



**Energy
Audit**



Mundeshwari College for Teacher Education

(Under Vikramshila Educational and Welfare Society, Patna, Bihar)

Affiliated to A.K.U., Patna Bihar and NCTE Recognized

GREEN AUDIT REPORT

2023-24

**PREPARED BY
GREEN INDIA MISSION
POWERED BY LOK SEWA SANGH PATNA**

Address : Sarari - Usri Road, Khagaul Patna - 801105 (Bihar)



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CERTIFICATE

Registration No. 981/2003-04

Green India Mission

let's go green

(Running under Lok Sewa Sangh, Patna, Bihar)

Registration under the Societies Registration Act 21, 1860 with government of Bihar



Audit Certificate



Mundeshwari College for Teacher Education

Sarari - Usri Road, Khagaul, Patna - 801105 (Bihar)

Has been assessed by Green India Mission, Patna for the comprehensive study of green and environmental impacts on institutional working framework to fulfill the requirement of

GREEN AUDIT

ACADEMIC YEAR 2023-24

The green and eco-friendly initiatives and carried out by the institution have been verified in the report submitted and were found to be satisfactory.

The efforts taken by the management and faculty towards environment sustainability and eco-friendly green initiatives are highly appreciated and noteworthy.

The institution is credited score 8.54/10 Certificate No. GIM/GRA/38/2023-24

[Signature]
Expert Auditor
BLE & BIS Certified Auditor
UIN: EM-7832 SIM - 14231

[Signature]
President
Green India Mission
(Patna, Bihar)
Green India Mission, Patna

[Signature]
General Secretary
Green India Mission
(Patna, Bihar)
Green India Mission, Patna



Green India Mission running under Lok Sewa Sangh, Patna, Bihar
Head Office: 27/383A, Trilokpur, Mayapuri Vihar Phase I, New Delhi - 110091
Registered Office: Loharwaha Lane, Alanganj, P.O. Gulsarbagh, Patna - 800006, Bihar
E-mail: loksewasanghpatna@gmail.com Website: www.loksewasangh.org

ACKNOWLEDGEMENT

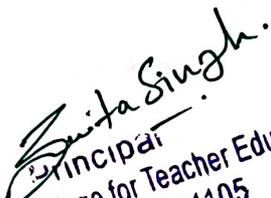
Green India Mission, Patna would like to thank the management of Mundeshwari College for Teacher Education (MCTE), Patna for assigning this important work of Green Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank **Dr. Kumari Sunita Singh - Principal** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank **Mrs. Kumari Shashi Singh- Audit Coordinator**, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. **Dr. Dinesh Kumar**
2. **Anjana Kumari**
3. **Naushia Tabassum**
4. **Bandana Prakash**
5. **Reena Kumari**


Principal
Mundeshwari College for Teacher Education,
Sarari Patna-801105



DISCLAIMER

Green India Mission Audit Team has prepared this report for Mundeshwari College for Teacher Education, Patna based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Gulshan Anoop
General Secretary
Green India Mission
Patna (Bihar)
Green India Mission
Patna, Bihar



CONCEPT AND CONTEXT

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment.

Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:



INTRODUCTION

Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

The activities carried out by the institution can also create adverse environmental impacts. Greenaudit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and makesavings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.



OVERVIEW OF THE COLLEGE

Mundeshwari College for Teacher Education (MCTE) is permanently affiliated to Aryabhata Knowledge University, Patna. It was established in the year 2013. The college possesses a campus of 0.625 acre with a student strength of 183 and 16 strong core faculty members along with visiting / guest faculties along with guest faculties located in the semi-urban area of Khagaul, Patna, MCTE was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in the capital of the state. The college while maintaining its exemplary record in University examinations.





MISSION

- MCTE's mission is to develop outstanding educators who are not only proficient in their subjects but also deeply committed to the welfare of their students and communities.
- The college aims to provide an environment where students can develop their intellectual, social, and emotional capacities, preparing them for the challenge of the modern educational landscape.
- MCTE is dedicated to continuous improvement, ensuring that its programs are responsive to the evolving needs of the education sector.
- Through its commitment to research, community service, and academic excellence, MCTE strives to be a leader in teacher education in India.

VISION

- The founders of MCTE were driven by a profound commitment to educational excellence and social reform.
- Their vision was to create an institution that would serve as a catalyst for change in the educational system of Bihar, which had long suffered from neglect and underdevelopment.
- They believed that by training high-quality teaching professionals, MCTE could play a crucial role in transforming the educational landscape of the state. This vision continues to guide the college's operations, shaping its mission, curriculum, and community engagement initiatives.

Geo Location

Geo Coordinates from Google maps:

25.5898072410912,85.0226555989

5476



AUDIT PARTICIPANTS

On behalf of the College Administration

Name	Designation
Dr. Kumari Sunita Singh	Principal
Mrs. Kumari Shashi Singh	IQAC Coordinator
Ms. Reena Kumari	Member
Dr. Dinesh Kumar	Member
Ms. Anjana Kumari	Member
Mr. Pravin Kumar	Member
Ms. Naushia Tabassum	Member

On behalf of Green India Mission, Patna, Bihar

Name	Position	Qualifications
Dr. Shamim Ahmad	Chief Auditor	Ph.D, M.Sc, Field Expert & Environmental Scientist.
Dr. Syed Eqbal Afzal	President, Lok Sewa Sangh, Patna	Ph.D., Field Expert




General Secretary
Green India Mission
Patna (Bihar)
General Secretary
Green India Mission
Patna, Bihar



EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert them into green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the second attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

GENERAL INFORMATION

1. Was any Green Audit conducted earlier?

Yes, this is the third external audit organized by the College

2. What is the total strength (people count) of the Institute?

Students
Male: 47 Female: 136 Total: 183

Teachers (including guest faculty)
Male: 06 Female: 10 Total: 16

Non-Teaching Staff
Male: 09 Female: 01 Total: 10

Technical staff
Male: 03 Female: 01 Total: 04

Total Strength
Male : 65 Female: 148 Total:213

3. What is the total number of working days of your campus in a year?

There are one hundred and eighty working days in a year.

