KHAIRA COLLEGE, KHAIRA
BALASORE

GREEN / ENVIRONMENT AUDIT & ENERGY AUDIT REPORT

2022-23

GREEN AUDIT COMMITTEE MEMBER

- **ARUN KUMAR PARHI** (PRINCIPAL)
- **MR. BANAMALI BARIK** (IQAC CO-ORDINATOR)
- **DR. SUJIT KUMAR CHHATIA** (MEMBER IQAC)

MEMBERS:-

- DR. SUJIT KUMAR CHHATIA
- SAMEEKHSYA PRUSTY
- ZIN SAIMAN SAMAL
- SUSHREE SANGITA ROUT
- SARBESWAR SAMAL

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MEMBERS:-

- SASHIKANTA PANDA
- ZIN SAIMAN SAMAL
- SUSHREE SANGITA ROUT
- SASHIBHUSAN MOHAPATRA

INSTITUTE PROFILE

ESTABLISHMENT INFORMATION:-

1-	Name and Address of College	**KHAIRA COLLEGE, KHAIRA, BLS**
2-	Telephone Number	**9337005383**
3-	E-mail ID	**khairacollege@gmail.com**
	Website URL	**www.khairacollegekhaira.com**
4-	Year of Establishment	**1986**
5-	Status of College	**Aided**
6-	Name of the Principal	**Arun Kumar Parhi**
7-	Affiliation	**Fakir Mohan University, Balasore**
8-	Whether 2(f) and 12(B) status?	**Yes**
9-	College Development Committee	**Yes**
10-	IQAC	**Active**
11-	Type of College	**Co-Education**

About the college:

Khaira College, Khaira owes its inception on 16th August 1980 to the endeavour of the people in and around Khaira for the fulfilment of their dream of having a temple of higher learning. The baby institute has bloomed into a vibrant youth and has celebrated its Silver Jubilee in the year 2006-07.

It is now a full-fledge degree college and is one of the lead colleges in Balasore district. It is affiliated to Fakir Mohan University, Vyasa Vihar, Balasore, Odisha. The college has its own campus and well connected by road. The college has total thirteen departments with computer lab, Auditorium, Conference Hall, canteen, gymnasium, class rooms, science laboratories, library, etc. It also has well hostel facility and staff quarters.

The institute has IGNOU centre and OSOU centre, which provide distance learning courses. It also has NCC, NSS and YRC units. The institute is the chief centre of knowledge for nearer area students.

Introduction:

The environment means a surrounding where we live, we breathe, we play. It is the one of the basic essential things for living organisms.

The environment includes all biotic and abiotic things which are present around us and provides the fundamental things like air, water, food and land which are very important for our well-being.

The environment is largely neglected due to rapid urbanisation and various human activities. The increasing level of pollutions lead to environmental degradation and is growing concern to all.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory for all Higher Educational Institutions to submit an annual Green Audit Report.

According to International Chambers of Commerce (ICC), Green Audit (Environmental audit) is defined as, "A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organisation, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations\projects.

It is otherwise called as institutional self-inquiry on nature and nature related things for quality education.

This ensure the practices followed in the campus are in accordance with the Green Policy adopted by the institute.

This is imperative that the college contribution toward a sustainable future.

University Grant Commission has mentioned, "Green campus Clean campus" mission mandatory for all higher educational institutes.

Objectives of Green Audit:

- The aim is achieving an eco-friendly approach to the institute 's sustainable development.
- Understanding the different sustainable activities with regard to the use of water resource, energy resource as well as waste management.
- Creating awareness among students, staff and local people about environmental issues.
- Finding alternative practices to reduce harm full effects of pollutants and provides good strategies and action plans towards improving environment.

Scope of the Green Audit Policy:

The college shall take the following steps or activities for sustainable campus development.

1. Water Management:

The study observed that the main source of water for the college is received from

These are based solely on underground water source. The water is used for drinking purpose, canteen use, toilets and gardening. The water is distributed to different buildings of our college, labs, common room, canteen, office, hostels and staff quarters.

