपाम	Arecaceae	Tree	34
30	*Jasminum auriculatum*	जाई	Oleaceae	Climber	3
31	*Lantana camera*	लांटांना	Verbenaceae	Shrub	5
32	*Leucaena leucocephala*	सुबाभूळ	Mimosaceae	Tree	22
33	*Mangifera indica*	आंबा	Anacardiaceae	Tree	19
34	*Manilkara zapota*	चिक्कू	Sapotaceae	Tree	1
35	*Melia azadirachta*	बकम	Meliaceae	Tree	2

36	*Mimosa pudica*	लाजाळू	Fabaceae	Creeper	4
37	*Mimuso pselengi*	बकुल	Sapotaceae	Tree	2
38	*Morus alba*	तुती	Moraceae	Tree	2
39	*Musa spp.*	केळी	Musaceae	Shrub	1
40	*Neolamarkia cadamba*	कडंबा	Rubiaceae	Tree	3
41	*Nerium indicum*	कन्हेर	Apocynaceae	Shrub	104
42	*Phyllanthus emblica*	आवळा	Euphorbiaceae	Tree	19
43	*Pithecellobium dulce*	विलायतीचिंच	Fabaceae	Tree	33
44	*Plumeria rubra*	चाफा	Apocynaceae	Shrub	8
45	*Polyalthia longifolia*	अशोक	Annonaceae	Tree	32
46	*Pongamia pinnata*	करंज	Fabaceae	Tree	55
47	*Prunus amygdalis*	बदाम	Rosaceae	Tree	2
48	*Psidium guajava*	पेरू	Myrtaceae	Tree	25
49	*Ricinus communis*	एरंड	Euphorbiaceae	Shrub	4
50	*Samanea saman*	पावसाचे झाड	Fabaceae	Tree	11
51	*Sesbania grandiflora*	हदगा	Fabaceae	Tree	2
52	*Spathodea campanulata*	स्पॅथोडिया	Bignonaceae	Tree	12
53	*Syzgium cuminii*	जांभूळ	Myrtaceae	Tree	118
54	*Tamarindus indica*	चिंच	Caesalpiniaceae	Tree	12
55	*Tecoma stans*	टेकोमा	Bignoniaceae	Shrub	1
56	*Tectona grandis*	सागवान	Verbenaceae	Tree	18
57	*Thuja occidentalis*	मोरपंखी	Cupressaceae	Shrub	27
58	*Ziziphus mauritiana*	बोर	Rhamnaceae	Tree	5
59	*Gliricidia sepium*	उंदीरमारी	Fabaceae	Tree	14
				Total	966

ECONOMIC AND ENVIRONMENTAL IMPORTANCE OF TREES

The college campus has trees, shrubs, climbers, herbs, crop plants etc. These all plants have their own economic importance as well as environmental importance also. Most of the trees of the campus are medicinal plants and they have their economic importance also. There are around 118 trees of *Syzgium cuminii* which has Dibeties and antibacterial properties and also used as evergreen ornamental along with this economic importance it has ecological importance also, It helps to check soil erosion; it is draught resistant and grows in different types of soils. Along with it around 59 different species of trees in the campus were studied with their economic and ecological importance. Around 304 shrubs, 4 creeper plants 4 climbers and five Ornamental Garden plants were studied. Most of the plants also have medicinal importance and can be used as first aid for many minor health problems and injuries. Tree plants like Delonix regia Pongamia pinnata, , Tamarindus indicum, , Manilkara Zapota, Bauhinia purpurea, Tectona grandis etc. have their own economic and medicinal importance, Tectona grandis is a state tree of Maharashtra Wood yellowish brown timber used in the manufacturing of furniture, used in boat building and this plant is deciduous grows in dry black soil, *Samanea saman* Ornamental and road side shade tree, strong durable wood, fruit pulp one of Ecologically it is Ornamental, shade giver.

Sr.No.	Botanical Name	Common Name	Economic Importance	Ecological Importance	No.of Plants
1	*Acacia auriculiformis*	ऑस्ट्रेलियन बाभूळ	Use of the species is for fuel wood, used in the pulp and paper industry, leaves may be utilised for the production of biogas as they are easily degradable.	Plants with or without dehydrated sewage sludge application in a degraded area	1
2	*Adhatoda vasaka*	अडुलसा	It is an ayurvedic medicine plant used for cough, astma, brithing trouble, nesal conjastion, bleeding disorder,alergic conditions upper respiratory etc.	Ecological dyeing of wooden, natural dry in the presence of bio mordent act an alternative co partener to metal mordent	2
3	*Alstonia scholaris*	सप्तपर्णी	In india, the bark of alstoniaschoris is used medicinal plant epilipcy to skeen condition and astma, in ayurveda it is used as better astrigent for treating skeen disorder, in snake	Tree is medium to large stately tree growing toll with some what exploted for its valuable timber and is consider good timber while protected	18
4	*Areca catechu*	सुपारी	As a chewing substance. Trunks and leaves serve in local	Supari are the benefits to eating, increased stamina, a sence of	22

			construction, in the making of weapons, and as sources of wax	well being, euphoria, and salivation. use of supari in hindu puja to all the gods & goddesses.	
5	*Artocarpus heterophyllus*	फणस	Plant for a future cannot take any responsibility adveb effect ashes of lives with or without oil are used a treat alser. The rind of the fruits fear gelly, strong smell, they can be dried smell. they contain high starch about 5%	It is a tropical ever green, it has one or more strunk with dark green bar fruit is large , it is cultivated wide range.	6
6	*Asparagus racemosus*	शतावरी	Asparagus racemosus has been described to use as antioxidant,immune stimulant,anti-dyspepsia and anti-tussive effects.	An a commercel scale for eats young suit. this high value specilly scrub, ever green. Natural habitate, tropical, climate with dry summer.	1
7	*Bahuhinia purpurea*	कांचन	Traditional medicine, Herbal remedy for ulcers,cure healing wounds, source of various drugs.	Fast growing with the potential to invade and displace native vegetation	1
8	*Bambusa Vulgaris*	बांबू	used for a variety of purposes, primarily for use in light construction such as houses, huts, boats (masts, rudders, outriggers, boating poles), fences, scaffolding, furniture, musical instruments and handicrafts.	Bambus are described as one of the most important renewable, easily obtained and valuable of all forest resources.	3
9	*Bauhinia variegata*	रक्तचंदन	Used mainly for heavy packing cases, agricultural implements, posts, scantlings, rafters and inferior construction, besides it is used for fuel. The leaves give a fodder of medium quality. Flowers are cooked as vegetable and pickles.	Tropical and Subtropical Trees	1
10	*Caesalipina pulcherrima*	शंखासुर	Four grams from the root are also said to induce abortion in the first trimester of pregnancy Maroon medicine men in Suriname	Garden plant	16
11	*Caesalpinia bonduc*	सागरगोटा	Its leaves, bark and roots are used to cure fever, headache and chest pain and as an anthelminthic.	The morphological and ecological diversity of legumes are reflected in their	44
12	*Callistemon acuminatus*	बाटलीब्रश	The herbicide Mesotrione	Birds have been observed using the	1

			was developed as a synthetic analogue of leptospermone,a natural herbicide produced by the roots	species as a source of food. Those seeking nectar from the flower include estern spinebills,New holland honeyeaters noisy miners, red wattlebirds and silvereyes while crimson rosellas eat the seeds	
13	*Calotropis procera*	रुई	In folk medicine to have purgative and anthelimintic properties and used in treating leprosy, ulcers, tumors and piles as well as purgative, anticoagulant, and anticancer, moreover,	Calotropis procera populations have an immense ecologic role being habitat for several	22
14	*Canna indica*	कर्दळ	The rhizome of Canna edulis is used as foodstuff for starch, it contains. Ornamental: Canna indica is a favourate garden plant, cultivated in almost all parts of the world.	With its large leaves sheathing a central stem, the plant has the appearance somewhat like a small banana plant. The plant provides food (especially the root)	
15	*Carica papaya*	पपई	Fruit is a rich source of vitamin A and C. It has a high nutritive and medicinal value. Papain prepared from dried latex of its immature fruits is used in meat tenderizing, manufacture of chewing gum, cosmetics, for degumming natural silk and to give shrink resistance to wool.	Papaya is a small, fast-growing but short-lived, evergreen tree growing 3 - 10 ... range of other uses, particularly for the medicinal value of its fruits and leaves	2
16	*Carrisa carandus*	करवंद	Acaricides are one of the cornerstones of an efficient control program for phytophagous mites. An analysis of the global acaricide market reveals that spider	Ecology of Chondrus crispus on the northern coast of India. Reproduction. A guide to commercially important seaweeds.	1
17	*Casuarina equisetifolia*	सुरू	Among many tree species, Casuarina equisetifolia with a fast growth rate is widely planted in many countries as a shelterbelt tree species. Along with the general traits of the shelterbelt, a casuarina plantation has potential to protect agricultural lands from salt spray.	It exerted many pharmacological activities including antimicrobial, antidiabetic, antioxidant, cytotoxic, hypolipidemic, gastroprotective, hepatoprotective and	4