4. Where is the campus located?

The campus is located at Usri, Khagaul Rd, Sarai, Khagaul, Patna, Bihar 801105.

5. Which of the following are available in your institute?

Garden area	Available
Playground	Available
Kitchen	Available
Toilets	Available
Garbage Or Waste Store Yard	Available
Laboratory	Available



6. Which of the following are found near your institute?

Municipal dump yard
Garbage heap
Public convenience
Sewerline

Not in vicinity of Institute
No Garbage heaps
Public convenience is available
Approximately 500M sewer line within campus

Stagnant water
Open drainage

No stagnant water
No

WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?

Yes, following waste are generated in campus

- Solid waste
- Canteen waste
- Paper, plastic
- Horticulture waste
- Laboratories waste

2. What is the approximate amount of waste generated per day? (in Kg approx.)

Biodegradable waste – 07 Kg
Non-biodegradable waste -3 Kg Hazardous
Waste- 500 gm

3. How is the waste managed in the Institute? By Composting, Recycling, Reusing, Others (specify)

- Mundeshwari College for Teacher Education is using providing segregated solid waste to municipal corporation
- The college is making efforts to transition to a paperless environment, adopting digitalization and reducing paper usage through various measures, such as digital storage, digital communication, and e-assignments.
- RO wastewater is used in washrooms
- Rain water harvesting pits are therefore ground water recharge.
- Lab waste is managed through distillation process.

4. Do you use recycled paper in Institute?

Yes for file covers and internal assessments.

5. How would you spread the message of recycling to others in the community?

College is spreading the awareness about recycling through different activities and campaigns to students, staff and local nearby villages.

6. Can you achieve zero waste in your Institute? If yes, how?

College is following the five "R" principle of reduce, reuse, recycle, refuse and regenerate to obtain zero waste in campus

GREENING THE CAMPUS

1. Is there a garden in your Institute?

Yes, about 2535sq.ft areas are developed as Gardens.

2. Do students spend time in the garden?

Yes, students spend around 2-3 Hours during winters.

3. Total number of Plants in Campus?

Plant type with approx. count	
Full grown Trees	90
Small Trees	70
Hedge Plants	1250
Grass Cover	20996 Sq.ft

4. Is the College campus having any Horticulture Department? (If yes, give details)

Yes, 2 staff (maali) deployed in horticulture department

5. How many Tree Plantation Drives organized by campus per annum?

6 Plantation Drive is carried out annually.
Survival rate is more than 85%.

6. Is there any Plant Distribution Program for Students and Community?

College provides planters to all guests as a gift rather than a bouquet of flowers.

8. Is there any Plant Ownership Program?

No



WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:
Drinking – 105.5KL/month
Gardening – 30.6KL/month
Kitchen and Toilets – 160.5KL/month
Hostel – 120KL/month
Others – 265.4 KL/month

2. How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in terrace tanks.

Saving Techniques

- Avoid overflow of water-controlled valves are provided in water supply system.
- Close supervision for water supply system.

3. Locate the point of entry of water and point of exit of waste water in your institute.

Entry- Water comes from Municipal corporation, borewell and through rain water harvesting
Exit- From Canteen, Toilets, Hostel, bathrooms and Labs through covered drainage which is connected to sewage line

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- ☑ Close the taps after usage
- ☑ Water Conservation awareness for new students
- ☑ Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage
- ☑ Use of sprinklers for gardening purpose to save water
- ☑ Push taps are installed to save water
- ☑ Re use wastewater created by a reverse osmosis (RO) system in washroom

ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

3-4 dogs, 2-3Cats, 100+ Squirrels and 100+ Birds are found in campus. A variety of bird's species and other flora and fauna are available, so institute is doing their bit for biodiversity conservation..





Does your institute have a Biodiversity Program or a KARUNA CLUB?

Yes, Mundeshwari College For Teacher Education Eco club actively organizes awareness through various campaigns and activities including seminars, poster competition, etc.

CARBON FOOTPRINT - EMISSION & ABSORPTION

1. Electricity used per year - CO2 emission from Electricity

(electricity used per year in kWh/1000)x0.84
=2,65,174/ 1000x0.84 =2,65,174/840

2. LPG/PNG used per year - CO2 emission from LPG/PNG

(LPG/PNG used per year in KG) x2.99
=1550x2.99 =4634.5/1000

3. Diesel used per year CO2 emission from HDS (Diesel)

(Diesel used per year in liters) x 2.68
= 3993.2x2.68 = 10701.8/1000

4. Transportation per year (car) CO2 emission from transportation (Bus and Car)

There are 4 college owned vehicles
=(7*2*2*180/100)*0.01+(10*4*2*180/100)*0.02



Total CO2 emission per year is 127.55 tons

After considering the carbon absorption capacity of the campus (2.49tons), the total carbon emission is 324.19 tons

CARBON ABSORPTION BY FLORA IN THE INSTITUTION

There are 90 full grown trees and 70 semi grown trees of different species, on the campus spreadover 20996 sq ft.

Carbon absorption capacity of one full grown tree 22 kg Co2 Therefore Carbon absorption capacity of 90 full-grown trees 90 x 22 kg Co2 = 1.98 tons of Co2.

The carbon absorption capacity of 70 semi-grown trees is 30% of that of full-grown trees. Hence the carbon absorption 70 x 6.8 kg of Co2 = 0.48 tons of Co2

There are approximately Hedge Plants 1250 of various species being raised in the gardens and grown in the areas where no buildings are built Carbon absorption of bush plants varies widely with their species. Certain bushes absorb very high level of Co2 where as some



others absorb very low level of Co₂. In the absence of a detailed scientific study, 200g of Co₂ absorption is taken per bush (in consultation with Environmental Science specialists). Based on this, total carbon absorption of bushes is $1250 \times 200 \text{ g} = 0.25 \text{ ton of Co}_2$

The lawns on the campus have buffalo grass, Mexican grass and indigenous grass species and cover a total area of 20996 sq. ft. Carbon absorption capacity of a 10 sq. ft. area of lawn is 1 g per day. Therefore, carbon absorption by lawn area $20996 \times 365 \times 0.1 \text{ g Co}_2 = 0.77 \text{ tons Co}_2$ per year.