S. No.	Parameters	
1.	Source of water	08 tube wells
2.	No of overhead tanks	12
3.	No of motors used	03+03
4.	No of water purifier	08

Water conservation methods:

The college ensure minimum water wastes by following necessary steps:

- Periodic maintenance of water pipelines, taps, tanks and water purifiers.
- The college always try to balance the supply and demand of water.
- Water sprinklers are used to minimise water use.
- A rain water harvesting pond is also found behind the college. The rain water collected from this pond is used for watering the plants during summer.
- The waste water from the water purifier is reused in campus garden.
- During summer small earthen pots are installed in garden, balcony and roadside for birds drinking purpose.

Recommendations:

- A well distillation method should be installed for RO and lab released waters.
- Well maintained shock pits are also recommended.

Fig 1:- A water reservoir

2. Waste management:

Solid waste management is the collecting, treating, disposing of solid material that is discarded because it is no longer useful.

Waste generated from different sources inside campus create issue. The institute shall ensure minimal impact on environment due to wastes through proper management.

The 3R method (Reduce, Reuse, Recycle) is properly followed. Proper segregation of solid waste materials is done like degradable, solid nondegradable, recyclable and hazardous.

For different categories different colour dustbins are installed inside the campus for waste management.

Colour	Substance
Green	Biodegradable
Yellow	Non-biodegradable (glass wastes)
Blue	Recyclable plastic wastes
Red	Hazardous wastes

For biodegradable wastes, the institute installed a biogas plant. Biogas plant is a chamber that provides oxygen- free condition for anaerobic degradation of materials with liberation of biogas (methane). This biogas is used in cooking as smoke free fuel in hostel canteen and sustainable electricity can be produced. The remaining

unused biodegradable material discarded from biogas plant is used as eco-friendly fertilizer.

Image:

Fig 2:- Pots made out of plastic wastes

The grey water is being discarded in the main drainage pipeline.

The institute follows Government guideline for disposal of e-waste from departments and offices.

Some plastic waste bottles are reused for plantation, crafts and decorations

Recommendations:

- A vermicomposting plant can be installed.
- All non-compostable plastic things should be avoided to create plastic- free environment.

Fig 3:- Plastic free campus initiatives

E-WASTE MANAGEMENT

E-waste broadly covers various electronic products such as, computers, mobile phones, digital music recorders/players, refrigerators, televisions (TVs), etc. Some of them containing toxic substances/chemical like lead, zinc, barium, cadmium, mercury, beryllium, BFR, polyvinyl chloride and phosphor compounds that release in the atmosphere can have an adverse impact on human health and the environment if not handled properly. Serious repercussions may arise for those in proximity to places where E-waste is recycled or burnt due to improper recycling and disposal procedure.

List of E-waste that is collected from various sections of the College:

- Printers, Printer cartridges, Copying Equipment.
- Electrical and electronic typewriters.
- Telephones, Cellular telephones
- Television sets based on Liquid Crystal Display (LCD) and Light Emitting Diode (LED) technology & Computer CPU, UPS, Computer Monitors, Invertors, and battery etc.
- Electrical and electronic items.

3- Green Management:

The institute is responsible to provide an eco-friendly atmosphere.

The surroundings of the college campus are full of greenery with different plant species.

The grass lawns and gardens in the campus are very well maintained. Our college also has a botanical garden rich with medicinal plant species.

The organic manure, cow dung, discard of biogas tank for gardening purposes. Green campus audit may be beneficial to the campus in improving the greenery activities.

The following plant species are listed below present in college campus.