				many other pharmacological effects.	
18	*Delonix regia*	गुलमोहर	Anti-rheumatic, gum, pesticides, herbicides, wood, seed carminative	Dry, deciduous, cultivated in forestryroad side, shaded, ornamental values, control soil erosion	7
19	*Duranta repens*	गोल्डनडुरांटा	Duranta erecta is a usually thorny, evergreen shrub or small tree, sometimes with ... land boundaries; whilst also providing a range of medicinal and other uses	Commonly referred to golden dewdrop, pigeon berry, angel whisper, or skyflower is one of the traditional medicinal plants. It has been shown to possess antimicrobial, antioxidant, and insecticide properties.	63
20	*Dypsis lutescens*	अरेकापाम	Also known as golden cane palm, areca palm, yellow palm, or butterfly palm, is a species of flowering plant in the family Arecaceae,	Dypsis lutescens is an evergreen plant, producing a clump of stems 4 - 9 metres tall and 10 - 13cm in diameter, often with small prop	6
21	*Erythriana variegata*	पांगारा	Erythrina variegata is valued as an ornamental tree. ... variegata is often used in agroforestry systems. It can be used for fodder as its foliage has a good nutritive value for most livestock.	Erythrina variegata is a multipurpose tree, often used in agroforestry systems. It can be lopped for fodder, as its foliage has a relatively high protein content	1
22	*Eucalyptus globulus*	नीलगिरी	Timber , gum, pulpwood, essential herb, good source of nectar, phenolic, volatile oil.	Environmental weed , sogal forestry .	1
23	*Ficus benghalensis*	वड	Ayurvedic plant for the treatment of wounds , skin diseases , diabetes, diarrhea	Native of India propagating roots, grown downwards as aerial roots scared Indian tree	22
24	*Ficus recimosa*	उंबर	Tree have healing power , bark paste is useful in skin diseases, insect bite , burns etc, raw food cooked , pickled, used in soap ,	Deciduous tree shaded	12

			astringent , root is chewed in treatment of tonsils, bark contain tannin.		
25	*Ficus religiosa*	पिंपळ	Traditional medicine types of disorders including asthma, diabetes, diarrhea, epilepsy, gastric problem, inflammatory disorders, infections and sexual disorders	Large dry seasson deciduous or semi evergreen tree, religious tree, Buddha got enlightenment under this tree.	2
26	*Grevillia robusta*	सिल्व्हरओक	Grevillea robusta increased species richness of seeds by three times and abundance of seeds by 3–30 times compared with plantations without them.	Grevillea robusta is a deciduous tree with a dense, conical crown; it can grow 12 - 25 metres	65
27	*Hibiscus rosa-sinensis*	जासवंद	Some potential in cosmetic skin care, function as an anti-solar agent, used as a pH indicator, roots are useful in gynac problems.	Attractive to birds, it is not visited regularly by hummingbirds grown in the In the subtropical and temperate Americas humming bird are regularly attracted	39
28	*Hymenocallis littoralis*	लिली	Medicinal plants have antifungal, antibacterial and anti-inflammation activities.	Hymenocallis littoralis has allelochemical importance such as defensive compounds, insect repellents, attractants, and their role in ecological balance.	1
29	*Hyophor belagenicaulis*	बाटलीपाम	Young apical buds edible , fruit used in wine preparation, various syrup, leaves and fibers used for making baskets , hats etc.	Queen palm , ornamental and garden tree, evergreen palm tree, propogation	34
30	*Jasminum auriculatum*	जाई	Oleaceae	Climber	3
31	*Lantana camera*	लांटांना	Verbenaceae	Shrub	5
32	*Leucaena leucocephala*	सुबाभूळ	Forage and fodder, content high protein Mimosine, green manure, biomass, young pods edible.	VAM, Rhzobium fixation	22
33	*Mangifera indica*	आंबा	Dried flowers are of medicinal value and used for curing dysentery and cattarah of bladder. It is a cure for wasp sting, rubbed between hands and left to dry.	Also suitable for tea chest plywood. A hard charcoal of high calorific value is	19

			Mango fruit is one of the delicious fruit of India exported to many countries. The green unripe fruits are used in curries, sharbats and pickles.	obtained from mango wood	
34	*Manilkara zapota*	चिक्कू	The latex of Manilkara, Achras yeilds 'chickle' used for making chewing gum. Aromatic oil is obtained from the flowers of Mimusops elengi and is used in manufacture of perfumes.	A tree with a wide range of local uses as a food and medicine, it is also very important commercially as the source of an edible fruit, a latex and a timber.	1
35	*Melia azadirachta*	बकम	Pesticides, insecticides, effective in Skin disease, burns, scabies, Neem cake as fertilizer.	Drought resistance grows in different types of soils.	2
36	*Mimosa pudica*	लाजाळू	The plant has very good antiseptic and medicinal properties. The root of the plant can be crushed and the paste can be utilized for treatment of boils, acnes and other minor skin ailments.	Basic information on a wide range of useful plants, plus details of environmental needs where available. The plant can grow up to 1 metre tall,	4
37	*Mimuso pselengi*	बकुल	In Asia the leaves are used medicinally to treat headache, toothache, wounds and sore eyes, and are smoked to cure infections of the nose and mouth.	The energy value of the heartwood is 21,340 kJ/kg, that of the sapwood 21,090 kJ/kg	2
38	*Morus alba*	तुती	It is estimated that mulberry silk contributes around 90 % of the total global raw silk production and it is a very attractive economic activities mostly to the rural people.	An excellent online database of a huge range of trees giving very good information on each plant.	2
39	*Musa paradisiaca*	केळी	Use of fruits of Musa spp. as a food source (esp. triploid forms of Musa acuminata and the triploid hybrid Musa × paradisiaca)	There is a need to use the data available on light response curves to simulate carbon fixation by a canopy of banana leaves.	1
40	*Neolamarkia cadamba*	कडंबा	The unique ecological role of Fabaceae is in nitrogen fixation.	It is important to bring out a technology package on successful and viable agroforestry systems suitable for different agro-ecological zones for socioeconomic	3
41	*Nerium indicum*	कन्हेर	Flowers	Ornamental	104

42	*Phyllanthus emblica*	आवळा	Anti-ageing herb, eye tonic, effective in various bleeding disorders, anti diabetic, reduces burning sensation, improve voice, protect from viral, fungal and bacterial infection	Small, medium sized tree.	19
43	*Pithecellobium dulce*	विलायती चिंच	Pod used as food, eaten raw, used in meat dishes and drinks, seed editable, contain protein,astringent , haemostatic, used against dysentery,diarrhea, ulcers.	Host of many insects, moths	33
44	*Plumeria rubra*	चाफा	Bark is used as a stimulant, in decoction used as a purgative, febrifuge, and emmenagogue; also used in dropsical and venereal affections and said to be a powerful anti-herpatic. Latex rubefacient and purgative; useful in treatments for itch, rheumatism, and gum troubles.	An on-line resource, providing top quality pictures and some basic information on various plants being grown at the Botanic Gardens, often including uses	8
45	*Polyalthia longifolia*	अशोक	Ornamental, leaves, used in ships manufacturing and articles like pencils, boxes, etc.	Native of India evergreen tree.	32
46	*Pongamia pinnata*	करंज	Seeds yield fatty oil, Pongam oil, used in tanning industry for dressing E.I.	There is some disagreement as to the correct name for this species, with Millettia pinnata	55
47	*Prunus amygdalis*	बदाम	An economically important crop tree grown primarily in Mediterranean climates between 28° and 48° N and between 20° and 40° S, its fruit crops and also the ease	The taxonomic history of Prunus is long and complicated, its fruit crops and also the ease .	2
48	*Psidium guajava*	पेरू	Wood, traditional medicine , used as food	Crop/ Cultivated	25
49	*Ricinus communis*	एरंड	Castor oil extracted from the seeds of Ricinus communis (Castor) is used as lubricant, vegetable oil and purgative. Jatropha oil obtained from the seeds of Jatropha curcas (Kattamanakku) is used as purgative, to treat skin diseases and to extract bio-diesel.	A much-branched, short-lived perennial plant with stout, hollow stems that become more or less woody and persist. A fast-growing plant	4
50	*Samanea saman*	पावसाचे झाड	Ornamental and road side shade tree, strong durable wood, fruit pulp nutritive,	Big tree, shade	11

			crude protein, carbohydrates, minerals.		
51	*Sesbania grandiflora*	हदगा	A valued fodder for ruminants. The leaves, flowers and pods of Sesbania grandiflora are eaten as a vegetable,The dried leaves are used for their ethno-medicinal properties	A short-lived, soft-wooded, loosely-branching tree with . information on each plant - its uses, ecology, identity, propagation, pests etc. Sesbania grandiflora is well adapted to hot, humid environments in the lowland tropics.	2
52	*Spathodea campanulata*	स्पॅथोडिया	Flower liquid contain tonic, bark has laxative and antiseptic properties Seeds, flower, root is used as medicines.	Ornamental tree planted in gardens road side.	12
53	*Syzgium cuminii*	जांभूळ	Medicinal plant, cures diabetes, antibacterial, used against dysentery, absorbent, wood	Evergreen, Ornamental, Slow growing	118
54	*Tamarindus indica*	चिंच	Folk medicine, wood working, metal polish, Nutritional properties.	More germination capacity, ornamental, garden, indigenous fruit and plant	12
55	*Tecoma stans*	टेकोमा	Cool	Garden plant	1
56	*Tectona grandis*	सागवान	Wood yellowish brown timber used in the manufacturing of furniture, used in boat building	Tropical heart wood tree deciduous tree	18
57	*Thuja occidentalis*	मोरपंखी	Oil of Thuja contains the terpene thujone which has been studied for its GABA receptor antagonizing effects, with potentially lethal properties	They are widely grown as ornamental trees, and extensively used for hedges	27
58	*Ziziphus mauritiana*	बोर	Fruit is eaten raw nutritious, vitamin - C	Medium sized tree, quick growing tree, extreme temperate	5
59	*Gliricidia sepium*	उंदीरमारी	The toxic property of seeds and bark has given rise to the epithet (mouse killer)	Agroforest tree and reforestation degraded area, due to their fast growth, symbiosis with rhizobia	14

Green Spots of the Campus

These Various green spots are found in College Campus, which are full of greenery maintained with various plant species. Botanical garden contains different types of educationally important plants.

Space in front of main building

On the south side of the main buliding a green spot is developed.The whole area is covered with various plants, grass lawns, palm species, Pithecellobium dulce, Thuja occidentalis, Neolamarkia cadamba, Prunus amygdalis, Polyalthia longifolia, Samanea saman, Leucaena leucocephala etc . plants are present in this green spot.