Grand total of carbon absorption capacity of the campus is 3.48 tons.

GREEN INITIATIVES

- There is ban on single-use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- Personal Vehicles(Students) are not allowed in the campus
- College has three types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii) Blue Color for dry waste material, (iii) Red Color for Hazardous Waste (Electronic waste).
- Installation of rain water harvesting systems in campus building.
- **Green India Mission** initiative by the college.
- The college is actively engaged with the Green India Mission.
- Students are involved in 'Best out of waste projects ' such as paper- bagmaking, card board dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- The college carries out various awareness campaigns, seminars, workshops, and interactive sessions to engage the campus community in the implementation of its Green Campus, Energy, and Environment policies.
- Vermicompost pit is present near the Herbal Garden which effectively uses organic plant waste to produce manure that is then used in the college gardens.
- The college is actively coordinating cleanliness activities within and beyond the campus, aligning with the vision of the Swachh Bharat Abhiyan. This includes raising awareness about cleanliness and hygiene through regular drives, rallies, and the active participation of students and staff in cleanliness efforts.



RECOMMENDATIONS

- Green building guidelines for future expansion projects of the campus.
- Environmental parameters shall be included in the purchase policy to achieve a cradle-to-grave approach for sustainability.
- Increase plantation drives in nearby villages, local bodies, NGOs and Municipal Corporations to balance the carbon emission and absorption.
- Arrange training programs on environmental management systems and nature conservation for schools and local people.
- Increase in Environmental promotional activities for spreading awareness at the campus.
- Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other materials for needy students. This can be an initiative under the green program.
- Regular workshops related to Plastic free campus, plantation drives, 3R implementation, e-waste collection, menstrual hygiene, etc. should be carried out.
- Messages should be displayed at various locations to Aware the People about Energy Savings.

CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The eco club of Mundeshwari college for Teacher Education promotes conservation of resources.

Overall 45% of Mundeshwari College For Teacher Education is for landscaping. The college makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities. The recommendations in this report suggests some more ways in which the college can work to improve its practices and develop in to a more sustainable institution.

It's important to begin a few things, such as initiating drip irrigation and conservation awareness message display at different locations in campus. Additionally, we strongly advise to increase awareness amongst the students, staff and local societies for 3R principle and conservation of water and energy.

REFERENCE

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle Rules: 1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981)
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices



ANNEXURE I- COLLEGE PLANT LIST WITH QR CODE

Mundeshwari College for Teacher Education, Patna
List of Plants with Classifications and QR Code Plant Tagging

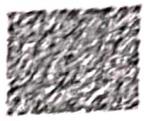
S.NO.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
1	Yellow bell	<i>Tecoma chrysantha</i>	Bignoniaceae	Ornamental	2	It is a species of flowering perennial shrub in the trumpet vine family, Bignoniaceae, that is native to the Americas. It is a medicinal plant used against diabetes and against diseases of the digestive system, among other uses.	MCTEPT101	
2	Indian rubber plant	<i>Ficus elastica</i>	Moraceae	Rubber	1	It is a species of flowering plant in the family Moraceae, native to eastern parts of South and Southeast Asia. In parts of India, people guide the roots of the tree over chasms to eventually form living bridges.	MCTEPT102	
3	Bakain	<i>Melia azedarach</i>	Meliaceae	Medicinal	1	The fully grown tree has a rounded crown, and commonly measures 7-12 metres (20-40 feet) tall, exceptionally 45 m (150 ft). The plant was introduced around 1830 as an ornamental in the United States (South Carolina and Georgia) and widely planted in southern states. The plant is toxic to cats.	MCTEPT103	
4	Neem	<i>Azadirachta indica</i>	Meliaceae	Medicinal	2	<i>Azadirachta indica</i> , commonly known as neem, margosa, nimtree or Indian lilac, is a tree in the mahogany family Meliaceae. It is one of two species in the genus <i>Azadirachta</i> . Products made from margosa trees have been used in the traditional medicine of India for centuries, for treating skin troubles and rheumatism.	MCTEPT104	
5	Ashok	<i>Saraca asoca</i>	Caesalpinaceae	Medicinal	5	<i>Saraca asoca</i> , commonly known as the ashoka tree. It is a rain-forest tree. The bark of the ashoka plant is mixed with fourteen other herbs like haritaki (dried tree fruit), vibhitaki, sandalwood, and mustak roots (<i>Cyperus rotundus</i>). It also contains jaggery (cane sugar) and mango seeds, to make asokarista.	MCTEPT105	
6	Gulmohar	<i>Delonix regia</i>	Caesalpinaceae	Ornamental	1	<i>Delonix regia</i> is a medium-sized deciduous tree that grows to about 10 m (33 ft). The bark is light brown. Often creased at branches, it has prominent lenticels. In addition to its ornamental value, it is a useful shade tree in tropical conditions, because it usually grows to a modest height.	MCTEPT106	