Common name (Odia or English)	**Scientific name**	**Family**	**Medicinal uses**
Ada, ginger	*Zingiber officinale*	Zingiberaceae	Commonly used as spice and herbal medicine, commonly used for headache, colds, nausea, emesis
Amba, mango	*Mangifera indica L.*	Anacardiaceae	Antiseptic, astringent, diuretic, use in dysentery, diarrhoea, bronchitis
Amrutabhanda, papaya	*Carica payaya L.*	Caricaceae	Fruit is rich in fibre, helps in digestion, soften bowel movements, skin protection, speeds up the healing the wound

Arjuna	*Terminalia arjuna*	Combretaceae	Useful for treating eye related issues, low blood pressure, maintaining a healthy cholesterol
Arakha	*Calotropis procera R. Br.*	Asclepiadaceae	Cholera, cold or chough, rheumatoid arthritis, ring worm, chicken pox, stomach problem, toothache
Aloe vera	*Aloe barbadensis Miller.*	Liliaceae	Treat skin problem, burns, wound, anti-inflammatory, antidiabetic, anticancer, antioxidant, antihyperlipidemic, good for hair
Ashok	*Saraca asoca Roxb.*	Caesalpiniaceae	Used as uterine tonic, menstrual irregularities, other reproductive disorders in women, treatment in urogenital tract, fever, pain
Ashok	*Ixora chinensis Lam.*	Rubiaceae	Used in diarrhoea, dysentery, gastroprotective, hepatoprotective
Aparajita	*Clitoria ternatae*	Fabaceae	Memory enhancer, nootropic, antistress, antidepressant,

			anticonvulsant, sedative agent
Bara, banyan tree	*Ficus benghalensis L.*	Moraceae	Treatment for diarrhoea, dysentery, leucorrhoea, nasal trouble, ear problem, piles, gum and teeth disease
Barakoli	*Ziziphus mauriliana Lam*	Rhamnaceae	Used as a sedative to avoid stress, ulcers, improve muscle mass and strength, improve liver and bladder function
Bela, wood apple	*Aegle marmelos L.*	Rutaceae	Plant parts have anti-cancer properties, cure of digestion problem, ulcer, rheumatism, haemorrhage
Bhrusanga patra, curry leaf	*Murraya koenigii L.*	Rutaceae	Used externally to treat rashes and deadly animal bite, for hair growth, dysentery, vomiting, low cholesterol
Debadaru	*Polyalthia longifolia*	Annonaceae	Relieve skin disease, helminthiasis, hypertension, various cardiac problem
Jamu, black berry	*Syzygium cumini L.*	Myrtaceae	Treatment of sore throat, bronchitis, asthma, thirst,

			biliousness, dysentery, ulcers, antidiabetic
Kagaja phula	*Baugainvillia spectabilis*	Nyctaginaceae	Anticancer, antidiabetic, antihepatotoxic, anti-inflammatory, antihyperlipidemic, antimicrobial, antioxidant properties
Kagaji lembu, lemon	*Citrus medica*	Rutaceae	Used to treat kidney stone, tinnitus, Meniere's illness, common cold, flu, skin disease and scurvy
Kanchana	*Bauhinia acuminata*	Caealpiniaceae	Treatment in liver inflammation, abscess, tumours, wounds
Katha champa	*Plumeria rubra L.*	Apocyanaceae	Used in venereal disease, rheumatism, leprosy, fever
karabira	*Nerium oleander*	Apocyanaceae	Used for heart disease, epilepsy, painful menstruation, leprosy, malaria, ringworm
Labanga, clove	*Syzygium aromaticum*	Myrtaceae	Antibacterial, pain killing, antibacterial, antiviral, used in toothache
Madhumalati	*Quisqualis indica L.*	Combretaceae	Used as ascariasis, ringworm disease, digestive disorders