Open Space in Building(Behind the Main Building)

On the north side of the main building, the open space of about 30.50 sq.meter is partially covered with various trees like Polyalthia longifolia, Casuarina equisetifolia, Hibiscus rosa-sinensis, Syzgiumcuminii, Nerium indicum etc. All trees are useful to increase the natural beauty of the campus.

Botanical Garden Area (Right Side of The Main Building)

In the east of main building newly developed green spot is the Botanical Garden. Adhatodavasaka, Asparagus racemosus, Tejpan, Mentha spicata, Gulvel, Anjeer, Blackberry, Cycas, Hirva chafa, Powder puf, Haldikunku, Ixora, Kaaju, Dalchini, Marva lavang, Bryophyllum, Jatropa, Velchi Dragon fruit , Coconut, etc.are Medicinal plants planted and developed very well.

Around The Play Ground (North Side of The Main Building)

On the north side of the main building near the playground a green belt is developed with a number of tree plants were planted there, plants like Psidium guava, Syzgiumcuminii, Pongamia pinnata, Delonix regia, Ficus benghalensis, Ziziphus mauritiana etc. Plants provide shade to players and Students during the recess

Carbon Neutrality

Carbon neutrality refers to achieving net-zero carbon dioxide emissions. This can be done by balancing emissions of carbon dioxide with its removal (often through carbon offsetting) or by eliminating emissions from society (the transition to the "post-carbon economy"). It is used in the context of carbon dioxide-releasing processes associated with transportation, energy production, agriculture, and industry.

Although the term "carbon neutral" is used, a carbon foot print also includes other greenhouse gases, usually carbon-based, measured in terms of their carbon dioxide equivalence. The term climate-neutral reflects the broader inclusiveness of other greenhouse gases in climate change, even if CO_2 is the most abundant. The term "net zero" is increasingly used to describe a broader more comprehensive

commitment to decarbonization and climate action, moving beyond carbon neutrality by including more activities under the scope of indirect emissions, and often including a science-based target on emissions reduction, as opposed to relying solely on offsetting.

Carbon Offsetting

Balancing carbon dioxide emissions with carbon offsets — the process of reducing or avoiding greenhouse gas emissions or removing carbon dioxide from the atmosphere to make up for emissions for other places. Of the total greenhouse gasses emitted is equal to the total amount avoided or removed, then the two effects cancel each other out and the net emissions are 'neutral'.

Reducing Emissions

Reducing carbon emissions can be done by moving towards energy sources and industry processes that produce less greenhouse gases, thereby transitioning to a low-carbon economy. Shifting towards the use of renewable energy such as hydro, wind, geothermal, and solar power, as well as nuclear power reduces greenhouse gas emissions. Although both renewable and non-renewable energy production produce carbon emissions in some form, renewable sources produce negligible to almost zero carbon emissions. Transitioning to a low-carbon economy would also mean making changes to current industrial and agricultural processes to reduce carbon emissions, for example, diet changes to livestock such as cattle can potentially reduce methane production by 40%. Carbon projects and emissions trading are often used to reduce carbon emissions, and carbon dioxide can even sometimes be prevented from entering the atmosphere entirely (such as by carbon scrubbing).

One way to implement carbon-neutral products is by making these products cheaper and more cost effective than carbon positive fuels.

Suggestions To Reduce Carbon Footprint.

- Encourage staff to take public transport or to car-pool and remind everyone to switch off computers, monitors and printers at night.
- College also promotes car and bike pooling system. Teachers/ students coming from the same area share their vehicles to reach the college. This also reduces the number of private vehicles used in the college campus.

ZOOLOGICAL ASPECTS

Fauna On the College Campus

The college campus has a large amount of Greenery, due to the initiative taken by the college toward the plantation. As well the college is located near the mountain and surrounded from all sides by the agricultural land. This Location is useful habitat for the feeding and perpetuation of the different types of insects, reptiles, birds and mammals. To find out the types of organism that are found in the college campus a project is given to the students. The following facts and figures are taken from the field visits and surveys conducted by the S.Y.B.Sc. Students of zoology as a part of their curriculum. During the survey 09 species of reptiles, 08 species of bird, 07 species of mammals. 01 species of annelids and 12 species of insect and also 1 species of Arthropoda have been discovered in the college premises. The table below enumerates the types of species that are found in the college campus.

List of Reptiles Found in The College Campus

Sr.No.	Scientific names	Common Name English/Marathi	Types	Food
1	*Naja naja*	Cobra / Nag	Poisonous	Rodents, Lizards and Frogs.
2	*Daboia russelli*	Russel viper / Ghonas	Poisonous	Reptiles, Land Crabs, Scorpions, Arthropods. Lizards
3	*Bungarus caeruleus*	Krait / Maniyar	Poisonous	Blind Worms, Rats, Mice, Lizard, Frog
4	*Trimeresurus gramineus*	Bamboo Pit Viper/ Chapda	Poisonous	Rodents, Birds, Frogs, and Lizards.
5	*Echis carinatus*	Saw scaled viper/ Phursya	Poisonous	Lizards, Frogs, Birds and Mice,
6	*Ptyas mucosa*	Rat snake / Dhaman	Non-Poisonous	Mice, Rats, Chipmunks and Voles, Frogs, Lizards, Birds and Bird Eggs
7	*Oxybelis fulgidus*	Green vine snake / Harantol	Non-Poisonous	Frogs, Lizards
8	*Calotes versicolour*	Oriental Garden lizard / Sarda	Non-poisonous	Crickets, Grasshoppers, Ants, and small Vertebrates
9.	*Hemidactylus frenatus*	Common house gecko / Pal	Non-poisonous	Fruit Flies and other small Flies, Silkworms, Mealworm, and other Insects

1.*Naja naja*: The Indian cobra (*Naja naja*), also known as the spectacled cobra, Asian cobra, or binocellate cobra, is a species of the genus Naja found, in India, Pakistan, Bangladesh, Sri Lanka, Nepal, and Bhutan, and a member of the "big four" species that inflict the most snakebites on humans in India. It is distinct from the king cobra which belongs to the monotypic genus Ophiophagus. The Indian cobra is revered in Indian mythology and culture, and is often seen with snake charmers. It is now

1. *Naja naja (Cobra)*

2.Russell's viper (*Daboia russelii*): is a species of venomous snake (one of the big four venomous snakes) in the family Viperidae native to the Indian subcontinent. It was described in 1797 by George Shaw and Frederick Polydore Nodder, and named in honour of Patrick Russell who wrote of it in his 1796 work An account of Indian serpents, collected on the coast of Coromandel.

2. Daboia russelli (Ghonus)

3.The common krait (*Bungarus caeruleus*): also known as the blue krait, is a species of highly venomous snake of the genus *Bungarus* native to the Indian subcontinent. It is a member of the "big four" species, inflicting the most snakebites on humans in Bangladesh and India.

*3.**Bungarus caeruleus (Maniyar)***

4.*Trimeresurus gramineus*: known as the bamboo pit viper, Indian green pit viper, or common green pit viper, is a venomous pit viper species found in the southern and north eastern parts of India. It is the type species for the genus *Trimeresurus.*

*4.**Trimeresurus gramineus***

5.Echis carinatus

5. *Echis carinatus* : is a genus of venomous vipers found in the dry regions of Africa, Middle East, India, Sri Lanka and Pakistan. They have a characteristic threat display, rubbing sections of their body together to produce a "sizzling" warning sound.[3] The name Echis is the Latin transliteration of the Greek word for "viper" Their common name is "saw-scaled vipers" and they include some of the species responsible for causing the most snakebite cases and deaths in the world

6. Ptyas mucosa (Ghonus)

6.*Ptyas mucosa*: commonly known as the oriental ratsnake,[1]Indian rat snake,[3] darash or dhaman,[1] is a common non-venomous species of colubrid snake found in parts of South and Southeast Asia. Dhamans are large snakes. Typical mature total length is around 1.5 to 1.95 m (4 ft 11 in to 6 ft 5 in) though some exceed 2 m (6 ft 7 in).

7. Oxybelis fulgidus

7.*Oxybelis fulgidus*: commonly known as the green vine snake or the flatbread snake (not to be confused with green-colored species in the genus Ahaetulla, which are also referred as "green vine snake", is a species of long, slender, arboreal colubrid snake, which is endemic to Central America and northern South America.

8. Calotes versicolour(Sarda)

8.The oriental garden lizard, eastern garden lizard, Indian garden lizard, common garden lizard, bloodsucker, or changeable lizard (Calotes versicolor) is an agamid lizard found widely distributed in indo-Malaya. It has also been introduced in many other parts of the world.

9. Hemidactylus frenatus (Pal)

9.The common house gecko (Hemidactylus frenatus) (not to be confused with Hemidactylus turcicus, the Mediterranean house gecko), is a gecko native to South and Southeast Asia. It is also known as the Asian house gecko, Pacific house gecko, wall gecko, house lizard, Tayoto or moon lizard.

List of Mammals Found on the Campus

Sr.No.	Scientific Names	Common names in English and marathi	Food
1.	*Suncus murinus*	House shrew / Chichundri	Cockroaches,
2.	*Rattus rattus*	Black rat / Undir	Seeds,Fruit,Stems, Leaves, Fungi,
3.	*Bandicota indica*	Greater bandicoot rat /Ghus	Insects, Larvae, Grass Seeds and Fruits in Lawn and Garden.
4.	*Lepus nigricollis*	Wild rabbit / Jangli Sasa	Weeds, Grasses, Clover, Wildflowers, and Flower and Vegetable Plants
5.	*Funambulus palmarum*	Indian palm squirrel/three-striped palm squirrel / खार	Nuts and Fruits
6.	*Felis catus*	domestic cat / मांजर	Rodents,Rabbits, Amphibians,Birds, Reptiles and Fish,
7.	*South Asian pye dog*	Indian Pariah Dog / Indian native dog / South Asian pye dog / Desi Dog / कुत्रा	Fruits and Vegetables,Cottage Cheese, and Cooked Eggs

1.Suncus murinus

1.The Asian house shrew (*Suncus murinus*) is a shrew species native to South and Southeast Asia that has been listed as Least Concern on the IUCN Red List since 2008 because of its large population and wide distribution. It has been introduced in several West Asian and East African countries. It is considered an invasive species and implicated in the demise of several island lizard species.It is also called house shrew, grey musk shrew, Asian musk shrew or Indian musk shrew.