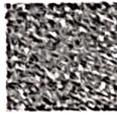
S. NO.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/Trees	Interesting Facts	QR Code No.	QR Code
7	Croton	<i>Codiaeum variegatum</i>	Euphorbiaceae	Ornamental	15	<i>Codiaeum variegatum</i> is an evergreen and monoecious tropical shrub growing to 3 m (9.8 ft) tall, with thick, somewhat "leathery" and shiny, alternately arranged leaves. Care must be taken to avoid touching this latex, such as only handling the plant while wearing sufficiently protective gloves, as well as eye goggles or sunglasses.	MCTEPT107	
8	Gulab	<i>Rosa Indica</i>	Rosaceae	Ornamental	15	A rose is a perennial flower shrub or vine of the genus <i>Rosa</i> , within the family Rosaceae, that contains over 100 species and comes in a variety of colours.	MCTEPT108	
9	Arhul	<i>Hibiscus rosa-sinensis</i>	Malvaceae	Ornamental	15	<i>Hibiscus rosa-sinensis</i> is a bushy, evergreen shrub or small tree growing 2.5–5 m (8–16 ft) tall and 1.5–3 m (5–10 ft) wide. The plant has a branched taproot. The flower is used as an accessory, particularly as a hairpiece. It is also used to shine shoes in certain parts of India, hence the common name "shoeblack plant".	MCTEPT109	
10	Oriental plant	<i>Thuja occidentalis</i>	cupressaceae	Medicinal	15	<i>Thuja occidentalis</i> , also known as northern white-cedar, [1] eastern white-cedar, [2] or arborvitae, [2][3] is an evergreen coniferous tree, in the cypress family Cupressaceae, which is native to eastern Canada and much of the north-central and northeastern United States. It is one of the four plants of the Ojibwe medicine wheel, associated with the north. The foliage is rich in vitamin C.	MCTEPT110	
11	Lemon	<i>Citrus limon</i>	Rutaceae	Fruit yielding	1	The lemon (<i>Citrus × limon</i>) is a species of small evergreen tree in the flowering plant family Rutaceae, native to Asia, primarily Northeast India (Assam), Northern Myanmar, and China. The lemon tree produces an ellipsoidal yellow fruit. Lemon juice, rind, and peel are used in a wide variety of foods and drinks.	MCTEPT111	
12	Burgad	<i>Ficus benghalensis</i>	Moraceae	Timber yielding	2	<i>Ficus benghalensis</i> is an evergreen, monoecious fast-growing tree found mainly in monsoon and rainforests, that can reach a height of up to 30 meters. It is the tree under which Adhinath the first Jain Tirthankara attained Kewal Gyan or spiritual enlightenment.	MCTEPT112	
13	Tagari	<i>Ervatamia divaricata</i>	Apocynaceae	Ornamental	10	<i>Tabernaemontana divaricata</i> , commonly called pinwheel flower, [3] crape jasmine, East India rosebay, and Nero's crown, [4] is an evergreen shrub or small tree native to South Asia, Southeast Asia and China.	MCTEPT113	





Sl. No.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/Trees	Interesting facts	QR Code No.	QR Code
14	Bougainvillea	<i>Bougainvillea spectabilis</i>	Nictaginaceae	Ornamenta	4	<i>Bougainvillea spectabilis</i> , also known as great bougainvillea, is a species of flowering plant. The Yanadi tribe of Chittoor district, Andhra Pradesh, India, once used the leaves of <i>Bougainvillea spectabilis</i> to heal diabetes.	MCTEPT114	
15	Bottle brush	<i>Callistemon lanceolatus</i>	Myrtaceae	Ornamenta	1	<i>Melaleuca citrina</i> , the common red bottlebrush, crimson bottlebrush, or lemon bottlebrush,[3] is a plant in the myrtle family Myrtaceae, and is endemic to eastern Australia. The herbicide Mesotrione was developed as a synthetic analogue of leptospermane, a natural herbicide produced by the roots of <i>Callistemon citrinus</i> .	MCTEPT115	
16	Guava	<i>Psidium guajava</i>	Myrtaceae	Fruit yielding	1	<i>Psidium guajava</i> , the common guava, yellow guava, lemon guava, or apple guava is an evergreen shrub or small tree native to the Caribbean, Central America and South America. Guava is an edible fruit, and can be eaten raw or cooked. The processing of the fruits yields by-products that can be fed to livestock. The leaves can also be used as fodder.	MCTEPT116	
17	Banana	<i>Musa paradisiaca</i>	Musaceae	Fruit yielding	1	<i>Musa x paradisiaca</i> is a species as well as a cultivar, originating as the hybrid between <i>Musa acuminata</i> and <i>Musa balbisiana</i> , cultivated and domesticated by human very early. Banana plants were originally classified by Linnaeus into two species, which he called <i>Musa paradisiaca</i> for those used as cooking bananas (plantains), and <i>M. sapientum</i> for those used as dessert bananas.	MCTEPT117	
18	Pomegranate	<i>Punica granatum</i>	Lythraceae	Fruit yielding	1	The pomegranate (<i>Punica granatum</i>) is a fruit-bearing deciduous shrub in the family Lythraceae, subfamily Punicoideae, that grows between 5 and 10 m (16 and 33 ft) tall. Pomegranate seeds are used as a spice known as anar dana (from Persian: anar + dana, pomegranate + seed), most notably in Indian and Pakistani cuisine.	MCTEPT118	
19	Tulsi	<i>Ocimum teneriflorum</i>	Lamiaceae	Medicinal	4	<i>Ocimum tenuiflorum</i> , commonly known as holy basil or tulsi, is an aromatic perennial plant in the family Lamiaceae. Tulsi is cultivated for religious and traditional medicine purposes, and also for its essential oil. It is widely used as a herbal tea.	MCTEPT119	