Mandara, China rose .	*Hibiscus rosa sinensis L.*	Malvaceae	Used in hypertension, cholesterol production, cancer progression
Nadia, coconut	*Cocos nucifera L.*	Arecaceae	Immunostimulant, antiparasitic, hypoglycaemic, hepatoprotective, good for skin and hair
Nagapheni, prickly pear	*Opuntia vulgaris A. Juss.*	Cactaceae	Treating diabetes, high cholesterol, obesity, hangover, with antiviral, anti-inflammatory
Nimba, neem	*Azadirachta indica*	Meliaceae	Anti-inflammatory, antifungal, antibacterial, antiarthritic, antipyretic, antigastric, antitumour
Pijuli, gauva	*Psidium guajava L.*	Myrtaceae	Used in gastrointestinal infection like diarrhoea, dysentery, stomach aches, indigestion
Peepal	*Ficus religiosa L.*	Moraceae	Used as antiulcer, antibacterial, antidiabetic, treatment of gonorrhea
Sadabihari	*Catharanthus roseus L.*	Apocyanaceae	Anticancer, antidiabetic, used in

.			fever, septic wound, menorrhagia, treatment in malaria and skin
Sagwan, teak	*Tectona grandis L.*	Verbenaceae	Treatment of common cold, headache, in wound healing, anti-inflammatory, antidiabetic, antioxidant, lipid disorder
Sajana, drumstick	*Moringa olifera Lam.*	Moringaceae	Stimulates heart and blood flow, anti-tumour, antipyretic, antiepileptic, anti-inflammatory, anti-ulcer, antioxidant property, anti-diabetic, anti-fungal and anti-bacterial properties
Tejapatra	*Cinnamum tamala*	Lauraceae	Antidermatitic, antibacterial, antifungal, with antihyperglycemic effect
Tulasi, holy basil	*Oscimum sanctum*	Lamiaceae	Treatment of diarrhoea, dysentery, anticough, ant bronchitis, common cold, flu, fever, rheumatism

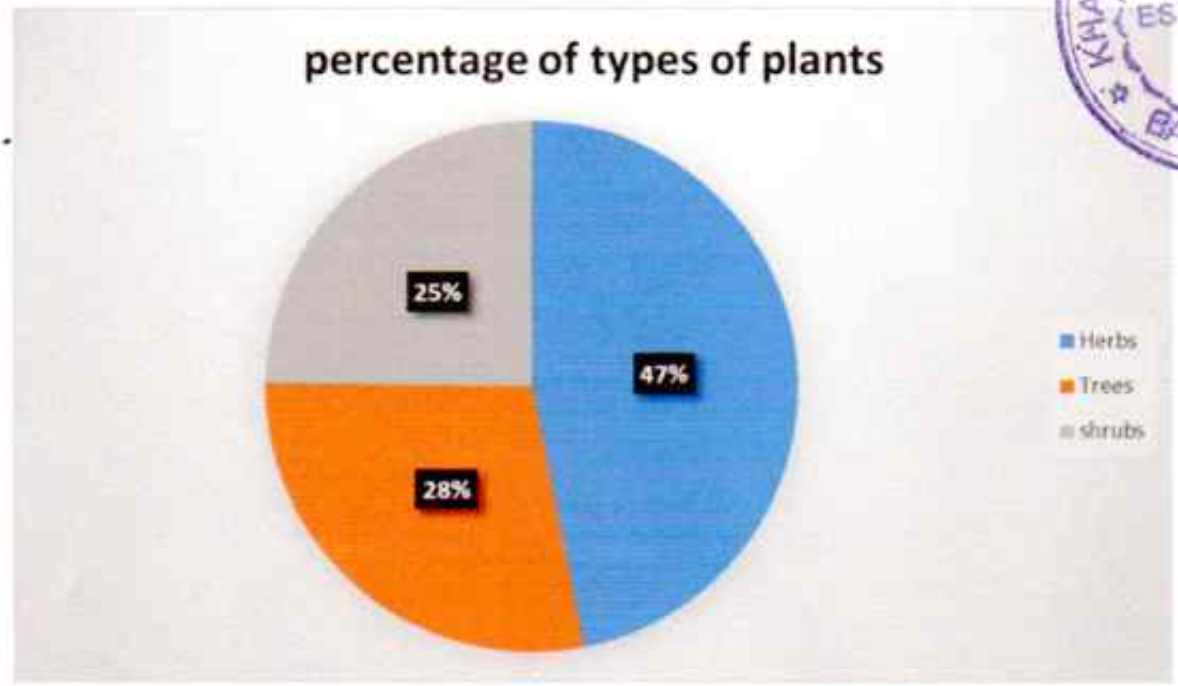

Fig 4:- Species diversity of Khaira College, Khaira

Healthy practices adapted by the institute:

