



Karnataka State Council for Science and Technology

(An autonomous organisation under the Dept. of Science & Technology, Govt. of Karnataka)

Indian Institute of Science Campus, Bengaluru – 560 012

Telephone: 080-23341652, 23348848, 23348849, 23348840

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Mr. H. Hemanth Kumar
Executive Secretary

11th May, 2022

Ref: 7.1.01/SPP/91

The Principal,
Ramaiah College of Arts Science and Commerce,
MSR Nagar, MSRIT Post,
Bangalore – 560 054.

Dear Sir/Madam,

Sub : Sanction of Student Project - 45th Series: Year 2021-2022

Project Proposal Reference No. : 45S_MBA_072

Ref : Project Proposal entitled **TREATMENT OF AGRICULTURE WASTE WATER USING BIO ADSORBENTS**

We are pleased to inform that your student project proposal referred above, has been approved by the Council under "Student Project Programme - 45th Series". The project details are as below:

Student(s)	Ms. KHADAGI DHANASHRI BHAGAVATRAO	Department	MANAGEMENT STUDIES
	Ms. BHOOMIKA B BILGAR		
	Ms. KATTA ADI SAI HARSHITHA		
	Mr. BHARATH KUMAR S		
Guide(s)	Dr. PALLAVI	Sanctioned Amount (in Rs.)	8,000.00
	Dr. BINDU NAMBIAR		

Instructions:

- The project should be performed based on the objectives of the proposal submitted.
- Any changes in the project title, objectives or students team is liable for rejection of the project and your institution shall return the sanctioned funds to KSCST.
- Please quote your project reference number printed above in all your future correspondences.
- After completing the project, 2 to 3 page write-up (synopsis) needs to be uploaded on to the following Google Forms link <https://forms.gle/YMn9K7XETu96i8KbA>. The synopsis should include following:
 - Project Reference Number
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords
 - Introduction / background (with specific reference to the project, work done earlier, etc) - about 20 lines
 - Objectives (about 10 lines)

8) Methodology (about 20 lines on materials, methods, details of work carried out, including drawings, diagrams etc)

10) Scope for future work (about 20 lines).

f) The sanctioned amount will be transferred by NEFT to the bank account provided by the College/Institute.

h) After completion of the project, soft copy of the project report duly signed by the Principal, the HoD, Guide(s) and student(s) shall be uploaded in the following Google Forms Link <https://forms.gle/PciAaAVisn6bn8AM7>. The report should be prepared in the format prescribed by the university.

Thanking you and with best regards,

H. W. W. W.

Copy to:

MANAGEMENT STUDIES

RAMAIAH COLLEGE OF ARTS SCIENCE AND COMMERCE, BENGALURU

Dr. BINDU NAMBIAR

MANAGEMENT STUDIES

RAMAIAH COLLEGE OF ARTS SCIENCE AND COMMERCE, BENGALURU

3) THE ACCOUNTS OFFICER

KSCST, BENGALURU



SLN Testing Laboratory

#15, Premnagar,
Pipeline Road,
Laggere, Bengaluru,
Karnataka – 560 058

Invoice

Bill To Ms. Khadgi Dhanashri Bhagawatrao
MS Ramaiah College of Arts, Science and Commerce
Bengaluru - 560 097

Invoice Number 2001219
Date 7/13/2022
Due Date -
Terms -

Description	Quantity	Unit price	Amount
Lab usage charges (Labour + equipment + Chemicals)	1	Rs. 3,000	Rs. 3,000
Miscellaneous charges	1	Rs. 1,500	Rs. 1,500
Total			Rs. 4,500
Paid Amount			Rs. 4,500
Balance Due			Rs. 0



SLN Testing Laboratory

#15, Premnagar,
Pipeline Road,
Laggere, Bengaluru,
Karnataka - 560 058

Invoice

Bill To Ms. Khadgi Dhanashri Bhagawatrao
MS Ramaiah College of Arts, Science and Commerce
Bengaluru - 560 097

Invoice Number 2001321
Date 7/25/2022
Due Date -
Terms -

Description	Quantity	Unit price	Amount
Lab usage charges (Labour + equipment + Chemicals)	1	Rs. 3,000	Rs. 3,000
Miscellaneous charges	1	Rs. 1,500	Rs. 1,500

Total Rs. 4,500

Paid Amount Rs. 4,500

Balance Due Rs. 0



25 July 2022

Here's your receipt for your ride, Bharat

We hope you enjoyed your ride this evening.

Total	₹248.52
--------------	----------------

Trip charge	₹252.10
-------------	---------

Subtotal	₹252.10
-----------------	----------------

Booking fee	₹6.00
-------------	-------

Promotion	-₹21.41
-----------	---------

Before Taxes	₹236.69
--------------	---------

GST	₹11.83
-----	--------

Payments

Cash	₹248.52
-------------	----------------

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Naresha

License Plate: KA41B4971

UberGo 9.3 kilometres | 53min(s)

16:07 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

17:00 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



18 July 2022

Here's your receipt for your ride, Harshita

We hope you enjoyed your ride this evening.

Total	₹288.60
-------	---------

Trip charge	₹297.79
-------------	---------

Subtotal	₹297.79
----------	---------

Booking fee	₹6.00
-------------	-------

Promotion	-₹15.19
-----------	---------

Before Taxes	₹268.62
--------------	---------

GST	₹19.98
-----	--------

Payments

Cash	₹288.60
------	---------

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Ashok S

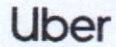
License Plate: KA13B9534

UberGo 9.3 kilometres | 40min(s)

16:10 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

16:50 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



13 July 2022

Here's your receipt for your ride, Bharat

We hope you enjoyed your ride this Afternoon.

Total	₹259.65
-------	---------

Trip charge	₹267.32
-------------	---------

Subtotal	₹267.32
Booking fee	₹6.00
Promotion	-₹13.67

Before Taxes	₹241.61
GST	₹18.04

Payments

Cash	₹259.65
------	---------

[Visit the trip page](#) for more information, including invoices (where available)

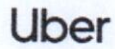
You rode with Shivanudra

License Plate: KA01AF4328

UberGo 13.66 kilometres | 44min(s)

15:45	15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India
16:29	2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



18 July 2022

Here's your receipt for your ride, Harshita

We hope you enjoyed your ride this morning.

Total	₹258.61
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Trip charge	₹250.20
-------------	---------

Subtotal	₹250.20
----------	---------

Rider promo	-₹9.65
-------------	--------

Booking fee	₹6.00
-------------	-------

Before Taxes	₹246.32
--------------	---------

GST	₹12.30
-----	--------

Amount Charged

Cash	₹258.61
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[Visit the trip page](#) for more information, including invoices (where available)

You rode with Kasif

License Plate: KA01AF3952

UberGo 9.3 kilometres | 44min(s)

11:04 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

11:40 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



25 July 2022

Here's your receipt for your ride, Bharat

We hope you enjoyed your ride this morning.

