ANDHRA UNIVERSITY

VISHAKHAPATNAM

Green Campus Audit Report

2018-19

Date: 13/2/2019

AUDITED BY

1. Prof. VAZEER MAHAMMOOD

2. Prof. _____ (P. M. Rao)

3. Independent Auditor _____

1. **INTRODUCTION**:

The Green campus audit aims to analyse environmental practices within and outside the university campuses, which will have an impact on the eco-friendly atmosphere. green campus audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of university environment. It was initiated with the motive of inspecting the effort within the institutions whose exercises can cause threat to the health of inhabitants and the environment. Through the Green campus audit, a direction as how to improve the structure of Green campusand there are include several factors that have determined the growth of carried out the green campus audit.

1.1. NEED FOR GREEN CAMPUS AUDITING

Green campusauditing is the process of identifying and determining whether institutions practices are ecofriendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like water become habitual for everyone especially, in common areas. Now, it is necessary to check Whether we are handling resources carefully? Green campus audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green campus audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment. 1.2. GOALS OF GREEN CAMPUS AUDIT University has conducted a green campus audit with specific goals as: 1. Identification and documentation of green campus practices followed by university. 2. Identify strength and weakness in Green campuspractices. 3. Analyze and suggest solution for problems identified. 4. Assess facility of different types of waste management. 5. Increase environmental awareness throughout campus 6. Identify and assess environmental risk. 7. Motivates staff for optimized sustainable use of available resources. 8. The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue before they become problem.

1.3. OBJECTIVES OF GREEN CAMPUS AUDIT

1. To examine the current practices, which can impact on green campus such as of resource utilization, waste management etc.

2. To identify and analyze significant environmental issues.

3. Setup goal, vision, and mission for Green campuspractices in campus.

4. Establish and implement Green Campus Management in various departments.

5. Continuous assessment for betterment in performance in Green campus

1.4. BENEFITS OF GREEN CAMPUS AUDIT TO EDUCATIONAL INSTITUTIONS

There are many advantages of Green campusaudit to an Educational Institute:

1. It would help to protect the Green campusin and around the campus.

2. Recognize the cost saving methods through waste minimization and energy conservation.

3. Empower the organization to frame a better environmental performance.

4. It portrays good image of institution through its clean and green campus. Finally, it will help to build positive impression for through green initiatives the upcoming NAAC visit.

2. OBJECTIVE AND SCOPE

The broad aims/benefits of the eco-auditing system would be:

• Environmental education through systematic environmental management approach

• Improving environmental standards

• Benchmarking for environmental protection initiatives

• Sustainable use of natural resource in the campus.

• Financial savings through a reduction in resource use

• Curriculum enrichment through practical experience

• Development of ownership, personal and social responsibility for the College campus

• Enhancement of College profile

• Developing an environmental ethic and value systems in young people.

3. EXECUTIVE SUMMARY

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. This audit report contains observations and recommendations for improvement of environmental consciousness.

4. BIODIVERSITY

4.1 Biodiversity (Flora) in AU Campus

The Green Belt Area is meant for conservation of nature and aesthetic value of the University premises. The Green Area in the campus includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

4.1.1 Observations

Campus is located in the vicinity of approximately **650** types (species) flora and fauna. Various tree plantation programs are being organized during the month of June and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly Green campus which provides pure oxygen within the institute and awareness among city people. The plantation program includes various types of indigenous species of ornamental and medicinal. Instead of maintaining biodiversity the similar species planted is observed for example "NEEM". The dominant species in green belt are Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree and Teak. No. of trees planted in campus Types of trees planted which are Green campus friendly are enlisted below: Neem, Indian Black berry Tree, Flame Tree, Mango, Jack Fruit, Teak, Guava, Almond, Cashew, Exotic Flora, Asoka and Spanish Cherry Plant.

4.1.2 RECOMMENDATIONS

The University authority may consider on top priority that total 50% area is to be reserved for plantation.

1. The Biodiversity is to be maintained while considering the plantation in future.
2. The selection of trees species to be based on environmental conservation and carbon sequestration value.
3. Special Tree Plantation shall be celebrated every year on green campus day and also competitions for bird species identification and knowing the tree values in terms of medicinal and Green campus conservation.

Table 1. Some plant species Andhra University Campus 2018-2019.

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
1	*Acacia auriculiformis* Benth.	Mimosaceae	Australia tumma	Australian Oke	18
2	*Adenanthera pavonina* L.	Mimosaceae	Bandi gurivinda	Peacock flower fence	14
3	*Aegle marmelos* (L.) Correa	Rutaceae	Maaredu	Bengal Quince	9
4	*Ailanthus excelsa* Roxb.	Simaroubaceae	Peddamanu	Indian Tree of Heaven	8
5	*Alangium salvifolium* (L. f.) Wangerin	Alangiaceae	Uduga	Sage-leaved alangium	5

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
6	*Albizia chinensis* (Osbeck) Merr.	Mimosaceae	Chinduga	Chinese albizia	14
7	*Albizia lebbeck* (L.) Willd.	Mimosaceae	Dirisena, Siresha puspam	East Indian Walnut	19
8	*Albizia saman* (Jacq.) Merr.	Mimosaceae	Nidraganneru	Rain Tree	28
9	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Edakula pala	Devil tree, white cheesewood	31
10	*Alstonia venenata* R.Br.	Apocynaceae	Chinna edakula pala	Poison Devil Tree	6
11	*Anacardium occidentale* L.	Anacardiaceae	Zeedimamidi	Cashe Nut	7
12	*Annona reticulata* L.	Annonaceae	Rama phalam	Bull's heart	4
13	*Annona squamosa* L.	Annonaceae	Seeta phalam	Custard apple	24
14	*Anogeissus acuminata* (Roxb. ex DC.) Guill. & Seneg.	Combretaceae	Pasi chettu	Button tree	8
15	*Anogeissus latifolia* (Roxb. ex DC.)Wall.	Combretaceae	Sirimanu	Axlewood	12
16	*Araucaria columnaris* (Forst.) Hk.	Araucariaceae	Christmas tree	Monkey puzzle tree	24
17	*Areca catechu* L.	Arecaceae	Pokachekka	Areca palm	21
18	*Artocarpus heterophyllus* Lam.	Moraceae	Panasa	Honey Jack tree	16
19	*Azadirachta indica* A. Juss.	Meliaceae	Vepa	Neem	40
20	*Bauhinia purpurea* L.	Caesalpiniaceae	Devakanchanam	Pink bauhinia	31
21	*Bauhinia tomentosa* L.	Caesalpiniaceae		yellow bauhinia	12
22	*Bixa orellana* L.	Bixaceae	Mitayirangu	Lipstick tree	6
23	*Bombax ceiba* L.	Bombacaceae	Erra buruga	Red silk cotton	14
24	*Borassus flabellifer* L.	Arecaceae	Tati chettu	Palmyra Palm	11
25	*Brownea coccinia* Jacq.	Caesalpiniaceae		Rose of Venezuela	8
26	*Butea monosperma* (Lam.) Taub.	Fabaceae	Moduga	Flame of the forest	6
27	*Caesalpinia coriaria* (Jacq.) Willd.	Caesalpiniaceae	Divi Divi	American Sumach	18
28	*Caesalpinia pulcherrima* (L.)	Caesalpiniaceae	Chinna turayi	Peacock Flower	18
29	*Callistemon lanceolatus* (Sm.) Sweet	Myrtaceae	Bottle brush	Bottle brush	14
30	*Calophyllum inophyllum* L.	Clusiaceae	Ponna chettu	Alexandrian laurel	9
31	*Carica papaya* L.	Caricaceae	Boppayi	Papaya	35
32	*Caryota urens* L.	Arecaceae	Jeeluga	Fish tail palm	6
33	*Cascabela thevitia* (L.) Lippold	Apocynaceae	Pachha ganneru	Yellow oleander	25
34	*Cassia fistula* L.	Caesalpiniaceae	Reela	Golden shower	39

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
35	*Cassine glauca* (Rottb.) O. Kuntze	Celastraceae	Nirija	Ceylon Tea	8
36	*Casuarina equisetifolia* Forst. & Forst f.	Casuarinaceae	Sarugudu	Sae oke	8
37	*Ceiba pentandra* (L.) Gaertn.	Bombacaceae	Pachha buruga	White silk cotton	4
38	*Citrus aurantifolia* (Christm.) Swingle	Rutaceae	Nimma	Limon	5
39	*Citrus aurantium* L.	Rutaceae	Narinja	Orange	6
40	*Citrus limon* (L.) Burm.	Rutaceae	Dabba	Lemon	1
41	*Citrus sinensis* (L.) Osbeck	Rutaceae	Bathai	Sweet orang	2
42	*Cocos nucifera* L.	Arecaceae	Kobbari, tenkaya	Coconut plam	19
43	*Cordia dichotoma* Forest.	Cordiaceae	Nakkeri	Earth cake tree	2
44	*Cordia sebestena* L.	Cordiaceae		Aloe Wood tree	1
45	*Couroupita guinensis* Aubl.	Lecythidaceae	Naga lingam	Cannon ball tree	2
46	*Crateva magna* (Lour.) DC.	Capparaceae		Sacred garlic pear	21
47	*Cycas circinalis* L.	Cycadaceae		Fern palm	12
48	*Cycas revoluta* Thunb.	Cycadaceae	Madana kamashi	Japanese sago palm	2
49	*Cycas sphaerica* Roxb.	Cycadaceae	Kodhada chettu		3
50	*Dalbergia latifolia* Roxb.	Fabaceae	Rose wood	Rose wood	5
51	*Dalbergia sissoo* Roxb.	Fabaceae	Sosso	Sisso	2
52	*Delonix regia* (Boj. ex Hook.) Rafin.	Caesalpiniaceae	Tureyi	Gulmohar	6
53	*Dichrostachys cinerea* (L.) Wighth & Arn.	Mimosaceae	Veluturu	Sickle Bush	6
54	*Diospyros chloroxylon* Roxb.	Ebenaceae	Illenda		2
55	*Diospyros ferrea* (Willd.) Bakh.	Ebenaceae	Pisinika	Black ebony	1
56	*Diospyros malabarica* (Desr.) Kostel.	Ebenaceae	Neeti tumiki	Malabar ebony	2
57	*Dypsis lutescens* (H.Wendl.) Beentje & J.Dransf.	Arecaceae		Bamboo palm	1
58	*Elaesis guuneensis* Jacq.	Arecaceae	Palm oil chettu	Oil palm	5
59	*Enterolobium timbouva* Mart.	Mimosaceae		Earpod tree	6
60	*Erioglossum rubiginosum* Bl.	Sapindaceae		Rusty sapindus	12
61	*Erythrina variegata* L.	Fabaceae	Badita	Indian Coral tree	12
62	*Erythroxylum monogynum* Roxb.	Erythroxylaceae	Devadari	Bastard Sandal, Red cedar	18
63	*Eucalyptus globulus* Labill.	Myrtaceae	Jamail	Southern blue-gum	10