- Campus is flourished with many plant species. Due to different ornamental flowers present in the college gardens, every year honey bees make their hives inside college campus.
- Various plantation programs are organised at the institute and surrounding areas.
- NSS unit of the college helps in development of eco-friendly environment and awareness programs in nearer villages.
- The institute also celebrates "Environment Day" on 5th June in every year. "Vana Mahotsav" week also observed in the college.
- Eco-club, NSS, NCC units of the college are very active, involve in various cleaning, awareness, disaster management programs. NSS team of the institute adopted a nearby village.
- Environment concern rally and seminar programs are organised by the institute.

Fig 5:- Healthy Practices Activities

Fig 6:- Different varieties of hibiscus

Fig 7:- Some Plant species






Fig 8:- Green Campus of Khaira College, Khaira

Energy Audit:

The purpose of energy audit is to address the status of the electrical systems, energy uses and performance assessment of various facilities.

The energy audit committee observed the following energy system and their uses.

The committee also suggest solutions to improve system efficiency, performance of different equipment's and safety measures.

Electricity bill analysis (2022-23):

S. No.	Bill period	Contract demand(kw)	Charges (INR)	Energy consumption (kwh)
1	April	5kw	10,030	1892
2	May	5kw	4,320	815
3	June	5kw	6,079	1146
4	July	5kw	5,588	1054
5	August	5kw	8,264	1559
6	September	5kw	10,178	1922
7	October	5kw	5,224	985
8	November	5kw	5,760	1085
9	December	5kw	3,845	725
10	January	5kw	3,476	655
11	February	5kw	3,606	680

From the above data the energy consumption graph is obtained.