Total	₹285.13
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Trip charge	₹275.20
-------------	---------

Subtotal	₹275.20
----------	---------

Rider promo	-₹9.65
-------------	--------

Booking fee	₹6.00
-------------	-------

Before Taxes	₹271.55
--------------	---------

GST	₹13.57
-----	--------

Amount Charged

Cash	₹285.13
------	---------

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Nagendra G

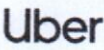
License Plate: KA51AA0677

UberGo 9.3 kilometres | 55min(s)

10:50 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

11:45 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



13 July 2022

Here's your receipt for your ride, Bharat

We hope you enjoyed your ride this morning.

Total ₹282.03

Trip charge ₹277.79

Subtotal ₹277.79

Booking fee ₹6.00

Promotion -₹15.19

Before Taxes ₹268.60

GST ₹13.43

Payments

Cash ₹282.03

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Afzal TM

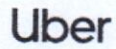
License Plate: KA13AB9890

UberGo 9.3 kilometres | 52min(s)

10:44 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

11:36 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



19 July 2022

Here's your receipt for your ride, Harshita

We hope you enjoyed your ride this morning.

Total	₹295.83
--------------	----------------

Trip charge	₹284.20
-------------	---------

Subtotal	₹284.20
----------	---------

Rider promo	-₹8.45
-------------	--------

Booking fee	₹6.00
-------------	-------

Before Taxes	₹281.75
--------------	---------

GST	₹14.08
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Amount Charged

Cash	₹295.83
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[Visit the trip page](#) for more information, including invoices (where available)

You rode with Narayana

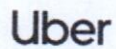
License Plate: KA01AD1756

UberGo 9.3 kilometres | 45min(s)

10:38 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

11:26 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



19 July 2022

Here's your receipt for your ride, Harshita

We hope you enjoyed your ride this evening.

Total	₹231.55
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Trip charge	₹235.20
-------------	---------

Subtotal	₹235.20
----------	---------

Rider promo	-₹9.65
-------------	--------

Booking fee	₹6.00
-------------	-------

Before Taxes	₹215.21
--------------	---------

GST	₹16.34
-----	--------

Amount Charged

Cash	₹231.55
------	---------

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Nagendra G

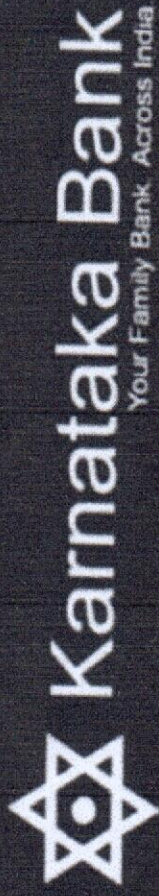
License Plate: KA51AA0677

UberGo 9.3 kilometres | 50min(s)

16:30 | 15, Pipeline Rd, Chowdeshwari Nagar, Prem Nagar, Laggere, Bengaluru, Karnataka 560058, India

17:20 | 2HJ8+VGR, 7th Main Rd, MSRIT, M S R Nagar, Mathikere, Bengaluru, Karnataka 560054, India

Fares are inclusive of GST. Please download the tax invoice from the trip detail page for a full tax breakdown.



Statement for A/c 1952500101981301 Between 21-08-2022 and 22-08-2022

Customer ID

195064979

Name

DHANASHREE B KHADGI

Address

D/O BHAGWATRAOVIKAS NAGAR 1ST MAIN 3RD

RANEBENNUR

KARNATAKA

INDIA

581115

Phone

919742792933

Email Id

VPA

Branch Code

656

Branch Name

RANEBENNUR

Address

D NO 1837, STATION ROAD,
RANEBENNUR, HAVERI DISTRICT

Phone Number

KARB0000656

IFSC Code

आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT. OF INDIA



स्थायी लेखा संख्या कार्ड
Permanent Account Number Card

GYLPK1910C

नाम/ Name

DHANASHREE KHADGI

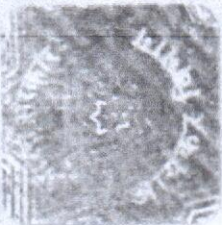
पिता का नाम/ Father's Name

BHAGWATRAO KHADGI

जन्म की तारीख / Date of Birth

05/09/1995

हस्ताक्षर/ Signature



30032018

इस कार्ड के खोने / पाने पर कृपया सूचित करें / लौटाएं :
आयकर पैन सेवा इकाई, एन एस डी एल
5 वीं मंजिल, मंत्री स्टर्लिंग, प्लॉट नं. 341, सर्वे नं. 997/8,
मॉडल कॉलोनी, दीप बंगला चौक के पास,
पुणे - 411 016.

*If this card is lost / someone's lost card is found,
please inform / return to :*

Income Tax PAN Services Unit, NSDL

5th floor, Mantri Sterling,

Plot No. 341, Survey No. 997/8,

Model Colony, Near Deep Bungalow Chowk,

Pune - 411 016.

Tel: 91-20-2721 8080, Fax: 91-20-2721 8081

e-mail: tininfo@nsdl.co.in

The 45th Series of Student Project Programme

Final Report

On

“Plastic waste management – Eco friendly plastic using organic waste”

Proposal Reference No. 44S_MBA_015

Sanctioned Budget: 7000/



Name of the Department & College:
Ramaiah College of Arts, Science and Commerce,
Department of management studies,
MSR Nagar, Mathikere,
Bengaluru – 560054.

Name of the Students:

1. Ms. Sreeparvathi.s - MB202445
2. Ms. Kavya Shetty - MB202420
3. Mr. Vishnu Darshan - MB202456

Name of the Guides:

1. Dr. Pallavi , Assistant professor
2. Dr. Bindu Nambiar, Dean department of management studies

Date of Commencement - April 26th 2022

Date of Submission – August 8th 2022

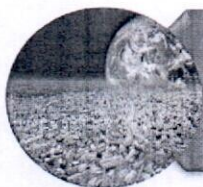
Introduction

In this current scenario most of the individual encounter various problems in their daily life such as weather, health etc. Today, the whole world is deeply concerned about the environment and its protection because environment protect us and ensures a healthy place for living. The environmental protection is of paramount importance. Even though it is undeniable that it provides various benefits for the society but at the same time overuse of plastic without knowing its consequences can have adverse effect too. People tend to engage in various activities without knowing its impact on the nature.

Recently, a study on Break Free From Plastic revealed that 4% of petroleum is used to make plastic and another 4% for its manufacturing process. This might sound little but the plastic waste production has increased from 1.8 to 400 million tons per year from 1950 to 2018. People are exposed to chemicals from plastic multiple times per day through the air, dust, water, food and use of consumer products. For example, phthalates are used as plasticizers in the manufacture of vinyl flooring and wall coverings, food packaging and medical devices. Eight out of every ten babies, and nearly all adults, have measurable levels of phthalates in their bodies

Government has already proposed the ban on plastic and now it is essential to have the alternatives for the products which are not bio degradable and eco-friendly. The world is facing a plastic crisis, the status quo is not an option. Plastic pollution is a serious issue of global concern which requires an urgent response from all relevant actors at different levels. As a citizen it is our responsibility to protect the environment and think about the sustainable future.





The Covid 19 outbreak has boosted the demand for single use plastic due to the inclusion of doorstep delivery



Less than 20% of waste is recycled and 60% of Plastic Waste Discarded In Landfills and Oceans .