2.The black rat (*Rattus rattus*), also known as the roof rat, ship rat, or house rat, is a common long-tailed rodent of the stereotypical rat genus *Rattus*, in the subfamily Murinae.[1] It likely originated in the Indian subcontinent, but is now found worldwide.The black rat is black to light brown in colour with a lighter underside. It is a generalist omnivore and a serious pest to farmers because it feeds on a wide range of agricultural crops. It is sometimes kept as a pet. In parts of India, it is considered sacred and respected in the Karni Mata Temple in Deshnoke.

2.Rattus rattus

3.The greater bandicoot rat (*Bandicota indica*) is a species of rodent in the family Muridae found in Bangladesh, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Taiwan, Thailand, and Vietnam. It can grow to about 27–29 cm without including the tail which can grow to 28 cm. These should not be confused with marsupial bandicoots which inhabit Australia and neighbouring New Guinea, which were named after the bandicota rats.

3.Bandicota indica

4.The Indian hare (*Lepus nigricolli*): also known as the black-naped hare, is a common species of hare native to the Indian subcontinent, and Java.

4.Lepus nigricolli

5. Funambulus palmarum

5.The Indian palm squirrel or three-striped palm squirrel (*Funambulus palmarum*) is a species of rodent in the family Sciuridae found naturally in India (south of the Vindhyas) and Sri Lanka. In the late 19th century, the palm squirrel was introduced to Madagascar, Réunion, Mayotte, Comoro Islands, Mauritius, Seychelles and Australia, where it has since become a minor pest.[3][4] The closely related five-striped palm squirrel, F. pennantii, is found in northern India, and its range partly overlaps with this species.

6. Felis catus

6.*Felis catus* was domesticated in the eastern Mediterranean c. 3000 years ago. Considering the extent to which cats are valued as pets, it is not surprising that they have since been translocated by humans to almost all parts of the world. Notable predators, cats threaten native birdlife and other fauna, especially on islands where native species have evolved in relative isolation from predators.

7. South Asian pye dog

7.The Indian pariah dog, also known as the Indian native dog or INDog, South Asian pye dog and Desi Dog, is a landrace of dog native to the Indian subcontinent.[5] They have erect ears, a wedge-shaped head, and a curved tail. It is easily trainable and often used as a guard dog and police dog. This dog is an example of an ancient group of dogs known as pye-dogs. It is possible that the ancestry of this dog dates back 4,500 years ago.

List of Birds Found on the Campus

Sr.No.	Scientific Names	Common names English /Marathi	Food
1.	*Passer domesticus*	House sparrow / chimni	Raw seeds, Buds, Berries, and Fruits such as Grapes and Cherries.
2.	*Apus affinis*	Indian house swift bird / पाकोळी	Flies, Airborne Spiders, Moths, Butterflies, Flying Termites and ants, Dragonflies, Locust, Cicadas, Grasshoppers, Crickets and Mantises
3.	*Bubulcus ibis*	Cattle Egret / Bagula	Grasshoppers, Crickets, Flies (Adults and Maggots), Moths, as well as Spiders, Frogs, Lizards and Earthworms.
4.	*Corvus splendens*	Indian house crow / Kavla	Small Reptiles Mammals, Insects and other small Invertebrates,Eggs, Nestlings,Ggrain and Fruits.
5.	*Cinnyris asiaticus*	Purple sunbird / जांभळा सूर्यपक्षी	Nectar, Insects,
6.	*Anthus rufulus*	Indian paddy field pippet / Dhan Tirchimni	Small Insects' Larger Beetles, Tiny Snails,Worms etc.
7.	*Ficedula parva*	Red breast fly catcher / लाल छातीची लिटकुरी,	Worms, Snails and Woodlice
8.	*Parus cinereus*	Great tit / Rakhi Balguli	Insects, Caterpillars Spiders Small Earthworms, Seeds, Nuts, Berries and Buds

1.Passer domesticus

1.The house sparrow (*Passer domesticus*) is a bird of the sparrow family Passeridae, found in most parts of the world. It is a small bird that has a typical length of 16 cm (6.3 in) and a mass of 24–39.5 g (0.85–1.39 oz). the house sparrow is native to most of Europe, the Mediterranean Basin, and a large part of Asia. Its intentional or accidental introductions to many regions, including parts of Australasia, Africa, and the Americas, make it the most widely distributed wild bird.

2. Apus affinis

2.House swift: These birds have very short legs which they use only for clinging to vertical surfaces. House Swifts breed around habitation and cliffs from Africa eastwards through southern tropical Asia to western Indonesia. Unlike the more northerly Common Swift, many birds are resident, but some populations are migratory, and winter further south than their breeding areas. They wander widely on migration, and are seen as rare vagrants in much of Europe and Asia.

3. Bubulcus ibis

3.The cattle egret (*Bubulcus ibis)* is a cosmopolitan species of heron (family Ardeidae) found in the tropics, subtropics, and warm-temperate zones. It is the only member of the monotypic genus Bubulcus, although some authorities regard its two subspecies as full species, the western cattle egret and the eastern cattle egret. Despite the similarities in plumage to the egrets of the genus Egretta, it is more closely related to the herons of Ardea. Originally native to parts of Asia, Africa, and Europe, it has undergone a rapid expansion in its

4.Corvus splendens

4.The house crow (*Corvus splendens*), also known as the Indian, greynecked, Ceylon or Colombo crow, is a common bird of the crow family that is of Asian origin but now found in many parts of the world, where they arrived assisted by shipping. It is between the jackdaw and the carrion crow in size (40 cm (16 in) in length) but is slimmer than either. The forehead, crown, throat and upper breast are a richly glossed black, whilst the neck and breast are a lighter grey-brown in colour. The wings, tail and legs are black. There are regional variations in the thickness of the bill and the depth of colour

5. Cinnyris asiaticus

5.The purple sunbird (*Cinnyris asiaticus*) is a small bird in the sunbird family found mainly in South and Southeast Asia but extending west into parts of the Arabian peninsula. Like other sunbirds they feed mainly on nectar, although they will also take insects, especially when feeding young. They have a fast and direct flight and can take nectar by hovering like a hummingbird but often

6. Anthus rufulus

6.The paddy field pipit or Oriental pipit (*Anthus rufulus*) is a small passerine bird in the pipit and wagtail family. It is a resident (non-migratory) breeder in open scrub, grassland and cultivation in southern Asia east to the Philippines. Although among the few breeding pipits in the Asian region, identification becomes difficult in winter when several other species migrate into the region. The taxonomy of the species is complex and has undergone considerable changes.

7. Ficedula parva

7.The red-breasted flycatcher (*Ficedula parva)* is a small passerine bird in the Old World flycatcher family. It breeds in eastern Europe and across Central Asia and is migratory, wintering in south Asia. It is a regular passage migrant in western Europe, whereas the collared flycatcher which breeds further east is rare. This is because of the different migration direction.

8.Parus cinereus

8.The cinereous tit (*Parus cinereus*) is a species of bird in the tit family Paridae. This species is made up of several populations that were earlier treated as subspecies of the great tit (Parus major). These birds are grey backed with white undersides. The great tit in the new sense is distinguishable by the greenish-back and yellowish underside.The distribution of this species extends from parts of West Asia across South Asia and into Southeast Asia.

List Of Insects Found on the Campus

Sr.No.	Scientific names	Common names in English / Marathi	Food
1.	*Xenocatantops humilis*	Rufous-legged Grasshopper / फडफड	Leaves,Buflowers, Stems and Seeds and Insects
2.	*Parantica aglea*	Glassy tiger / फुलपाखरू	Plant-Tylophora carnosa
3.	*Teratodes monticollis*	hooded grasshoppers / फडफड	Leaves of teak and sandalwood
4.	*Blattella asahinai*	Asian cockroach / झुरळ	Flowers and Agricultural crops.
5.	*Dysdercus cingulatus*	cotton stainer bug / लाल सुती बग	Cotton,hibiscus,citrus ,maize
6.	*Chorthippus albomarginatus*	Lesser marsh grasshopper /	Grass
7.	*Cyrtophora cicatrosa*	Garden tent-web spider /	Grass
8.	*Illeis kobebeli*	Yellow ladybird Spotless	Aphids (plant lice), Scale Insects,Mealybugs, Plant and Pollen mildews
9.	*Coccinella septempunctata*	07 spotted lady bird /	Larvae of Psyllidae and Cicadellidae,egg and Larvae of some beetles and Butterflies
10.	*Camponotus pennsylvanicus*	Carpenter ant /	Sources of Protein and Sugar. eat living and dead Insects, Honeydew.
11.	*Monomorium minimum*	Little black ant /	Feed on grease, Oil, meats, Fruits,Corn Meal and Sweets.
12.	*Scolopendra hardwickei*	Centipede / गोम	Soft-bodied Insects,Spiders, Worms and other Arthropods

1.Xenocatantops humilis

1.*Xenocatantops humilis*: is the type species of grasshoppers in its genus, belonging to the family Acrididae and subfamily Catantopinae.This species can be found in India, Indo-China, Malaysia (the type locality is Java), and Papua New Guinea

2. Parantica aglea

2.*Parantica aglea*, the glassy tiger, is a butterfly found in Indomalayan realm that belongs to the crows and tigers, that is, the danaid group of the brush-footed butterflies family. Two subspecies are recognized but neither form is constant either in markings or in habitat. In the British Museum collection there are specimens of true Parantica aglea aglea from Myanmar, and others, inseparable from typical Parantica aglea melanoides, from Mysore

3. Teratodes monticollis

3.*Teratodes*, commonly known as hooded grasshoppers, is a genus of grasshopper native to India and Sri Lanka. It was established by the French entomologist Gaspard Auguste Brullé in 1835.