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
64	*Euphorbia antiqiorum* L.	Euphorbiaceae	Jemudu	Antique Spurge	6
65	*Euphorbia caducifolia* Haines.	Euphorbiaceae	Katte jemudu	Leafless Milk Hedge	6
66	*Euphorbia pulcherrima* Willd. ex Klotzsch	Euphorbiaceae		Christmas Star	5
67	*Euphorbia tirucalli* L.	Euphorbiaceae	Katimandu	Pencil cactus	6
68	*Ficus amplissima* Sm.	Moraceae	Jeechettu	Bat tree	10
69	*Ficus benghalensis* L.	Moraceae	Marri	Indian Fig tree	11
70	*Ficus benjamina* L.	Moraceae		Weeping fig	45
71	*Ficus elastica* Roxb.	Moraceae	Rabbaru chettu	Indian Rubber	3
72	*Ficus hispida* L. f.	Moraceae	Bodda marri	Wild Fig	14
73	*Ficus racemosa* L.	Moraceae		Cluster fig tree	16
74	*Ficus religiosa* L.	Moraceae	Raavi	Wisdom tree	19
75	*Flacourtia indica* (Burm.f.) Merr.	Flacourtiaceae	Kanavegu chettu	Indian plum	1
76	*Flueggea virosa* (Roxb. ex Willd.) Royle	Euphorbiaceae		Bushweed	2
77	*Gardenia latifolia* Ait.	Rubiaceae	Bikki	Papra	3
78	*Gliricidia sepium* (Jacq.) Kunth ex Walp.	Fabaceae	Madri	Quickstick	12
79	*Grevillea robusta* A. Cunn. ex R.Br.	Proteaceae	Silver oke	Silver Oke	6
80	*Guaiacum officinale* L.	Zygophyllaceae		Guaiacwood	12
81	*Guazuma ulmifolia* Lam.	Sterculiaceae		Bastard Ceder	2
82	*Haldinia cordifolia* (Roxb.) Ridsd.	Rubiaceae	Kamba	Haldu	9
83	*Hamelia patens* Jacq.	Rubiaceae		Hamelia	28
84	*Hibiscus mutabilis* L.	Malvaceae	Muddamandara	Cotton rosemallow	20
85	*Hibiscus rosa-sinensis* L.	Malvaceae	Mandara	China rose	23
86	*Hibiscus schizopetalus* (Dyer) Hook. f.	Malvaceae		Coral hibiscus	21
87	*Hibiscus tiliaceus* L.	Malvaceae	Etagogu	Coast cotton tree	25
88	*Hymenodictyon orixense* (Roxb.) Mabb.	Rubiaceae	Dudippa	Bridal Couch, bandaaru-chettu	12
89	*Ixora coccinia* L.	Rubiaceae	Rama banum	flame of the woods	38
90	*Ixora finlaysoniana* Wall. ex G.Don	Rubiaceae	Tellaguttupulu	Fragrant Ixora, White	34
				Siamese Ixora	
91	*Ixora pavetta* Andrews	Rubiaceae	Korivi	Torch tree	34
92	*Jacaranda mimosifolia* D.	Bignoniaceae		Jacaranda	20

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93	*Jacquinia ruscifolia* Jacq.	Theophrastaceae		Jaqinia	12
94	*Jatropha curcas* L.	Euphorbiaceae	Adavi amudam, Pedda nepalam	Barbados nut	25
95	*Kigelia africana* (Lam.) Benth.	Bignoniaceae	Enugu kaaya	Susage tree	24
96	*Lagerstroemia indica* L.	Lythraceae	Chinna gogu	Bonnet flower	12
97	*Lagerstroemia speciosa* (L.) Pers.	Lythraceae	Varagogu	Queen's pride	34
98	*Lannea coromandelica* (Houtt.) Merr.	Anacardiaceae	Gumpina	Indian ash tree	12
99	*Lawsonia inermis* L.	Lythraceae	Gorinta	Henna plant	2
100	*Leucaena leucocephala* (Lam.) de Wit	Mimosaceae	Chandra chettu	Subabul	10
101	*Licuala grandis* Wndl.	Arecaceae		Ruffled Fan Palm	2
102	*Litsea deccanensis* Gamble	Lauraceae	Naaramamidi	Deccan Tallow Laurel	2
103	*Madhuca indica* J. Gmelin	Sapotaceae	Ippa	Indian Butter tree	2
104	*Magnolia champaca* (L.) Baill. ex Pierre	Magnoliaceae	Chettu champanga	Champak	18
105	*Mangifera indica* L.	Anacardiaceae	Mamidi	Mango	37
106	*Manihot glaziovii* Müll. Arg.	Euphorbiaceae	Rabbaru chettu	Ceara rubber tree	2
107	*Manilkara hexandra* (Roxb.) Dubard	Sapotaceae	Pala	Ceylon Iron wood	2
108	*Manilkara zapota* (L.) P. Royen	Sapotaceae	Sapota	Sapodilla	5
109	*Melaleuca bracteata* F. Muell.	Myrtaceae		Black tea-tree, River tea-tree	6
110	*Memecylon edule* Roxb.	Melastomaceae	Alli	Kaayam, Delek bangas	5
111	*Millingtonia hortensis* L. f.	Bignoniaceae	Kada malle	Cork tree	5
112	*Mimusops elengi* L.	Sapotaceae	Pogadu	Spanish cherry	6
113	*Mitragyna parviflora* (Roxb.) Korth.	Rubiaceae	Neer kadamba	Water cadamba	21
114	*Morinda coreia* Buch.-Ham.	Rubiaceae	Togaru	Tohari wood	6
115	*Moringa oleifera* Lam.	Moringaceae	Munaga	Drum Stick	5
116	*Muntingia calabura* L.	Elaeocarpaceae	BP paluu	Chinese Cherry	2
117	*Murraya koenigii* (L.) Spreng.	Rutaceae	Karivepaku	Curry leaf	2
118	*Murraya paniculata* (L.) Jack	Rutaceae	Puvelaga	Orange Jasmine	3
119	*Mussaenda erythrophylla* Schum. & Thonn.	Rubiaceae		Red Flag Bush	2
120	*Mussaenda frondosa* L.	Rubiaceae		Dhobi tree	2

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
121	*Neolamarckia cadamba* (Roxb.) Bosser	Rubiaceae	Kadamba	Kadam	12
122	*Nerium oleander* L.	Apocynaceae	Erra ganneru	Oleander	46
123	*Nyctanthes arbor-tristis* L.	Oleaceae	Parijatam	Night-flowering Jasmine	13
124	*Ochna obtusata* DC.	Ochnaceae		Ramdhan Champa, Mickey-mouse	3
125	*Ochna squarrosa* L.	Ochnaceae		Bird's-eye bush	2
126	*Parkia biglandulosa* Wight & Arn.	Mimosaceae	Tennis ball	Badminton Ball Tree	5
127	*Peltophorum pterocarpum* (DC.) Barker ex Heyne	Caesalpiniaceae	Coffee pod	Rusty Shield Bearer	24
128	*Phoenix sylvestris* (L.) Roxb.	Arecaceae	Eeta	Wield date palm	25
129	*Phyllanthus acidus* (L.) Skeels	Euphorbiaceae	Racha Usiri	Star gooseberry	56
130	*Phyllanthus emblica* L.	Euphorbiaceae	Usiri	Indian Goose Berry	15
131	*Pisonia grandis* R.Br.	Nyctaginaceae	Aravapappu kura	Lettuce tree	28
132	*Pithecellobium dulce* (Roxb.) Benth.	Mimosaceae	Chema chinta	Manilla tamarind	15
133	*Plumeria alba* L.	Apocynaceae	Nuru vahalu	Temple tree	12
134	*Plumeria rubra* L.	Apocynaceae	Deva ganneru	Temple tree	14
135	*Polyalthia longifolia* (Sonner) Thw.	Annonaceae	Naramamidi, Asoka	Ashoka	48
136	*Pongamia pinnata* (L.) Pierre	Fabaceae	Ganuga/Kamu	Indian Beech tree	50
137	*Posoqueria latifolia* Aubl.	Rubiaceae		Monkey apple	2
138	*Premna mollissima* Roth	Verbenaceae	Nelli	Dusky leaved fire brand	24
139	*Prichardia pacifica* Seem. & Wendl.	Arecaceae		Fiji Fan Palm	21
140	*Prosopis chilensis* (Molina) Stuntz	Mimosaceae	Tella tumma, Kanche tumma	Chilean mesquite	10
141	*Psidium guajava* L.	Myrtaceae	Jama	Guava	10
142	*Pterocarpus santalinus* L. f.	Fabaceae	Erra chandanam	Red sandal	20
143	*Punica granatum* L.	Lythraceae	Danimma	Pomegranate	24
144	*Putranjiva roxburghii* Wall.	Euphorbiaceae	Puttaranjivi	Lucky Bean Tree	15
145	*Ravenala madagascariensis* Sonn.	Streliziaceae	Travellar palm	Travellar palm	2
146	*Ricinus communis* L.	Euphorbiaceae	Amudam	Caster	37
147	*Roystonea regia* (H.B. & K.) O.F. Cook	Arecaceae	Bojja chettu	Royal palm	2
148	*Santalum album* L.	Santalaceae	Chandanam, Gandam	Sandal wood	15
149	*Sapindus emarginatus* Vahl.	Sapindaceae	Konkudu, Ritta kaya	Soap nut	25

