

Environmental
Audit Report
2019



RAMANANDA COLLEGE, BISHNUPUR BANKURA, W.B.



PREPARED BY
**TROPICAL INSTITUTE OF EARTH AND
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Environmental Audit Report, 2019 of Ramananda College, Bishnupur, Bankura

Environmental Audit Report of Ramananda College, Bishnupur, Bankura has been prepared by Tropical Institute of Earth and Environmental Research (TIEER) based on visit to the college campus, checking records and interactions with faculty, non-teaching staff and students. No intrusive study was conducted during the audit.

The audit was conducted on **5th April, 2019**. The audit report presents green initiatives taken up by the institution, and provides suggestions and recommendations to improve environmental sustainability.

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The Enquiry Team with Principal, Ramananda College

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1. Introduction:

1.1 About the College

The inception of Ramananda College in 1945 was the beginning of providing higher education to the otherwise marginalized youths of this locality. The “Temple Town” Bishnupur, a Sub-Divisional Head Quarter is endowed so far with this only co-educational Degree College, which has been serving for more than 74 years as the Alma Mater of thousands of students coming from rural Bengal.



Green and healthy college premises

The proposal to establish a centre of higher education was initially made by Sri Ramnalini Chakraborty, freedom fighter and social worker of Bishnupur. Initiative was taken by Sri Radhagobinda Roy, founder Principal of this college and Ex-minister, Government of West Bengal and many other eminent personalities of the town and the district. Fund was generated by the contributions of Sri Ramnalini Chakraborty (Rs. 25,000/-), Koley family (Rs. 36,000/-), Sri Anil Kumar Bhattacharya (Rs. 10,000/-), Members of the Friends’ Union Club (Rs. 10,000/-) and by the donations of the common people. The college was named after the illustrious son of the district of Bankura, Sri Ramananda Chattopadhyay, noted journalists, editor and scholar.

Ramananda Chattopadhyay was the editor, publisher and owner of the Modern Review, a high grade illustrated monthly magazine published in English and Prabasi, a Bengali organ, published in the vernacular. He was pre-eminently an editor although during his useful life he was associated with many reform movements.

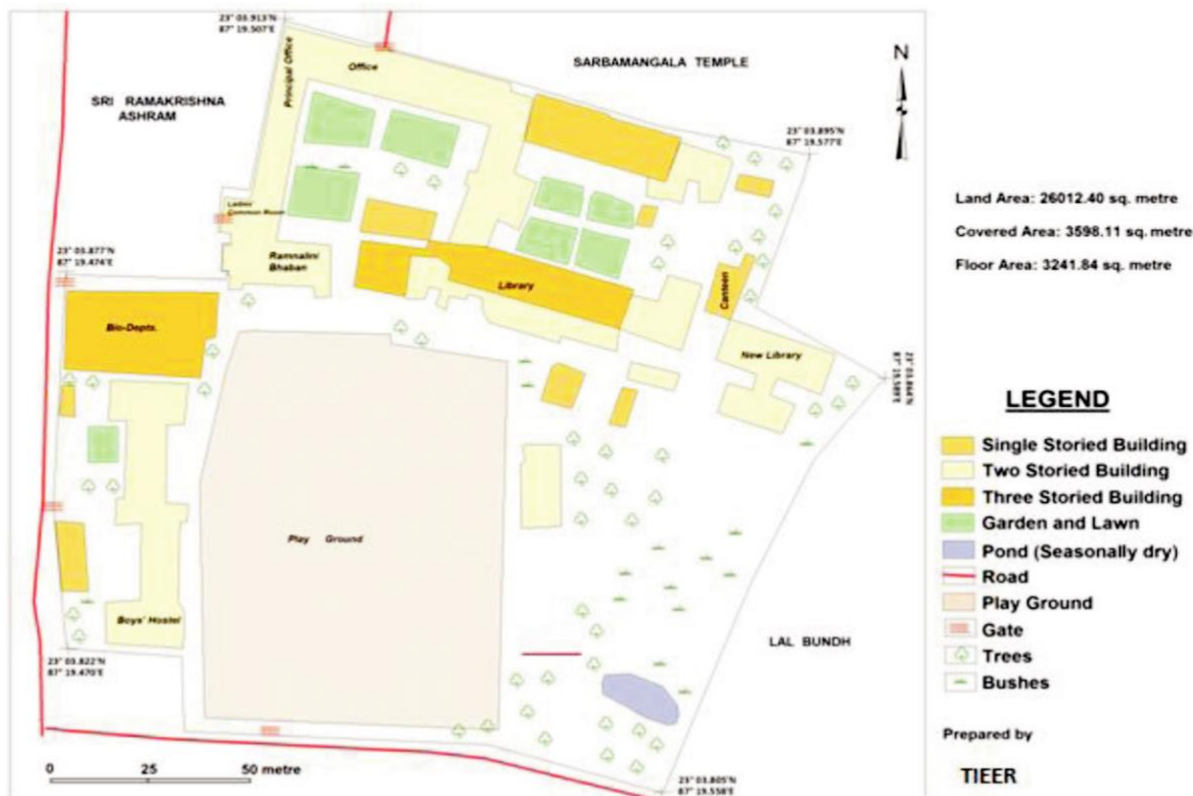
The sapling of the past has become the full-grown tree of the present. It fulfils the academic need of the students and nourishes them with the knowledge of real value. The College was initially affiliated to the University of Calcutta and later on to the University of Burdwan and presently to the Bankura University since 1st January, 2017.

