



MARIANI COLLEGE

SELF STUDY REPORT

FOR 3RD CYCLE OF NAAC ACCREDITATION
2018-2023



Supporting Documents for NAAC Self Study Report (SSR) (3rd Cycle) Period: 2018-2023



Prepared and submitted by:
Mariani College

Criterion 7	Key Indicator: 7.1
Institutional values and Best Practices	Institutional values and social responsibilities
Metric Number: 7.1.3	Quality audits on environment and energy regularly undertaken by the Institution



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GOVERNMENT OF ASSAM
DEPARTMENT OF ENVIRONMENT & FORESTS
OFFICE OF THE DIVISIONAL FOREST OFFICER
JORHAT DIVISION: JORHAT

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Letter No.FJT/ B/Misc/ 2829

Date: 22-06-2023

Certificate of Green Campus – cum - Environmental Audit

This is to certify that, the “Green Campus Environmental Audit” of Mariani College, Mariani, Dist-Jorhat Assam was done on 16-06-2023 to assess the initiatives – ‘planning and efforts’ being carried out in the campus in order to keep it environment (including water, soil and air) friendly to all the stakeholders and as per the assessment it is found to be excellent.

Date:- 22-06-2023

Place:- Jorhat


Signature of competent authority

DIVISIONAL FOREST OFFICER
JORHAT DIVISION, JORHAT


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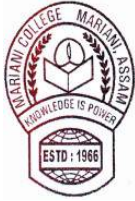

Principal
Mariani College, Mariani

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Green and Environmental Audit Report



Mariani College

Mariani, Jorhat

Assam - 785634

2017-2023

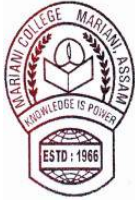
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Bhramari

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Jharna
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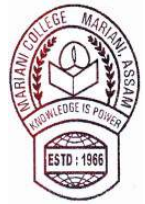


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Green Audit Team

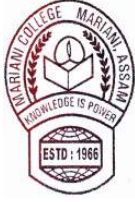
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Foreword

This report is prepared as part of NAAC (National Accreditation & Assessment Council) inspection purposes. I hope this report will fulfill the need of Mariani College Green & Environmental Audit. I am grateful to all the stakeholders including the students, faculty members and office staff for supporting me in preparation of this report.

I offer my gratitude to our principal for providing me the facilities for undertaking this exercise.

My sincere thanks to my colleagues of Mariani College for their constant support and encouragement during this period.

Least but not the last, I offer my gratitude to the members of the Green Audit Team who underlook this precision exercise.

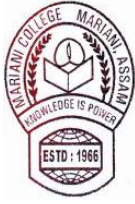
P.K. Baruah
Coordinator

(Dr. Raj Kumar Gohain Baruah)
Green & Environmental Audit Committee
Mariani College

B. Baruah
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A. Baruah
Principal
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Green Audit Team

Sl. No.	Name	Signature
1	Dr. Utpal Dutta Associate Professor Department of Botany, The Sibsagar College, Joysagar (Autonomous)	
2	Mr. Diganta Bora Associate Professor Department of Chemistry, The Sibsagar College, Joysagar (Autonomous)	

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1. Introduction

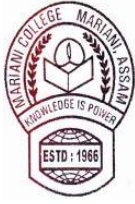
Mariani College was established in 1966. The College has a distinctive position of its own in the field of higher education in upper Assam and one among very few colleges of Assam having all the three streams viz., arts, commerce and science. The Arts stream was brought under the deficit grant-in-aid system by the government of Assam wef 1st February, 1975. The Commerce stream was introduced in 1975. The Science stream was introduced in 1992 and provincialized on 14th August, 2013. The college has been playing a remarkable role in creating academic atmosphere among the young generation. Basically, Mariani is a tea garden area and also shares a long border with the state of Nagaland. Besides local Assamese people, the town is a cosmopolitan one having the diversity of people from all over India with different languages, cultures, religions and caste & creed. Mariani is the only railway junction of Jorhat district having a huge railway colony area since the Britishers period. Few decades back, there was one mega plywood factory under the Birla group. Due to these reasons, people from various states of India used to migrate here in search of employment opportunities. The college started its journey with few students under the founder principalship of Hariprasad Neog (1966-1969). After crossing many initial hurdles, the college crossed another milestone in the year 2004 in the form of NAAC gradation in the first cycle and the college was awarded C⁺ grade. The NAAC peer team for the second cycle visited our college in 2017 and have been awarded a B⁺ grade. Under arts stream, the college has departments offering BA courses in Assamese, Bengali, Economics, Education, English, History, Geography, Sanskrit, Political Science; B.Com Courses in Accounting & Finance, Human Resource Management and Statistics. And B.Sc. courses in Botany, Chemistry, Mathematics, Physics and Zoology and Computer Science. In the distance education sector, the college has started various courses under KKH State Open University in 2022. Recently the Dibrugarh University has approved 13 Add-on courses namely, Basic Electrical House Wiring, Basic Computer Course, Mushroom Cultivation, Translation in Bengali, Spoken English, History & Tourism, Human Rights, Professional Diploma in Geo-informatics, Diploma in Disaster Management, Speciality Tea Processing & Machinery Management, Bioinformatics, Self-Defence (Karate) and Pre-primary Education.

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OUR VISION & MISSION

VISION

The vision of Mariani College is to establish itself as a comprehensive institution of excellence in offering arts, commerce and science education to the society by responding to the changing realities of today's globalized world. The vision is also to facilitate the creation of policies and programmes for developing professional approaches and to serve as a valuable resource for the industry and society as a whole.

MISSION

- To provide quality education of national standard in all the three disciplines.
- To create a vibrant environment that supports the teaching and learning system.
- Providing excellence in professional education programmes that would complement the General Degree Courses for the benefit of the students as well as the society.
- To create a congenial atmosphere for promoting research & development activities.
- To facilitate the development of a competitive mindset among students along with ethics & value sense.
- To undertake collaborative projects offering opportunities for long term interaction with academia and industry.
- To develop future entrepreneurs.
- To develop capacity building measures of the students as well as social groups.
- To promote sports, cultural and extracurricular activities for the all-around development of the students.
- To develop ecological and social awareness among stakeholders.

Aims and Objectives

- To impart higher education to the eligible youths in the discipline of arts, commerce, science and allied subjects including professional courses.
- To impart vocational training for livelihood through self-entrepreneurship.
- To build scientific temperament and humanistic values among students.
- To promote national integration and to make aware of the cultural heritage of the region.
- To impart training in Games and Sports, Music, Art & Culture

2. The objective of the Green Audit

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Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of an organization. The main objective of this green audit is to assess and understand the strategies taken by Mariani College to control and maintain its environmental quality.

These objectives are as follows:

1. Identification and documentation of green practice followed by the college.
2. Monitoring of renewable sources of energy use by the college.
3. To assess the water quality management system of the college.
4. To assess the waste management system of the college.
5. Financial savings through proper use of resources.
6. Developing an environmental ethic and value systems in young people
7. To ensure the safety of all of its stakeholders.

2.1 Environmental policy of the college

Mariani College is situated in the historic Jorhat district of Assam is a pioneer institute of higher education of the locality. And as an environment-conscious college, every stakeholder of the college performs green practice.

Environmental policy of the college as follows:

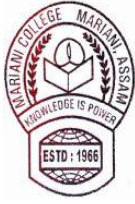
1. To create awareness among students and local community regarding the importance of a green, clean and sustainable environment.
2. To plant and look after more and more trees.
3. To make pollution and plastic-free campus.
4. To utilize rainwater with the help of a rainwater harvesting system.
5. To minimize the use of paper by using digital platforms.

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3. Awareness Programme and Tree Plantation Programme

The college has been regularly conducting programmes like tree plantation and cleanliness drives with the volunteer support of teachers, staff, students, NCC and NSS units for maintaining and protecting their environment.



Figure 3. (a)

World environment day programme amongst school students



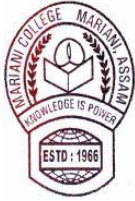
Figure 3. (b)

CM tree plantation programme

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Figure 3. (c)
Plantation in Botanical garden by Principal (i/c) Dr. M. Borthakur



Figure 3. (d)
Inauguration of Botanical garden by Principal (i/c) Dr. M. Borthakur



Figure 3. (e)
CM plantation programme



Figure 3. (f)
CM plantation programme

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Figure 3. (g)
CM plantation programme



Figure 3. (h)
CM plantation programme by Commerce Department



Figure 3. (i)
Plantation by RPF with school students old campus



Figure 3. (j)
Plantation in Botanical Garden by Principal Dr. H. Goowalla

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4. Land Use

The Mariani College is situated in Mariani town. The college has two campuses- (1) arts & administrative campus is located in new campus near Mariani railway junction and (2) commerce & science departments are located in old campus. Both the campuses are situated along the historic Dhodar Aliin Jorhat district of Assam.

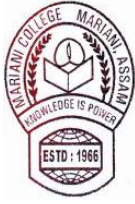


Figure 4. (a)
Aerial view of Mariani College Old Campus

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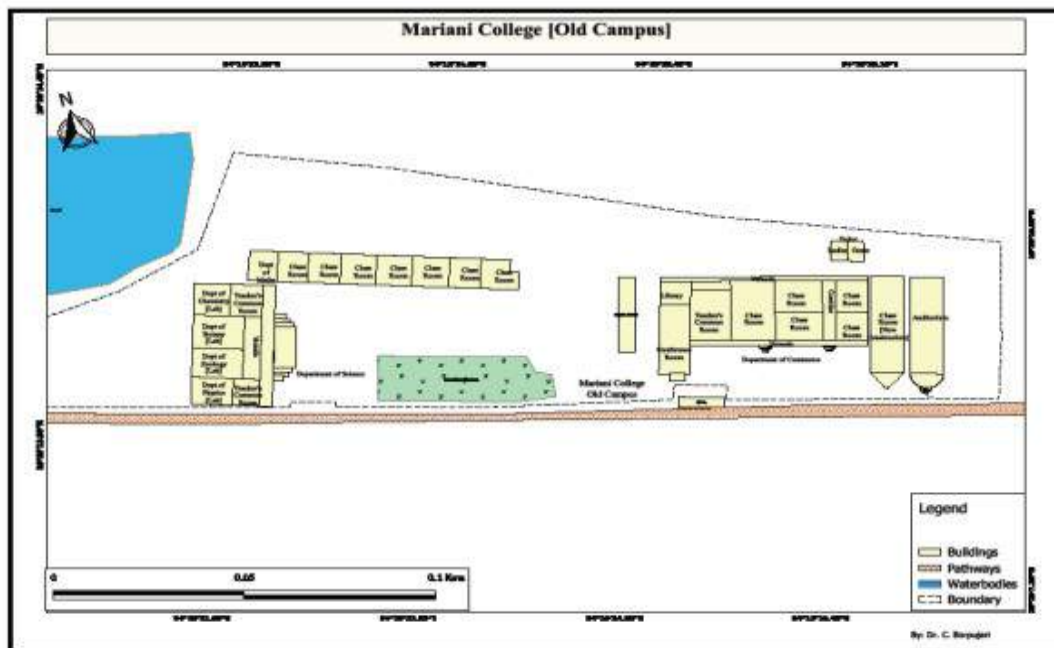
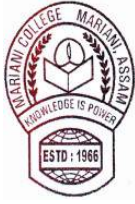