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
150	*Saraca asoca* (Roxb.) de Wilde	Caesalpiniaceae	Ashoka chettu	Ashoka Tree	2
151	*Semecarpus anacardium* L.	Anacardiaceae	Nallazeedi	Marking nut	1
152	*Senna siamea* (Lam.) H.S. Irwin & Barneby	Caesalpiniaceae	Chetuu tangedu	Kassod tree	10
153	*Senna spectabilis* (DC.) H.S. Irwin & Barneby	Caesalpiniaceae		Yellow cassia	12
154	*Sesbania sesban* (L.)	Fabaceae	Avisa	Egyptian riverhemp	12
155	*Shorea robusta* Gaertn. f.	Dipterocarpaceae	Guggilam	Sal	8
156	*Spathodea campanulata* P. Beauv.	Bignoniaceae	Tulip	African tulip	12
157	*Sterculia foetida* L.	Sterculiaceae	Seema badam	Jangle Badam	2
158	*Sterculia urens* Roxb.	Sterculiaceae	Kovela, Tapasi	Gum karaya	10
159	*Streblus asper* Lour.	Moraceae	Barnika	Sand Paper Tree, Toothbrush tree	2
160	*Switenia mahagoni* (L.) Jacq.	Meliaceae	Mahagani	mahogany	1
161	*Syzygium cumini* (L.) Skeels	Myrtaceae	Neredu	Indian Cherry	24
162	*Tabebuia argentea* (But. & K. Schum) Britt.	Bignoniaceae		Silver Trumpet Tree	15
163	*Tabebuia aurea* (Silva Manso) Benth. & Hook.f. ex S.Moore	Bignoniaceae		Caribbean trumpet tree	24
164	*Tabebuia rosea* (Bertol.) DC.	Bignoniaceae		Rosy trumpet tree	26
165	*Tamarindus indica* L.	Caesalpiniaceae	Chinta	Tamarind	21
166	*Tecoma stans* (L.) Kunth	Bignoniaceae	Swarna ganneru	Yellow trumpet flower	20
167	*Tectona grandis* L. f.	Verbenaceae	Teku	Teak	65
168	*Terminalia arjuna* (Roxb. DC.) Wight. & Arn.	Combretaceae	Tella maddi	Arjun tree	4
169	*Terminalia bellirica (*Gaertn.) Roxb.	Combretaceae	Tanikaya	Beleric	2
170	*Terminalia catappa* L.	Combretaceae	Badam	Indian Almond	50
171	*Thespesia populnea* (L.) Soland. ex Correa	Malvaceae	Ganga raavi	India tulip tree	41
172	*Thuja orentalis* L.	Cupressaceae		Tree of life	40
173	*Wendlandia heynei* (Roem. & Schult.)Santapau & Merchant	Rubiaceae	Tellapucu	Tilki	2
174	*Wrightia tinctoria* R.Br.	Apocynaceae	Ankudu	Ivory wood	40

Sr. No.	Name of the plant	Family	Local (Telugu) Name	Common Name	No. of Individual
175	*Ziziphus mauritiana* Lam.	Rhmnaceae	Regu	Chinese date	20
TOTAL					2494
Previous Year Plants species details of Andhra University Campus 2017-2018					2557
Total of 2018 & 2019					5051

4.2 Biodiversity (Fauna) in AU Campus

Fauna is all of the animal life present in a particular region or time. The corresponding term for plants is *flora*, and for fungi, it is *funga*. Flora, fauna, funga and other forms of life are collectively referred to as *biota*. Zoologists and paleontologists use *fauna* to refer to a typical collection of animals found in a specific time or place, e.g. the "Sonoran Desert fauna" or the "Burgess Shale fauna". Paleontologists sometimes refer to a sequence of faunal stages, which is a series of rocks all containing similar fossils. The study of animals of a particular region is called **faunistics**.

Fauna of Andhra University campus 2018-2019				
S.No	Scientific name	Common name	Family	Phylum
1	*Papilio gigon*	Butterfly	Papilionidae	Arthropoda
2	*Chamaeleo calyptratus*	Chameleon	Chamaeleonidae	Reptelia
3	*Naja naja*	Cobra	Elapidae	Reptelia
4	*Ardea alba modesta*	Crane	Ardeidae	Aves
5	*Corvus splendens*	Crow	Corvidae	Aves
6	*Calopteryx splendens*	Damselflies	Calopterygidae	Arthropoda
7	*Diplacodes trivialis*	Dragon flies	Libellulidae	Arthropoda
8	*Clanga hastata*	Eagle	Accipitridae	Aves
9	*Pheretima posthuma*	Earthworm	Megascolecidae	Annelida
10	*Bactrocera cucurbitae*	Fruit fly	Tephritidae	Arthropoda
11	*Calotes versicolor*	Garden lizard	Agamidae	Reptelia
12	*Polyspilota aeruginosa*	Grasshopper	Mantidae	Arthropoda
13	*Buteo jamaicensis*	Hawk	Accipitridae	Aves
14	*Apis indica*	Honeybee	Apidae	Arthropoda
15	*Calliphora vomitoria*	Houseflies	Calliphoridae	Arthropoda
16	*Ardeola grayii*	Indian crane	Ardeidae	Aves
17	*Acridotheres tristis*	Indian myna	Sturnidae	Aves
18	*Halcyon smyrnensis*	Kingfisher	Alcedinidae	Aves
19	*Hirudo medicinalis*	Leeches	Glossiphoniidae	Annelida
20	*Junonia lemonias*	Lemon pansy	Nymphalidae	Arthropoda
21	*Varanus varius*	Monitor lizard	Varanidae	Reptelia
22	*Micronia aculeata*	Moths	Uraniidae	Arthropoda
23	*Psi1acula krameri*	Parrot	Psittaculidae	Aves
24	*Columba livia domestica*	Pigeons/Doves	Columbidae	Aves
25	*Ra1us norvegicus*	Rat	Muridae	Mammal
26	*Ptyas mucosa*	Rat snake	Colubridae	Reptelia
27	*Solenopsis*	Red ant fire ant	Formicidae	Arthropoda
28	*Ho1ento1a tamulus*	Scorpion	Scorpionidae	Arthropoda
29	*Helixpomatia molluscus*	Snails	Gastropoda	Mollusca
30	*Passer domesticus*	Sparrows	Passeridae	Aves

Types of Phylum in AU in 2019		
Sr. No.	Phylum	Total
1	Annelida	2
2	Arthropoda	11
3	Aves	10
4	Mammal	1
5	Mollusca	1
6	Reptelia	5
Total		30

Total Phylum in AU in 2018 & 2019				
Sr. No.	Types of Phylum	No. of Phylum in 2018	No. of Phylum in 2019	Total
1	Annelida	2	2	4
2	Arthropoda	13	11	24
3	Aves	10	10	20
4	Mammal	2	1	3
5	Mollusca	1	1	2
6	Reptelia	6	5	11
Total				64

5. Water Consumption Report of Andhra University

Andhra University is reducing water usage and benefits through its water efficiency measures. To that end, it is hoped that the results of the study would benefit the policy and planning authorities in Andhra University in optimizing the existing water resources for campus development.

The Critical factors in green design, construction, and product selection, according to McGraw-Hill Construction's latest Smart Market Report, are water efficiency and onservation over the next five years. According to reports released, of the all other acaspects of green building, water efficiency is rapidly becoming a higher priority over energy efficiency and waste [Water's Role in Green Building, 2009]. According to the United Nations Environmental Program, on the ongoing basis buildings are responsible for 30-40 % of energy use and 15-20 % of water use worldwide [Sumateja Reddy.V, 2016& Levine, A.D., and T. Asano, 2004], a resource that becomes scarcer each year.

Per capita water availability as per the National Commission of Integrated Water Resources Development (NCIWRD) projection, the urban water demand in 2025 and 2050 has been assessed at 200 and 220 lpcd [GRIHA manual, 2017]. The requirement of a total daily supply of about 8 gallons per person for a day is essential for good health and cleanliness, according to the World Health Organization (WHO) [UNESCO 2003 & Bahar Zoghi Moghadam, 2009]. Water efficiency strategies in green building practices are becoming paramount to new and existing construction efforts.