The college, with best academic standard, offers Honours & General courses in Bengali, English, Sanskrit, History, Political Science, Philosophy, Geography, Economics, Education, Music, Physical Education, Computer Science, Mathematics, Physics, Chemistry, Botany, Zoology, Physiology and Nutrition. It has separate morning shift for the Commerce section. Every year some students secure ranks in the University Final Examinations. The rate of success in the University Final Examination is more than 90%. Along with this excellent

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academic performance the students are involved in social activities like Extension Programme, Adult Education Programme, organizing Health Camp, Plantation Programme, etc. With equal enthusiasm the students serve the nation by being an integral part of N.S.S. & N.C.C. units of the college.

Initially the College was affiliated to the University of Calcutta and later, to the University of Burdwan and now under the affiliation of the Bankura University since 1st January, 2017. The College is recognized by the UGC under Sections 2f and 12B. As the college was established before Independence, it predates both the creations of the UGC and the University of Burdwan. In 2015, the National Assessment and Accreditation Council (NAAC) re-accredited (2nd cycle) the College with 2.75 score. Further, with the introduction of different Post Graduate Courses in Science and Humanities, the College has become a constituent College of the Bankura University. Now the College is compliant with the visions of RUSA.



Location of the College and Land use map

2. Environmental Audit

The Audit covered the following major areas:

- 2.1. Water Efficiency and Wastewater Management
- 2.2. Indoor Air Quality
- 2.3. Energy Efficiency
- 2.3. Paper Waste Management
- 2.5. E-Waste Management
- 2.6. Canteen and Solid Waste Management
- 2.7. Green Belt

2.1. Water Efficiency and Wastewater Management:

The water is stored in the four storage tanks (Make – Sintex, one of 6 KL, capacity and three of 2Kl capacity each) located on building terrace. Water from bore well is pumped to storage tank around 3 times daily. Stored water is used for drinking, flushing and cleaning. 12 Aquagaurds are provided for drinking water purpose. Water tanks of Hostels are not included.

No leaking faucets were seen anywhere in washrooms. If water leakage is observed, in-house plumber is called immediately to attend to the complaints. Water conservation faucets in washrooms were not seen. Installation of such faucets can save water and will help in minimising the water footprint of the institute. No



Polluted water in Unusable tank

signage emphasising water conservation was found in the institute. Sanitary wastewater generated from washrooms is connected to sewerage system. Chemical wastewater generated in chemical labs in the institute is also connected to sewerage system.

Waste water recycle is not practiced in the institute as grey water/ sewage



Chemical liquid wastage

treatment /recycle facility is not provided.

Ramananda College is in Bankura region of W.B, which is a water scarce area. Therefore, proper water management practices along with rooftop rain water harvesting system must be installed for recharging ground water and meeting part of the water requirements.