S.NO.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
20	Juranda hatch	<i>Duranta erecta</i>	<i>Duranta erecta</i>	Ornamenta	10	<i>Duranta erecta</i> is a species of flowering shrub in the verbena family Verbenaceae, native from Mexico to South America and the Caribbean. Golden dewdrop is widely grown as an ornamental plant throughout tropical and warm subtropical regions.	MCTEPT120	
21	Vilati Mehndi	<i>Myrtus communis</i>	Myrtaceae	Cosmetic	1	<i>Myrtus communis</i> , the common myrtle or true myrtle, is a species of flowering plant in the myrtle family Myrtaceae. The flowers are white or tinged with pink, with five petals and many stamens that protrude from the flower.	MCTEPT121	
22	Copper coat	<i>Acalypha wilkesiana</i>	Euphorbiaceae	Ornamenta	1	<i>Acalypha wilkesiana</i> , common names copperleaf, Jacob's coat[1] and Flamengueira,[2] is an evergreen shrub growing to 3 metres (9.8 ft) high and 2 metres (6 ft 7 in) across. <i>Acalypha wilkesiana</i> ointment is used to treat fungal skin diseases.	MCTEPT122	
23	Hostel palm	<i>Chrysalidocarpus lutescens</i>	Arecaceae	Ornamenta	1	<i>Chrysalidocarpus lutescens</i> is a perennial tropical plant that grows to 6–12 m (20–39 ft) in height and spreads from 3–5 m (8–15ft). In areas of eastern Madagascar, this plant also has environmental and medicinal uses.	MCTEPT123	
24	Coleus	<i>Solenostemon sculleroides</i>	Limiaceae	Ornamenta	10	<i>Coleus</i> (/ˈkoʊliəs/, KOH-lee-əs) is a genus of annual or perennial herbs or shrubs, sometimes succulent, sometimes with a fleshy or tuberous rootstock, found in the Afro-Eurasia tropics and subtropics. Coleus are cultivated as ornamental plants, particularly <i>Coleus scutellaroides</i> (syns. <i>Coleus blumei</i> , <i>Plectranthus scutellaroides</i>), which is popular as a garden plant for its brightly colored foliage.	MCTEPT124	
25	Rangers	<i>Ixora coccinea</i>	Rubiaceae	Ornamenta	2	<i>Ixora coccinea</i> (also known as jungle geranium, flame of the woods or jungle flame or pendkull) is a species of flowering plant in the family Rubiaceae.[1] It is a common flowering shrub native to Southern India, Bangladesh, and Sri Lanka. The flowers, leaves, roots, and the stem are used to treat various ailments in the Indian traditional system of medicine, the Ayurveda, and in various folk medicines. In traditional Indian medicine the fusion of juice leaves and the fruit of <i>Ixora coccinea</i> is used to care for dysentery, ulcers and gonorrhoea.	MCTEPT125	



COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
Arecapalm	<i>Chrysalidocarpus lutescens</i>	Arecaceae	Ornamenta 	1	<i>Chrysalidocarpus lutescens</i> is a perennial tropical plant that grows to 6-12 m (20-39 ft) in height and spreads from 3-5 m (8-15ft). In areas of eastern Madagascar, this plant also has environmental and medicinal uses.	MCTEPT126	
Rabbit palm	<i>Rhapis excelsa</i>	Arecaceae	Ornamenta 	1	<i>Rhapis excelsa</i> , also known as broadleaf lady palm or bamboo palm, [1] is a species of fan palm (Arecaceae subfamily Coryphoideae, tribe Trachycarpeae) in the genus <i>Rhapis</i> . <i>Rhapis excelsa</i> grows up to 4 m in height and 30 mm in diameter in multi-stemmed clumps with glossy, palmate evergreen leaves divided into broad, ribbed segments.	MCTEPT127	
Model palm	<i>Phoenix sylvestris</i>	Arecaceae	Ornamenta 	1	<i>Phoenix sylvestris</i> (<i>sylvestris</i> - Latin, of the forest) also known as silver date palm, Indian date, sugar date palm or wild date palm, [2] is a species of flowering plant in the palm family native to southern Pakistan, most of India, Nepal, Bhutan, Myanmar and Bangladesh.	MCTEPT128	
Tejpatta	<i>Cinnamomum tamala</i>	Lauraceae	Spices	2	<i>Cinnamomum tamala</i> , Indian bay leaf, also known as tejpat, tejapatta, Malabar leaf, Indian bark, Indian cassia, or malabathrum, is a tree in the family Lauraceae that is native to India, Bangladesh, Nepal, Bhutan, and China. They are often used in kumbilappam or chakka-ada, an authentic sweet from Kerala, infusing their characteristic flavor to the dumplings.	MCTEPT129	
Tejpatta	<i>Murraya koenigii</i>	Meliaceae	Medicinal	2	The curry tree or <i>Bergera koenigii</i> (syn. <i>Murraya koenigii</i>), is a tropical and sub-tropical tree in the family Rutaceae (the rue family, which includes rue, citrus, and satinwood), native to Asia. The fresh leaves are an indispensable part of Indian cuisine and Indian traditional medicines.	MCTEPT130	
Sago plant	<i>Cycas revoluta</i>	Cycadaceae	Ornamenta 	2	<i>Cycas revoluta</i> (Sotetsu [Japanese ソテツ], sago palm, king sago, sago cycad, Japanese sago palm) is a species of gymnosperm in the family Cycadaceae, native to southern Japan including the Ryukyu Islands. It is one of the most widely cultivated cycads, grown outdoors in warm temperate and subtropical regions, or under glass in colder areas.	MCTEPT131	





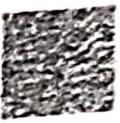
S.No.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
32	Nariyal	<i>Cocos nucifera</i>	Areaceae	Fruit	1	<i>Cocos nucifera</i> is a large palm, growing up to 30 metres (100 feet) tall, with pinnate leaves 4–6 m (13–20 ft) long, and pinnae 60–90 centimetres (2–3 ft) long; old leaves break away cleanly, leaving the trunk smooth. Botanically, the coconut fruit is a drupe, not a true nut.[13] Like other fruits, it has three layers: the exocarp, mesocarp, and endocarp. The water is consumed throughout the humid tropics, and has been introduced into the retail market as a processed sports drink.	MCTEPT132	
33	Henna	<i>Lawsonia inermis</i>	Lythraceae	Cosmetic	1	<i>Lawsonia inermis</i> , also known as henna, the henna tree, the mignonette tree, and the Egyptian privet,[4] is a flowering plant and one of the only two species of the genus <i>Lawsonia</i> , with the other being <i>Lawsonia odorata</i> . Its dried leaves are the source of the dye henna used to dye skin, hair and fingernails, as well as fabrics including silk, wool and leather.	MCTEPT133	
34	Ghrit Kumari	<i>Aloe vera</i>	Liliaceae	Medicinal	10	<i>Aloe vera</i> (/ˈælou(i) vera, vi-ər-/) [3] is a succulent plant species of the genus <i>Aloe</i> . [4] It is widely distributed, and is considered an invasive species in many world regions. Two substances from <i>Aloe vera</i> – a clear gel and its yellow latex – are used to manufacture commercial products. [9] [39] Aloe gel typically is used to make topical medications for skin conditions, such as burns, wounds, frostbite, rashes, psoriasis, cold sores, and dry skin.	MCTEPT134	
35	Amla	<i>Phyllanthus emblica</i>	Euphorbiaceae	Medicinal	1	The tree is small to medium in size, reaching 1–8 metres (3+1/2–26 feet) in height. The bark is mottled. Ripening in autumn, the berries are harvested by hand after climbing to upper branches bearing the fruits. It is used as an ingredient in dishes including dal, and is also made into amle ka murabbah, a sweet dish.	MCTEPT135	
36	Mango	<i>Mangifera indica</i>	Anacardiaceae	Fruit	7	<i>Mangifera indica</i> , commonly known as mango, is a species of flowering plant in the family Anacardiaceae. It is a large green tree, valued mainly for its fruits, both green and ripe. The tree is more known for its fruit rather than for its timber.	MCTEPT136	