6.1 The Energy, Water and Global Warming Connection

The collection, distribution, and treatment of drinking water and wastewater citywide consume tremendous amounts of energy and release carbon dioxide (Co). The energy-water connection is particularly strong in the driest regions 2 where significant amounts of energy are used to import water. Solutions exist to cut both water and energy use. Nationwide, about 4% [Water facts, 2009] of power

generation is used for water supply and treatment, reducing water consumption saves energy because less water needs to be treated and pumped to end users.

The University is spread in a sprawling lush green campus of 423.15 acres dotted with 121 buildings of Academic, Administrative and support services with a plinth area of about 20 lakhs sq. ft., and 324 staff quarters. Approximately strength of student and staff is 50,000.

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on-campus, and on-grounds. Wastewater is referred to as the water which is transported off the campus. The wastewater includes sewerage; residence water used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately go down in the sink or drainage system.

6.2 Water Quality

Primary Water Quality Criteria for Bathing Waters, in a water body or its part, water is subjected to several types of uses. Depending on the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various types of uses there is one use that demands highest level of water quality or purity and that is termed as "Designated Best Use" in that stretch of water body. Based on this, water quality requirements have been specified for different uses in terms of primary water quality criteria. The primary water quality criteria for bathing water are specified along with the rationale in table 1. PRIMARY WATER QUALITY CRITERIA FOR BATHING WATER (Water used for organized outdoor bathing) CRITERIA.

1. Fecal Coliform MPN/100 ml: 2. Fecal Streptococci MPN/100 ml:
2. pH
3. Dissolved Oxygen:
4. Biochemical Oxygen

The desirable and permissible limits are suggested to allow for fluctuation in environmental conditions such as seasonal change, changes in flow conditions etc. The range provides protection to the skin and delicate organs like eyes, nose, ears etc. which are directly exposed during outdoor bathing. The minimum dissolved oxygen concentration of 5 mg/1 ensures reasonable freedom from oxygen consuming organic pollution immediately upstream which is necessary for preventing production of anaerobic gases (obnoxious gases) from sediment. The Biochemical Oxygen Demand of 3 mg/1 or less of the water ensures reasonable freedom from oxygen demanding pollutants and prevent production of obnoxious gases.

6.3 Drinking Water Quality

The ground water of Indore contains Designated Best Use Water Quality Criteria Designated-Best-Use Class of water Criteria Drinking Water Source without conventional treatment but after disinfection

- Total Coli Forms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20C 2mg/l or less Outdoor bathing (Organized)
- Total Coli Forms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20C 3mg/l or less Drinking water source after conventional treatment and disinfection
- Total Coli Forms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20C 3mg/l or less Propagation of Wild life and Fisheries
- pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less Irrigation, Industrial Cooling, Controlled Waste disposal
- pH between 6.0 to 8.5 Electrical Conductivity at 25C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l.
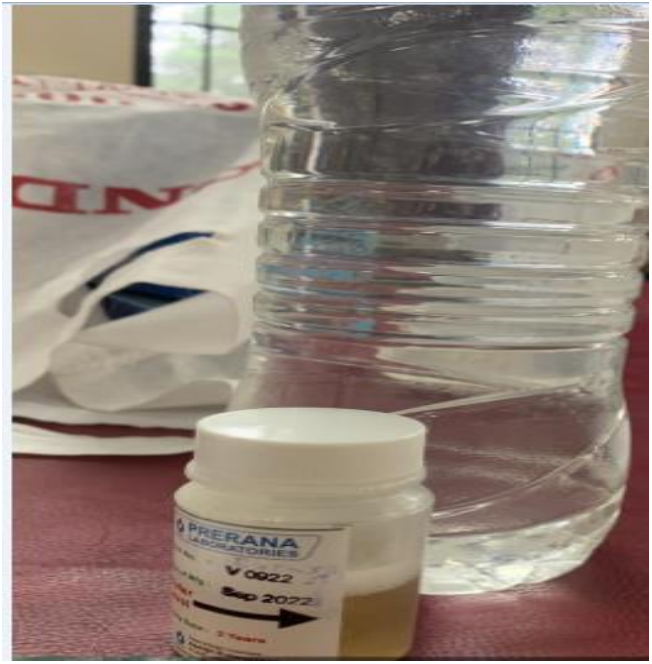
6.4 Electrical Conductivity:

The lowest value of E.C (µS/cmat 250C) was recorded at Gudem village as 110. Higher values of E.C more than 3,000 recorded as 3,263 at Addaroad village, 3,202 at Pudimadaka village, and 3,150at Revupolavaram village. The EC increases from north to south i.e. towards Coast. Higher values of E care recorded at Addaroad, Pudimadaka, and Revupolavaram.

The lowest value of chloride recorded as 7 mg/l at Kottur and higher value was recorded at Pudimadaka village as 674 mg/l. The concentrations of Nitrates in the district range from a minimum of 0.4 mg/l at Lotugadda village, to maximum value of 249 mg/l at Pudimadaka. Fluoride in the area ranges from 0.04 to 1.6mg/l, by and large the area is free from fluoride hazards. The lowest value of 0.04 mg/lisre corded at Gudem village and maximum value of1.6mg/lre corded at Narsipatnam.
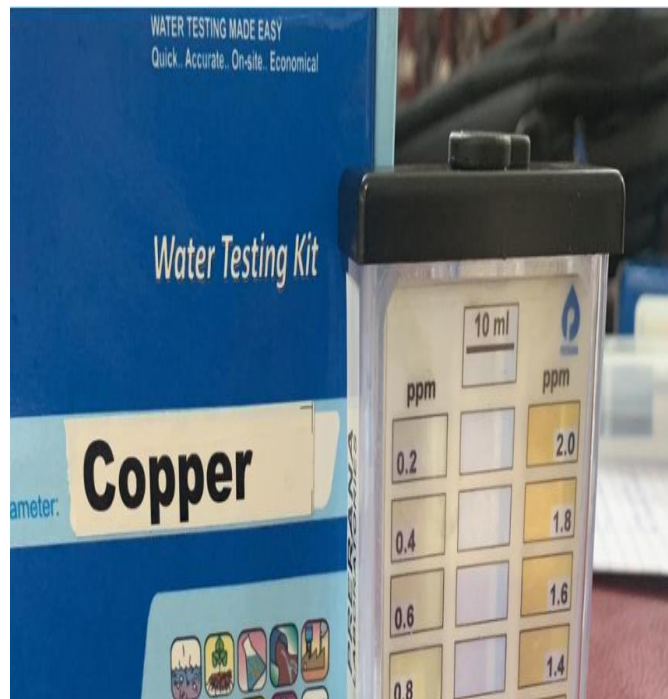
6.5 GROUND WATER RELATED ISSUES AND PROBLEMS

Overall, there is no significant change in water levels in the district. However, at few places decline in water table exists, which suggests that suitable preventive steps to be taken. However, the magnitude of the decline is less. Water logging does not exist in University campus area.

Ground water pollution is not significant in the non-industrial area of the district. However, localized Nitrate pollution in the district is due to excess use of fertilizers, urban sewerage disposal and improper drainage system. Though district has a coastline of 132 km, no significant sea water intrusion/ ingress is reported. Heavy metal pollution of ground water exists in the Mindi-Chukkavanipalem industrial area due to the industrial effluents. In old city area of Visakhapatnam i.e. Kotaveedhi, Gnanapuram etc. ground water is already contaminated due to the marshy nature. In such areas well should be limited to allow zones only.

Mass awareness programmes may be conducted to aware the people to adopt for construction of roof top water harvesting in a large scale so that rainwater can be harvested, and it will increase ground water resource. In Visakhapatnam Urbanarea it is evident from the investigations carried out by various agencies and scientific scholars the groundwater has also polluted within the vicinity of industries due to industrial effluents released without proper treatment. It is also reported the polluted ground water affecting adversely the human health of the people who are living in the industrial areas. So, it is recommended industry wise systematic micro level ground water quality studies may be taken up immediately and remedial measures may be taken up by the Government organizations and also the agencies involved in water related issues. Strict measures should be implemented to ensure the industrial effluents are properly treated before discharging into canals/surface drainage.

Total hardness includes both temporary and permanent hardness caused by the calcium and magnesium, based on which water is categorized as soft or hard and very hard. Several epidemiological investigations have demonstrated the relation between risk for cardiovascular disease, growth retardation, reproductive failure, and other health problems and hardness of drinking water or its content of magnesium and calcium. A good percentage of people who consumes hard water, which is considered to be a significant etiological factor around the globe causing many diseases such as cardiovascular problems, diabetes, reproductive failure, neural diseases, and renal dysfunction and so on.

Table 1 Concentrations of dissolved calcium and magnesium in soft and hard water.

Dissolved calcium and magnesium		
Water	**Milligrams per liter (mg/l)**	**Grains per US gallon (gpg)**
Soft	0-60	0-3.5
Moderate	61-120	3.5-7.0
Hard	121-180	7.0-10.5
Very hard	>180	>10.5
1 ppm=0.058 grains/US gallon		

6.5.1 pH value:

A pH of 7 is considered neutral. That "seven" number is considered neutral or balanced between acidic and alkaline. If water is below 7 on the pH scale, it's "acidic." If it's higher than 7, it's "alkaline." EPA guidelines state that the pH of tap water should be between 6.5 and 8.5.

Acidic water with a pH of less than 6.5 is more likely to be contaminated with pollutants, making it unsafe to drink. It can also corrode (dissolve) metal pipes.

Many municipal water suppliers voluntarily test the pH of their water to monitor for pollutants, which may be indicated by a changing pH. When pollutants are present, water companies treat their water to make it safe to drink again.

6.5.2 Alkaline water

Alkaline water has become a popular drinking water choice over the past few years. Some people say that drinking slightly alkaline water — with a pH between 8 and 9 — can improve your health. They say it may make you age more slowly, maintain a healthy pH in your body, and block chronic disease.