Plastic Waste Can Affect The Quality Of Life, Health , Tourism and Even Our Economy

The recent COVID-19 pandemic has led to an increased demand for single-use plastic, intensifying pressure on this already out-of-control problem. When plastic disposed in the ocean, it slowly breaks down into microscopic fragments called micro plastics, that can also enter the ocean food chain and do a great deal of harm to marine species. 80% of the plastic that ends up in the ocean comes from land, causing problems in ocean food chain and affects the marine species. It is time to stop using plastic and creating awareness on non usage or minimal usage of plastic resulting in sustainability of the environment and that's why this team has come up with the idea of plastic waste management. The main intension of this project is to ensure the protection of the environment through an effective waste management system and promote, reduce and recycle process to convert left over plastic to eco- friendly plastic.

A significant amount of plastic garbage has been produced by the widespread use of plastic products. We must educate people about their applications and regular waste management as part of our way of life. Today, plastics are used more frequently in everyday activities, such as packaging of foods , cosmetics, pharmaceutical, and other manufacturing industries in order to convey goods to the public more effectively and safely. The biological process of polymerization or polycondensation is used to create plastics. It has a negative impact on environment if plastic usage is not limited.

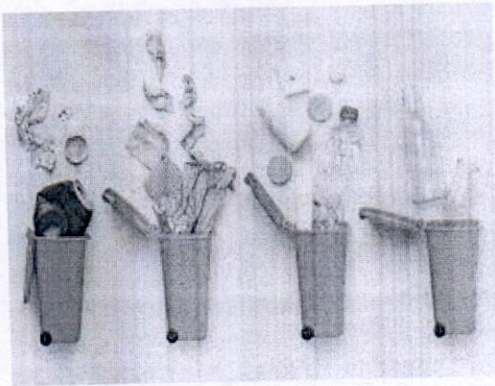


The "3Rs" (**reduce, reuse and recycle**) helps to save landfill space by keeping useful materials out. The amount of energy and natural resources needed to produce or collect the raw materials and manufacture the product are reduced.

Reduce means to cut back on the amount of trash we generate.

Reuse means to find new ways to use things that otherwise would have been thrown out.

Recycle means to turn something old and useless (like plastic milk jugs) into something new and useful (like picnic benches, playground equipment and recycling bins)

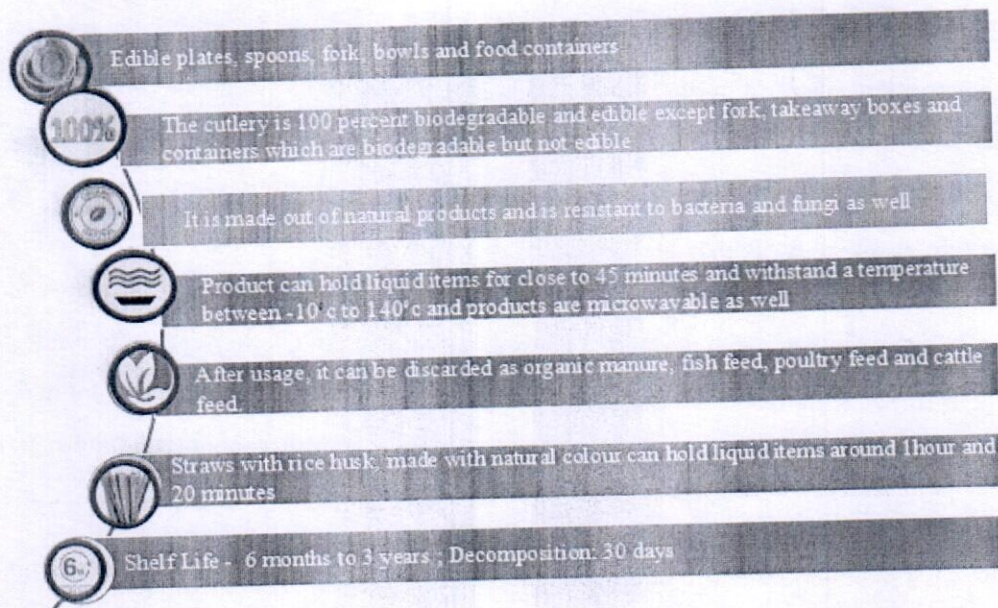


Recycling sounds like a great solution but it is inefficient in most of the cases because now the products are coming with different types of packaging with layers which makes decomposing a complex process. The collapse of recycling is primarily due to high contamination levels in the recycling stream. The public is throwing a lot of "garbage" in recycling bins. Contamination cripples the economics of recycling. 400 million tons of plastic is produced in every year. This has resulted a unimaginable consequences on the health of our planet. More than 50% of plastic that's produced every year is single-use (they are used once, or for a short period of time, before being thrown away) and less than one-fifth of the total plastic produced has been recycled. In the last 70 years, more than 8.3 billion tonnes of plastic have been produced and more than 80% of this has been discarded as waste. This makes having an efficient plastic waste management an absolute necessity.



As the government has proposed ban on plastic and plastic-based products. Currently, there are many substitute for plastic like wood, bamboo, paper etc but it is ineffective in most of the situations. Some food products cannot be packed or stored safely with these alternatives for example; straws with paper have less life. It can hold liquid substance for less than 20 minutes. (NVWA) recommends that melamine plastic tableware in which bamboo and / or maize fibers are processed should not be used (anymore). In Netherland, the food safety authority informs importers and suppliers of these products that they must immediately withdraw the products from the market. It is the time to think about an alternative or substitute for the plastic.

With a motive to shield the earth and make eating a responsible affair, we have come up with an idea of making plates with wheat bran. Even though there are many alternatives for the plastic, this idea helps to cut down the plastic usage to a greater extend. Millions of single-use cutlery end up in landfills every year after being used once. Through our initiative, we hope to put an end to plastic usage or improper waste management behaviour and increase public awareness. A range of plates, bowls, spoons, and straws made from natural wheat bran and rice bran. It has a longer shelf life and is fungus and bacteria resistant. They are biodegradable and partially edible. It is not necessary to eat the plate; if you throw it away, it decomposes into organic manure for the plants. After its use, these table wares can be used as cattle feed, fish feed, or poultry feed. The use of single-use plastic could be reduced to some extend by using this novel concept.