Figure 4. (b)
Master plan of Mariani College Old Campus

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Figure 4. (c)
Layout of New Campus

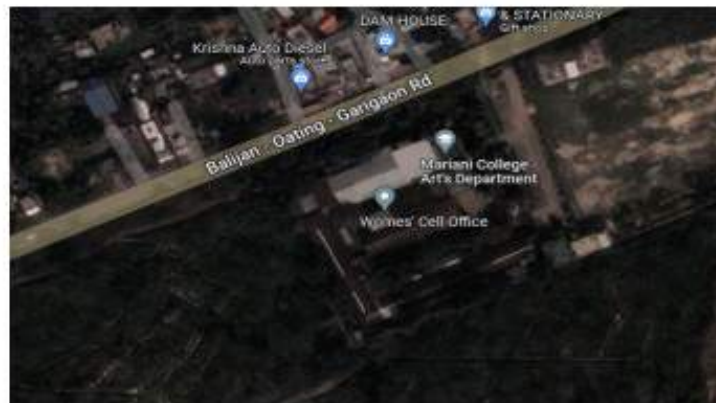
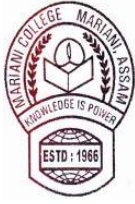


Figure 4. (d)
Aerial view of Mariani College New Campus

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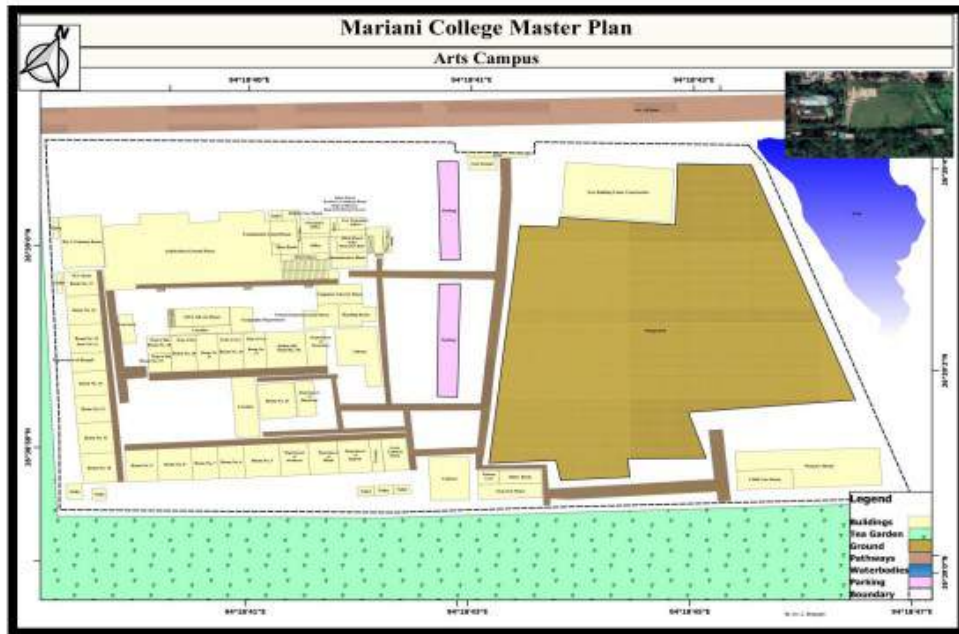


Figure 4. (e)
Master plan of Mariani College New Campus

NAAC

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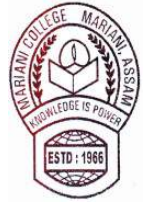


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4.1 Sustainable Land Use Activities:

4.1.1 Plantation Drive- To increase the number of trees within and outside of the college campuses, plantation drives are being held from time to time. Particularly on the occasion National Science Day (28th February), World Environment Day (5th June), Teachers Day (5th September), NCC Day etc.

4.1.2 Vermicompost Pit-To avoid and to minimize chemical-based fertilizer and to promote sustainable agriculture practice among students & local community, the Zoology department is running two vermicompost pits in the science campus. Mariani College fulfills its organic manure needs from these two pits.



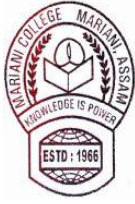
Figure 4. (f)
Inauguration of Vermicompost project

4.1.3 Botanical cum Herbal Garden- To make students and community people aware of plant biodiversity, ecological & medicinal importance of plants and to conserve rare plants, a botanical garden is being established by college authority and maintained by the Botany department from 2022.


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Figure 4. (g)
Botanical cum Herbal Garden



Figure 4. (h)
Plantation Drive by students



Figure 4 (i)
Tea plantation plot in Botanical garden

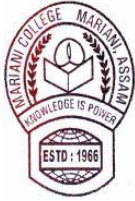


Figure 4 (j)
Plantation on World environment day By Dr. D. Kalita, Scientist (CSIR-NEIST)

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5. Bio-diversity in College Campus

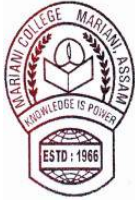
5.1 Plant-diversity (old campus) :

Sl. No.	Common Name	Scientific Name	Family
1	Curry Leaf Tree	<i>Murraya koenigii</i> (L.) Sprengel	Rutaceae
2	Banyan Tree	<i>Ficus benghalensis</i> L.	Moraceae
3	Dodder	<i>Cuscuta europaea</i> L.	Cuscutaceae
4	Kachlora	<i>Archidendron bigeminum</i> L.	Fabaceae
5	Fairy Castus	<i>Chamaecrista coccifera</i>	Costraceae
6	Taro	<i>Colocasia esculenta</i> (L.) Schaff	Araceae
7	Lemon	<i>Citrus limon</i> (L.) DCBrock	Rutaceae
8	Betel-nut Palm	<i>Anaca castrchu</i> L.	Araceae
9	Sickle Senna	<i>Cassia tora</i> L.	Fabaceae
10	Butterfly Pea	<i>Citonia ternstroia</i> L.	Fabaceae
11	Cadamb Tree	<i>Anthocephalus cadamba</i> (Roxb.) Miq.	Rubiaceae
12	Coarse Grass	<i>Echinochloa indica</i> L.	Poaceae
13	Common Mint	<i>Mentha arvensis</i> (L.)	Lamiaceae
14	Ashoka	<i>Polyalthia longifolia</i> Sonn.	Annonaceae
15	Jackfruit	<i>Artocarpus heterophyllus</i> Lam.	Moraceae
16	Mango	<i>Mangifera indica</i> L.	Anacardiaceae
17	Indian Jujube	<i>Zizyphus mauritiana</i> Lam.	Rhamnaceae
18	Cluster Fig	<i>Ficus racemosa</i> L.	Moraceae
19	Jama Plum	<i>Syzygium cumini</i> L.	Myrtaceae
20	Tanjong Tree	<i>Mimosa pigra</i> L.	Sapotaceae
21	Ceylon Olive	<i>Elaeocarpus serratus</i> L.	Elaeocarpaceae
22	Royal Poinciana	<i>Dalmanis regia</i> Raf.	Fabaceae
23	Yellow Flame	<i>Petalophorum pterocarpum</i> (DC.) K. Hayne	Fabaceae
24	Indian Trumpet	<i>Cratogeomys indicum</i> (L.) Benth. et Hook.	Bignoniaceae
25	Drumstick Tree	<i>Moringa oleifera</i> Lam.	Moringaceae
26	Litchi Tree	<i>Litchi chinensis</i> (Sonn.)	Sapindaceae
27	Agar Wood	<i>Aquilaria malaccensis</i> Lam.	Thymelaeaceae
28	Golden Shower Tree	<i>Cassia faluta</i>	Fabaceae
29	Karunda	<i>Cassia sophora</i>	Fabaceae
30	Aloe Vera	<i>Aloe vera</i> (L.) Burm. F.	Aphrodelaceae
31	Indian Pennywort	<i>Cerastium asiaticum</i> (L.) Urban	Aplacaeae
32		<i>Clerodendron odoratum</i> Roxb.	
33	Red Sage	<i>Lactaria camara</i>	Verbenaceae
34	Sadabahar	<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae
35	Life Plant	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crasulaceae
36	Queen's Flower	<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae
37	Datura	<i>Datura stramonium</i> L.	Solanaceae
38	Brihati	<i>Solanum indicum</i> L.	Solanaceae
39	Black Nightshade	<i>Solanum nigrum</i> L.	Solanaceae
40	Hibiscus	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae
41	Giant Dodder	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae
42	Diloy	<i>Paspalum cordifolium</i> (Thunb.) Miq.	Maripogonaceae
43	Nut Grass	<i>Cyperus rotundus</i> L.	Cyperaceae


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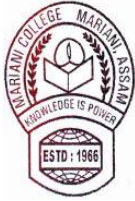