6.5.3 Electrical Conductivity of Water

Pure water is not a good conductor of electricity. Ordinary distilled water in equilibrium with carbon dioxide of the air has a conductivity of about 10 x 10-6 W-1*m-1 (20 dS/m). Because the electrical current is transported by the ions in solution, the conductivity increases as the concentration of ions increases.

Electrical conductivity (EC) is a measurement of water's ability to conduct electricity. EC is related to water temperature and the total concentration, mobility, valence and relative concentration of ions. Higher EC means more electrolytes in the water.

The reason that the conductivity of water is important is because it can tell you how much dissolved substances, chemicals, and minerals are present in the water. Higher amounts of these impurities will lead to a higher conductivity.

Types of water	Conductivity Value
Pure distilled and Deionized water	0.05 μS/cm
Seawater	50 mS/cm
Drinking water	200 to 800 μS/cm.
Rain or Snow water	2 to 100 μS/cm

Water Consumption in Andhra University, Visakhapatnam, Andhra Pradesh

WATER CONSUMPTION				
Sr. No.	PUMP LOCATION	PUMPING HOURS (IN HOURS)	PUMPING CAPACITY IN HP	OVERHEAD TANK CAPACITY
1	Main Pump House(Near A.U. Health Centre)	10 Hours	35 HP	350 KL
2	Victory Tank (Near C.A.O. Office)	7 Hours	15 HP	60 KL
3	Library Pump House	8 Hours	35 HP	200 KL
4	Seasand Pump House	5 Hours	15HP	30 KL
5	Pithapuram Pump Hosue	5 Hours	15HP	25 KL
6	Bhagiradha Pump House	4 Hours	15HP	40KL
7	Ladies Hostel (Maharanipeta)	6 Hours	30 hp	100 KL
8	Main Pump House (Near Gandhi Bhavan)	10 Hours	15 HP	140 KL
9	4,5, Pump House (Ladies Hostel Backside)	10 Hours	15 HP	160 KL
10	Near Mechanical Engineering Pump House	4 Hours	15 HP	150 kl
11	Vidya Hostel Pump shed	6 Hours	7.5 HP	100 KL

5.6 Rain Water Harvesting Andhra University Campus, Visakhapatnam

The Andhra University is one of the oldest premier educational institutions in the country, constituted in the year 1926 by the Madras Act of 1926. The 93-year-old institution works with the vision of creating new frontiers of knowledge in quest for development of a humane and just society. The University has more than 66 academic departments and centres as part of the constituent colleges: Arts, Commerce & Management, Law, Science & Technology and Engineering & Pharmacy. Institute of Yoga & Consciousness, a world class yoga village, caters to the emotional and physical health of the citizens of Visakhapatnam. The University promotes Fine Arts and Performing Arts through the Department of Fine Arts, Music, Dance and Theatre. Center of adnvironment, Sustainable Development and climate Change is the recent addition to extend the academic and extensive services to the government and society. The University is spread in a sprawling campus of 422 acres dotted with 170 buildings of academic, administrative and support services and 258 staff quarters with a roof top area of about 20 lakhs sq.ft.

More than 7000 students and 600 staff with their family members are residing in the campus. The area comprises of North and South campuses of the Andhra University which is surrounded by several residential colonies viz., Pithapuram Colony, Naukanagar, Chinna Waltair, HPCL Colony, Panduranga Puram, Siripuram, BalajiNagar, Resuvanipalem and Maddilapalem with a population of approximately 3,00,000. The layout of the Andhra University is depicted in the Figure 1. The Google Earth image of the Andhra University campus is shown in Figure 2. Total number of rain water harvesting pits made in 2018 was16 in north campus, and this year additional RWH made was 18. Thus total number of RWH for recharging ground water is now 34.
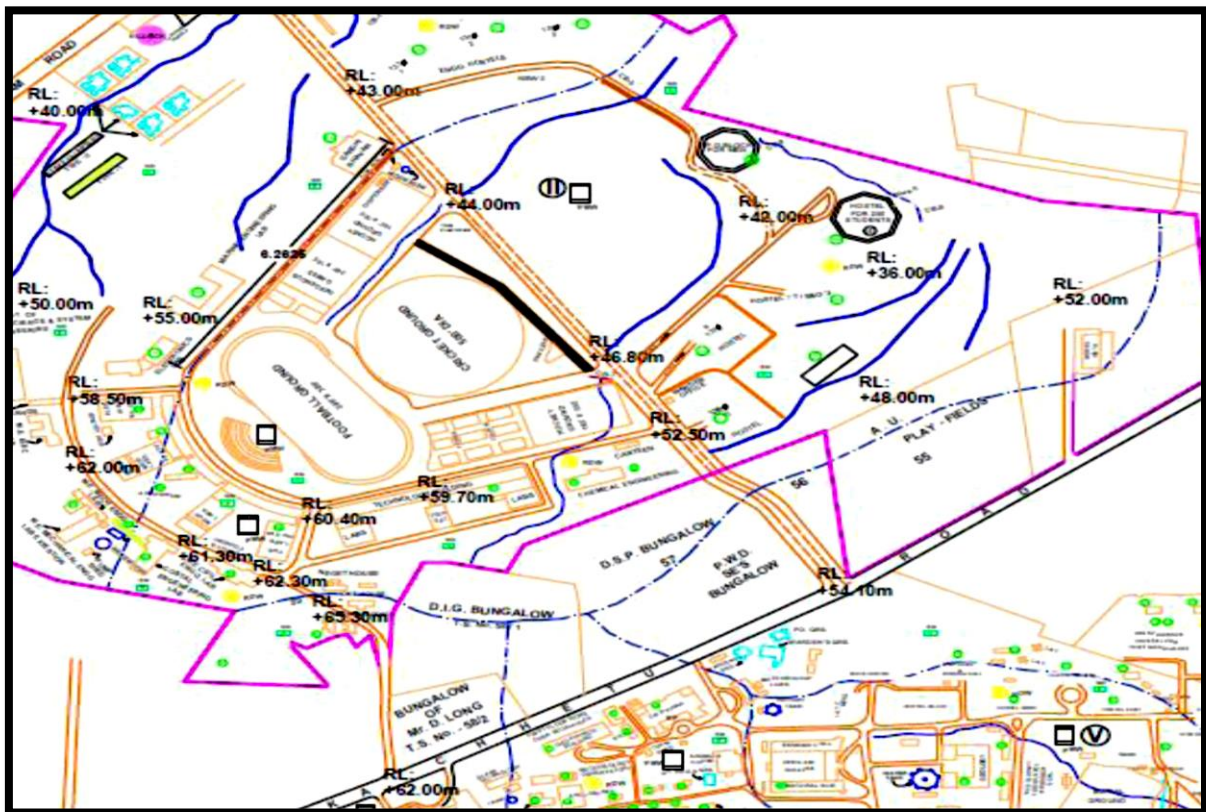

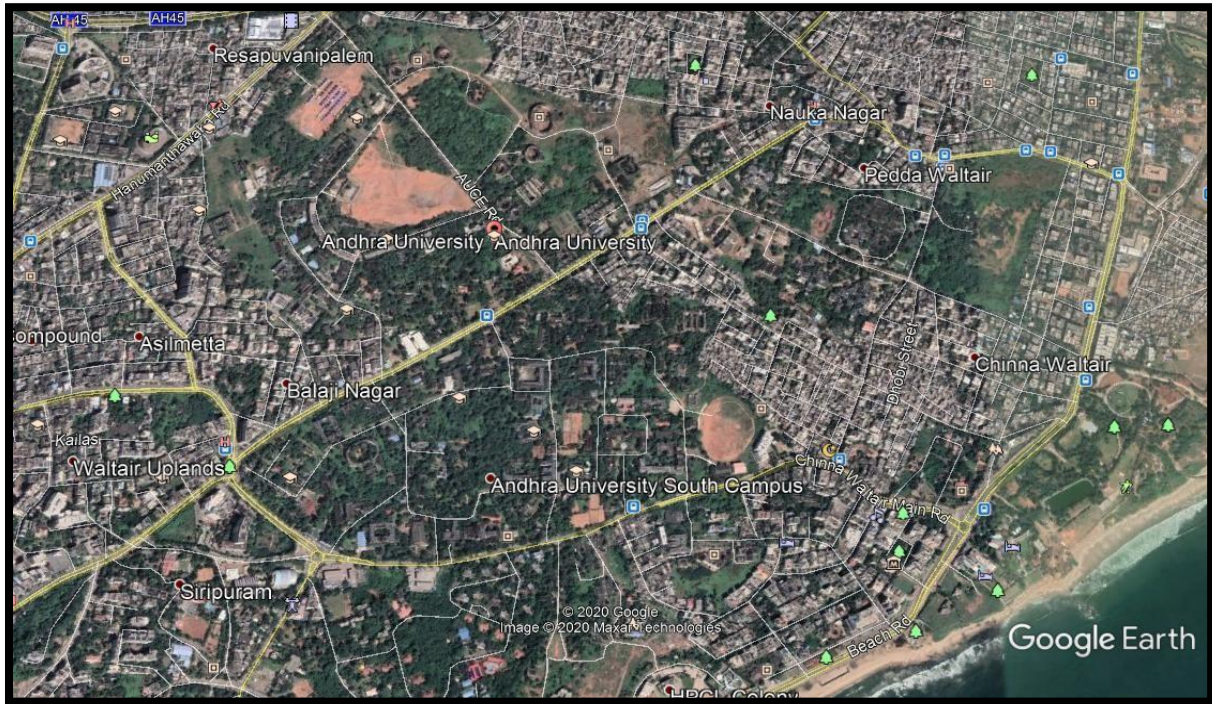Figure 1: Andhra University Campus Layout along with the adjoining areas.