1. plates / Cutleries/ Compartment plates/Delivery boxes from wheat bran

- Eco – friendly
- Biodegradable
- Edible
- Fungus and bacteria - resistant

2. Straws from Husk

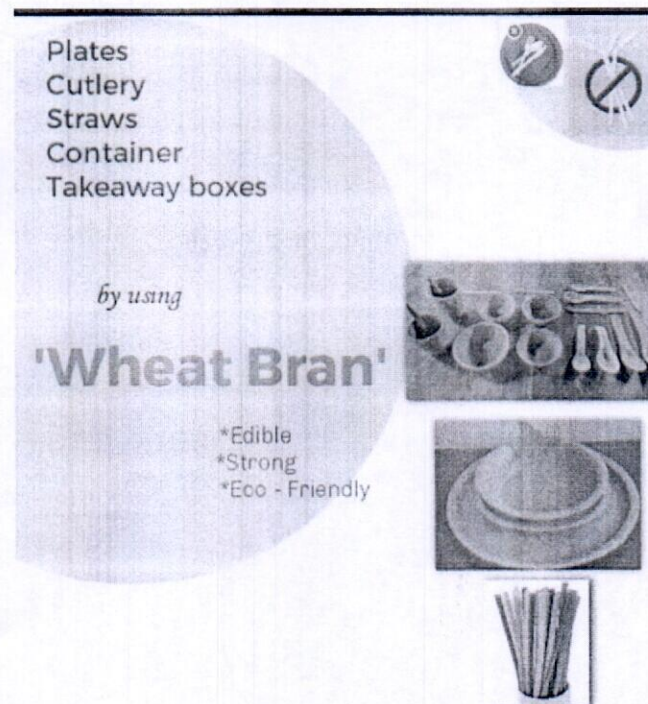
- Natural colour
- More life
- Strong
- Edible

By using the husk (the waste from rice mill) edible, compostable straws can be produced. Recently, paper straw has introduced as a substitute for plastic straws. They soften quickly and uncomfortable for drinking purposes. Due to the wax coating, decomposing is bit hard.

The straws with husk can last for 1 hour 20 minutes and easy to have all drinks. Once its used, it can be either consumed, or can be used as a fertilizer, fish feed etc. These straws are made with natural colour and easy for decomposing.

After the data collection and detailed analysis , it is evident that huge volume of plastic waste is produced from food packaging, plastic cups, plates and so on so forth. By using the same modus operandi along with advanced technology , **cutleries, container box, takeaway boxes, compartment plates** etc can be produced as a part of the initiative too.

- Not edible
- 6 months life time
- Compostable

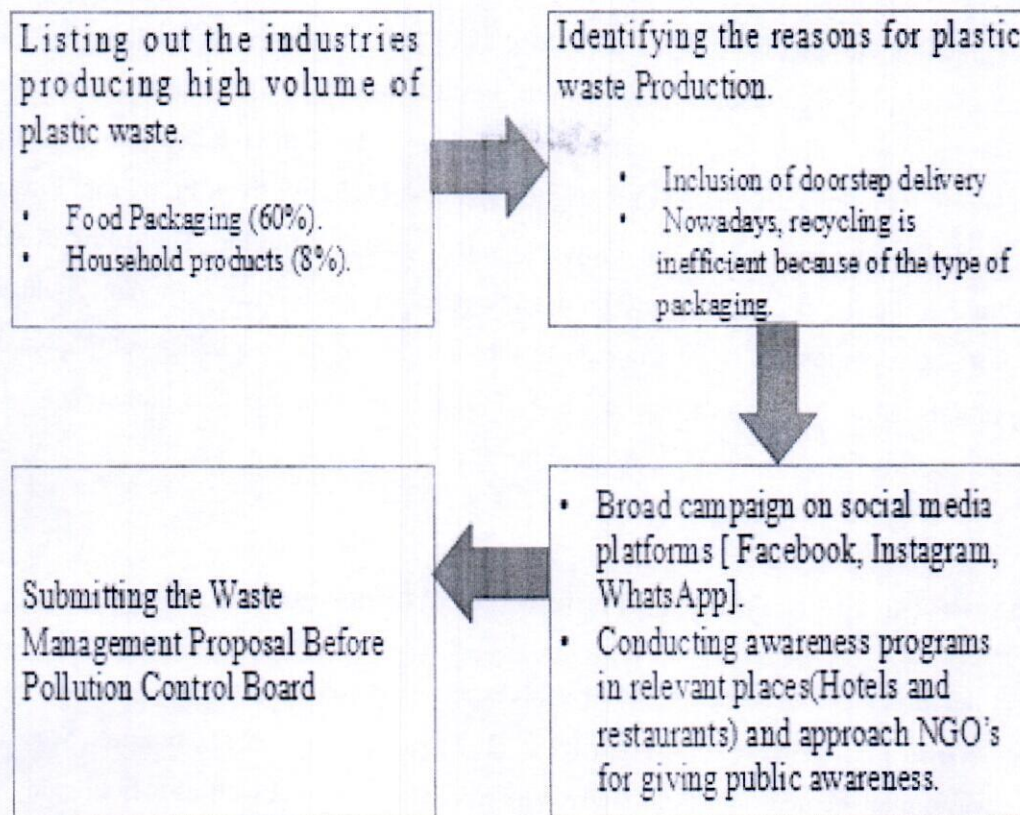


Work Plan

STATUS	MONTHLY SCHEDULE	DESCRIPTION
✓	April 26 th – April 30 th	Collected data on plastic waste management from internet
✓	May 1 st – May 12 th	Conducted a field study to understand the reason for increase in plastic waste and its impact.
✓	May 13 th – till date	Giving awareness using Social media tools such as Facebook, Instagram and WhatsApp
✓	May 20 th – June 3 rd	Broad Campaign in Hostels , restaurants and residential areas
✓	July 11 th	Approached NGO's for spreading awareness
✓	August 6 th	Submitting the proposal on the pollution control board



Procedure



In this study, the problems caused by the inadequate processing of plastic and improper waste management was identified by conducting various research and field study. This study also aims to provide with the possible solutions to ensure a healthy place for living.

1. Listing out the plastic producing industries

The first step is to finding the industries that produces high amount of plastic waste. Book, journals, internet etc are the sources used to collect the information. Packaging was the dominant use of primary plastics, with 42 % of plastics entering in the use phase. Building and construction was the second largest sector utilizing 19 % of the total. Recently a brand audit exercise has conducted and it was designed and developed by Break Free From Plastic , it was a global movement envisioning a future free from plastic pollution. The study revealed that the use of plastic packaging material has increased over the years particularly with the growth of e-com companies, with Amazon leading the list. Among product companies, the leading brands which use a lot of plastic material to package their products include Unilever, Coca Cola, Reckitt Benckiser, ITC and Britannia.

2. Identifying the reason for plastic waste production

After collecting data from web and other sources, the next step is to identify the reasons for the increase in plastic waste. From April 26th 2022 to May 12th 2022 research was done plastic waste management and field study. The Secondary data as well as a field study was carried out in order to find out the reasons behind this cause. The team had public interactions in various places in Karnataka and the inputs from the study helped us to take the project forward. It was identified that during pandemic, the inclusion of doorstep delivery by most of the companies, added with new streams of plastic waste. 60% waste is produced from food packaging and 8% from households . Rest 32% of waste is produced from cosmetics, pharmaceutical etc. Since, the major contribution of waste is from food industry the project mainly focused in that arena.





E-delivery business has witnessed a significant rise during pandemic. With social distancing in force, people are now switching towards online shopping for essentials, medicines, groceries, and other products. No doubt, today, the online business is booming, and logistic industries are also growing as they offer job opportunities to the individuals in the delivery sector. Foods are packing with different material and plastic can be avoid only to certain extend because of the lack of substitute and nature for product. Hence the waste management is a difficult process now a days.