The type species is *Teratodes monticollis*, which was described by the English zoo logist George Robert Gray in 1832 as Gryllus monticollis.

4. Blattella asahinai

4.The Asian cockroach (*Blattella asahinai*), is a species of cockroach that was first described in 1981 from insects collected on Okinawa Island, Japan.[1] It is a small species of cockroach, and typically are 1.3 to 1.6 cm long and is tan to dark brown in colour with dark parallel stripes on the back of their head.It is commonly mistaken with the German cockroach (Blattella germanica) for their similar appearance. It is commonly found in the United States in and around houses.

5.Dysdercus cingulatus

5*.Dysdercus cingulatus* is a species of true bug in the family Pyrrhocoridae, commonly known as the red cotton stainer. It is a serious pest of cotton crops, the adults and older nymphs feeding on the emerging bolls and the cotton seeds as they mature, transmitting cotton-staining fungi as they do so.

6.Chorthippus albomarginatus

6.*Chorthippus albomarginatus*, the lesser marsh grasshopper, is a common grasshopper of European grassland both damp-marshy and (despite its name) dry, including salt-marsh and coastal habitats.

7.Cyrtophora cicatrosa

7.*Cyrtophora cicatrosa*, commonly known as the garden tent-web spider or dome spider, is a common species of orb-weavers found in many parts of Asia. It is common in gardens and has a very dense, thick, three dimensional and strong tent-like web.

8. Illeis kobebeli

8.Also commonly called polished ladybug. ... Adult ladybugs have convex, hemispherical shaped elytra (the hardened wings used to cover the soft flying wings underneath) that can be yellow, pink, orange, red, or black, and usually are marked with distinct spots.

9.Coccinella septempunctata

9.*Coccinella septempunctata*, the seven-spot ladybird (or, in North America, seven-spotted ladybug or "C-7"[1]), is the most common ladybird in Europe. Its elytra are of a red colour, but punctuated with three black spots each, with one further spot being spread over the junction of the two, making a total of seven spots, from which the species derives both its common and scientific names (from the Latin septem = "seven" and punctus = "spot").

10.Camponotus pennsylvanicus

10. *Camponotus pennsylvanicus* It nests in living and dead trees, rotten logs or stumps in forested areas. This is an important, destructive pest that attacks fences, poles and buildings. It often forages inside homes, making it an important house pest.

11.Monomorium minimum

11.The little black ant (*Monomorium minimum*) is a species of ant native to North America.[1] It is a shiny black color, the workers about 1 to 2 mm long and the queens 4 to 5 mm long. It is a monomorphic species, with only one caste of worker, and polygyne, meaning a nest may have more than one queen. A colony is usually moderately sized with only a few thousand workers.[citation needed]

12.Scolopendra hardwickei

12.*Scolopendra hardwickei*, the Indian tiger centipede, is a species of centipede in the family Scolopendridae. *Scolopendra hardwickei* can reach a length of 16 centimetres (6.3 in). Antennas consist of 17 or 18 segments, of which the first 6-7 are shiny. It is a pigmented species, with exceptionally bright and contrasting coloration, alternating dark orange and deep black segments, with dark orange legs.

List Of Annelids Found in College Campus

Sr.No.	Scientific names	Common names in English / Marathi	Food
1	*Pheretima posthuma*	Earthworm / Gandul	Decaying roots and Leaves, Nematodes,Protozoans, Rotifers, Bacteria, Fungi in Soil.

1.Pheretima posthuma

1.The earthworms are long cylindrical worms of brownish colour which live in burrows in moist earth particularly that contains decaying vegetation or humus. They are also common in agricultural fields where they increase the productivity of crops. The life span of earthworm is 3-10 years.

List Of Arthropods Found in College Campus

Sr.No.	Scientific names	Common names in English / Marathi	Food
1	*Genus Cancer*	Crab/Khekda	Earthworms,Grass,fish

Crab/Khekda

Crab/Khekda. This crab are found in the pady fieled, mud,and fresh water. Largely responsible for destruction of rice crop

ENVIRONMENTAL ACTIVITIES

- **Soil and Water Analysis**

As a part of community services, Department of Chemistry has innovatively started "Soil and Water Testing Laboratory" keeping the view the farmers problems regarding quality and productivity. The laboratory was set up in September 2018. The main crop in Igatpuri Tehsil is rice. So, it becomes prime importance to examine the quality of soil and water which would help in increasing crop productivity and quality. The laboratory was set up with vision "No profit" basis. Therefore, the soil and water testing are done free of cost. In this laboratory following parameters of soil and water have been checked.

Sr.No	Soil Parameters	Water Parameters
1.	Bulk Density	Total Dissolved Salts
2.	Moisture Content	pH
3.	Specific Gravity	Electrical Conductivity
4.	Water Holding Capacity	Acidity and Alkanity
5.	pH	Oxidizable substances
6.	Total Soluble Salts	Chloride
7.	% of total soluble salts	Sulphates
8.	Electrical Conductivity	Calcium
9.	Calcium Carbonate content	Ammonium
10.	Gypsum Requirement	Nitrate
11.	---------	Magnesium
12.	----------	Residue on Evaporation

Soil and water parameter as well as organic micronutrients will be tested from this academic year.

The parameters are checked by volumetric analysis and instruments such as pH meter, conductivity meter, colorimeter etc.The department creates awareness through local newspapers to submit the samples of soil and water. Total 18 samples have been tested so far. The Following is the list of beneficiaries of our services.

Sr.No	The Names of beneficiaries	Address
1.	Mr. Pardeshi Roshan Dipaksing	Khairgaon, Igatpuri
2.	Mr. Waje Bhaskar Tryambak	Khed, Igatpuri
3.	Mr. Barhe Ganpat Dhondu	Adherwad, Igatpuri
4.	Mr. Waje Abhishek Chandrakant	Khed, Igatpuri
5.	Mr. Mande Dnyaneshwar Dada	Ghoti, Igatpuri
6.	Miss. Waje Pooja Chandrakant	Khed, Igatpuri
7.	Miss.Waje Rani Bhaskar	Khed, Igatpuri
8.	Mr. Shinde Mohan Vishwanath	Ghoti, Igatpuri
9.	Mr. Shelke Namdev	Taloshi, Igatpuri
10.	Mr. Binnor Ramdas	Taloshi, Igatpuri
11.	My. Jadhav Shyam	Samneragaon, Igatpuri
12.	Miss. Barhe Vanita Ganpat	Adherwad, Igatpuri
13.	Miss Mande Kirti Dnyaneshwar	Ghoti, Igatpuri
14.	K.P.G College, Igatpuri	Take-Ghoti, Igatpuri
15.	Mr. Mandole Navnath Eknath	Take-Ghoti, Igatpuri
16.	Mr. Walunje Yogesh Hiraman	Parwala Nagar, Nashik
17.	Mr. Gaikar Ramdas Pandurang	Khairgaon, Igatpuri
18	Miss. Thore Savita Kiran	Makhmalabad Naka, Nashik

The following students participated as “Chemist” for testing the soil and water samples

Sr.No	Class	Address
1.	Miss. Barhe Vanita	T.Y.B.Sc.
2.	Miss Shinde Priyanka	T.Y.B.Sc.
3.	Miss Waje Rani	T.Y.B.Sc.
4.	Miss Mande Kirti	T.Y.B.Sc.
5.	Miss Waje Pooja	T.Y.B.Sc.
6.	Mr. Mandole Navnath	T.Y.B.Sc.

Dr. Dnyaneshwar Lokhande, Head, Department of Chemistry, Dr. Manoj Gaware, Coordinator, Mr. Shaktising Pardeshi, Expertee monitored and verified the testing report of soil and water. The feedback and suggestions are also noted down laid by each beneficiary during submission of the report.

Dr. Manoj R. Gaware
In Charge

Dr. Dnyaneshwar D. Lokhande
Head

Dr. P. R. Bhabad
Principal

सकाळ

गोवर्धने महाविद्यालयात माती, पाणी परीक्षण केंद्राचे उद्घाटन

विद्यार्थिनी करणार परीक्षण : शेतकऱ्यांना आवाहन

विजय पगारे : सकाळ वृत्तसेवा

इगतपुरी, ता. २४ : वातावरणाचा लहरीपणा, पावसाचे असमतोल प्रमाण तसेच उत्पन्नातील घट यामुळे तालुक्यातील शेतकरी मोठ्या प्रमाणात रासायनिक खतांचा वापर करत आहे. परिणामी मातीचा पोत व दर्जा खालावत आहे. त्यामुळे येथील मराठा विद्याप्रसारक समाज संस्थेच्या कर्मवीर पुंजाबाबा गोवर्धने महाविद्यालयात रसायनशास्त्र विभागात माती व पाणी परीक्षण केंद्र सुरू करण्यात आले आहे.

रसायनशास्त्र विभागप्रमुख डॉ. डी. डी. लोखंडे यांनी परीक्षणासाठी आवश्यक सर्व प्रक्रियांचा अभ्यास करून प्रात्यक्षिके घेण्यात आली. यात प्रामुख्याने बल्क डेसिटी, वॉटर होल्डिंग, मॉयश्चर कंटेंट, ग्रॅव्हिटी, पोटेशियम कार्बोनेट, जिप्सम,

इगतपुरी : माती, पाणी परीक्षण व प्रात्यक्षिक करताना तृतीय वर्ष विज्ञान शाखेतील विद्यार्थिनी.