Figure 2: Google Image of the Andhra University Campus

5.6.1 THE ANDHRA UNIVERSITY: RAIN WATER HARVESTING

The campus is located in an upland area on the east coast and the ground levels vary from + 72.00 m to +10.00 m making it a sloppy terrain. The contour differences are about 30 m in the northern portion and 50m in the southern portion of the campus. The contour map is presented in the Figure 3. The entire university area is covered with red loamy, laterite and sandy soils with high porosity and infiltration capacity. Red soils are formed from the parent khondalite rock whereas the sandy soils are confined to sea coast. Uneven land topography with gullied nature is observed. The hilly terrain contains a thin veneer of hydrophilic soils which supports luxuriant forest vegetation. The hilly terrain contains a thin layer of hydrophilic soils supporting forest vegetation. Table 1 shows the results of the geophysical studies conducted at different locations in the university campus. The details of the geological strata of the Andhra University area along with its immediate neighbourhood are shown pictorially in Figure 4 and Figure 5. The ground water pathways are shown in Figure 6. The micro watersheds in the university campus are shown in Figure 7.
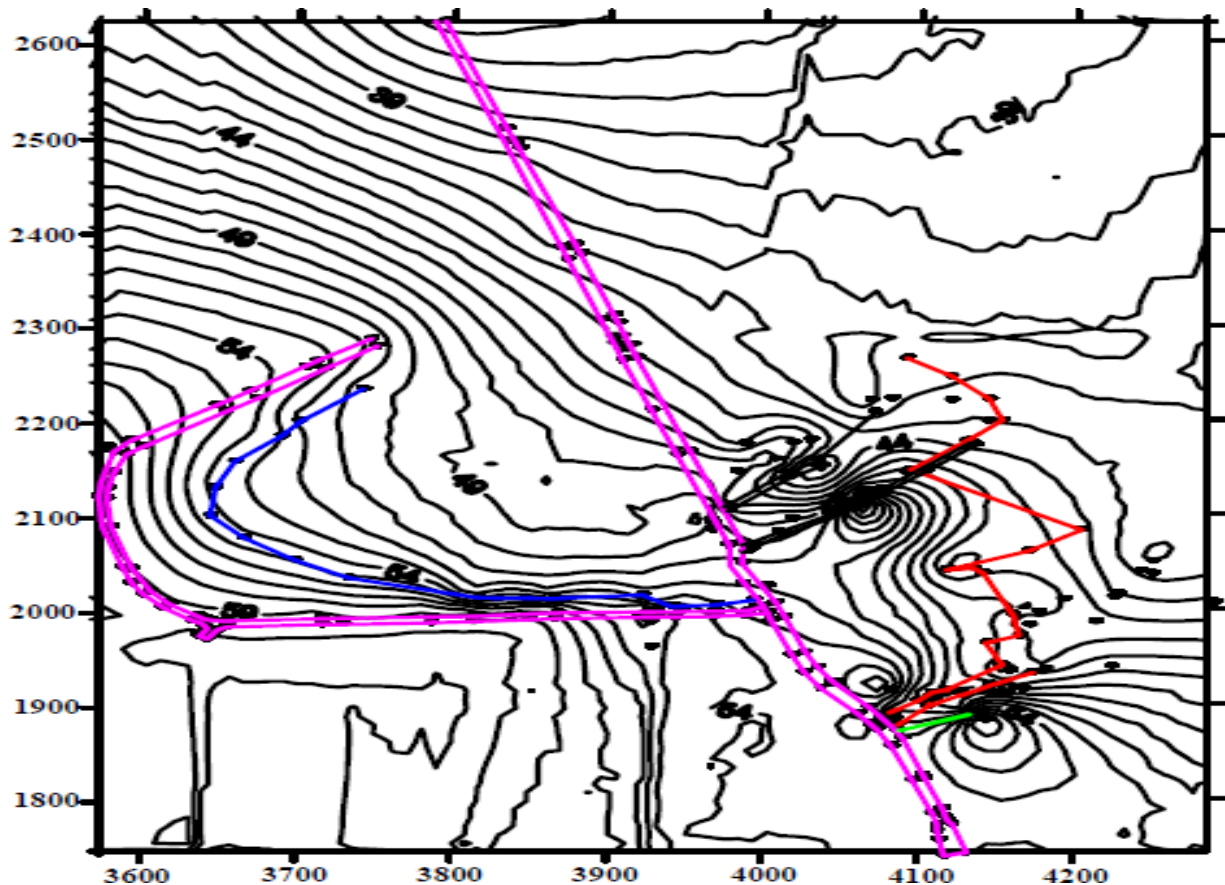
Figure 3: The Contour Map of Andhra University, Visakhapatnam.

The campus receives a total rainfall of 1121.60 mm per year on an average. The rainfall is distributed over 118 rainy days with maximum amount of rainfall occurring during months July to October every year. Owing to the varied topographical features most of the rainfall goes without tapped and utilized properly. On the other hand, to support the needs of nearly 9000 students, faculty and supporting staff residing in the campus and for other activities the university requires approximately 20 lakh litres of water per day. The groundwater sources of the university at present are able to supply only 7 to 9 lakh litres per day, the remaining amount of water being supplied by the municipal corporation at a specified rate. The university is located on a dome like geological terrain surrounded by number of residential colonies on all sides; the effective recharging of rainwater in the campus may enrich the groundwater table in the surrounding colonies benefiting two to three lakhs of people residing there. Therefore, keeping in view of the above cited figures, there is a necessity to adopt and implement suitable rainwater harvesting systems through systematic study to tap the groundwater recharge potential at the campus. Hence, the Andhra University implemented the 'Catch the Rain' program through an effective RWH system in its campus.

The RWH systems in place in the Andhra University campus are i) Construction of suitable rainwater harvesting structures of different types like recharge wells, pits, check dams etc. throughout the campus; ii) Providing monitoring wells in the area of influence to study the water level fluctuations at regular intervals of time; and iii) dissemination of the knowledge gained through the RWH project and creating awareness in the society for proper management of groundwater resources.

Table 1: Results of Geophysical Studies Conducted at Different Places in Andhra University Campus.

Depth (ft)	Type of Soil/Rock				
	NCC Camp Office	CSE Department	Samatha Hostel	Dispensary, AU South Campus	Assembly Hall
0-10	Gravel	Gravel	Gravel	Gravel	Gravel
10-20	Gravel	Gravel	Gravel	Gravel	Gravel
20-30	Weathered Charnockite	Gravel	Gravel	Gravel	Weathered Liptinite
30-40	Weathered Charnockite	Loamy RedSoil	Gravel	Highly Weathered Liptinite	Weathered Liptinite
40-50	Weathered Charnockite	Loamy RedSoil	Red Loamy	Highly Weathered Liptinite	Weathered Liptinite
50-60	Weathered Charnockite	Highly Weathered Khondalite	Red Loamy	Weathered Liptinite	Weathered Liptinite
60-70	Fractured Charnockite	Highly Weathered Khondalite	Red Loamy	Weathered Liptinite	Fractured Liptinite
70-80	Fractured Charnockite	Highly Weathered Khondalite	Red Loamy	Weathered Liptinite	Fractured Liptinite
80-90	Fractured Charnockite	Highly Weathered Khondalite	Highly Weathered Khondalite	Fractured Liptinite	Fractured Liptinite
90-100	Fractured Charnockite	Weathered Khondalite	Highly Weathered Khondalite	Fractured Liptinite	Fractured Liptinite