KNOW
Practice
WHERE
Proper
IT SHOULD
Waste
GO!
Segregation



Just say 'NO' to plastic
Think, act & save

3. Broad Campaign

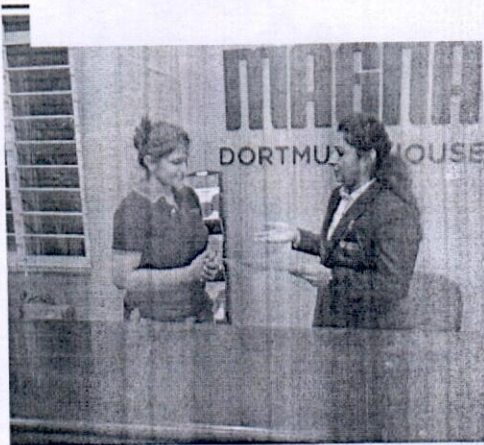
As the part of this project, we conducted the campaign in several places in Bangalore city (mathikere, kormangala, indiranagar) and given awareness on managing the plastic waste. we shared the poster in social media platforms like instagram, whatsapp facebook etc from may 13th 2022 – till date. Campaign through Digital platform helped us to have more reach and received positive feedback and support. The main aim of the campaign is to provide awareness to the public about plastic waste management and familiarizing **wheat bran** products as an substitute for plastic. In addition , we visited the restaurants, residential areas, hostels etc to know about their waste management.



Venue : Thalassery Restaurant, Mathikere



Venue:Al-bek, Kormangala



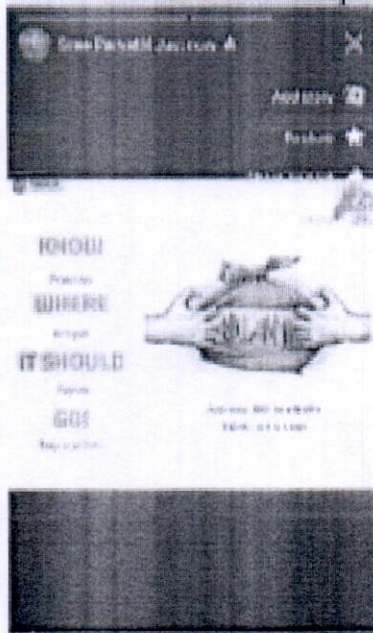
Venue : Stanza living hostel, indiranagar



venue : Clubhouse cafe, whitefeild



Campaign on social media platforms

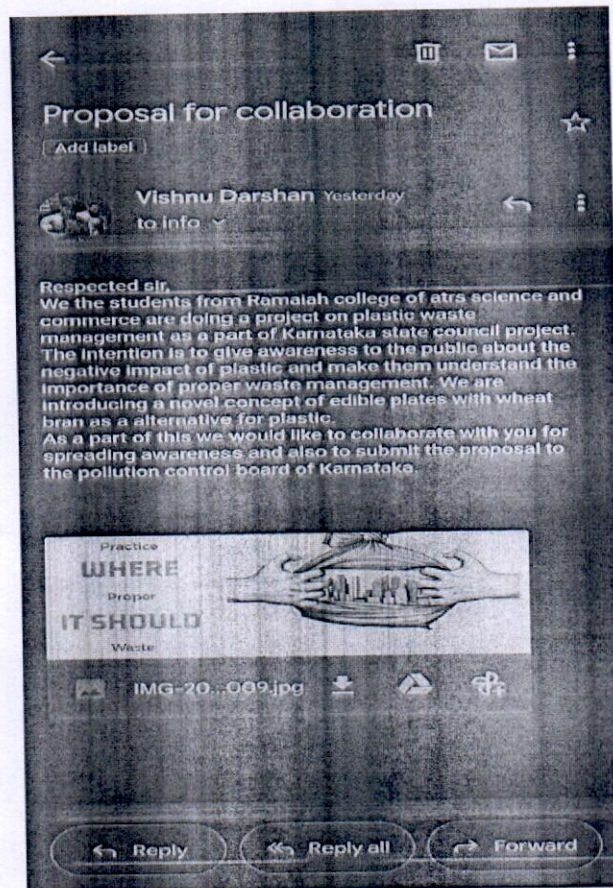


Outcome of the study.

In the process of the project it was identified catering units and takeaway restaurants are unaware of alternative packaging material other than plastic. The packaging must be capable of portability, storage, rigidity and hygiene. Thus they don't adhere to the plastic usage norms. An interesting find of this study was that in the Hostels with about 57 residents, 30kg of plastic waste is generated in a day which includes online orders, usage of highly packed food. The magnitude of the plastic waste is enormous.

4. Approaching Ngo

We have collaborated with NGO organization in Bangalore- Aahwahan Foundation for spreading awareness to the public and to receive more reach for this novel concept. They helped us to reach to more people and also provided with valid inputs for approaching the pollution control board .





5. Submitting the proposal

Eventually, we approached the Karnataka pollution control board for the submitting the proposal. In the request we enclosed all the details, data , statistics of the study. We hope through this initiative the aim of this project can be achieved and also this novel concept receives a mass reach and used widely.

Respected sir,
We are the Students from Ramaiah college of Arts Science and Commerce . As a part of Karnataka State Council for Science and Technology , we have done a project on "Plastic Waste Management". In reference to that, we have done a field study.

For this we also have approached NGO Aahwahan foundation bangalore.
The purpose of this project is only to protect environment and promote reusables and recycles.

We wanted to spread awareness to the public about the negative impact of plastic and also to introduce them an alternative solution a novel concept ie., "Wheat Bran Plates" and Straws . This alternative is currently existing in few places but it's not widely used and most of them are unaware of this Alternative.

The brief details regarding these alternatives in a PDF format is enclosed herewith this email. We would like to submit the proposal. Kindly we are requesting you do the needful.

Yours faithfully
Sreeparvathi.s



waste management .pdf





Conclusion

The goal is to provide a replacement for the current disposable plastic utensils on the market. People tend to engage in various activities without knowing the negative impact of plastic.

Through this initiative we hope to put an end to this behaviour and increase public awareness on waste management and impact of plastic waste. Wheat bran based disposal products are Eco-friendly and biodegradable. This is an effective response to the plastic waste threatening the environment. The use of single-use plastic can be reduced to some extent.

Let us join our hands to make the future a better place for living.



ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ಮಂಡಳಿ

Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone : 080 - 2334 1652, 2334 8840, 2360 0978

Email: spp@kscst.org.in || Website: www.kscst.iisc.ernet.in/spp.html or www.kscst.org.in/spp.html

45th series SPP: Synopsis Submission

Your response has been recorded.

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Google Forms

Mr. H. Hemanth Kumar
Executive Secretary

11th May, 2022

Ref: 7.1.01/SPP/91

The Principal,
Ramaiah College of Arts Science and Commerce,
MSR Nagar, MSRIT Post,
Bangalore - 560 054

Dear Sir/Madam,

Sub : Sanction of Student Project - 45th Series: Year 2021-2022

Project Proposal Reference No. : 45S_MBA_071

Ref : Project Proposal entitled **PLASTIC WASTE MANAGEMENT - ECOFRIENDLY PLASTIC USING ORGANIC WASTE**

We are pleased to inform that your student project proposal referred above, has been approved by the Council under "Student Project Programme - 45th Series". The project details are as below:

Student(s)	Ms. SREE PARVATHI	Department	MANAGEMENT STUDIES
	Ms. KAVYA SHETTY		
	Mr. VISHNU DARSHAN		
	Mr. NIKHIL LIJI CHAKO		
Guide(s)	Dr. PALLAVI	Sanctioned Amount (in Rs.)	7,000.00
	Dr. BINDU NAMBIAR		

Please find the expenses incurred for the project below.