SL. No.	Common Name	Scientific Name	Family
44	Spiny Amaranth	<i>Amaranthus spinosus</i> L.	Amaranthaceae
45	Turmeric	<i>Curcuma longa</i> L.	Zingiberaceae
46	Indian Oleander	<i>Nerium oleander</i> L.	Apocynaceae
47	Four O' Clock	<i>Mirabilis jalapa</i> L.	Nyctaginaceae
48	White Weed	<i>Ageratum conyzoides</i> L.	Asteraceae
49	False Shamrock	<i>Oxalis corymbosa</i> L.	Oxalidaceae
50	Spadeleaf	<i>Centella asiatica</i> (L.) Urban	Apiaceae
51	Pea Eggplant	<i>Solanum torvum</i> Ws.	Solanaceae
52	Asthma Weed	<i>Euphorbia hirta</i> L.	Euphorbiaceae
53	Tulsi	<i>Ocimum sanctum</i> L.	Lamiaceae
54	Minute Weed	<i>Mikania micrantha</i> Kunth	Asteraceae
55	Thumbai	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae
56	Water Willow	<i>Justicia simplex</i> D. Don	Acanthaceae
57	Durva Grass	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae
58	Rough Cocklebur	<i>Xanthium strumarium</i> L.	Asteraceae
59	Carpet Weed	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae
60	Tropical Chickweed	<i>Drymaria cordata</i> (L.) Willd	Caryophyllaceae
61	Vegetable Fern	<i>Diplazium esculentum</i> (Retz.) Sw.	Athyriaceae
62	Water Pepper	<i>Persicaria hydropiper</i> (L.)	Polygonaceae
63	Love Grass	<i>Chrysopogon aciculatus</i> (Retz.) Trim.	Poaceae
64	Brush Orchid	<i>Aerides odorata</i> L.	Orchidaceae
65	Rosy Fox Brush Orchid	<i>Aerides rosea</i> L.	Orchidaceae
66	Bamboo Orchid	<i>Arundina graminifolia</i> L.	Orchidaceae
67	Acampe Orchid	<i>Acampe papillosa</i> L.	Orchidaceae
68	Rothschild's Bulbophyllum	<i>Bulbophyllum rothschildianum</i> L.	Orchidaceae
69	Hooded Orchid	<i>Dendrobium aphyllum</i> L.	Orchidaceae
70	Musky-Smelling Dendrobium	<i>Dendrobium moschatum</i> L.	Orchidaceae
71	Fried Egg Orchid	<i>Dendrobium chryotoxum</i> L.	Orchidaceae
72	Jenkin's Dendrobium	<i>Dendrobium jenkinsii</i> L.	Orchidaceae
73	Fringe-Lipped Dendrobium	<i>Dendrobium fimbriatum</i> L.	Orchidaceae
74	Golden Yellow Flowered Dendrobium	<i>Dendrobium chrysanthum</i> L.	Orchidaceae
75	Primerose Yellow Dendrobium	<i>Dendrobium primulinum</i> L.	Orchidaceae
76	Foxtail Orchid	<i>Rhynchostylis retusa</i> L.	Orchidaceae
77	Grey Orchid	<i>Vanda tessellate</i> L.	Orchidaceae
78	Aloe-Leafed Cymbidium	<i>Cymbidium aloifolium</i> L.	Orchidaceae
79	Greater Swamp Orchid	<i>Phaius tankervilleae</i> L.	Orchidaceae
80	Christmas Orchid	<i>Calanthe musuka</i> L.	Orchidaceae
81	Cylindrical Vanda	<i>Papilionanthe teres</i> L.	Orchidaceae
82	Fading Dendrobium	<i>Flickingeria fugax</i> L.	Orchidaceae


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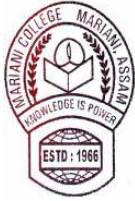
5.2 Plant-diversity in Botanical Garden(oid campus) :

Sl. No.	Scientific Name	Common Name	Family
1	<i>Ocimum tenuiflorum</i>	Holy Basil	Lamiaceae
2	<i>Mirabilis jalapa</i>	Four o' Clocks	Nyctaginaceae
3	<i>Colpus scutellarioides</i>	Painted Nettle	Lamiaceae
4	<i>Tradescantia spathacea</i>	Boat Lily	Commelinaceae
5	<i>Tradescantia zebrina</i>	Zebra Plant	Commelinaceae
6	<i>Laurus nobilis</i>	Bay Laurel	Lauraceae
7	<i>Pilea depressa</i>	Pistol Plant	Urticaceae
8	<i>Datura stramonium</i>	Jimsonweed	Solanaceae
9	<i>Chamaecyparis lawsoniana</i>	Lawson Cypress	Cupressaceae
10	<i>Kalanchoe pinnata</i>	Life Plant	Crasulaceae
11	<i>Cunninghamia lanceolata</i>	China fir	Cupressaceae
12	<i>Sorbus rotundifolius</i>	Fan Palm	Arecaceae
13	<i>Aloe barbadensis</i>	Aloe Vera	Asphodelaceae
14	<i>Cordyline frutescens</i>	Good Luck Plant	Asparagaceae
15	<i>Arenga engleri</i>	Formosa Palm	Arecaceae
16	<i>Hibiscus rosa-sinensis</i>	Hibiscus	Malvaceae
17	<i>Carchorus alchorus</i>	Indian Jute	Malvaceae
18	<i>Ocimum gratissimum</i>	African Basil	Lamiaceae
19	<i>Cinnamomum verum</i>	Cinnamon	Lauraceae
20	<i>Litchi chinensis</i>	Lychie	Sapindaceae
21	<i>Nerium oleander</i>	Nerium	Apocynaceae
22	<i>Mesembryanthemum tortuosum</i>	Kanna	Aizoaceae
23	<i>Jasminum multiflorum</i>	Star Jasmine	Oleaceae
24	<i>Citrus limon</i>	Lemon	Rutaceae
25	<i>Azadirachta indica</i>	Neem	Meliaceae
26	<i>Phyllanthus emblica</i>	Indian gooseberry	Phyllanthaceae
27	<i>Amaranthus spinosus</i>	Spiry Amaranth	Amaranthaceae
28	<i>Chamaecrista cuspidatus</i>	Spiral Flag	Cistaceae
29	<i>Manihara zapoda</i>	Sapodilla	Sapotaceae
30	<i>Colocasia esculenta</i>	Taro	Araceae
31	<i>Musa velutina</i>	Velvet Pink Banana	Musaceae
32	<i>Murraya koenigii</i>	Curry Leaf Tree	Rutaceae
33	<i>Urtica dioica</i>	Stinging Nettle	Urticaceae
34	<i>Carica papaya</i>	Papaya	Caricaceae
35	<i>Citrus aurantifolia</i>	Key Lime	Rutaceae
36	<i>Citrus limetta</i>	Mouambi	Rutaceae
37	<i>Capsicum chinense</i>	Habanero Pepper	Solanaceae
38	<i>Pandanus tectorius</i>	Screw Pine	Pandanaceae
39	<i>Citrus jambhiri</i>	Rough Lemon	Rutaceae
40	<i>Cynodon dactylon</i>	Bermuda Grass	Poaceae
41	<i>Syzygium cumini</i>	Java Plum	Myrtaceae
42	<i>Piper nigrum</i>	Black Pepper	Piperaceae
43	<i>Psidium guajava</i>	Guava	Myrtaceae


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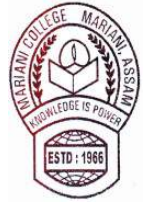


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Sl. No.	Scientific Name	Common Name	Family
44	<i>Punica granatum</i>	Pomegranate	Lythraceae
45	<i>Phyllanthus acidus</i>	Malay Gooseberry	Phyllanthaceae
46	<i>Prunus persica</i>	Peach	Rosaceae
47	<i>Camellia sinensis</i>	Tea Plant	Theaceae
48	<i>Dioscorea compositifolia</i>	Creeping Woodsonnel	Dioscoreaceae
49	<i>Cucumis grandis</i>	Ivy Gourd	Cucurbitaceae
50	<i>Alternanthera versicolor</i>	Carpet Weed	Amaranthaceae
51	<i>Cassia sara</i>	Sicklepod	Fabaceae
52	<i>Mentha spicata</i>	Spearmint	Lamiaceae
53	<i>Lobelia chinensis</i>	Creeping Lobelia	Camparullaceae
54	<i>Ricinus communis</i>	Caster Plant	Euphorbiaceae
55	<i>Sambucus nigra</i>	European Elder	Adocaceae
56	<i>Terminalia catappa</i>	Sea Almond	Combretaceae
57	<i>Gossypium hirsutum</i>	Cotton	Malvaceae
58	<i>Citrus limonia</i>	Butterfly Pea	Fabaceae
59	<i>Capsella bursa-pastoris</i>	Shepherd's Purse	Brassicaceae
60	<i>Fabiana imbricaria divaricata</i>	Pinwheel Flower	Apocynaceae
61	<i>Dioscorea trifoliata</i>	Snake Plant	Asparagaceae
62	<i>Drosera fragrans</i>	Corn Palm	Asparagaceae

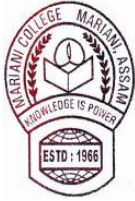
5.3 Plant-diversity (New campus) :

Sl. No.	Common Name	Scientific Name	Family
1	Indian Sris	<i>Albizia lebbek</i>	Fabaceae
2	Mahogany	<i>Swietenia mahagoni</i>	Meliaceae
3	Royal Poinciana	<i>Delonix regia (Boj. Ex Hook) Raf.</i>	Fabaceae
4	Guava	<i>Psidium guajava L.</i>	Myrtaceae
5	White Willow	<i>Salix alba L.</i>	Salicaceae
6	Common Plum	<i>Prunus domestica L.</i>	Rosaceae
7	Papaya	<i>Carica papaya L.</i>	Caricaceae
8	Misamata Stringybark	<i>Eucalyptus obliqua L'Her.</i>	Myrtaceae
9	Banyan	<i>Ficus benghalensis L.</i>	Moraceae
10	Traveler's Tree	<i>Marattia madagascariensis Sam.</i>	Storiliaceae
11	White Teak	<i>Gmelina arborea Roxb.</i>	Lamiaceae
12	Teak Tree	<i>Tectona grandis L. f.</i>	Lamiaceae
13	Indian Palai	<i>Alcatonia scholaria (L.) R. Br.</i>	Apocynaceae
14	Arjun Tree	<i>Terminalia arjuna (Hook.) Wight & Arn.</i>	Combretaceae
15	Chinaberry Tree	<i>Melia azadirachta L.</i>	Meliaceae
16	Mango Tree	<i>Mangifera indica L.</i>	Anacardiaceae
17	Jasmine	<i>Jasminum officinale</i>	Oleaceae
18	Giant Crepe Myrtle	<i>Lagerstroemia speciosa (L.) Pers.</i>	Lythraceae
19	Sago Palm	<i>Cycas revoluta Thunb.</i>	Cycadaceae
20	Tropical Dogwood	<i>Mussaenda erythrophylla Schumacher & Thonn.</i>	Rubiaceae