GEOLOGICAL STRATA OF ANDHRA UNIVERSITY CAMPUS

Legend

Zone 1 : Red Sandy soil
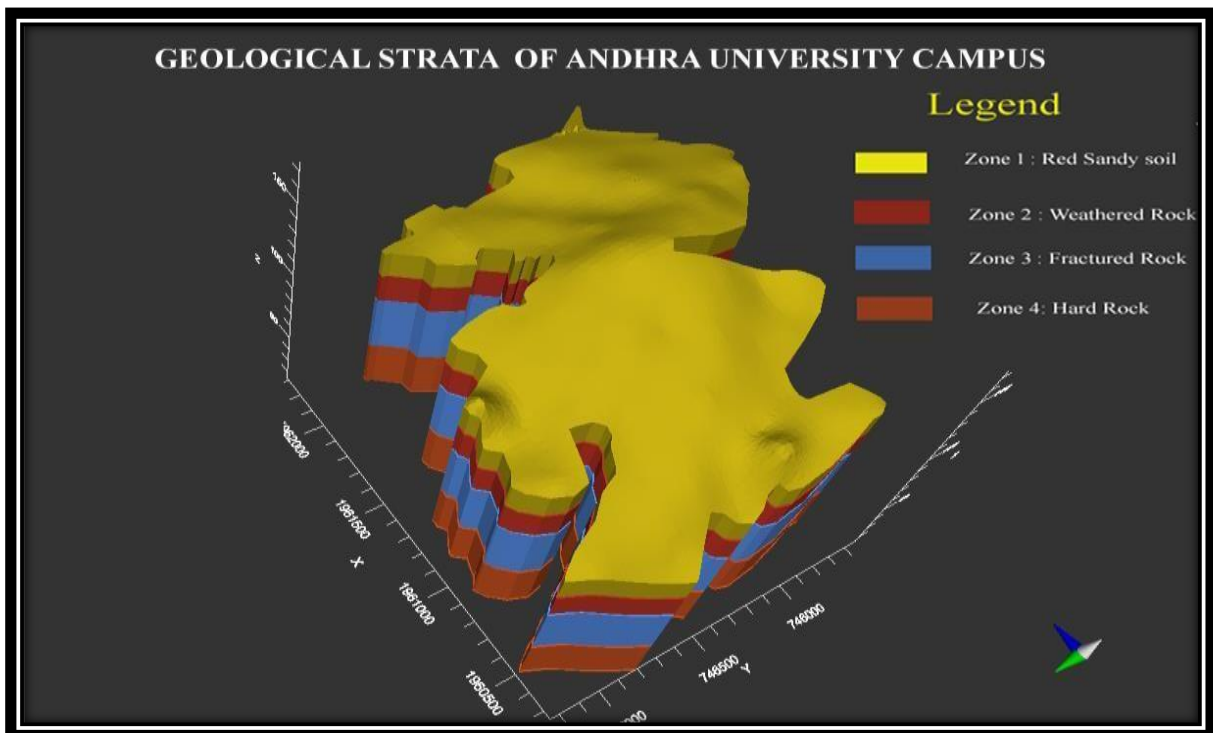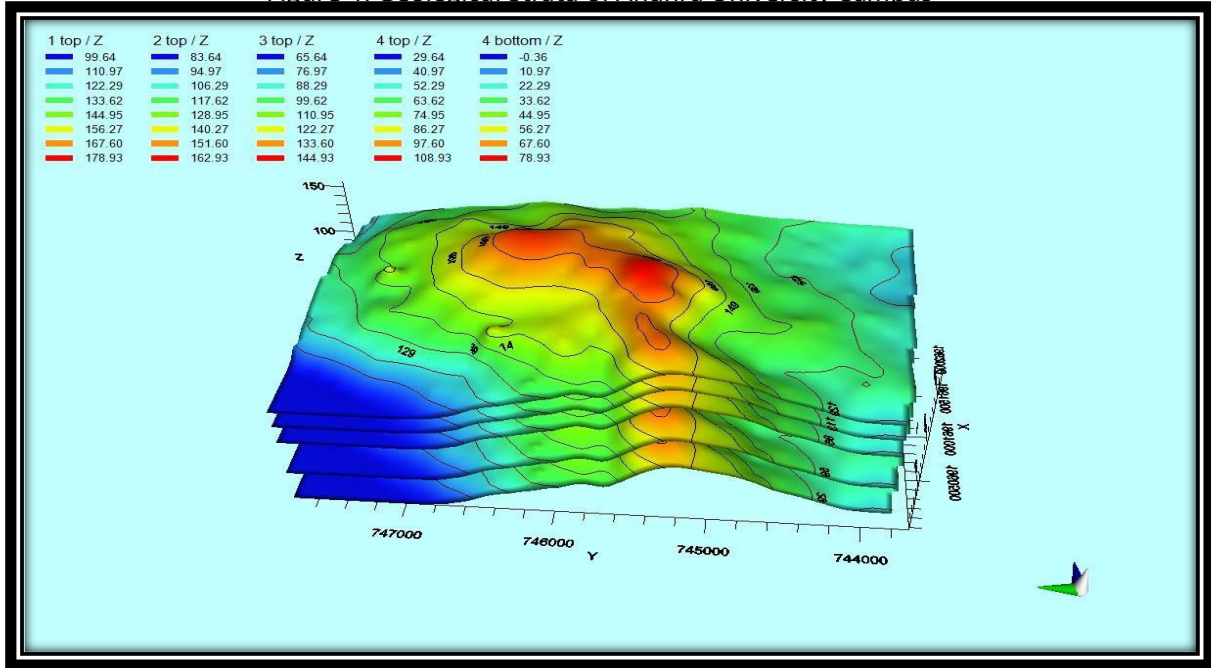Zone 2 : Weathered Rock
Zone 3 : Fractured Rock
Zone 4: Hard Rock

Figure 4: Geological Strata of Andhra University Campus

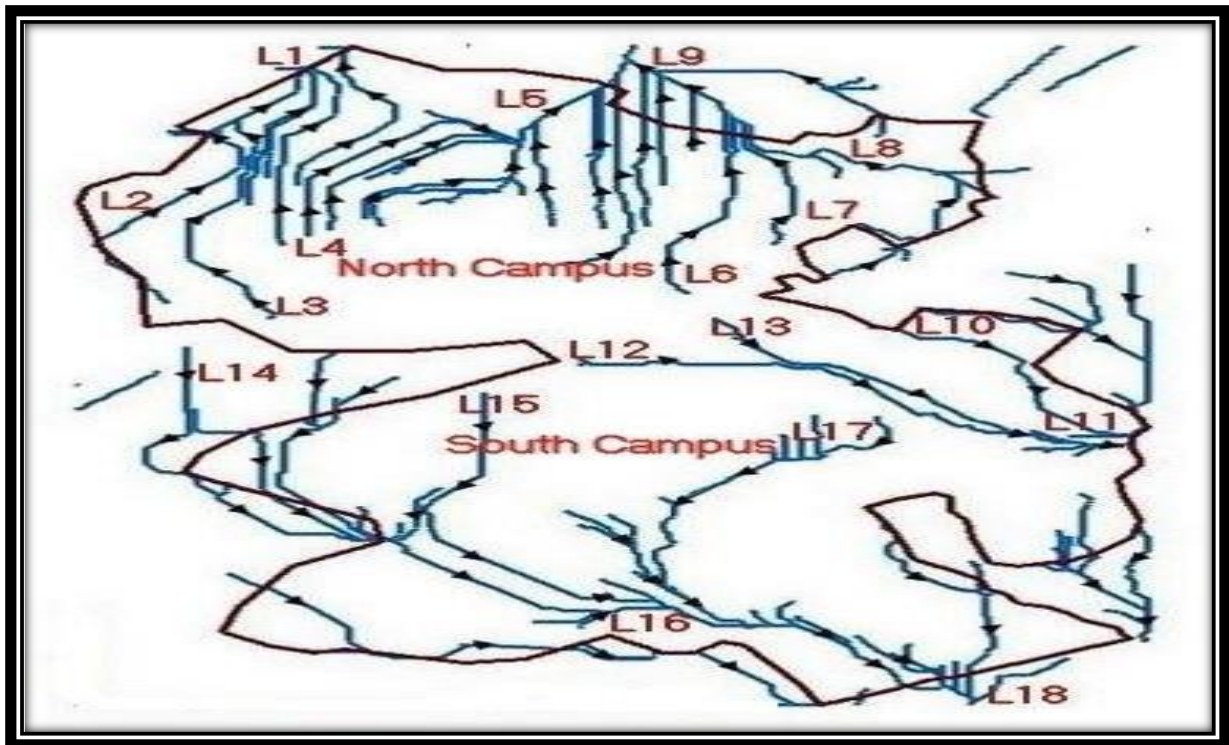Figure 5: Geological Strata of the Andhra University along with its Neighbourhood
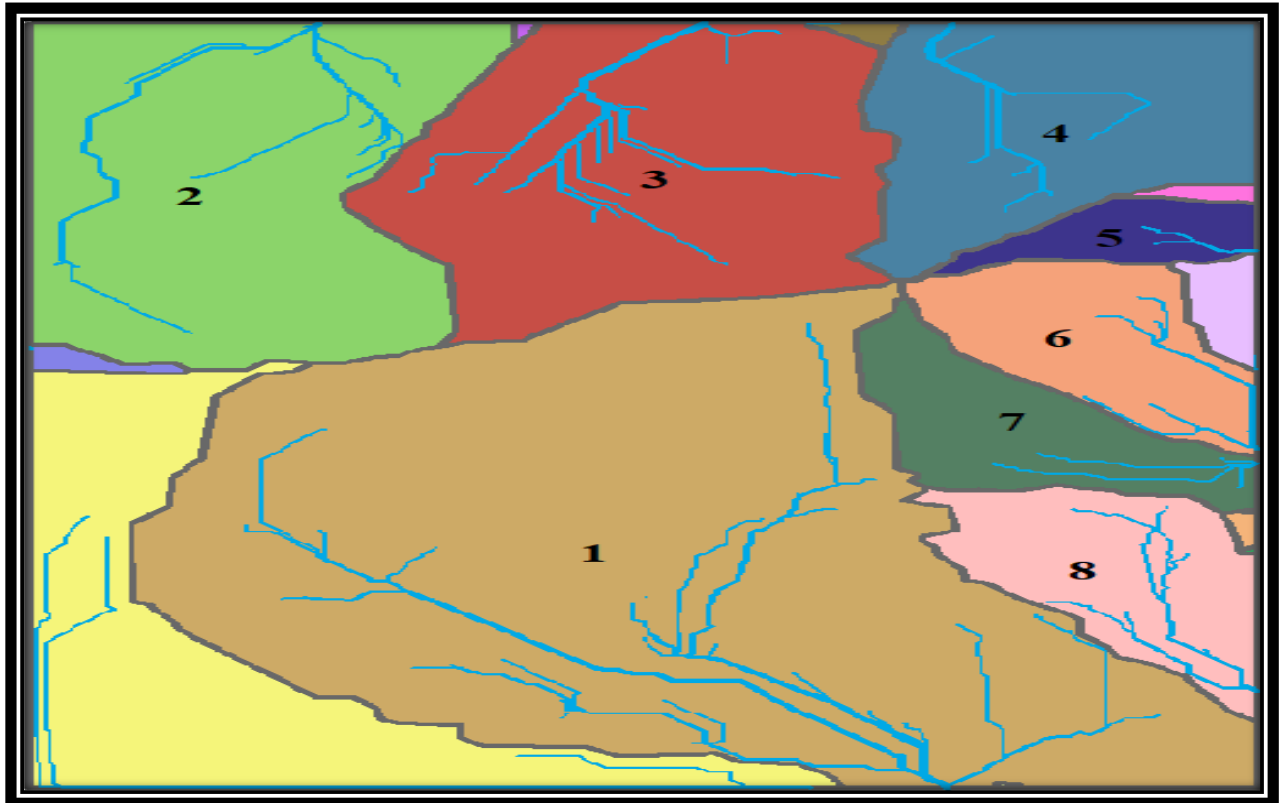
Figure 7: Delineation of Micro Watersheds in the University Campus

The major buildings in each of the watershed of the Andhra University campus are identified for placing the RWH systems. The topographical characteristics of the micro-watersheds are shown in Table 3. The details of identified major buildings in each of the watersheds are given in Table 4. The order of the channels or water courses or streams passing through the campus are presented in Table 5.