नायट्रेड, अमोनियम सल्फेट, टीडीएस अशा विविध घटकांच्या परीक्षणातून माती व पाणी परीक्षण होणार असल्याची माहिती त्यांनी दिली. या उपक्रमास रसायनशास्त्र विभागातील डॉ. मनोज गवारे, प्रा. एस. एस परदेशी, डॉ. टी. ए. क्षीरसागर, प्रा. एस. ए. हांडगे, प्रा. अर्चना धोंगडे यांचे मार्गदर्शन मिळाले. तृतीय रसायनशास्त्र वर्षातील विद्यार्थिनी वनिता बरे, राणी वाजे, प्रियंका शिंदे, कीर्ती मांडे, पूजा वाजे, नवनाथ मंडोळे यांनी प्रात्यक्षिक परीक्षणाचे काम केले. प्राचार्य डॉ. एस. एस. काळे, उपप्राचार्य देवीदास गिरी यांनी सर्व शेतकऱ्यांनी या संधीचा लाभ घेण्याचे आवाहन केले.

Nashik, Nashik-Today

Soil and Water Testing Awareness through local news paper

RAIN WATER HARVESTING

- The total area of the check dam is 4246.3480 Sq.ft.
- Underground level of water is increased by Rainwater Harvesting at College / Campus.
- 9.25 feet deep pond was dug at the lowest elevation to catch the draining water runoff from the campus. An embarkment or a bund was constructed at the lower elevation of the pond to restrict the flow of water.
- Besides the dug well, there is borewell on the campus to meet the needs. Around 100000 to 150000 liters of water is storing capacity of the dug check dam per annual.
- This makes us self-sufficient for around the 3 to 4 months for camps plantation after the rainy season.
- This water is also used for chemistry laboratory of college.

• *Analysis Of Waste Generation and Disposal*

Wastes cannot be avoided in any environment. Wastes can be classified as Biodegradable and Non- biodegradable wastes. Biodegradable wastes include food wastes; which can be easily decomposed by the bacteria in soil. But nonbiodegradable wastes are those which cannot be degraded by any organism and remain as such for many years. Much amount of waste is generated from the college campus.

- Canteen – The food waste generated from the canteen is collected and given to pigs. Plastic waste is generally less generated from the canteen. The plastic waste generated is burned inside the ring near the dog kennel. Some organic waste is used in biogas plant.
- Library - The most generated waste is paper waste. It is taken for recycling.
- Store- Not much waste is generated. But the paper waste and plastic covers are burned in the ring.
- Office- Paper waste generated are recycled and reused.
- Garden-Plastic and paper waste is comparatively less. It may be clean
- Auditorium -The wastes are collected after each programme and they are used for vermicompost.
- Bathroom-The wastes are collected and recycled and also reused.

- Classrooms-Paper Wastes are collected in the waste basket and recycled.
- Laboratory-The broken glass wastes and the useless instruments are disposed for recycling after thorough washing.
- College Premises-Plastic waste generated is usually less. But paper waste is generated in a larger amount.

OBSERVATIONS

The total solid waste collected in the campus is 10 Kg/day. Waste generation from tree droppings and lawn management 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. Segregation of chemical waste generated in Chemistry, Botany, Physics, zoology and Computer Science laboratories is also practiced. Single sided used papers reused for writing and printing in all departments. Important and confidential reports/ papers are sent for pulping and recycling after completion of their preservation period. Very less plastic waste (0.1Kg/day) is generated by some departments, 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. Few glass bottles are reused in the laboratories. The food waste from main canteen is used or sent for vermicomposting. The institute has adopted vermiculture composting in culture house 1.5 m width, 15 m length and 0.3 m height are constructed inside a shed open from all side. The main purpose of this is to reduce disposable waste in the college campus. After complete process of vermicomposting, it is used as manure in the garden and campus trees. Awareness programme among farmers is also conducted in the village nearby.

RECOMMENDATIONS

- Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by City 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.
- Single sided papers to be used for writing and photocopy Important and confidential papers after their validity to be sent for pulping.

WATER USE

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.

OBSERVATIONS

The study observed that Well and Borewell are the two major sources of water. Water is used for drinking purpose, canteen, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 10,000 L/day, which include 2,000 L/day for domestic purposes, 3,000 L/day for gardening and 5,000 L/day for different laboratories. Rain water harvesting units are also functional for storing and reuse. Gardens are watered by using drip irrigation system to save water. This is one of the unique steps towards greening practices.

RECOMMENDATIONS

- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. 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 and the wastage of water is not below the industry average for such equipment's used in similar capacity.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations

APICULTURE

AIM

To provide education on Bee improvement and to increase public awareness of the native honey bee.

OBJECTIVE

- To provide self-employment to beekeepers.
- Improvement of local health standards through the use of bee products such as honey & propolis.

INTRODUCTION

Apiculture is the commercial production of honey. Bee colonies in man-made hives is called Bee-Keeping. Bees are generally farmed for their honey and other products like bee wax, propolis, flower pollen, royal jelly, bee pollen etc. Plants which are good source of Pollen and Nectar -Marigold, Niger & sunflower. This practice also produces bees which are sold by the beekeepers for income generation

Apiculture Demonstration for Zoology Students

MANAGEMENT OF BEE KEEPING

i**. Hive Inspection** - Opening the hive at least twice a week and inspecting for following details. - Presence of queen – Presence of eggs and brood – Honey and pollen storage – Hive record to be maintained for each hive Presence of bee enemies like wax moth, mite, disease

ii. Expanding brood net - Done by providing comb foundation sheet in empty frame during honey flow period.

iii. Sugar syrup feeding - Sugar dissolved in water at 1:1 dilution - Used to feed bees **during dearth** period

iv. Honey extraction - Bee escape board – Kept between brood and super chamber – Bees bushed away using brush – Cells uncapped using uncapping knife – Honey extracted using honey extractor – Combs replaced in hive for reuse

Hive inspection

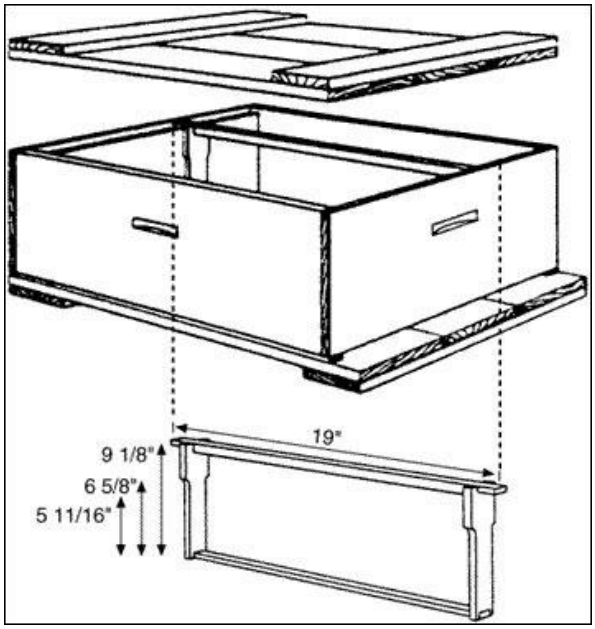
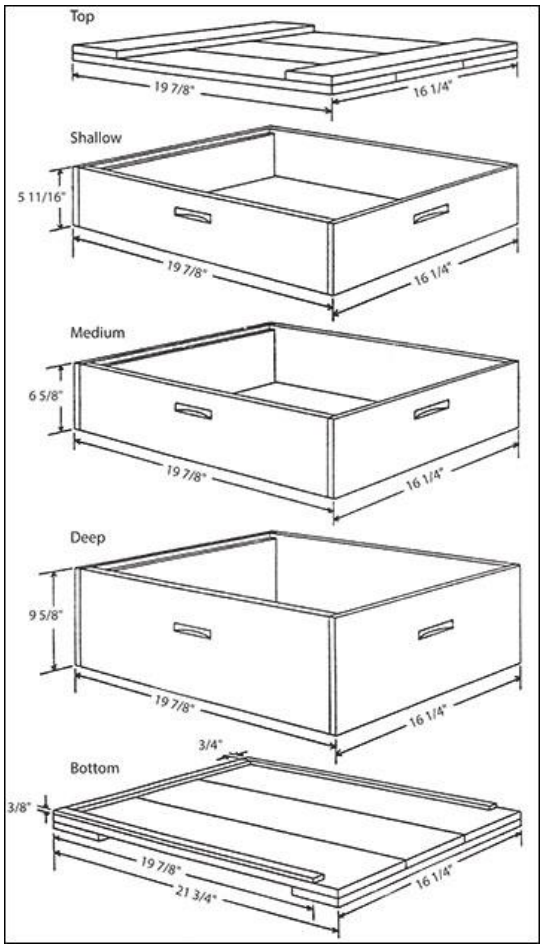


Fig- Wooden frames for holding the comb hang inside the body of a hive. Frames are sized for shallow, medium or deep hive bodies.



Parts of a beehive. -Bees are reared in a brood chamber in the lowest level of the hive. Honey is stored in upper levels.

LOCATION

Our Apiary boxes place near the botanical garden.

Social Awareness and Importance of Bee Keeping

- To provide self-employment to beekeepers
- Provides honey- a valuable nutritional food
- Honey bees are excellent pollinating agent, thus increasing agricultural yields.
- To impart training in Bee-keeping to traditional Bee-keepers and poor farmers in the rural and hilly areas, provide them with financial assistance and technical guidance and also a source of supplementary income.
- Providing technical guidance, supply of bee-colonies, distribution of bee queens, capturing of colonies and breeding of new colonies, production of honey through nursery colonies, research, processing of honey, sale of honey, wax propolis, flower pollen, royal jelly, bee pollen etc.
- Igatpuri district is a ruler area and agricultural field specially rice farming. Therefore, in our college, students need to get education for organic farming to provide self-employment
- Most of the farmer's students in our college they have benefitted from this project, about 500 beneficiary students from B. Sc.as well as commerce and arts students in between 2019-21 academic year.