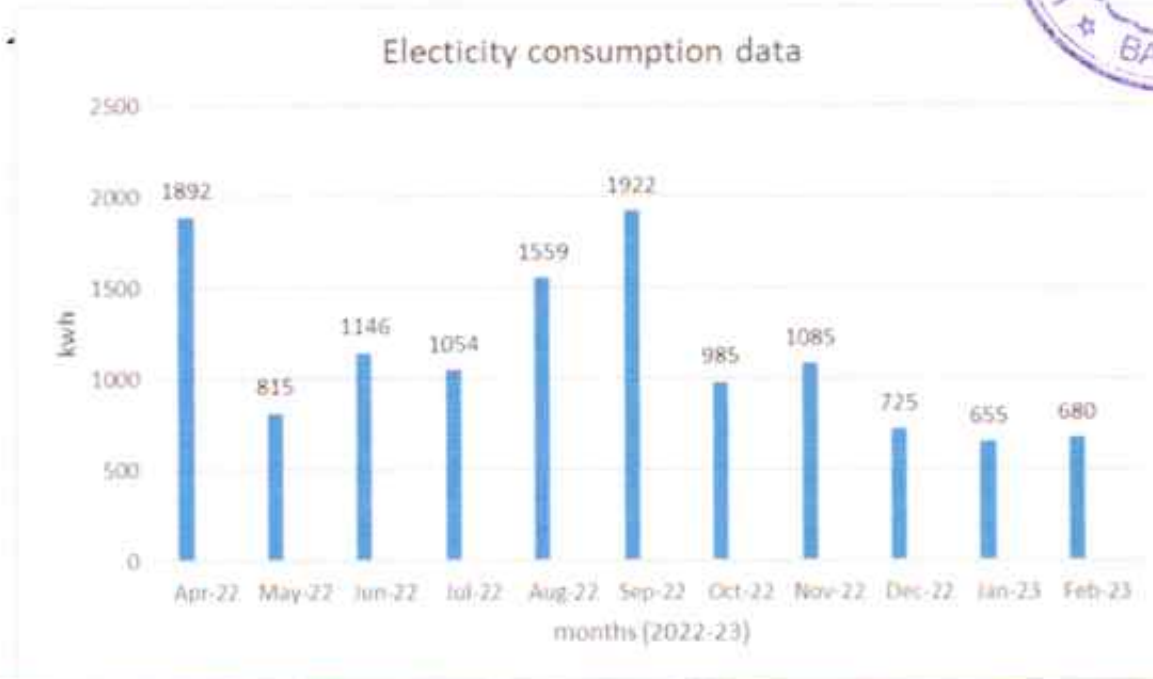

Fig 9:- Electric consumption data from April 2022-Feb 2023 of Khaira College, Khaira

From the above graph, it is observed that the energy consumption is highest in the months of April, September and August.

This primarily due to use of fans and AC during hot months. Though May, June months are summer vacation time, electricity consumption is less.

During 2019-20 and 2020-22 the energy consumptions was low due to lock down situation during COVID-19.

Electrical Appliances Major Load Details:

.S. No.	Description	Total No.	Watts	Total kwatts
1	Fans	198	60w	11.88kw
2	Exhaust fans	03	60w	0.18kw
3	Tube lights	20	20w	0.4kw
4	CFL	190	9w	1.71kw
5	LED lights	10	30w	0.3kw
6	AC	09	2kw	18kw
7	Computers	70	60w	4.2kw
8	Water coolers	02	500w	1kw
9	RO systems	06	100w	0.6kw
10	Projectors	02	500w	1kw
11	Motors (1 Hp)	04	700w	2.8kw
12	Fridges	03	500w	1.5kw
13	Total connection load in canteen		500w	0.5kw
14	Total connection load in common room		5000w	5kw

Healthy and productive steps towards energy conservation taken by the institute:

- **Replacement of old tube lights to CFL:**
  Total No. of CFL (11w) = 190 × 11= 2090w
  Average running hours per day= 8 × 2090=16.7kwh
  Average working days per month= 16.7 × 30=500 unit
  Whereas average power consumption of tube light = 190 ×20= 3.8kw
  Average running hours per day= 8 × 3.8=30.4kwh
  Average working days per month= 30.4×30 = 912 unit
  Average power saving by LED = 912-500 = 412 unit

- **Installation of solar plant:**
  The institute installed solar plates on the rooftop. The electricity produced by solar plates used in labs, office and smart classes.
  Image:

Fig 10:- Solar panels installed in Khaira College, Khaira

- **Bio gas:**
  The institute installed bio gas tank for energy conservation and waste management purposes.

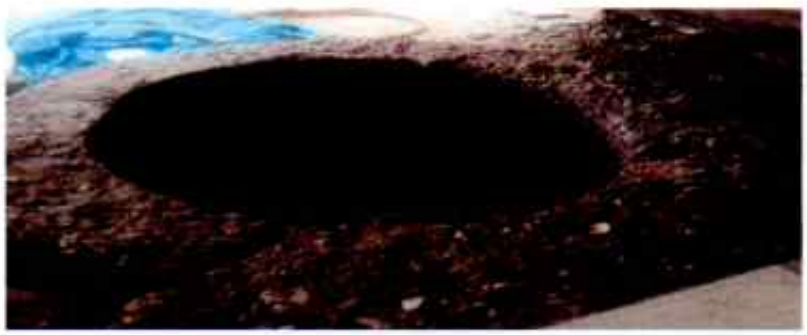

Fig 11:- Biogas Tank in Khaira College, Khaira

- **Green room:**

  The institute has green rooms with provision of sufficient light and ventilations. Which sufficiently reduce the energy consumption due to less use of lights, fans and AC.

8.3.23
Coordinator
IQAC, Khaira College

KHAIRA COLLEGE ESTD-1980 BALASORE

8.3.23
Principal
Khaira College, Khaira
Balasore