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Sl. No.	Common Name	Scientific Name	Family
21	Bamboo Palm	<i>Dypsis lutescens</i> (H. Wood.) Beentje & J. Dransf.	Arecaceae
22	African Marigold	<i>Tigridis erecta</i> L.	Asteraceae
23	Jackfruit Tree	<i>Artocarpus heterophylla</i> Lam.	Moraceae
24	Agarwood	<i>Aquilaria malaccensis</i> Lam.	Thymelaeaceae
25	Brush Orchid	<i>Aerides odorata</i>	Orchidaceae
26	Boyy Fox Brush Orchid	<i>Aerides rosea</i>	Orchidaceae
27	Bamboo Orchid	<i>Arundina graminifolia</i>	Orchidaceae
28	Acampe Orchid	<i>Acampe papillosa</i>	Orchidaceae
29	Rothschild's Bulbophyllum	<i>Bulbophyllum rothschildianum</i>	Orchidaceae
30	Hooded Orchid	<i>Dendrobium ophyllum</i>	Orchidaceae
31	Musky-Smelling Dendrobium	<i>Dendrobium maculatum</i>	Orchidaceae
32	Fried Egg Orchid	<i>Dendrobium chrysoxanthum</i>	Orchidaceae
33	Jenkin's Dendrobium	<i>Dendrobium jenkinsii</i>	Orchidaceae
34	Fringe-Lipped Dendrobium	<i>Dendrobium fimbriatum</i>	Orchidaceae
35	Golden Yellow Flowered Dendrobium	<i>Dendrobium chrysanthum</i>	Orchidaceae
36	Primrose Yellow Dendrobium	<i>Dendrobium primulinum</i>	Orchidaceae
37	Fossil Orchid	<i>Rhynchostylis retusa</i>	Orchidaceae
38	Grey Orchid	<i>Vanda tereslate</i>	Orchidaceae
39	Aloe-Leaved Cymbidium	<i>Cymbidium aloefolium</i>	Orchidaceae
40	Greater Swamp Orchid	<i>Phaius tankervilleae</i>	Orchidaceae
41	Christmas Orchid	<i>Colothea musaka</i>	Orchidaceae
42	Cylindrical Vanda	<i>Papilionanthe lutea</i>	Orchidaceae
43	Fading Dendrobium	<i>Fickingeria fugax</i>	Orchidaceae

5.4. Animal-diversity

Animal-diversity in both the campus are similar.

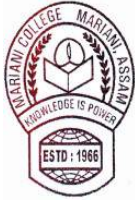
Mammals

Sl. No.	Common Name	Scientific name
1	Flying fox	<i>Pteropus</i> sp.
2	Bat	<i>Microchiroptera</i> sp.
3	Squirrel	<i>Funambulus</i> sp.
4	Bat	<i>Rattus rattus</i>
5	Bat	<i>Eptesicus athenae</i>
6	Asian macaque	<i>Macaca mulatta</i>
7	Bat	<i>Myotis</i> sp.
8	Cow	<i>Bos taurus</i>
9	Domestic goat	<i>Capra hircus</i>


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Amphibians

Sl. No.	Common Name	Scientific name
10	Toad	<i>Bufo melanostictus</i>
11	Frog	<i>Rana tigrina</i>
12	Hyla	<i>Hyla</i>

Reptiles

Sl. No.	Common Name	Scientific name
14	House lizard	<i>Hemidactylus flaviviridis</i>
15	Calotes	<i>Calotes versicolor</i>
16	Common Indian Monitor	<i>Varanus monitor</i>
17	Python	<i>Python reticulatus</i>
18	Checkered keelback	<i>Xenochrophis piscator</i>
19	Banded krait	<i>Bungarus fasciatus</i>
20	Monocled cobra	<i>Naja kaouthia</i>
21	Brahminy blind snake	<i>Ramphotyphlops braminus</i>
22	Bronzeback tree snake	<i>Dendrelaphis dendrelaphis</i>
23	Oriental rat snake	<i>Ptyas mucosa</i>
24	King cobra	<i>Ophiophagus hannah</i>
25	Black krait	<i>Bungarus niger</i>
26	Red necked keelback	<i>Rhabdophis subminiatus</i>
27	Common krait	<i>Bungarus caeruleus</i>

Birds

Sl. No.	Common Name	Scientific name
28	Little cormorant	<i>Phalacrocorax niger</i>
29	Great egret	<i>Egretta alba</i>
30	Eastern cattle egret	<i>Bubulcus coromandus</i>
31	Indian pond heron	<i>Ardeola grayii</i>
32	Asian open bill	<i>Anastomus oscitans</i>
33	Greater Adjutant	<i>Leptoptilos dubius</i>
34	Lesser Adjutant	<i>Leptoptilos javanicus</i>
35	Black kite	<i>Milvus migrans</i>
36	Red jungle fowl	<i>Gallus gallus</i>
37	White breasted water hen	<i>Amurornis phoenicurus</i>


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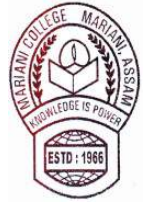


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Invertebrates

Sl. No.	Common Name	Scientific name
38	Earth worm	<i>Pheretima posthuma</i>
39	Lecch	<i>Hirsutiaria granulosa</i>
40	Seven spotted ladybird	<i>Coccinella septempunctata</i>
41	Narcis	<i>Nereis virens</i>

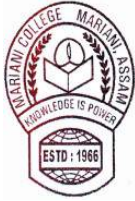
Insects

Sl. No.	Common Name	Scientific name
42	May fly	<i>Ephemeroptera</i>
43	Dragon flies	<i>Anisoptera</i>
44	Grass hopper	<i>Coleoptera</i>
45	Gryllus	<i>Gryllus bimaculatus</i>
46	Gryllotalpa	<i>Gryllotalpa agryrotoides</i>
47	Mantis	<i>Mantodea</i>
48	Phyllium	<i>Phyllium scybalium</i>
49	Belostomat	<i>Belostomatidulum</i>
50	Pieris	<i>Pieris brassicae</i>
51	Moth	<i>Lepidoptera</i>
52	Apis (honey bee)	<i>Apis florea</i>
53	Termites	<i>Isopoda</i>
54	Spider	<i>Argiope catenulata</i> <i>Latrodectus hesperus</i>
55	Mosquito	<i>Culex pipiens</i>


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6. Renewable Energy & Energy Conservation

The college is committed to the use renewable energy and hence both the campuses are installed with solar-powered street lights with the assistance from Government Bodies.



Figure 6. (a)
Solar powered Street Light (Old Campus)



Figure 6. (b)
Solar powered Street Light (New Campus)

Energy Conservation and Awareness Drive by Student Union

To create awareness of energy conservation among students, the student union of Mariani College issued circulars to students for taking necessary measures from time to time. They are asked to power-off lights and fans while not required. (Appendices- I & II)

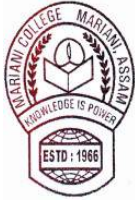
Use of LED in the College

In order to minimize the unit of electricity consumption in college campus, LED bulbs and LED tube lights are being used and also energy efficient electronic equipment are used.

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7. Water Management

To meet the basic requirement of water supply in College campus is mainly dependent on

1. Deep tube well (Submersible Pump)
2. Rainwater Harvesting System

To fulfil the need for drinking water the college is well equipped with electric water purifiers, RO filters and a dedicated drinking water facility. Drinking water of both the campuses are analyzed regularly in Government Laboratory of Public Health Engineering Department, Jorhat Division, Govt. of Assam.

Old Campus – the water analysis report are available in Appendices III & IV .

New Campus – the water analysis report are available in Appendices V & VI .



Figure 7. (a) Sand water filter system



Figure 7. (b) R. O. water filter system

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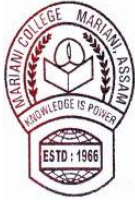
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Rain Water Harvesting (RWH) System

College is equipped with a giant 3000 litre capacity reservoir to collect rain water collected from its roof tops in the new campus. As a monsoon region it is very much capable to collect water during summer season.


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8. Human Health and Safety Management

8.1 Health Check-Up & Blood Donation Camp

The Womens' cell Mariani College in collaboration with Satyam Hospital & Research Centre, Jorhat conducted a Health Check-Up & Blood Donation Camp on 23rd May, 2022.

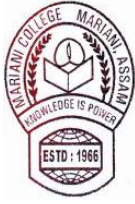


Figure 8. (a) Health Check-Up & Blood donation camp



Figure 8. (b)





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Figure 8. (c)



Figure 8. (d)

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Figure 8. (e)



Figure 8. (f)

8.2 Smoking and tobacco-free campus

The use of tobacco and tobacco products are strictly prohibited and inside the college campus, any act of consuming and using this product is considered as a punishable offence. The instruction has been mentioned in the code of conduct of the college. Regarding this, the Government Authority has issued smoking and tobacco-free campus which is available in Appendix VII

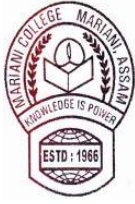


Figure 8. (g) Smoking & tobacco free board

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9. Paperless

9.1 Library Automation

The library of Mariani College is partially automated. The following activities are currently available.

1. Cataloguing
2. Barcoding (Books)

Due to the shifting of library activities from traditional method to automation. The library activities are partially shifted to digital mode so that there is very less use of paper in various library activities which directly or indirectly protect our nature.

9.2 Office Automation

Especially due to the partial shifting of the Admission system from offline to online mode saves a huge amount of paper being wasted.

For example:

1. Printing of Prospectus
2. Printing of Admission Form.

As all the mentioned activities are performed online there is no need to print a hard copy for the same which saves a huge amount of paper (Appendix – VIII)


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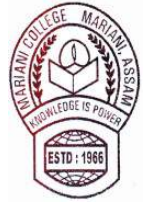


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10. Waste Disposal

10.1 Laboratory Waste Disposal

Solid wastes which are not biodegradable viz., plastic material, glassware etc are sent for recycling. Biodegradable wastes are dumped in to pits and when dicomposed are applied to plants in college campus. Organic wastes are applied into the vermicomposting pits. Liquid wastes are disposed in to pits dug out on reserved and protected area and covered by soil.