Allocated budget: Rs 7000/-

Total expense:

Particulars	Amount
Travel expense	5,085/-
Banners	2,000/-
Colour printout	3,190 (3,094)
Stationary	305/-
Total	10,484/-

(Rupees Ten Thousand Four Hundred Eighty Four only)



Karnataka State Council for Science and Technology

(An autonomous organisation under the Dept. of Science & Technology, Govt. of Karnataka)

Indian Institute of Science Campus, Bengaluru – 560 012

Telephone: 080-23341652, 23348848, 23348849, 23348840

Email: office.kscst@iisc.ac.in, office@kscst.org.in ♦ Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Mr. H. Hemanth Kumar

Executive Secretary

Ref: 7.1.01/SPP/91

11th May, 2022

The Principal,
Ramaiah College of Arts Science and Commerce,
MSR Nagar, MSRIT Post,
Bangalore – 560 054

Dear Sir/Madam,

Sub : Sanction of Student Project - 45th Series: Year 2021-2022

Project Proposal Reference No. : 45S_MBA_071

Ref : Project Proposal entitled **PLASTIC WASTE MANAGEMENT - ECOFRIENDLY PLASTIC USING ORGANIC WASTE**

We are pleased to inform that your student project proposal referred above, has been approved by the Council under "Student Project Programme - 45th Series". The project details are as below:

Student(s)	Ms. SREE PARVATHI	Department	MANAGEMENT STUDIES
	Ms. KAVYA SHETTY		
	Mr. VISHNU DARSHAN		
	Mr. NIKHIL LIJI CHAKO		
Guide(s)	Dr. PALLAVI	Sanctioned Amount (in Rs.)	7,000.00
	Dr. BINDU NAMBIAR		

Instructions:

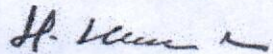
- The project should be performed based on the objectives of the proposal submitted.
- Any changes in the project title, objectives or students team is liable for rejection of the project and your institution shall return the sanctioned funds to KSCST.
- Please quote your project reference number printed above in all your future correspondences.
- After completing the project, 2 to 3 page write-up (synopsis) needs to be uploaded on to the following Google Forms link <https://forms.gle/YMn9K7XETu96i8KbA>. The synopsis should include following:
 - Project Reference Number
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords
 - Introduction / background (with specific reference to the project, work done earlier, etc) - about 20 lines
 - Objectives (about 10 lines)

- 8) Methodology (about 20 lines on materials, methods, details of work carried out, including drawings, diagrams etc)
- 9) Results and Conclusions (about 20 lines with specific reference to work carried out)
- 10) Scope for future work (about 20 lines).
- e) In case of incompeted projects, the sanctioned amount shall be returned to KSCST.
- f) The sanctioned amount will be transferred by NEFT to the bank account provided by the College/Institute.
- g) The sponsored projects evaluation will be held in the Nodal Centre/Online Mode and the details of the same will be intimated shortly by email / Website announcement.
- h) After completion of the project, soft copy of the project report duly signed by the Principal, the HoD, Guide(s) and student(s) shall be uploaded in the following Google Forms Link <https://forms.gle/PciAaAVisn6bn8AM7>. The report should be prepared in the format prescribed by the university.

Please visit our website for further announcements / information and for any clarifications please email to spp@kscst.org.in

Thanking you and with best regards,

Yours sincerely,



(H. Hemanth Kumar)

Copy to:

- 1) The HoD
MANAGEMENT STUDIES
RAMAIAH COLLEGE OF ARTS SCIENCE AND COMMERCE, BENGALURU
- 2) Dr. PALLAVI
MANAGEMENT STUDIES
RAMAIAH COLLEGE OF ARTS SCIENCE AND COMMERCE, BENGALURU
Dr. BINDU NAMBIAR
- 3) THE ACCOUNTS OFFICER
KSCST, BENGALURU

CASH BILL

Mob : 9901795799

BHAGYALAKSHMI ENTERPRISES

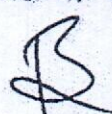
XEROX, Colour Xerox, Lamination, Spiral Binding & All Types of Stationaries

Near Bank of Baroda, Chikkabanavara, Bangalore - 560 090.

No. **892**

Date: **20/5/22**

M/s:

Sl.No.	PARTICULARS	QTY	RATE	AMOUNT
1	Colour printout & Xerox	200		1750/-
BHAGYALAKSHMI ENTERPRISES				
 Proprietor			Total	1750/-

For **BHAGYALAKSHMI ENTERPRISES**



Thu, May 26, 01:14 PM
CRN 6529207248



PRAVEEN L

You rated ★ ★ ★ ★ ★



Auto • RE Compact Plus



₹ 382

01:18 PM

● #1, 1st Main Rd, Tavarekere, Chikka
Adugodi, S.G. Palya, Bengaluru

02:41 PM

● Ramaiah Memorial Hospital, New BEL
Road M S Ramaiah Nagar MSRIT Po...

Bill Details

Ride Fare

₹ 267.75



USE COUPON

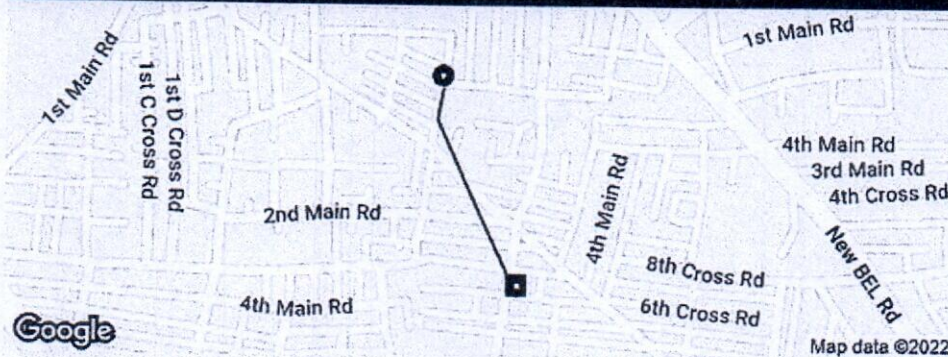


MAIL INVOICE



SUPPORT

Trip Details



1/6/22, 9:04 am

₹92.00

Add a tip

Cash

6th Cross Rd, Chikkamaranahalli,
M S R Nagar, Mathikere,
Bengaluru, Karnataka 560054,
India

Shop No: 443, 6th Cross Rd, M S
Ramaiah Nagar, Mathikere,
Bengaluru, Karnataka 560054,
India

Receipt



Your ride with Prathapa



Find Lost Item

We can help you get in
touch with your driver

8:29 PM

0.0KB/s

4G LTE 51%



Order Details



Service Type

Auto

Date of Ride

May 24th 2022, 12:12 PM

Ride ID

RD16579537441825464



ravi Rao

You rated ★★★★★

Fare

₹ 314.0

Paid By

UPI



Earned 15 coins (Expires on 23 Jul 2022)

17.31 km
DISTANCE

69.0 mins
DURATION



#5 vishwas complex near keb office msr road matt...