Sl. No.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
37	Kachnar	<i>Bauhinia variegata</i>	Caesalpiniaceae	Ornamental	1	Bauhinia variegata is a species of flowering plant in the legume family, Fabaceae. It is a small to medium-sized tree growing to 10–12 metres (33–39 ft) tall, deciduous in the dry season. The leaves are 10–20 centimetres (3.9–7.9 in) obcordate shaped, long and broad, rounded, and bilobed at the base and apex. Kachnar is a local name in the Indian subcontinent for the edible buds collected from the tree; it is widely used as an ingredient in many subcontinent recipes.	MCTEPT137	
38	Pilakaner	<i>Cascabela thevetia</i>	Apocynaceae	Ornamental	1	Cascabela thevetia is an evergreen tropical shrub or small tree. Its leaves are willow-like, linear-lanceolate, and glossy green in color. Cascabela thevetia is cultivated as an ornamental plant, and planted as large flowering shrub or small ornamental tree standards in gardens and parks in temperate climates. The plant's toxins have tested in experiments for uses in biological pest control. T. peruviana seed oil was used to make a 'paint' with antifungal, antibacterial and anti termite properties	MCTEPT138	
39	Mahogany	<i>Swietenia mahagoni</i>	Meliaceae	Timber	1	Mahogany is a straight-grained, reddish-brown timber of three tropical hardwood species of the genus Swietenia, indigenous to the Americas[1] and part of the pantropical chinaberry family, Meliaceae. Mahogany has a straight, fine, and even grain, and is relatively free of voids and pockets. Its reddish-brown color darkens over time, and displays a reddish sheen when polished.	MCTEPT139	
40	Lemongrass	<i>Cymbopogon</i>	Poaceae	Medicinal	2	Cymbopogon, also known as lemongrass, barbed wire grass, silky heads, oily heads, Cochin grass, Malabar grass, citronella grass or fever grass, is a genus of Asian, African, Australian, and tropical island plants in the grass family. These species are used for the production of citronella oil, which is used in soaps, as an insect repellent (especially mosquitoes and houseflies) in insect sprays and candles, and aromatherapy.	MCTEPT140	



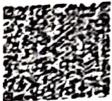
Sl. No.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
41	Pakur	<i>Ficus virens</i>	Moraceae	Medicinal	7	<i>Ficus virens</i> is a plant of the genus <i>Ficus</i> found in Pakistan, India, southeast Asia, through Malaysia and into Northern Australia. Its common name is white fig; it is locally known as pilkhan and in the Kurwinjku language it is called manbornde. The leaves are known in Thai cuisine as phak lueat.	MCTEPT141	
42	China palm	<i>Livistona chinensis</i>	Aricaceae	Ornamenta	1	<i>Livistona chinensis</i> , the Chinese fan palm[2] or fountain palm,[3] is a species of subtropical palm tree of east Asia. <i>Livistona chinensis</i> can attain heights of about 9 to 15 m (30 to 50 ft) and a spread of 4 m (12 ft). The leaves are fan shaped. The palm is cultivated as an ornamental tree in gardens and conservatories.	MCTEPT142	
43	Litchi	<i>Litchi chinensis</i>	Sapindaceae	Fruit	1	It is a tropical tree native to South China, Malaysia, and northern Vietnam. The tree has been introduced throughout Southeast Asia and South Asia. It is an evergreen tree that is frequently less than 15 m (49 ft) tall, sometimes reaching 28 m (92 ft).	MCTEPT143	
44	Monkey puzzle	<i>Araucaria</i>	Araucariaceae	Ornamenta	1	<i>Araucaria</i> original pronunciation: [a.rau'ka.rja][2] is a genus of evergreen coniferous trees in the family Araucariaceae. Some of the species are relatively common in cultivation because of their distinctive, formal symmetrical growth habit. Several species are economically important for timber production.	MCTEPT144	
45	Jamun	<i>Syzygium cumini</i>	Myrtaceae	Medicinal	10	As a rapidly growing species, it can reach heights of up to 30 m (100 ft) and can live more than 100 years. Its dense foliage provides shade and is grown just for its ornamental value. Jambolan fruits have a sweet or slightly acidic flavor, are eaten raw, and may be made into sauces or jam. Fruits may be made into juice, jelly, sorbet, syrup (e.g., kala khatta), or fruit salad.	MCTEPT145	
46	Pomele	<i>Citrus Maxima</i>	Rutaceae	Fruit	1	Rich in polyphenols and other bioactive compounds. Used for various medicinal purposes, including cough, fever, and digestive issues. Grown in a variety of soils and climates, with a preference for fertile soils and a 3-4 month dry season.	MCTEPT146	