Figure 10. (a)
Plastic & Glassware waste are sent for recycling (a regular practice for clean & green environemt)

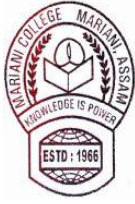


Figure 10. (b)
Plastic & Glassware waste are sent for recycling (a regular practice for clean & green environemt)

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Figure 10. (c)
Liquid chemical waste disposal

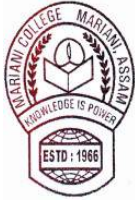


Figure 10. (c)
Liquid chemical waste disposal


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Appendices

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NAAC


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Appendices – I & II



30 | Green & Environmental Audit Report

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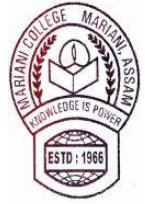


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Appendices-III & IV

Old Campus

DISTRICT LEVEL LABORATORY :: JORHAT PHE DISTRICT
JORHAT :: ASSAM

By: _____

Block Number/Room No.	Bharatnagar, Mariani, Dist. Jorhat (Old Campus)		
Name of College	Mariani College		
Date of Collection	23.10.2019	Time of Sample	11:30 AM
Date of Sample	23.10.2019	Time of Sample	11:30 AM
Date of Report Issued	23.10.2019		
Date of Report Received	23.10.2019		

Sl. No.	PARAMETER NAME	Acceptable Limit	Observed Limit		TEST RESULTS
			Observed Limit	Comparison of observed limit	
1	pH	6-9	7.5	6-9	pass
2	DO	5-15	10	5-15	pass
3	Hardness	500	150	500	pass
4	Total Hardness (CaCO ₃)	500	150	500	pass
5	Calcium (Ca)	100	30	100	pass
6	Total Magnesium (Mg)	100	30	100	pass
7	Chloride (Cl)	250	100	250	pass
8	Sulfate (SO ₄)	400	150	400	pass
9	Total Phosphate (P)	0.1	0.05	0.1	pass
10	Fluoride (F)	1	0.5	1	pass
11	Residual Chlorine	0.2	0.2	0.2	pass

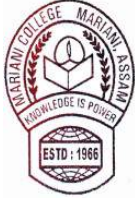
REMARKS: The water quality is good and suitable for drinking purposes. The water is free from any harmful substances. The water is safe for drinking.

Signature: _____
Designation: _____
Department: _____

B. B. B.
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Mariani College, Mariani



A. A. A.
Principal
Mariani College, Mariani

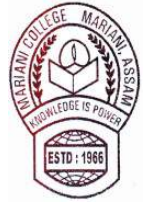


MARIANI COLLEGE

SELF STUDY REPORT

FOR 3RD CYCLE OF NAAC ACCREDITATION

2018 - 2023



Appendices-V & VI

New Campus

DISTRICT LEVEL LABORATORY - JAMBAT PHE BOSSONG
JAMBAT : ASSAM

Name of Sample Report ID		Water Sample Report ID	
Name of Institute	Year of Sample	Name of Institute	Year of Sample
Name of Analyst	Year of Sample	Name of Analyst	Year of Sample
Name of Institution	Year of Sample	Name of Institution	Year of Sample

Sl. No.	PARAMETER NAME	ACTUAL VALUE (ppm)		SIP RESULTS
		Acceptable Limit	Observed Value	
1	Temperature	1	1	pass
2	pH	5.5	6.5	pass
3	Dissolved Oxygen	10.00	10.00	pass
4	Total Hardness	15	15	pass
5	Total Hardness (CaCO ₃)	20	20	pass
6	Total Solids	10	10	pass
7	Total Solids (TSS)	10	10	pass
8	Total Solids (TDS)	10	10	pass
9	Total Solids (TS)	10	10	pass
10	Total Solids (TS)	10	10	pass
11	Total Solids (TS)	10	10	pass
12	Total Solids (TS)	10	10	pass
13	Total Solids (TS)	10	10	pass
14	Total Solids (TS)	10	10	pass
15	Total Solids (TS)	10	10	pass
16	Total Solids (TS)	10	10	pass
17	Total Solids (TS)	10	10	pass
18	Total Solids (TS)	10	10	pass
19	Total Solids (TS)	10	10	pass
20	Total Solids (TS)	10	10	pass

SIP - Satisfactory		SIP - Not Satisfactory	
1. Temperature	10.00	10.00	10.00
2. pH	6.5	6.5	6.5
3. Dissolved Oxygen	10.00	10.00	10.00
4. Total Hardness	15	15	15
5. Total Hardness (CaCO ₃)	20	20	20
6. Total Solids	10	10	10
7. Total Solids (TSS)	10	10	10
8. Total Solids (TDS)	10	10	10
9. Total Solids (TS)	10	10	10
10. Total Solids (TS)	10	10	10
11. Total Solids (TS)	10	10	10
12. Total Solids (TS)	10	10	10
13. Total Solids (TS)	10	10	10
14. Total Solids (TS)	10	10	10
15. Total Solids (TS)	10	10	10
16. Total Solids (TS)	10	10	10
17. Total Solids (TS)	10	10	10
18. Total Solids (TS)	10	10	10
19. Total Solids (TS)	10	10	10
20. Total Solids (TS)	10	10	10

REMARKS: The results are within the limits of the prescribed standards for drinking water as per BIS. The Drinking Water is fit for consumption.

Signature: [Signature] Date: [Date]

DISTRICT LEVEL LABORATORY - JAMBAT PHE BOSSONG
JAMBAT : ASSAM

Name of Sample Report ID		Water Sample Report ID	
Name of Institute	Year of Sample	Name of Institute	Year of Sample
Name of Analyst	Year of Sample	Name of Analyst	Year of Sample
Name of Institution	Year of Sample	Name of Institution	Year of Sample

Sl. No.	PARAMETER NAME	ACTUAL VALUE (ppm)		SIP RESULTS
		Acceptable Limit	Observed Value	
1	Temperature	1	1	pass
2	pH	5.5	6.5	pass
3	Dissolved Oxygen	10.00	10.00	pass
4	Total Hardness	15	15	pass
5	Total Hardness (CaCO ₃)	20	20	pass
6	Total Solids	10	10	pass
7	Total Solids (TSS)	10	10	pass
8	Total Solids (TDS)	10	10	pass
9	Total Solids (TS)	10	10	pass
10	Total Solids (TS)	10	10	pass
11	Total Solids (TS)	10	10	pass
12	Total Solids (TS)	10	10	pass
13	Total Solids (TS)	10	10	pass
14	Total Solids (TS)	10	10	pass
15	Total Solids (TS)	10	10	pass
16	Total Solids (TS)	10	10	pass
17	Total Solids (TS)	10	10	pass
18	Total Solids (TS)	10	10	pass
19	Total Solids (TS)	10	10	pass
20	Total Solids (TS)	10	10	pass

SIP - Satisfactory		SIP - Not Satisfactory	
1. Temperature	10.00	10.00	10.00
2. pH	6.5	6.5	6.5
3. Dissolved Oxygen	10.00	10.00	10.00
4. Total Hardness	15	15	15
5. Total Hardness (CaCO ₃)	20	20	20
6. Total Solids	10	10	10
7. Total Solids (TSS)	10	10	10
8. Total Solids (TDS)	10	10	10
9. Total Solids (TS)	10	10	10
10. Total Solids (TS)	10	10	10
11. Total Solids (TS)	10	10	10
12. Total Solids (TS)	10	10	10
13. Total Solids (TS)	10	10	10
14. Total Solids (TS)	10	10	10
15. Total Solids (TS)	10	10	10
16. Total Solids (TS)	10	10	10
17. Total Solids (TS)	10	10	10
18. Total Solids (TS)	10	10	10
19. Total Solids (TS)	10	10	10
20. Total Solids (TS)	10	10	10

REMARKS: The results are within the limits of the prescribed standards for drinking water as per BIS. The Drinking Water is fit for consumption.

Signature: [Signature] Date: [Date]

B. B. B.
COORDINATOR, IQAC CELL
Mariani College, Mariani



A. A. A.
Principal
Mariani College, Mariani



MARIANI COLLEGE



SELF STUDY REPORT FOR 3RD CYCLE OF NAAC ACCREDITATION 2018 - 2023

Appendix - VIII

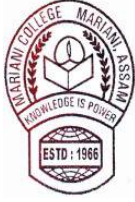


NAAC

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Jyoti
Principal
Mariani College, Mariani



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2018 - 2023



1 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

SEPTEMBER 14, 2022

A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

SUBMITTED TO
THE PRINCIPAL
MARIANI COLLEGE
NAHARBARI GRANT, MARIANI, ASSAM

SUBMITTED BY
ADD SQUARE SOLUTIONS
VILL: DEURIPARA (BEHIND DEEO OFFICE, BONGAIGAON),
P. O+DIST: BONGAIGAON, ASSAM-783380

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2 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

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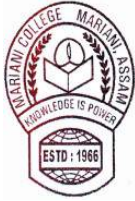
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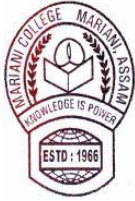
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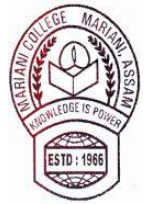


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A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

Acknowledgement:

We are sincerely thankful to the Mariani College management for giving us the opportunity to conduct energy audit.

We are also grateful to Dr. Horen Goowalla, Principal, Mariani College, Assam whose valuable comments / feedback, during various reviews have helped us to bring the report in the present format.

We express our sincere gratitude to all other concerned officials for their support and guidance during the conduct of this exercise.

For Add Square Solutions



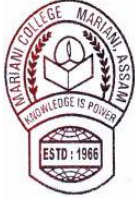
Mr. Deepjyoti Barman, B. E (Mech), M. Tech (Energy Technology)
(Proprietor)

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5 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

STUDY TEAM:

1. Mr. Deepjyoti Barman, B.E (Mechanical), M. Tech (Energy Technology),

ADD SQUARE SOLUTIONS

Vill: Deuripara (Behind DEEO Office, Bongaigaon), P. O+Dist: Bongaigaon, Assam-783380

RESOURCE PERSON AND ENERGY AUDITOR

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B.E.E Certified energy auditor (EA15266)



Mr. Deepjyoti Barman
Proprietor
Add Square Solution

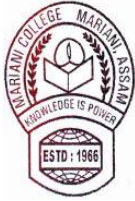
Mr. Samar Jyoti Hazarika
B.E.E Certified energy auditor (EA15266)

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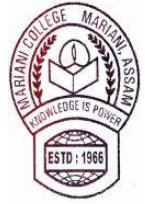


MARIANI COLLEGE

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A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

1. BACKGROUND:

Energy consumption in different forms has been continuously rising almost in all the sectors- agriculture, industry, transport, commercial, residential (domestic) and educational institutions. This has increased the dependency on fossil fuels and electricity. Therefore, energy efficiency improvement and possible energy conservation became a necessary objective for energy consumers. The Government of India enacted the Energy Conservation Act, 2001 in October 2001. The Energy Conservation Act, 2001 became effective from 1st March, 2002. The Act provides for institutionalizing and strengthening delivery mechanism for energy efficiency programs in the country and provides a framework for the much-needed coordination between various Government entities. Mariani College, an educational institute in Jorhat district of Assam taking initiative for reducing energy intensity in both the college campuses (Arts and Science/Commerce campus) and entrusted Add Square Solutions for conducting Energy Audit. To conduct the energy audit, the audit team visited the campus on 3rd and 22nd August 2022 to collect data and to take some measurement for assessment of different energy consuming components.