Table 3: Topographic Characteristics of the Micro-Watersheds

Micro watershed	Area(km²)	Minimum elevation (m MSL)	Maximumelevation (m MSL)
MW1	0.781	8	75
MW2	0.306	38	75
MW3	0.282	38	75
MW4	0.182	38	60
MW5	0.005	45	60
MW6	0.089	30	60
MW7	0.031	30	60
MW8	0.100	8	45

Table 4: Major buildings/areas in Micro-watershed of the Andhra University, Visakhapatnam

Water shedNo.	Buildings / Areas covered	Watershed No.	Buildings / Areas covered
1	Central administrative office	2	Maddilapalem Gate
	Avula Sambasiva Rao women'shostel		N.C.C. Building
	South Campus Post office		N.C.C. Opposite ground
	Commerce and Managementdepartment		Y.V.S. Murthy auditorium
	Sir CR Reddy convocation hall		Marine Department

	Nagarjuna hostel		ECE Department
	Officer's colony		CSE Department
	HPCL waltair park		CSE new class rooms
	Resident quarters		EEE Department
	A.U. Yoga village		Engineering Exams cell
	Department of Marine LivingResources		Mechanical Department
	A.U. High school		Civil Department
3	P.G. Girls hostel	4	A.U Samatha hostel
	A.U. Engineering boys hostel		A.U International studenthostel
	A.U. Engineering girls hostel		A.U Mamatha law hostel
	A.U. Engineering college ground		
5	Vidya Research Scholars hostel	6	Siddardha hostel
			Sathavahana hostel
			Sri Krishna Devarayahostel
			AU Health centre
7	G.M.C. Balayogi Researchscholars hostels	8	A.U. Platinum Jubilee GuestHouse
	A.U. South Campus Ground		School of Distance Education
	Dept. of Physical Sciences		APCET Office
	Dept. of fine arts		AU International StudentHostel (South Campus)
	T.L.N. Sabha Hall		
	Dept. of Physical education		

Table 5: Stream Order and Number of Streams in the Study Area in each of the Watersheds

Water Shed No.	1 Order streams	2 Order streams	3 Order stream	4 Order streams	Total Streams
1	32	6	2	1	41
2	11	2	1	0	14
3	15	5	1	1	22
4	8	2	1	0	11
5	2	1	0	0	3
6	6	2	0	0	8
7	4	1	0	0	5
8	6	2	1	0	9
Total	84	21	6	2	113

Energy Consumption Details

2019

S.NO	MONTHS	048 (South) — NO. OF UNITS CONSUMED KVAH APEPDCL	SOLAR POWER UNITS KWH	TOTAL NO. OF UNITS TWH(APEPDCL+SOLAR)	AMOUNT PAID TO APEPDCL	AMOUNT PAID TO SOLAR	TOTAL AMOUNT PAID	NO. OF UNITS CONSUMED TWH APEPDC	265 (NORTH) — NO. OF UNITS CONSUMED KVAH APEPDCL	SOLAR POWER UNITS	TOTAL NO. OF UNITS TWH (APEPDCL+SOLAR)	TOTAL NO. OF UNITS (APEPDCL+SOLAR)	AMOUNT PAID TO APEPDCL	AMOUNT PAID TO SOLAR	TOTAL AMOUNT PAID	NO. OF UNITS CONSUMED TWH APEPDC	601 (SDE) — NO. OF UNITS CONSUMED KVAH APEPDCL	SOLAR POWER UNITS KWH	TOTAL NO. OF UNITS TWH (APEPDCL+SOLAR)	TOTAL NO. OF UNITS (APEPDCL+SOLAR)	AMOUNT PAID TO APEPDCL	AMOUNT PAID TO SOLAR	TOTAL AMOUNT PAID	NO. OF UNITS CONSUMED TWH APEPDC	TOTAL NO. OF UNITS CONSUMED KVAH APEPDC	TOTAL NO. OF UNITS CONSUMED TWH APEPDC	TOTAL AMOUNT PAID	AMOUNT PAID TO SOLAR
1	JAN	2,53,884	0	2,07,907	24,72,853	0	24,72,853	2,07,307	1,43,834	0	1,15,067	1,43,834	14,40,563	0	14,40,563	1,15,067	28,662	0	22,930	28,662	3,22,899	0	3,22,899	22,930	4,32,380	3,45,904	42,36,315	0
2	FEB	2,14,500	0	1,71,600	21,15,685	0	21,15,685	1,71,600	1,08,240	0	86,532	1,08,240	11,53,250	0	11,53,250	86,532	22,814	0	18,251	22,814	2,77,079	0	2,77,079	18,251	3,45,554	2,76,443	35,52,014	0
3	MAR	2,85,300	0	2,28,240	27,05,232	0	27,05,232	2,28,240	1,85,648	0	1,48,518	1,85,648	17,67,337	0	17,67,337	1,48,518	27,224	0	21,779	27,224	3,11,653	0	3,11,653	21,779	4,98,172	3,98,538	47,84,222	0
4	APRIL	3,59,052	0	2,87,242	33,24,811	0	33,24,811	2,87,242	2,42,438	0	1,93,998	2,42,438	22,53,450	0	22,53,450	1,93,998	39,578	0	31,662	39,578	4,08,366	0	4,08,366	31,662	6,41,128	5,12,902	59,87,227	0
5	MAY	3,38,466	0	2,70,773	27,77,639	0	27,77,639	2,70,773	1,95,203	0	1,56,162	1,95,203	16,21,370	0	16,21,370	1,56,162	37,532	0	30,026	37,532	3,38,706	0	3,38,706	30,026	5,71,201	4,56,361	47,38,315	0
6	JUNE	2,72,508	0	2,18,006	25,53,275	0	25,53,275	2,18,006	1,42,185	0	1,13,748	1,42,185	14,21,670	0	14,21,670	1,13,748	43,446	0	34,757	43,446	4,38,205	0	4,38,205	34,757	4,58,139	3,66,511	44,13,150	0
7	JULY	2,35,638	0	1,88,510	22,63,454	0	22,63,454	1,88,510	1,21,680	0	97,344	1,21,680	12,57,307	0	12,57,307	97,344	36,792	0	29,434	36,792	3,85,550	0	3,85,550	29,434	3,94,110	3,15,288	33,12,311	0
8	AUG	3,39,480	0	2,71,584	31,34,386	0	31,34,386	2,71,584	2,25,075	0	1,80,060	2,25,075	21,85,441	0	21,85,441	1,80,060	45,388	0	36,310	45,388	4,53,565	0	4,53,565	36,310	6,09,943	4,87,954	57,73,392	0
9	SEP	3,42,510	0	2,74,008	31,67,551	0	31,67,551	2,74,008	2,20,695	0	1,76,556	2,20,695	21,14,966	0	21,14,966	1,76,556	36,594	0	29,275	36,594	3,84,462	0	3,84,462	29,275	5,99,799	4,79,839	56,66,979	0
10	OCT	3,25,002	0	2,60,002	30,51,093	0	30,51,093	2,60,002	2,31,938	0	1,85,550	2,31,938	22,72,652	0	22,72,652	1,85,550	36,814	0	29,451	36,814	3,85,836	0	3,85,836	29,451	5,93,754	4,75,003	57,03,641	0
11	NOV	2,78,382	41,385	2,64,631	26,42,419	1,52,826	27,35,245	2,22,706	2,10,353	0	1,68,282	2,10,353	20,10,233	0	20,10,233	1,68,282	37,816	0	30,253	37,816	3,04,091	0	3,04,091	30,253	5,26,551	4,21,241	51,09,629	1,52,826
12	DEC	1,69,101	1,13,025	2,48,306	17,67,821	4,11,411	21,79,232	1,35,281	2,14,523	6968	1,78,586	2,21,491	19,93,020	25,363	20,10,383	1,71,618	25,162	3419	23,543	34,581	2,36,029	34,286	3,30,315	20,130	4,08,786	3,27,023	45,13,930	4,71,060
TOTAL		34,19,823	1,55,010	28,30,863	3,19,88,219	5,64,237	3,25,52,456	27,35,858	22,41,872	6968	1800465	22,48,840	2,14,98,519	25,363	2,15,15,882	17,33,438	4,17,822	3419	3,43,677	4,27,241	43,07,101	34,286	43,41,387	3,34,258	60,79,517	48,63,614	5,84,03,725	6,23,886
AN AVERAGE		2,84,985	77,505	2,40,906	26,65,685	2,82,119	27,12,705	2,27,988	1,86,823	6968	150039	1,87,403	17,91,543	25,363	17,92,990	1,49,458	34,819	3419	28,640	35,603	3,58,325	34,286	3,61,782	27,855	5,06,626	4,05,301	48,67,477	3,11,343