2.2. Indoor Air Quality

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutants are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
- Volatile organic compounds – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Major observations under indoor air quality is as below:

- a) Ventilation is achieved by fans in the institute and air conditioners in some places.
- b) Heating Ventilation and Air Conditioning (HVAC) system is not installed.
- c) Smoke detectors are not provided in the institute.
- d) Exhaust fans are only provided in washrooms and chemistry lab.
- e) No indoor plants were observed in the entire institute. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits.

2.3. Energy Efficiency

- Good Daylight Design and Ventilation:
 - a) All the corridors receive good daylight due to the large windows.
 - b) Corridors are wide with good ceiling height.
 - c) Classrooms also have high ceiling with wide doors and large windows. Windows are kept open to receive sunlight.

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d) Curtains are provided on some of the windows to avoid glare. Due to the location some classrooms do not receive ample natural light and fresh air. Hence these rooms are provided with tube lights even during day time.



Spacious Laboratories



Conversation with students to Study of environment in laboratories

- **Electricity:**

07 electricity meters are provided for the entire complex. The monthly average electricity consumption is around 7000 KWh (units) approximately. It is necessary to monitor the electricity consumption and we suggest that institute carries out an energy audit to understand the reasons & take corrective action.

The areas of major consumption of electricity are:

LED lights– 100 approximately

Fans – 250 nos. approximately

Air Conditioners – 2nos. (Not energy rated)



Insufficient day light in Classrooms

Computers -150

Fridge 1 in almost every department

Three generators of 20 capacity and one of 15 capacity each are installed in every department, Office, Library and labs as backup in case of power failure.

It was observed that reflectors are not provided for tube lights which can reduce electricity consumption. Computers are always kept on standby mode with power saving screensavers.

There are no signage encouraging users to switch off light and fans to save electricity. Providing signage through screensavers & posters near electrical switches will help in making students responsible for conservation of electricity.

There is no renewable source of energy used e.g. Solar, Wind.

- a) LPG gas cylinders are used in laboratories and in the hostel and canteen building for cooking. Other than this, LPG gas is not used anywhere.
- b) There is no dedicated gas storage area. Gas cylinders are refilled as and when required.
- c) There are no diesel generators used in the premises.



LPG gas use for chemistry lab.

About waste

Waste (or wastes) are useless or unusable materials or components which are discarded after principal use. Sometimes, it is a defective article and of no use. In modern outlook waste may be a valuable substance subject to an appropriate operation or action on the waste. With the context of waste management RRR (reduce, reuse and recycle) model may be followed in appropriate fashion. Keeping the objective of the audit the following study will be limited to the waste generated in an academic campus and surroundings.

Kinds of waste

The following categories of wastes are generated in the college campus:

a) Solid waste

Nearby the physics department old instruments and furniture cause dump. Waste generated through plastic packaging causes nuisance. Some wastes are generated after various experiments, primarily, chemistry laboratory; broken test tube, glassware are the example.

b) Liquid waste

There are bio-chemical wastes generated through various chemical reactions and biological processes. Generally, these are being drained to nearby pond contaminating water and soil. Appropriate means is suggested to adopt scientific liquid waste management practices. These are neutralization, bacterial control, and natural control through plantation.

2.4. Paper Waste Management:

Being academic institution, waste paper is the main solid waste generated in the premises. The institution has taken steps to minimise and avoid paper usage. Faculty and administration staff uses old papers and envelopes for internal usages as rough work, file markers, page separators etc. Paper notices are displayed on the notice boards. The dissertation reports, journals, and answer papers are stored as per the University rules. Most of the storage is in computer laboratory, library and staff room. After couple of years, old submissions and answer papers will be archived and stored in a



Perception study for paper waste management

record room at ground floor. Old publications are still stored in the library. As per the memo, for the disposal of old newspaper scrap dealer is called by central purchase department.

2.5. E-Waste Management:

The institute has around 150 PCs and 2 air conditioners in working condition. The data on E-waste generation and its disposal is not available. There is no documented policy for collection, segregation of e-waste.