S.NO.	COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
47	Shami Tree	<i>Prosopis cineraria</i>	Fabaceae	Medicinal	1	<i>Prosopis cineraria</i> is also the state tree of Rajasthan (where it is known as khejri), Western Uttar Pradesh (where it is known as chhonkara) and Telangana (where it is known as Jammil[5]) in India. This tree is highly revered among Hindus and worshipped as part of Dusshera festival. Chewing its leaves for a few minutes, so releasing the juice of the leaves in the mouth can relieve the ulcers.	MCTEPT147	
48	Champa	<i>Magnolia champaca</i>	Magnoliaceae	Ornamenta	8	<i>Magnolia champaca</i> , known in English as champak, is a large evergreen tree in the family Magnoliaceae. <i>Magnolia champaca</i> is cultivated by specialty plant nurseries as an ornamental plant, for its form as an ornamental tree, as a dense screening hedge, and for its fragrant flowers.	MCTEPT148	
49	Palm Lily	<i>Cordyline fruticosa</i>	Asparagaceae	Ornamenta	6	<i>Cordyline fruticosa</i> is an evergreen flowering plant in the family Asparagaceae. It is a palm-like plant growing up to 4.5 metres tall with an attractive fan-like and spirally arranged cluster of broadly elongated leaves at the tip of the slender trunk. The roots and young leaves can be cooked and eaten as survival food. The leaves can make a rain cloak.	MCTEPT149	
50	Kamini	<i>Murraya paniculata</i>	Rutaceae	Ornamenta	4	<i>Murraya paniculata</i> , commonly known as orange jasmine, orange jessamine, china box or mock orange. <i>Murraya paniculata</i> is a tree that typically grows to a height of 7 m (23 ft) but often flowers and forms fruit as a shrub, and has smooth pale to whitish bark. The plant flowers throughout the year and produces small, fragrant flower clusters which attract bees, while the fruits attract small frugivorous birds.	MCTEPT150	
51	Spider Plant	<i>Chlorophytum comosum</i>	Asparagaceae	Ornamenta	4	<i>Chlorophytum comosum</i> is easy to grow as a houseplant because of its resilience, but it can be sensitive to the fluoride in tap water, which commonly gives it "burnt tips". Spider plants are non-toxic to humans and pets, and are considered edible. The tuberous roots are reportedly edible (whether raw or cooked unstated) although mild laxative effects are claimed by the Nguni people of its native South Africa.	MCTEPT151	





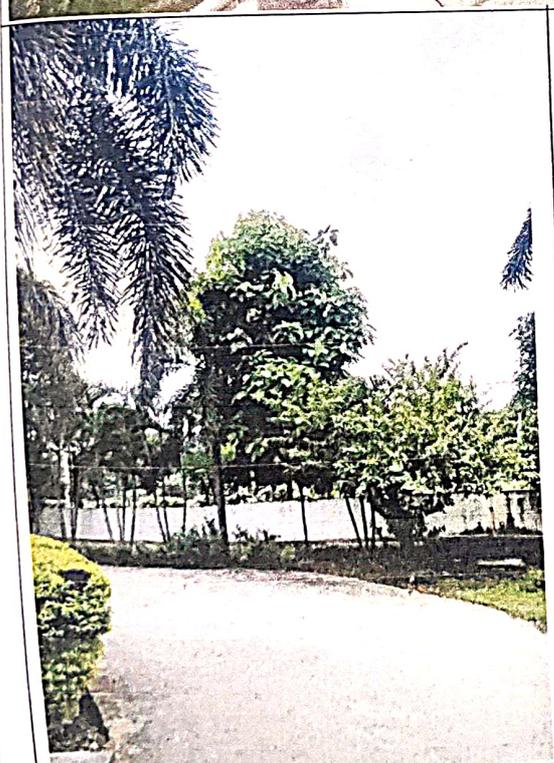
COMMON NAME	BOTANICAL NAME	FAMILY	Type	No. of Plants/ Trees	Interesting Facts	QR Code No.	QR Code
Mini Rangan	<i>Ixora coccinea</i>	Rubiaceae	Ornamenta	8	<i>Ixora coccinea</i> (also known as jungle geranium, flame of the woods or jungle flame or pendkuli) is a species of flowering plant in the family Rubiaceae. There are numerous named cultivars differing in flower colour (yellow, pink, orange) and plant size. Several popular cultivars are dwarfs, usually staying under 3 ft (0.91 m) in height.	MCTEPT152	
Chinese Thuja	<i>Platycladus orientalis</i>	Cupressaceae	Medicinal	4	The leaves are triangular scales with a blunt point and arranged in decussate pairs. Leaves emit an odor when bruised. The ripe seeds, leaves and twigs are used in Chinese medicine. The seeds, sweet to the taste, are used as a sedative in the treatment of minor headache, insomnia, palpitation and as a coagulant.	MCTEPT153	
Pong Pong	<i>Cerbera odollam</i>	Apocynaceae	Ornamenta	2	<i>Cerbera odollam</i> bears a close resemblance to oleander, another highly toxic plant from the same family. It grows to approximately 10-12 meters in height. Its leaves are glossy and it has white flowers with yellow throats. The plant as a whole yields a milky, white latex. It is also grown in tropical areas such as Hawaii as an ornamental.	MCTEPT154	
Japanese cheesewood	<i>Pittosporum tobira</i>	Pittosporaceae	Ornamenta	8	<i>Pittosporum tobira</i> is a species of sweet-smelling flowering plant in the pittosporum family Pittosporaceae known by several common names, including Australian laurel, Japanese pittosporum, mock orange and Japanese cheesewood. It is used for hedges, living privacy screens, and indoor and outdoor planter boxes. The stems, leaves, and dried fruits are used in flower arrangements.	MCTEPT155	