VERMICOMPOST

AIM

- To generate vermicomposting using organic wastes generated in the college

Premises with the aid of earthworms.

OBJECTIVES

- The main objective of vermicomposting project is to produce organic manure of exceptional quality for the organically starved soil.
- Promote composting as a treatment practice for organic waste.
- Vermicomposting project to aware and practical performance for zoology students
- To provide self-employment to students.
- To introduce local people to vermicomposting as a means of providing personal income and reducing local poverty

INTRODUCTION

- The earthworms being voracious eaters consume the biodegradable matter and give out a part of the matter as excreta or vermi-castings. The vermi-casting containing nutrients is a rich manure for the plants. Best species for vermicomposting is *Eisenia fetidida*

- Vermicomposting can be done on a small scale, by college with garden garbage like plant leaves by home owners with household organic wastes, on a large-scale by farmers with manure or by the food industry using organic wastes such as fruit and vegetable cull materials.

PROCESS OF VERMICOMPOSTING

- The process of composting plant residues and agro wastes using earthworms comprise spreading the plant-dry leaves wastes and cow dung in gradually built-up shallow layers.

- To enable earthworms to transform the material relatively faster a temperature of around 30^0 C is maintained. The final product generated by this process is called vermicompost which essentially consist of the casts made by earthworms eating the raw organic materials.

- The process consists of constructing beds generally of 1.5 m width, 15 m length and 0.3 m height are constructed inside a shed open from all sides.

- Cow dung and plant waste can be placed in layers to make a heap of about 0.6 to 0.9 m height. Earthworms are introduced in between the layers at 350 worms per m3 of bed volume that weighs nearly 1 Kg. The beds are maintained at about 40-50% moisture content and a temperature of 20–30^0 C by sprinkling water over the beds.

- The compost will be ready within 60 to 90 days and the material becomes moderately loose, crumbly with dark brown colour. It will be black, granular, lightweight and humus-rich.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College Campus Garden Waste-Collected for Vermicomposting

Vermicomposting and Demonstration for Students

Ready to use Vermicomposting

- Igatpuri district is a ruler area and agricultural field specially rice farming, so in our college, students need to educate for organic farming.
- Most of the farmer's students in our college they have benefitted from this project, about 500 beneficiary students from B. Sc.as well as commerce and arts students in between 2019-21 academic year.
- Organic farming with use of organic fertilizers like "vermicompost" could substitute the chemical fertilizers and can reduce the economic cost and may also lead to organic products which fetches higher price in the market.

CHARACTERISTICS

- Similar to the soil found in deciduous woodlands and mixed forests
- Black, odorless and crumbly substrate
- Balanced nutritional composition for plants
- It contains an above-average number of micro-organisms which revitalize the soil
- Loose yet stable soil structure (clay-humus complexes)
- Absolutely free from all types of synthetic chemical additives

The Present Study Is Designed with The Following Social Services

- To assess awareness level of farming of Igatpuri region regarding vermicomposting.
- To find out the sources of information from where farmers get awareness regarding the techniques of preparation and use of vermicompost.
- To ascertain the obstacle faced by respondents in the use of vermicompost.
- To give suggestions to promote the usage of vermicompost among farmers.
- In our college students are also aware of the use and manufacturing of vermicomposting.

Vermiwash Process

ENERGY RENOVATION

INTRODUCTION

A nation is tiring to advance in quantity and quality to the spread of education among the common India and development of their intelligence. In India the entire field of education and other fields of intelligent activities had been monopolized by a handful of men before independence. But today we are marching towards the desirable status of a developed nation with fast strides. But the development should be a sustained one. For

achieving such a interminable development energy management is essential. As far as concerning electricity crisis, we are facing lack of electricity during office work. So, institutional management is taking design regarding production of electricity and saving electricity for Eco social aspect. Energy requirement of India is growing and incomplete domestic fossil fuel treasury. The country has motivated strategy to enlarge its renewable energy resources and policy to establish the nuclear power plants.

In the present study, college electricity audit has been done. In this study considered practical laboratory, instrument, Fans, air conditioners, Computers etc are considered in this study. We have studied total budget of the college, total economic investment of college on the electricity and total generation electricity from the solar wind hybrid electricity generation unit. Also, we have studied total saving of electricity and money from solar wind generation and requirement of solar energy. Also, it is studied that exact contribution of bulb, fans, computer, instruments etc in the total requirement of electricity. We studied all these mentioned thinks by collecting exactly data form survey.

RECOMMENDATION

Sr. No.	Recommendation	Energy Saving,KWh/Annum	Monetary saving,Rs	Investment Rs
1	Replacement of 85 Nos T-12 FTL fittings by 20 W LEDs	108326	1351913	346000
2	Installation of 15 kW Solar PV Plant	11200	117120	750000
3	Total	119526	1469033	1096000

EXPERIMENTAL AND DATA COLLECTION

All required data is collected by Department of Physics. In this data different teams are prepared and make survey of the college. In building, in every room, how much fans, tubes, computer, instrument, AC, etc will these is measured. According to survey following data is collected.

NOTES & ASSUMPTIONS:

- 1 Unit of Electrical Energy releases 0.8 Kg of CO_2 into atmosphere
- 1 kWp Solar PV system generates 4Units (kWh) of Energy per Day
- Daily working hours-10 Nos
- Annual working Days-280 Nos
- Average Rate of Electrical Energy: Rs 12.48/- per kWh

1.1 Objectives

- To study present level of Energy Consumption
- To Study the present CO_2 emissions
- To assess the various equipment/facilities from Energy efficiency aspect
- To study Scope for usage of Renewable Energy
- To study various measures to reduce the Energy Consumption

1.2 Audit Methodology

- Study of connected load
- Study of various Electrical equipment
- To prepare the Report with various Encon measures with payback analysis

The Connected Load

In this table, we present the details of various Electrical loads.
Details of Overall Connected Load

Sr. No	Item	Quantity	Load, W/Unit	Load, kW
1	Tube Light	85	4.39	4.32
2	Ceiling Fan	70	7.02	4.55
3	Air conditioners	4	212	5.29
4	Water Pump 7.5 HP	1	932	3.73
5	Water Pump 2.5 HP	2	1492	2.98
6	Computer	42	11.66	5.25
7	Printer	12	30	1
8	Water Filter	1	15	2.5
9	Fridge	2	14.2	1.4
10	Xerox Machine	2	10.2	1.5
11	Projector	13	100	1
	Total	234	2616.47	33.52

Study of Energy Consumption

In this table, we present the analysis of last year Electricity Bills Electrical Bill Analysis 2020-21:

Sr.No.	Month	Energy Consumed (KWh)
1	Jun-20	910
2	Jul-20	1125
3	Aug-20	1158
4	Sep-20	1210
5	Oct-20	1141
6	Nov-20	1247
7	Dec-20	1206
8	Jan-21	1626
9	Feb-21	1230
10	Mar-21	1630
11	Apr-21	1728
12	May-21	1480
	Total	15691
	Maximum	1728
	Minimum	910
	Average	1307.58

Alternate Energy Sources

Installation of Solar PV Power Pack

During the Audit, it was revealed that the College has ample space on the Terrace. During the Electrical Load survey, the Day Electrical Load was found to be about 15 kW.

Computation of Daily Units consumed in Day time & Solar PV Plant Capacity

In the following Table, we present the Calculations for Solar PV Plant, the Cost involved & Simple Payback Calculations.

Sr.	Particulars	Value	Unit
1	Solar PV Plant Capacity	15	kW
2	Avg Units Gen/kWp of Solar PV Plant	4	kWh/Day
3	Daily Average Units generated	40	kWh/Day
4	Annual units generated	11200	kWh/Annum
5	Annual Saving potential	139776	Rs lump sum
6	Cost of Solar PV Plant	0.75	Lakh/kW
7	Investment Required	750000	Rs lump sum
8	Simple Payback period	55	Months

Study Of Percentage of Lighting Power Requirement Met by Led Lights

It is recommended to replace the Old T-12 FTLS with new Energy Efficient 20 W LED light fittings.

Energy Conservation

In the following Table, we present the saving calculations

Sr. No.	Particulars	Unit/quantity	Unit
1	Present Quantity of T-12 FTL Fittings	85	Nos
2	Consumption of T-12 FTL fitting	51	W/unit
3	Consumption of 7 W LED fitting	20	W/unit
4	Total saving potential	31	W/unit
5	Average Daily period of Usage	10	Hrs/Day
6	Average saving potential	386.88	kWh/Day
7	Annual Operating Days	280	Days/Annum
8	Annual saving potential	108326	kWh/Annum
9	Present Energy Charges	12.48	Rs/kWh
10	Annual monetary Gain	1351913	Rs/Annum
12	Annual CO_2 emissions reduction	73209	MT/Annum
13	Investment required	346000	Rs lump sum
14	Simple Payback period	4	Months

Installation of 15kWp Solar PV Plant

It is recommended to install 15kWp Roof top Solar PV Plant.

In the following Table, we present the saving potential.

Sr.No.	Particulars	Unit/quantity	Unit
1	Design Load	10	kW
2	Avg Units Gen/kWp of Solar PV Plant	4	kWh/Day
3	Daily Average Units generated	40	kWh/Day
4	Annual units generated	12000	kWh/Annum
5	Reduction in Co2 emissions	9.6	MT/Annum
6	Annual Saving potential	117120	Rs lump sum
7	Cost of Solar PV Plant	0.75	Lakh/kW
8	Investment Required	750000	Rs lump sum
9	Simple Payback period	62	Months

Results and discussion

As far concerning the energy audit, electricity audit is main concern regarding educational institution. We have collected data by considering the tube light, fan, computer, printer, A.C and instruments. In college most of the electricity required for instrument which is 37.64% out of total energy. A.C utilized 3.71%, Printers required 5.85%, computer required 18.9%, Fans are required 21.03% and tube light required 12.87%.