2.6. Solid Waste Management:

It was observed that:

a) Wet waste and dry waste segregation is not practised in the premises. No separate bins are provided for wet biodegradable and dry recyclable waste.

b) Combined waste is directly handed over to the Municipality

c) Hostel is the main area where biodegradable and non-biodegradable waste is generated. In the back of the girls hostel the sanitary napkins are mostly observed scattered here and there.

e) In other areas like classrooms, it is mostly paper waste and plastic wrappers



Crisis of solid wastage management

Impact of waste on health and environment

Throwing the old furniture here and there is strongly discouraged because it causes the home

for spiders, rats, snakes and mosquitoes. Plastics can choke drainage system by causing flood. If get mixed with soil, plastics hinder the growth of root of plants. Generally, bio-chemical wastes are being drained to nearby pond contaminating water and soil.



Inorganic and plastic wastage scattered here and there

2.6.1. Waste management

a) Solid waste

The suggestion is that old instruments may be preserved in a central museum (may be developed if does not exist). The same may be used for demonstration to the new and passionate students and to school children for their project purpose.

Old furniture may be reassembled to make stools, desks, chairs, tables, racks and book shelves with appropriate renovation. Moreover, since cutting of trees is not suggested, whatever timber we have from the ancestors must be preserved and utilize properly.

For plastic three dimensional package-of-practices is suggested. First of all, awareness on plastics material (and its life cycle), its uses and disposal will be there regularly among students. In the second stage, practice of keeping plastics wrapping, packaging, and other plastic-made things in the appropriate bin should be there. For this purpose sufficient numbers of bins will be placed in appropriate locations like students' common room, canteen etc. A mechanism will be there for regular collection by dedicated manpower. At the end, the plastics will recycled by grinding/ chopping instrument and final material is to be dispatched to market. The institution has accepted the suggestion of use of such innovative recycling machine and suggested to design the machine.

Wastes generated from chemical experiments are to be disposed safely maintaining chemical hazard disposal protocol.

b) Liquid waste

Appropriate means is suggested to adopt scientific liquid waste management practices. These are neutralization, bacterial control, and natural control through plantation.

2.6.2 Waste prevention

Since waste demands a cost for recycling, it is better to design such product which takes less recycling cost. So, at the design phase the proper need assessment is to be undertaken to reduce the target cost for disposal.

Major audit issues in management of waste:

The following are being emphasized during audit of waste management:

- a) Name of the waste
- b) Category of waste
- c) Quantity of waste

- d) Hazardous effect of the waste
- e) Institutional action and mechanism for waste management

Compliance audit of waste issues:

At the present stage the institute is capable in managing their waste. They are complying with the essential requirements of waste management although suggestions are given for future improvements.

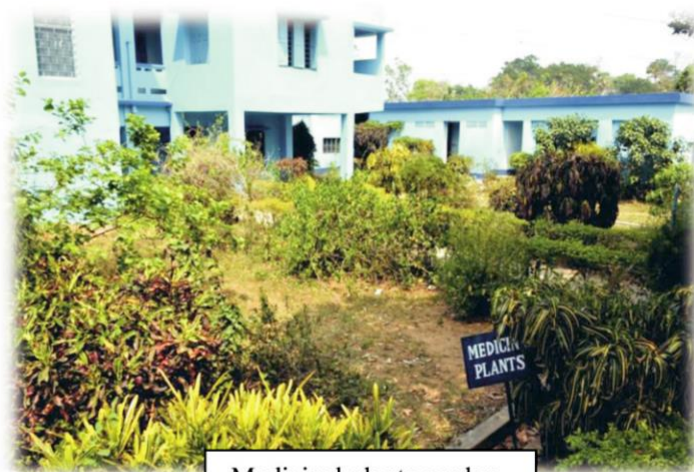
6.3 Performance audit of waste issues:

No critical audit issue is there with respect to the waste management.