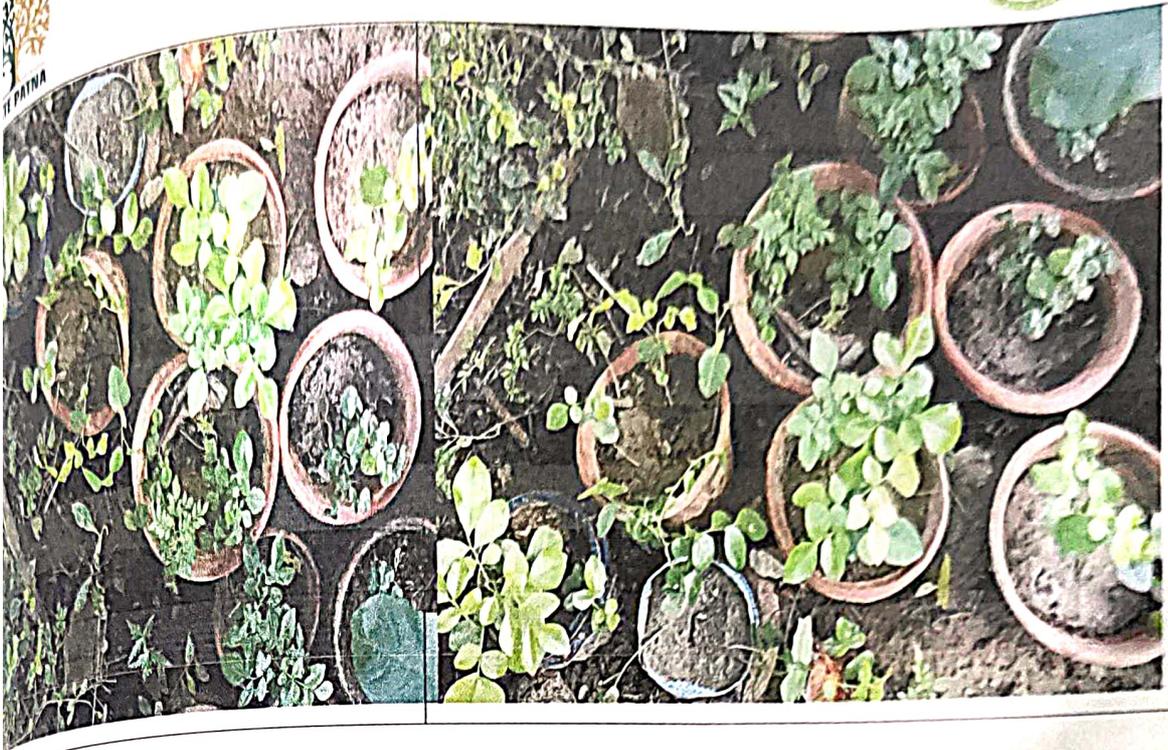


ANNEXURE II-ENVIRONMENT CONSCIOUSNESS PHOTOS









ANNEXURE III - SOME PHOTOS OF TAGGED PLANTS/TREES



Sample of Plants Tag with QR Code

Pomelo
Citrus Maxima
 Rutaceae

MCTE, Patna
 Plants/Tree
 QR Code No. MCTEPT146



Shami Tree
Prosopis cineraria
 Fabaceae

MCTE, Patna
 Plants/Tree
 QR Code No. MCTEPT147



Palm Lily
Cordyline fruticosa
 Asparagaceae

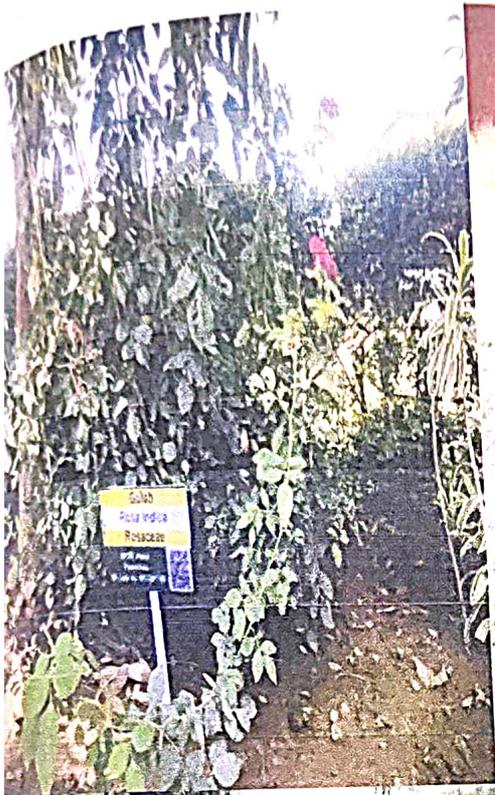
MCTE, Patna
 Plants/Tree
 QR Code No. MCTEPT149

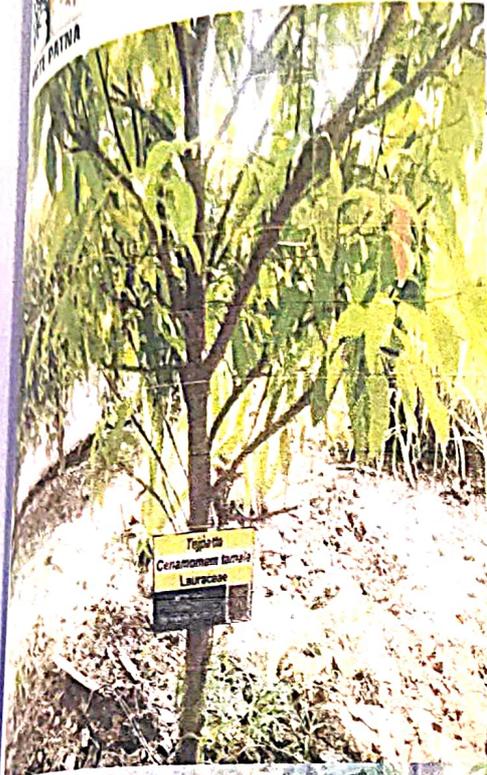


Pong Pong
Cerbera odollam
 Apocynaceae

MCTE, Patna
 Plants/Tree
 QR Code No. MCTEPT154







Roof Top Rainwater Harvesting and Vermicompost Pit



***** END OF THE REPORT *****

Sweta Singh
Principal
Mundeshwar College for Teacher Educator
Sarani Patna-801105