40, 2nd Main Rd, Tavarekere, Main Road, Bengaluru...

Support

Invoice

Ride Charge

₹ 293.66

Booking Fees & Convenience Charges

₹ 35.34

Discount

- ₹ 15.0

10:39



Thu, Jun 02, 04:26 PM

CRN 6579371515



Suresh M

You rated ★ ★ ★ ★ ★



Mini • White Ritz



₹ 386

- 04:26 PM • 15, near Ashoka Residency, Venkappa Garden, Ejipura, Bengaluru, Karnataka...
- 04:59 PM • Da Comforts girls pg, 14th Cross Road AGS Layout Dollars Colony R.M.V. 2n...

Bill Details

Your Trip ₹ 385.57

Rounded Off ₹ 0.44

Total Bill ₹ 386

Includes ₹27.23 Taxes

Total Payable ₹ 386

Payment

Cash ₹ 386



USE COUPON



MAIL INVOICE



SUPPORT



Order Details



Service Type

Auto

Date of Ride

May 24th 2022, 07:21 PM

Ride ID

RD16564242906692141



M NAYAZ KHAN

You rated ★★★★★

Fare

₹ 342.0

Paid By

Cash

16.15 km
DISTANCE60.0 mins
DURATION

41, 1, 9th Cross Rd, Tavarekere, Maruti Nagar, 1st St...

No. 421, 1st Floor, 3rd Main Road, Mathikere, Near...

Support Invoice

I have been charged higher than the estimated fare

Ride Safety

Billing Related Issues

I want to report an issue about the Captain/Ride

9:27

81



Thu, May 26, 11:07 AM
CRN 6503377808



Santhosh G

You rated ★ ★ ★ ★ ★



Auto • RE Compact Plus



₹ 293

11:08 AM

MSR Hospital Parking Front side, MS Ramaiah Hospital Bangalore

11:52 AM

1st Main Road, Bharathi Layout Thavarekere S.G. Palya Bengaluru K...

Bill Details

Ride Fare

₹ 250.12



USE COUPON



MAIL INVOICE



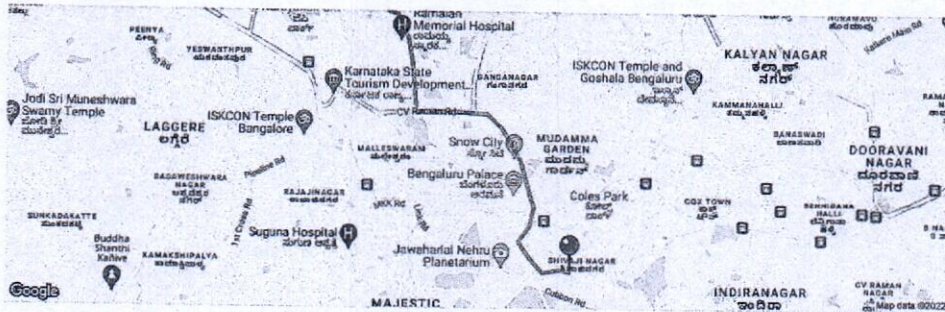
SUPPORT

11:28 M

VoLTE 4G



Thu, May 26, 06:32 PM
CRN 5662731469



You rated ★ ★ ★ ★ ★



Prime Sedan • Grey Etios



₹ 496

- 06:32 PM • No01 hkp Road, near Chandni Chowk, Sulthangunta, Shivaji Nagar, Bengalur...
- 07:12 PM • 141a, 7th Cross Road, M S R Nagar Mathikere Bengaluru Karnataka India

Ride Benefits



Ride insurance at ₹2
[Email My Policy](#)



Emergency Health Pack @ ₹8
[Email My Policy](#)

Bill Details



[USE COUPON](#)



[MAIL INVOICE](#)



[SUPPORT](#)

1:58 0 KB/s

VoLTE R 73%

← Tue, May 24, 04:33 PM
CRN 6570814065



Shivaraj arjunagi

You rated ★ ★ ★ ★ ★



Prime SUV • White Ertiga Tour M



₹ 867

04:33 PM • 82-84, 7th Cross Rd,
Venkateshwara Layout, S.G. Palya...
05:25 PM • 387, 4th Cross Road
Chikkamaranahalli M S R Nagar ...

Ride Benefits



Emergency Health Pack @ ₹8
Email My Policy

Bill Details



USE COUPON



MAIL INVOICE



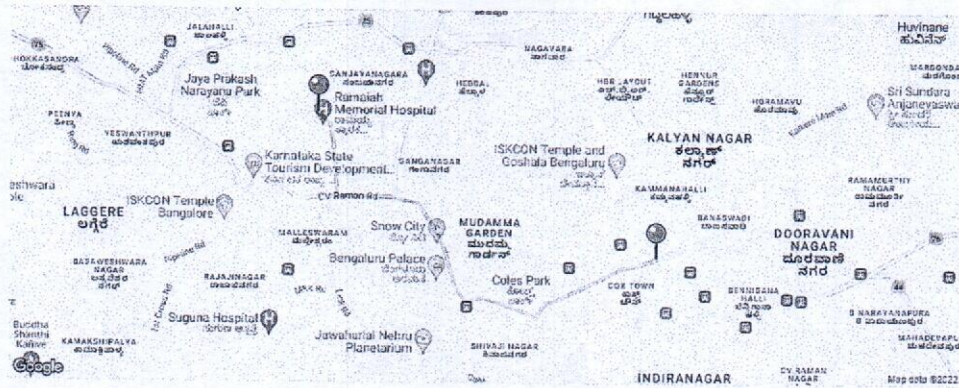
SUPPORT

11:28 AM



Thu, May 26, 04:17 PM

CRN 5189209381



You rated ★ ★ ★ ★ ★



Mini • Red Swift



₹ 421

- 04:22 PM • 26, 3rd Cross Rd, Venkateshwara Layout, ITI Layout, Mathikere, Bengal...
- 04:56 PM • Notary office, near mukunda theater Sathya Nagar Banaswadi Bengal...