2. SCOPE OF WORK

2.1 Assessment of actual operating load and scope for optimizing the same

- Review of present electrical load in both the campuses.
- Assessment of Building wise electrical load base on electrical fittings.

2.2 Illumination study and energy conservation option in lighting system

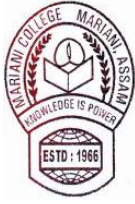
- Review of present lighting system, lighting inventories etc. Estimation of lighting load at various locations like different building floor, corridor, rooms etc. outside light and other important locations as mentioned by the management.
- Detail lux level study at various locations and comparison with acceptable standards.
- Study of present lighting system and recommendation for improvement.
- Exploring Energy Conservation options in lighting system.

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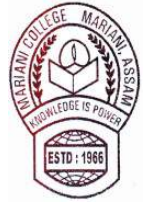


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2. A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

2.3 Energy Conservation in Air-Conditioning and water pumping system

- Observation and energy conservation.
- Exploring Energy Conservation Option (ENCON) in system.

2.4 Diesel Generator (DG) Sets

- Review of DG set operation
- Performance assessment of DG sets in terms of Specific Fuel Consumption (SFC i.e. Lit/kWh).

3. METHODOLOGY ADOPTED FOR BUILDING AUDIT

Step 1 - Interview with Key Facility Personnel

During the preliminary audit, a meeting is scheduled between the audit team and key operating personnel to start the assignment. The meeting agenda focuses on: audit objectives and scope of work, facility rules and regulations, roles and responsibilities of project team members, and description of scheduled project activities. During this meeting the team enlightened about operating characteristics of the facility, energy system specifications, operating and maintenance procedures.

Step 2 - Facility Tour

After the initial meeting, a tour of the facility is arranged to observe the various operations, focusing on the major energy consuming systems identified during the interview, including the building structure, lighting and power, mechanical energy systems.

Step 3 - Document Review

During the initial visit, available facility documentation is reviewed with facility representatives. This documentation review includes all facility operation and maintenance procedures and logs – sheets/ registers for the previous years.

Step 4 - Facility Inspection

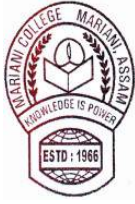
After a thorough review of the construction and operating documentation, the major energy consuming processes in the facility are further investigated. Where appropriate, field measurements are collected to substantiate operating parameters.

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3 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

Step 5 - Utility Analysis

The utility analysis is a detailed review for the previous months. Data reviewed includes energy usage, energy demand and energy consumption pattern.

Step 6 - Identify/Evaluate Feasible ECMs

Based upon a final review of all information and data gathered about the facility, and based on the measurements final energy conservation measures is developed.

Step 7 - Prepare a Report Summarizing Audit Findings

The results of our findings and recommendations are summarized in this report. The report includes a description of the facilities and their operation, a discussion of all major energy consuming systems, a description of all recommended ECMs with their specific energy impact. The report incorporates a summary of all the activities and effort performed throughout the project with specific conclusions and recommendations and ECMs – Energy Conservation Measures

4. BUILDING DESCRIPTION

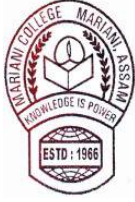
The Mariani College consists of multiple buildings (both RCC multi stored and Assam type building). The following Tables show the basic information about the building and the utilities.

Sl. No	Basic Building Data (Arts Campus)	Value
1	A. Connected Load/Contract Demand (For Academic & Administrative Building) Consumer Number: 177000003464	15 kW/17.65 kVA
	B. Connected Load/Contract Demand (For Hostel Building) Consumer Number: 1770000030235	5 kW/5.8 kVA
2	Installed capacity of DG set	20 kVA (1 No) Make: Mahindra Powerol Model: 3305GM 15 kVA (1 No) Make: Jaksons Limited Model: JSP-15


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4. A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

3	Annual electricity consumption considering both the consumer number (June'2021 to May'2022)	10921.00 kWh
4	Annual cost of electricity consumption @ 6.55/unit	Rs. 1,21,932.00
4.1	Annual cost of electricity consumption through DG set.	Rs. 58,200.00
4.2	Total cost of electricity (Utility + DG set)	Rs.1,80,132.00
5	Total Numbers of building covered	7 Nos
5.1	Working hours (Academic and Administration building)	8 Hrs (9 AM to 5PM)
5.2	Working hours (Hostel building)	24 Hr x7 days
5.3	Working Days/week	6 Days
6	Whether sub-metering of electricity consumption for each building	No

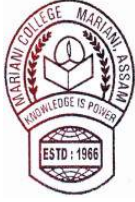
Table 1: Basic Building Description (Arts Campus)

Sl. No	Basic Building Data	Value
(Science/Commerce Campus)		
1	Connected Load/Contract Demand Consumer Number: 17700000414	19 kW/22.35 kVA
2	Installed capacity of DG set	25 kVA (1 No) Make: Jakson Limited Model: JSP-25
3	Annual electricity consumption (June'2021 to May'2022)	3,250.00 kWh
4	Annual cost of electricity consumption @6.55/unit	Rs. 52,376.00
4.1	Annual cost of electricity consumption through DG set.	Rs. 42,000.00
4.2	Total cost of electricity (Utility + DG set)	Rs.94,367.00


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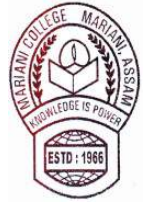


MARIANI COLLEGE

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5 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

5	Total Numbers of building covered	2 Nos
5.1	Working hours (Academic and Administration building)	8 Hrs (9 AM to 5PM)
5.2	Working hours (Hostel building)	24 Hr x7 days
5.3	Working Days/week	6 Days
6	Whether sub-metering of electricity consumption for each building	No

Table 2: Basic Building Description (Science/Commerce Campus)

5. PRESENT ENERGY SCENARIO

5.1 Review of analysis of electricity bill of Mariani College.

At present the overall energy consumption is catered by the electricity supply from Assam Power Distribution Company Limited and own DG sets. Mariani college has 3 electrical connections from APDCL having different connected load/ sanction load as mentioned in the table no. 1 & 2. Total 3 numbers of DG sets are installed to supply power during load shading hours. (2 numbers is in the Arts campus and 1 number in science and commerce campus) individual capacity of the DG sets are mentioned in the table no.1& 2.

5.1.1. Energy Consumption.

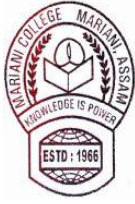
The total electricity consumption from June 2021 to May 2022 was 14,141.00 kWh and the total bill paid to distribution companies was Rs. 17,42,529.45.

Consumer number wise monthly electricity consumption(kWh) and electricity bill (Rs.) paid from June 2021 to May 2022 has shown in figures below.


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6 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

A. Consumer Number: 17700000414 (Science/Commerce Campus)

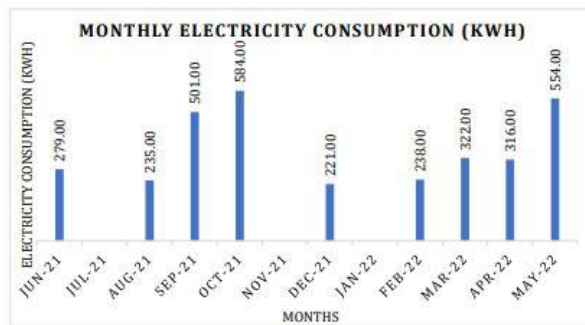


Figure 1: Monthly Electricity Consumption (Consumer Number: 17700000414)

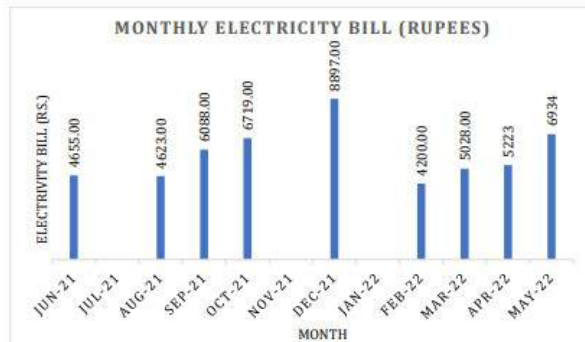
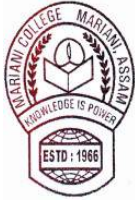


Figure 2: Monthly Electricity Bill (Consumer Number: 17700000414)

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7 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

B. Consumer Number: 177000030235 (Arts Campus Hostel Building)

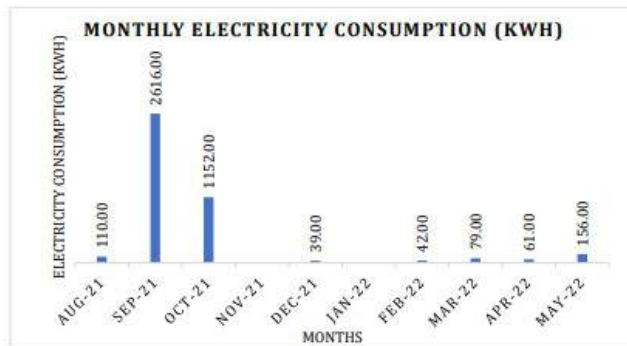


Figure 3: Monthly Electricity Consumption (Consumer Number: 177000030235)

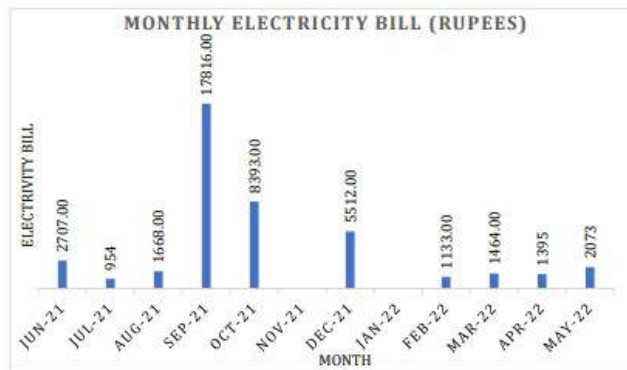
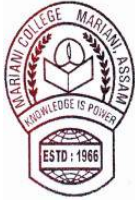


Figure 4: Monthly Electricity Bill (Consumer Number: 177000030235)