Photograph of hybrid (solar with wind miles) energy generation device

The hybrid energy generation devices contain a solar panel and wind turbine. The hybrid energy generation device generates 6 units per day. The college is now using 1.5 kW UPS and batteries for energy storage.

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CONCLUSION

Data generated in energy audit is useful for understanding the energy distribution and utilization of college. The college needs maximum 118600 W of electricity. In other words, college needs 3233 Units/month and hybrid energy generation device generates only 180 units/month. Energy 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. Observations Energy source utilized by the campus is electricity & solar energy. The total average energy consumption is determined as 60351 KWH/month. The entire campus including common facility centre are equipped with LED lamps, CFL lamps and tube lights. Solar panels are also used for campus lighting to conservation of energy.

CONCLUSIONS AND RECOMMENDATIONS

- The green audit assists in the process of testing performance in the environmental arena and is fast becoming an indispensable aid to decision making in a college.
- The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. A 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 and thus sustainable environment and community development.
- It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organisation. An outside view, perspective and opinion often helps staff who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable.

COMMON RECOMMENDATIONS

- Adopt an environmental policy for the college
- Introduce UGC Environmental Science course to all students
- Students and staff can be permitted to solve local environmental problems
- Renovation of cooking system in the canteen to save gas
- Establish water, waste and energy management systems
- Maintenance of the pollution control in relation to green area of the college campus.

TREE PLANTATION

- Plantation is contributing multiple benefits to the people from aesthetics to livelihood improvement.

SNAKE DIVERSITY

- Snakes are an integral part of many ecosystems. Currently, nearly about 3500 species of snakes found in the world, out of which 375 species (10.71%) are poisonous. While college campus habitats must be conserved to preserve biodiversity. There are 9 species.
- In general, people cannot distinguish the poisonous and non-poisonous snakes. They think every snake is poisonous. So, they kill snakes whenever they meet them. Thus, the snake species are decreasing day by day. For the conservation of snakes in college campus, public awareness regarding the importance of snake to keep the ecosystem in balanced condition is essential.
- In fact, snakes are extremely beneficial, eating unwanted rats and mice around the home, the same rodents who harbour ticks bearing lyme disease. They play a very important role in the food chain as their ambushing techniques allow them to prey on otherwise elusive pests like the grasshopper.

BIRD DIVERSITY

- The college campus supports a rich diversity of birds. The present study provides baseline data for monitoring the diversity of bird species in the campus. This study creates awareness about the bird diversity. There are 8 species.

- The behaviour and feeding ecology of birds in the campus will help to understand the birds more accurately and thereby pave the way for their better conservation measures.
- Birds play ecologically significant role in plant pollination and seed dispersal, and their conservation is highly necessary for the proper functioning of the ecological system. Although, there are natural and plant plantation in the college campus as habitat for birds of this region, conservation measures are of immense need for their future survival.

INSECTS

- insects drive the production of essential seeds, fruits, and vegetables via pollination, and are necessary decomposers of organic matter. There are 7 species.
- Insects provide useful services to mankind and the environment in a number of ways. They keep pest insects in check, pollinate crops we rely on as food, and act as sanitation experts, cleaning up waste so that the world doesn't become overrun with dung.
- Pollinators like bees have been thriving for millennia, making sure of securing food and nutrition, maintaining and vibrant ecosystems and biodiversity for humans, plants, and of course for the bees themselves.

SOIL & WATER ANALYSIS

- A soil test commonly refers to the analysis of a soil sample to determine nutrient content, composition, and other characteristics such as the acidity or pH level.
- It is vital that good soil management is implemented to ensure high sustainable production for economic viability and maintain or improve soil fertility. There is also a growing concern on soil degradation and environmental pollution with high inputs agriculture but these can be avoided with good soil management.
- Save water is an initiative to promote water conservation among people in order to maintain the presence of clean water on the earth in future. Clean water scarcity has become one of the big problems in India and other countries all over the world affecting people's lives in many ways.

APICULTURE

- There are some developments in the supply chain of honey industry from input supply, to production, to processing, to marketing and consumption.
- The gaps in the input supply could be attributed on how to increase the production of queen bees given the increasing number of beekeepers, as demonstrated by the increasing associations in the honey industry, and those that have been encouraged start a small beekeeping activity.

Insect

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- Insects provide useful services to mankind and the environment in a number of ways. They keep pest insects in check, pollinate crops we rely on as food, and act as sanitation experts, cleaning up waste so that the world doesn't become overrun with dung.
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VERMICOMPOST

- Organic solid waste can be managed through vermiculating.
- Vermicomposting can be used for biodegradable waste management.
- Vermicompost and vermiwash bio-fertilizers are obtained from vermiculture

ENERGY RENOVATION

- Energy in the college campus has described a wealth of opportunities for saving energy in college buildings. The bulk of this potential lies in heat energy savings through the large-scale application of very ordinary technologies i.e., solar energy, Wind energy and electrical battery energy.
- The technical potential for cutting electricity use is enormous. Yet it does seem an uphill struggle against a tide of new electronic devices that are designed to be attractive and convenient rather than energy efficient.

EXTERNAL GREEN AUDIT COMMITTEE REPORT
FOR THE YEARS-2019 TO 2021

1. Audit requirements

The Green Audit committee herewith presents its report for the Academic years 2019-20 and 2020-21, as required by the NAAC for the assessment and evaluation of the activities for maintaining greenery planned and conducted during the academic years for the keeping the premises eco-friendly and the climate protecting efforts in the college. For that this external green audit committee was appointed.

2. Audit committee members and attendance

The green auditing origin can be traced back to the 18th century when the practice of large scale production developed as the Green Revolution started as a result of the Industrial Revolution. Environmental auditing only became widely accepted by industry in the late 1980s as a common management tool in developed countries, and is increasingly being applied in developing countries by both foreign and local industry. An environmental audit is a type of evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions.

It is duty of the college to carry out the green audit to make sure whether it is performing in accordance with the rules and regulations. Through the college can get direction for improving the conditions of the environment and the various factors setting the some strategies for environmental security and their implementation.

The UGC has made it mandatory to Constitute an Internal Green Auditing Committee (IGAC) to upgrade the environmental condition in and around the college, waste management, energy saving and other ways tree plantation and growing them on the campus.

The audit committee was established in accordance with the UGC norms. It requires that the audit committee comprises a minimum of three members as follows:

SN	NAME	QUALIFICATIONS	ORGANIZATION
1	Dr. Hemant M. Patil	M.Sc. Agronomy. Ph.D	Associate Director, Research ZARS, Igatpuri, Rahuri Agri. Uni.
2	Dr. R.N.Bhavare	M.Sc. Ph.D,	Principal, KGM College,Niphad
3	Mrs. Shobha Ahire	M.A, M.Ed, NET, SET,	Forest Department Nashik

The members of the audit committee held meetings with the Internal Green Audit Committee on 17th Aug.2021. The committee also held a meeting on the same day with the honourable Principal and the members of the IQAC committee to visit the green spots, the botanical garden, the flora and fauna on the campus; and other relevant matters concerning the energy saving, solar energy and the windmill for renovation of energy and the Department of Zoology for observing its activities related to fauna related practices.

3. **Audit committee's responsibility**

The audit committee has complied with its responsibilities arising from the UGC rules and regulations for reporting in terms of the green audit committee in conjunction with the internal audit report.

4. **Effectiveness of Internal Management**

The Green Audit Committee acknowledges management's efforts to strengthen internal controls on the campus as well as the environmental activities. There is a need for increased technical support, monitoring and developing the greenery. However, there are continuous activities of planting herbs, shrubs and trees with evergreen and medicinal species from time to time to unlock the full potential of these efforts.

The green audit committee has adopted different measures to protect and grow plants and trees. We the members of the external green audit committee is completely satisfied with the practices and activities implemented. The green audit committee has requested that a detailed plantation plan and progressive reports on the layout plans for systematic development.

5. **The Quality of Yearly Report**

The External Green Audit Committee is satisfied with the content and statistical data of plants and trees and the annual reports prepared and issued during the year under review in compliance with the statutory framework.

The green audit committee has reviewed and commented on the internal audit committee's annual reports, the statements made on the practices and reports on zoological, botanical and environmental – geographical information of the respective departments and their timely submission to the external auditors.

6. **The Green Audit Committee Functioning**

It is observed that the internal Green Audit Committee has been working properly for carrying out all the activities for maintaining the ecological balance and circumstantial intactness. The boys and girls have been involved in all these activities

which save expenses and increase the sense of responsibility. The eco-friendly and recyclable approach have been observed by the faculty and staff in the college regularly.

7. External Green Auditor's Report

The following committee has visited Karmaveer Punjababa Govardhane Arts, Commerce and Science College, Igatpuri. For Green Audit (Year 2019-20 & 2020-21) the committee has gone through the Internal Gender Audit Committee Report and presentation on 17th August 2021. As per the observations and findings regarding Gender Audit Report submitted, the committee is happy to inform that the college is sensitive about gender equality and women empowerment.

The following are the recommendations and suggestions for the further activities.

- Adequate efforts have been made by the Dept. of Botany, Zoology, Geography and especially the NCC cadets and the NSS Volunteers.
- The committee also noticed the efforts of the Campus Development committee with help of the supporting staff for enrichment as well as prosperity of the prosperity.
- It is also observed that the college campus is beautified and progressively changing the face of it rapidly.
- The college has been involving the nearby stakeholders in the environmental activities such as Samsonite Pvt. Ltd and Forest Dept of Maharashtra at Mulane and Vaitarana Dam.
- More developing steps are to be taken by the internal green audit committee in particular and the college in general.

Dr. Hemant M. Patil
Chairman

Prin. Dr. R.N.Bhavare
Committee Member

Smt. Shobha J. Aher
Committee Member

Er. Bhausaheb Khatale
Management Representative

Dr. P.R.Bhabad
Principal

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