2.7. Green belt/ Landscaping:

The Institute has a sprawling campus of 37,635.82 Sq.m

a). Plantation is needed in the compound in the periphery of the campus. This plantation will also help keep down severe heat and cold. The trees should be planted in such a way that it should not completely obstruct the view of the building from outside and sunlight to room.



the institute.

b). Indoor plants can be potted along the corridors and entrance of the building. For enhancing the scenic beauty it is suggested to plant flowering trees, which bloom in different seasons, in front of the large trees along the periphery.

d). Vertical Gardening can be done on the compound wall of



Famous 'Lalbandh' water bodies



Rain water harvesting area around the college campus



Playground without any Greenary

Table. 1. Summary of Quantitative Environmental Impact Evaluation

Factors	Weightage
Water Efficiency and Wastewater Management	M
Indoor Air Quality	L
Energy Efficiency	M
Paper Waste Management	A
E-Waste Management	A
Green Belt	A

Key: Significant Impact – requires assessment and establishment of measures

Impacts of low or non-existent significance (rated as A = High, M = Moderate, L = Low)

2.8. For Improving Energy Consumption:

a) Every classroom and lab with central switch board should have a diagram linking place of tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.

b) Installation of automatic lights with sensors can be considered.

c) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing wherein equipment's with star rating; those using eco-friendly materials; those with safe disposal policy or return to supplier after defunctioning, can be considered.



Local biodiversity patch

d) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.

e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.

f) Notices/ signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electricals when not in use

g) Use of renewable energy should be considered.

2.9. Water Conservation:

a) Encourage efficient water use and reporting by installing water meters at key locations. Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.

b) Minimize/ reduce water usage by installing water saving faucets such as tap pressmatic taps, tap aerators, jet sprays etc.

c) Dual flushing system can be installed for toilet flushing which saves considerable amount of water.

d) Grey water/ sewage recycling system can be installed for flushing toilets. This will reduce the fresh water footprint.

e) Installation of waterless urinals can be considered to reduce water consumption.

f) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption. Encourage efficient water use.



Proposed water recharge site

2.10. Paper and other Solid Waste Reduction:

- a) There should be waste segregation practices at source by providing separate bins.
- b) Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other material to needy students. This can be an initiative under green program.
- c) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin. Biodegradable waste from canteen can be used for composting.
- d) Plastic bottles to be handed over to PET recyclers.
- e) The college can introduce online medium/ app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.



Minimum wastage management methods

f) Paper usage shall be monitored to understand the impact of digitisation in the facility.

2.11. Others

a) Environmental advisory committee could be formed. The discussions and information sharing among different departments can generate lot of ideas and awareness on green issues.



b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes.

Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.

c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation etc). Wallpapers informing students about environment conservation can be created.

d) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.

e) Small composting facility can be provided for canteen to treat the biodegradable waste. Compost generated can be utilised for plants near compound wall.

f) Vertical gardening can be done using indoor plants. Hydroponic garden can be an option where in small space also plants can be planted. Drip irrigation system can be provided for plants.

g) Indoor air quality can be monitored to ensure safe and healthy environment.



3. Suggestions and Proposal and policy on environment management planning for sustain green and healthy college campus

1. The proper conservation and management of heritage Lalbandh Water bodies should be properly done to protect the ecosystem.
2. An eco- green hub for teachers, students and staffs to sustain healthy environment, and to promote environmental awareness can be setup at premises.
3. A solar power grid can be established for implementation of non conventional energy and eco-friendly campus.
4. A ground water recharge station can be established to balance the GWL for water conservation as it is a drought prone area.
5. A green generator can be established for healthy environment.
6. A weather monitoring station can be set up at the college campus for weather forecasting to aware students and local villagers about natural hazard and for collection of weather and atmospheric data for weather forecasting and Disaster management.
7. Micro water harvesting methods could be applied around the catchment area of low land for Water Park at the north- eastern part of college campus.
8. Grass cover and trees walls can be grown at the play ground.
9. To apply the eco-sustainable organic Kitchen garden for the production of fruits, vegetables, flowers and medicinal plants by organic and biotic methods.
10. A Vermi composed pit can be set up to produce the organic fertilizer.
11. To be established the separate bin for chemical liquid waste, solid waste & e-waste.
12. To be maintained and reformed the water bodies (bandh) and ponds for aquaculture and fish farm.
13. Environment departments and offices can be established for perception of healthy environment.
14. Rules and regulations for the pollution free travel and transport system can be created.
15. To arrange the workshops for promoting tourism and skill development. The seminar, symposium, awareness programme can be organized to create awareness and concern about the bio-diversity and environmental conservation and need for management among students and local communities.

16. Can be a planning design for paradise green and healthy environment in college premises and a model for environmental awareness and beautification.

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'Silent Drive to Environment Management'