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6 A REPORT ON ENERGY AUDIT IN MARIANI COLLEGE, MARIANI

C. Consumer Number: 177000003464 (Arts Campus- Academic & Admin Building)

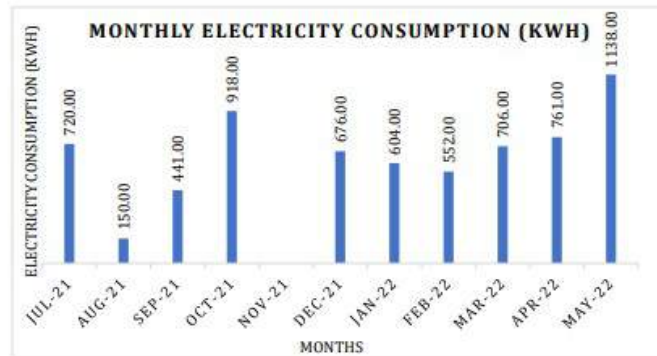


Figure 5: Monthly Electricity Consumption (Consumer Number: 177000003464)

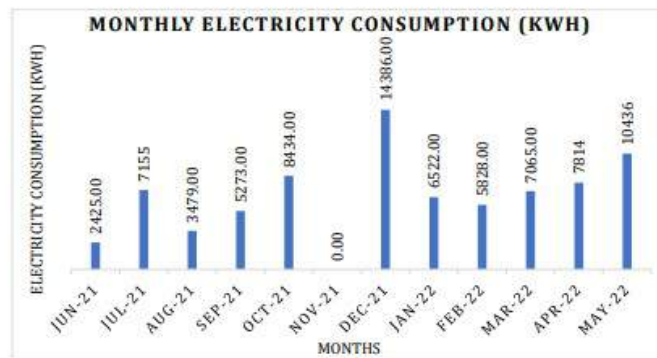


Figure 6: Monthly Electricity Bill (Consumer Number: 177000003464)

Annual expenses incurred due to diesel consumption by all the DG sets (cumulative) was Rs. 100,200.00.

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6. PERFORMANCE EVALUATION, OBSERVATION AND ANALYSIS

6.1 ASSESSMENT OF ACTUAL OPERATING LOAD AND SCOPE FOR OPTIMIZING

6.1.1 Energy Consumption in various Loads

The major energy consuming equipment/ utilities available in the building are-

- Lighting Load
- Cooling Load/ Fan & Air Conditioner
- Other Load (Computer/Laptop/projectors and digital classroom equipment)
- Water Pump

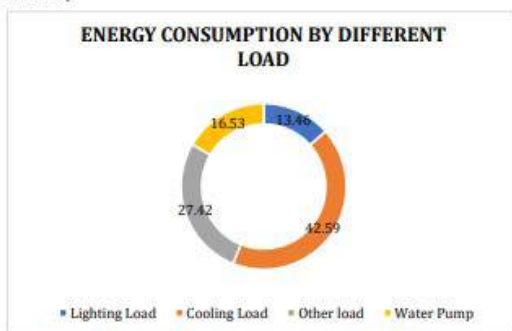


Figure 7: Energy consumption by different load (Arts Building)

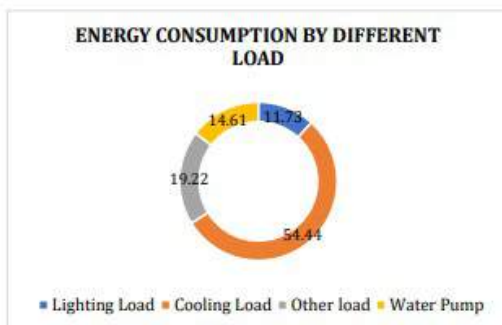
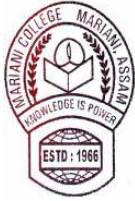


Figure 8: Energy Consumption by different load (Science & Commerce Building)

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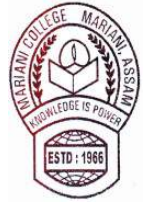


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6.1.2 Building wise estimation of load:

Mariani College consist of multiple buildings comprising various load. A detail assessment was carried out during audit period considering all the loads installed in the building. A building wise estimation (as shown in fig.9&10) has been made to understand the load profile which will further help to estimate the electrical energy requirement by the individual buildings for both the campus.

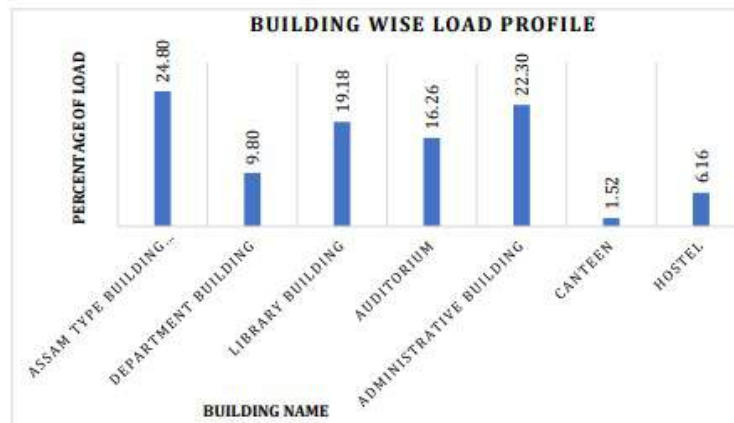


Figure 9: Building wise estimation of Load (Arts Campus)

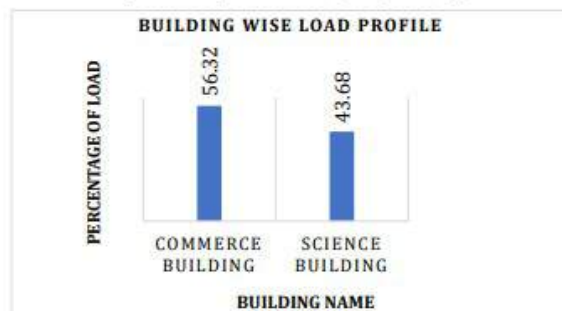
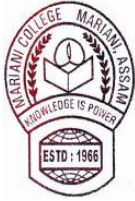


Figure 10: Building wise estimation of Load (Science/Commerce Campus)

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6.2 OBSERVATION AND RECOMMENDATION

- Since the campus consist of multiple numbers of buildings with high energy consuming equipment, therefore it is recommended to install separate submeter for each building to identify and energy consumption of each building. This will help the management to take energy conservation measures as well as it will help to do the performance assessment of electrical uses.
- Presently the total installed load of the arts and science/commerce campus are approximately 34 KW and 15 kW respectively, which include lighting load, Fan load, AC load, motor load etc. Out of these loads, most of the loads are used on occasional basis, except some areas where energy uses are in regular basis. Total installed load found in hostel is 2.25 kW.
- There is no evidence of recording data of energy generation and consumption by DG set. Management may take initiative to record in the log book for future performance assessment of energy profile of the systems as well as preventive and regular maintenance work. (Please refer annexures for reference).

ILLUMINATION STUDY AND ENERGY CONSERVATION IN LIGHTING SYSTEM:

6.2.1 Review of Present Lighting Loads

Lighting contributes about 13.46 % and 11.73% of total load in Arts campus and Science/Commerce campus respectively. The lighting load of the campus is consisting of 9-Watt LED bulb and 20 W LED tubes. It has also been observed that, almost all the luminaries have already been converted to energy efficient LED lighting except few CFL and FTL in some locations. The College authority intend to comply energy efficient measures by converting remaining lighting systems to LED lighting.

6.2.2 Lux Level Survey

The building wise and floor wise lux level is measured by the portable lux meter (Make: Fluke, Model: Fluke 941). For building energy audit the parking area is normally excluded. Location/Floor/ Room/ area wise Lux level was measured and the details are as follows:

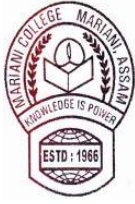
It has been observed that most of the area surveyed receives a good amount of day light if all windows and curtains are open, which implies lesser use of artificial lighting.


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Major Working Area	Luminaries used	Wattage	Avg. lux level (Lux)
Assam Type Building (Class Room)	LED Bulb/LED Tube	9W/20W	210
English Department	LED Bulb/LED Tube	9W/20W	176
Assamese Department	LED Bulb/LED Tube	9W/20W	188
Seminar Hall	LED Bulb/LED Tube	9W/20W	196
Girls Common Room	LED Bulb/LED Tube	9W/20W	166
Economics Department	LED Bulb/LED Tube	9W/20W	213
Education Department	LED Bulb/LED Tube	9W/20W	290
Library	LED Bulb/LED Tube/CFL	9W/20W/20W	112
Library Reading Room	LED Bulb/LED Tube	9W/20W	290
Digital Class Room	LED Bulb/LED Tube	9W/20W	276
Auditorium	LED Bulb/LED Tube/CFL	9W/20W/20W	226
Office Working Area	LED Bulb/LED Tube	9W/20W	253
Hostel	LED Bulb	20W	198
Class Room (Commerce Building)	LED Tube	20W	216
Teacher's Common Room (Commerce Building)	LED Tube	20W	203
Class Room (Science Building)	LED Tube	20W	211
Mathematics Department	LED Tube	20W	202
Chemistry Department Laboratory	LED Tube	20W	211
Botany Department Laboratory	LED Bulb	9W	131
Zoology Department Laboratory	LED Tube	20W	226
Physics Laboratory	LED Tube	20W	212

Table 3: Illumination level of different working areas


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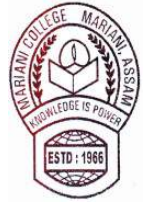


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OBSERVATIONS

- Since educational institutes are working mainly on day time, therefore illumination study was carried out during day time only and it is observed that if all windows are open and curtains are keep open, the working area or the study area covers adequate illumination level.
- It is also observed that, some part of the study area in Library, class room and laboratories, there is not adequate day lighting which leads to dependence on artificial lighting. This will increase the use of energy and operating cost to meet up the standard illumination level.

RECOMMENDATION

- Inculcate discipline and sense of participation in the energy conservation movement, any unnecessary lighting during day period should be avoided through awareness programmes.
- Intensive monitoring/inspection in order to ensure the minimum use of artificial light.
- It is recommended that all luminaries should be converted to energy efficient LED as an energy conservation measures.
- Area specific use of task lighting specifically where the back ground illumination is not required.
- Installation of master switch outside in each room which will help to switch off all electrical appliances during non-working hour.
- Tubular daylight devices to maximize the use of daylight which will reduce the energy consumption.
- Installation of occupancy sensors so that the lighting systems are controlled by this smart occupancy sensor.

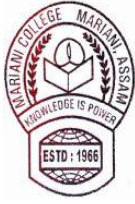
It is recommended to use standard practice of illumination level as follows (As per IES standard)

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Type of interior/activity	Standard illumination Level (Lux)
Libraries	
Shelves, book stacks	150
Reading table	300
Staff rooms, student rooms\student's hostels etc	
Gymnasium	300
Assembly halls general	300
Teaching spaces general	300
INDOOR SPORTS AND RECREATIONAL BUILDING	
MULTIPURPOSE SPORTS HALLS	
Athletics, basketball, bowls, judo	300
Hockey	700
BADMINTON COURTS	300
PUBLIC AND EDUCATIONAL BUILDING ASSEMBLY AND CONCERT HALLS	
Theatre and concert halls	100
Multipurpose	500
FURTHER EDUCATION ESTABLISHMENT	
Lecture theatres general	500
Chalkboard	500
Demonstration benches	500
Examination halls, seminar rooms, teaching spaces	500
Laboratories	500

Table 4: Standard Illumination Level


6.3 Diesel Generator (DG) Set

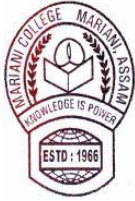
6.3.1 Review of present Diesel Generator (DG) Set:

Total 3 (Three) numbers (2 nos are in Arts campus and 1 no is in Science/Commerce Campus) of DG sets are installed in different location within the college campus and covers all the loads of academic blocks, administrative building, library, canteen, auditorium and hostel.


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The salient technical specifications are as follows:

Sl. No	Make	Model	MFG Date /SR No	Rated kVA	Rated kW	Voltage (V)	Frequency (Hz)	Phase
1	Mahindra	3305GM	October 2012	20	16	415	50	3 φ
2	Jakson Limited	JSP-15	25/05/2010	15	12	415	50	3 φ
3	Jakson Limited	JSP-25	24/09/2012	25	20	415	50	3 φ

Table 5: Diesel Generator Set Technical Specification

6.4.2 Performance assessment of the Diesel Generator sets:

For the performance assessment of the DG sets its need to study specific fuel consumption [SFC= Total fuel consumed (litres)/ total power generated (kW)]. For which at least Twelve (12) months data of monthly fuel consumption and monthly energy generated by the DG set is required to analyze the specific fuel consumption. As monthly energy generation data is not available, therefore the performance assessment of DG sets is not able to conduct.

Although the design value of fuel consumption/hr are Shown below-

Load Condition	Specific Fuel Consumption		
	Mahindra 3305GM 20 kVA	Jakson Ltd. JSP-15 15 kVA	Jakson Ltd. JSP-25 25 kVA
At 100% Load	165	2.49 (Ltr/hr)	2.49 (Ltr/hr)
At 75% Load	(gm/hp/hr)	2.04 (Ltr/hr)	2.04 (Ltr/hr)

Table 6: Design value of Specific Fuel Consumption of DG sets

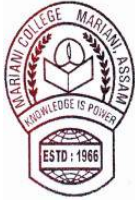
Recommendation:

It is strongly recommended the data recording or data logging of monthly fuel consumption and monthly energy generation practices for the DG set. A typical data logging format is given as ANNEX 1.


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6.4 Water Pumping System:

The arts campus of Mariani College has total 6 numbers of water pumps. Out of which 5 numbers are surface water pump and 1 submersible water pump. Similarly, the Science and commerce campus has 2 surface water pumps. The capacity of all the water pumps is of 1 HP each.

If any changes and new installation is required to be done management may take initiative to purchase energy efficient motor (EEM) only.

7. GOOD ENGINEERING PRACTICES

7.1 Guidelines for Energy Management in Buildings

7.1.1 Illumination:

Natural light should be used as far as possible to meet the required illumination level. Especially requirement of artificial light is less during daytime. While using the artificial lights care should be taken so as the lights in each area can be switched off partially when not in use. (e.g. The illumination level required for working on computers is 150 - 300 lux, but when the area is not used for work illumination level of 110 lux is sufficient. (This can be achieved by switching off some of the lights.) Also proper naming or numbering of the switches will facilitate the use of them by occupants or staff.

7.1.2 Use of Efficient Lighting Technology

The college campus has already taken the initiative to convert all inefficient luminaries to energy efficient LED tube lights and LED bulbs.

7.1.3 Air-Conditioning System

The Mariani College campus has very a smaller number of air conditioning units as cooling load. It has been observed that some of the installed air conditioning units are 3 star rating, therefore it is recommended to use 5 star rating air conditioning unit.

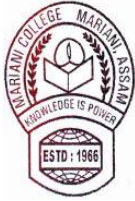
7.1.4 Preventive Maintenance

Inspect & monitor equipment operations. Maintain regular operation & maintenance log for major equipment. Fix minor problems before they result in major repairs. For this regular inspection of all equipment by trained staff is necessary. If necessary maintenance shutdown should be taken at least once in 6 months. During this wiring, contacts & other components should be thoroughly inspected for voltage imbalance,


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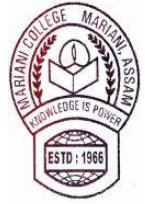


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loose connections or self heating. If major repairs are required, evaluate the economic benefit of replacing the old equipment with more efficient and compact equipment before doing the repairs. Such study should be done well in advance, so that in case of breakdown a decision can be taken quickly. Adjust schedules to keep all equipment on only when necessary. Adjust temperature & humidity set points for AC within comfort zones seasonally.

7.1.5 Training & Awareness

Maintenance & operating staff should be trained / informed about the energy management issues & procedures. To implement an effective preventive maintenance program, the operational staff must be given comprehensive training on each type of equipment, regarding system fundamentals, use of reference material & manuals, maintenance procedures, service guidelines & warranty information. Proper maintenance schedules could be supplied to them for different equipment.

7.1.6 Other Savings

New computers available in the market offer built in power saving modes. These monitors are called as Energy Star compliant monitors. However, it was found that most of the users are not aware of this facility. Therefore, steps should be taken to inform every one of this & any such future options. Switches for computers should be made more accessible, so that employee can turn off their terminals when not in use.

7.1.7 Integration of Renewable Energy in the campus

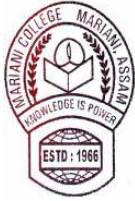
- It has been observed that a total 4 numbers of 30-Watt solar street lights are installed in the campus to illuminate some specific areas.
- Since the College campus consist of multiple buildings with enough roof space available, therefore the college authority can install and generate solar energy which will reduce the annual energy cost incurred by the College.

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ANNEX 1

Month/Year:...../.....				Generator Operator Name:.....						
Date	Generat or Name	Capacity Location	Time		Meter Reading		Fuel Added	Total Running Hrs	Total Meter Reading	Signature of Operator
			Start	End	Start	End				

DATA LOGGING FORMAT FOR PERIODIC MAINTENANCE.

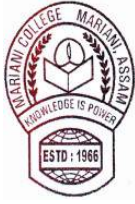
ANNEX 2

Month/Year:...../.....			Generator Operator Name:.....			
Date	Lub oil Level	Coolant Level	Fuel Filter	Lub Oil Filter	Battery Water Level	Coolant Filter

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Policy Document On Environment and Energy Usage

The Environment and Energy usage Policy of Mariani College is to manage energy in such a systematic way so as to minimize its impact on the environment. The policy implies to explore the renewable energy resources to reduce the burden of the government and to find out alternate resources as solutions to energy crisis.

This environment and energy policy is binding for all the components of the institution and applies to all its stakeholders and to the various activities undertaken by the institution. It will help us to embed efficiency and environmental awareness into our everyday activities, thus helping us to realize our responsibilities and commitment to conservation of natural resources and to limit its usage. The college regularly conducts green literacy programs to save energy and to protect the environment.

Policies:

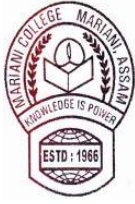
1. To assess our energy usage and measure its impact on the environment.
2. To count CO₂ emissions generated by our means of transportation - Vehicles. • To reduce local air pollution emissions using environment-friendly vehicles, including bicycles, public transportation and use of pedestrian-friendly roads.
3. To install photo voltaic solar panels for the generation of alternative energy • To install LED bulbs in the whole campus to save energy.
4. To develop systematic waste management mechanism.
5. To develop rain water harvesting unit.
6. To undertake tree plantation drive.
7. To take additional measures to continuously improve energy consumption.
8. To engage in dialogue with the government agencies, municipal corporation and the affiliating university and actively work with the local organizations in the areas of environment, energy efficiency and sustainable development.
9. To monitor and respond to emerging environmental and energy issues. To strengthen our employees' and students' environmental knowledge and skills in order to improve our own environmental performance.
10. To provide information and training opportunities on energy saving measures.
11. To offer opportunities for employees and students to engage in initiatives which contribute to environmental protection.
12. To train our employees and students to make them 'Go Green Specialists' and partners to plant trees each year.

This policy will be communicated to the students and employees via internal communication channels. The Environment, Energy Policy and objectives will be reviewed on a regular basis by the Principal.


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CHIEF MINISTER'S INSTITUTIONAL PLANTATION PROGRAMME, 15th July, 2022 to 15th August 2022

MARIANI COLLEGE, MARIANI organised a one-month Chief Minister's Institutional Plantation Programme celebrating Azadi ka Amrit Mahotsav. The programme began from 15th July, 2022 and continued till 15th August, 2022. The plantation drive was inaugurated in the College Campus (New) on 15th July, 2022 by the Principal of Mariani College, Dr. Horen Goowalla along with all other faculty members & non-teaching staffs of the college. Principal gave very valuable speech mentioning the benefits of tree plantation and how it can protect our environment at present and in future. All of them planted several kinds of saplings in the campus in different locations. Thereafter, NSS Programme Officer, Mr. Bonomali Bori took over the charge of the plantation drive. Principal along with the P.O of NSS Unit allotted different Schools, Police Station, Community places, Historical & Religious sites etc. to each faculty members of colleges to plant trees individually in their allotted schools and other places to make the event a successful and grand celebration of Azadi ka Amrit Mahotsav. Teachers and students participated from different schools in the drive. The purpose was mainly to educate the public about the importance of growing trees and aware them to protect the environment and promote institutional social responsibility. The faculty members planted different types of medicinal and fruit saplings in different locations and made the campaign a successful one. It was a great initiative to make the atmosphere clean and green.


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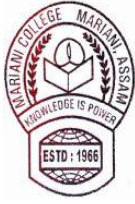
PLANTATION PROGRAMME, 2022



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PLANTATION PROGRAMME, 2022

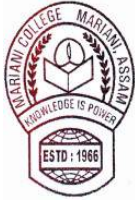


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File

MASSIVE SWACHHATA DRIVE
 Organized by
NSS UNIT, MARIANI COLLEGE
 IN COLLABORATION WITH **MARIANI MUNICIPALITY**
"NOT ME BUT YOU"



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