Ride Benefits



Ride insurance at ₹2

[Email My Policy](#)



Emergency Health Pack @ ₹8

[Email My Policy](#)



[USE COUPON](#)



[MAIL INVOICE](#)

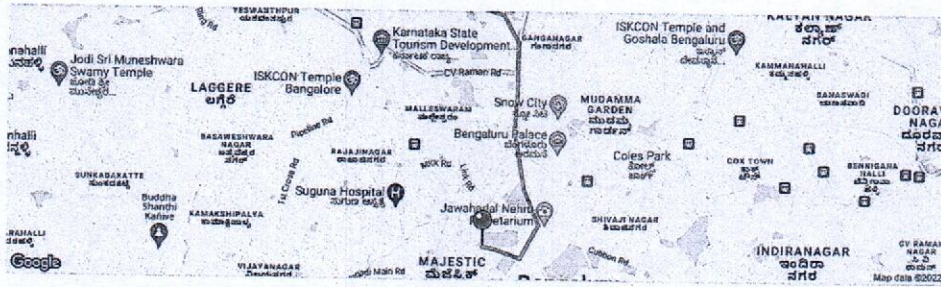


[SUPPORT](#)

11:28 M



Wed, Jun 01, 05:39 PM
CRN 5527816139



You rated ★ ★ ★ ★ ★



Prime Sedan • White Etios



₹ 316

- 05:39 PM • Ananda Rao Circle, Racecourse, Gandhi Nagar, Bengaluru, Karnataka 560001, ...
- 06:15 PM • 141, 7th Cross Road M S R Nagar Mathikere Bengaluru Karnataka India

Ride Benefits



Ride insurance at ₹2
[Email My Policy](#)



Emergency Health Pack @ ₹8
[Email My Policy](#)

Bill Details



USE COUPON



MAIL INVOICE



SUPPORT

1:58 KB/s

73%



Tue, May 24, 09:37 PM
CRN 6570427598



Yogesh S R

You rated ★★★★★



Prime SUV • Grey Ertiga



₹ 856

- 09:52 PM • 387, 4th Cross Road
Chikkamaranahalli M S R Nagar D...
- 10:36 PM • Srinivasa Theatre, DRC Post
Venkateshwara Layout S.G. Paly...

Ride Benefits



Emergency Health Pack @ ₹8
Email My Policy

Bill Details



USE COUPON



MAIL INVOICE

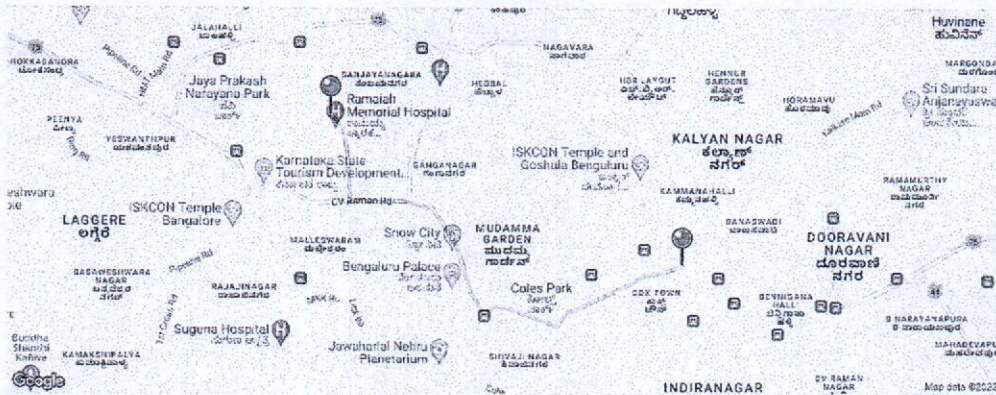


SUPPORT



Mon, May 30, 04:17 PM

CRN 5189209381



You rated ★ ★ ★ ★ ★



Mini • Red Swift



₹ 320

- 04:22 PM • 26, 3rd Cross Rd, Venkateshwara Layout, ITI Layout, Mathikere, Bengal...
- 04:56 PM • The Sandwich, Ramaswamipalaya Banaswadi, Bengaluru, 560033

Ride Benefits



Ride insurance at ₹2

[Email My Policy](#)

Emergency Health Pack @ ₹8

[Email My Policy](#)[USE COUPON](#)[MAIL INVOICE](#)[SUPPORT](#)

भारतीय स्टेट बैंक

Savings Bank Account

CLF No : 90226011154
Account No : 38125741800

Customer Name: Mr. KAVYA B P

S/D/W/H/o: D/O PRAKASH B M

Address: #123 MOGGADA BEEDHI BELLUR HOBLI
NAGAMANGALA TQ
MANDYA DIST.

Phone:

Email:

D.O.B. (If Minor):

MOP.: SINGLE

Nom. Reg. No.:



State Bank of India

BELLURCROSS

NO 338, YALADALLY ROAD.

Phone: 287001

Email: bellurcross@sbi.co.in

Branch Code: 40896

Date of Issue: 13/12/2018

13/12/2018 6271995 40896

IFSC: SBIN0040896

MICR: 571002540

Branch Manager

CONTINUATION



Mr. H. Hemanth Kumar
Executive Secretary

11th May, 2022

Ref: 7.1.01/SPP/91

The Principal,
Ramalah College of Arts Science and Commerce,
MSR Nagar, MSRIT Post,
Bangalore - 560 054.

Dear Sir/Madam,

Sub : Sanction of Student Project - 45th Series: Year 2021-2022

Project Proposal Reference No. : 45S_MBA_072

Ref : Project Proposal entitled **TREATMENT OF AGRICULTURE WASTE WATER USING BIO ADSORBENTS**

We are pleased to inform that your student project proposal referred above, has been approved by the Council under "Student Project Programme - 45th Series". The project details are as below:

Student(s)	Ms. KHADAGI DHANASHRI BHAGAVATRAO	Department	MANAGEMENT STUDIES
	Ms. BHOOMIKA B BILGAR		
	Ms. KATTA ADI SAI HARSHITHA		
	Mr. BHARATH KUMAR S		
Guide(s)	Dr. PALLAVI	Sanctioned Amount (in Rs.)	8,000.00
	Dr. BINDU NAMBIAR		

Please find the expenses incurred for the project below.

Allocated budget: Rs 8000/-

Total expense:

Particulars	Amount
Equipments, Chemicals, and laboratory and labour charges	7000
Travel	2150
Miscellaneous	2000
Total	11,150/-

(Rupees Eleven Thousand One Hundred Fifty only)

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

Website: <http://www.kscst.iisc.ernet.in/spp.html> || Email: spp@kscst.iisc.ernet.in || Phone: 080-23341652, 23348840/48/49

44th Series of Student Project Programme: 2020-21

List of Student Project Proposals Approved for Sponsorship

1. M.S. RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE, BENGALURU

S. No.	PROJECT REFERENCE No.	PROJECT TITLE	BRANCH	COURSE	NAME OF THE GUIDE(S)	NAME OF THE STUDENT(S)	SANCTIONED AMOUNT (IN Rs.)	Report softcopy Received
99.	44S_MBA_015	ICT- A SUBSTITUTE FOR OFFLINE EDUCATION IN RURAL EDUCATION DEVELOPMENT	MASTER OF BUSINESS ADMINISTRATION	M.B.A.	Dr. CHAKRAPANI GOPAL Mr. MAHESH PAI G	Mr. ABHISHEK B R Ms. HARIKA S Ms. SREEREKHA T R	7000.00	NO
00.	44S_MSC_050	SAPONINS AS NATURAL SANITIZER/DISINFECTANT AND ITS AUTOMISED APPLICATION IN EDUCATIONAL ARENAS FOR COVID MANAGEMENT	BIOCHEMISTRY	M.Sc	Dr. M. VIDYA	Ms. TANISHA RATHORE Ms. SANJANA C SHEKAR	7000.00	YES
01.	44S_MSC_051	GENERATION OF GREEN ELECTRICITY FROM NANOPARTICLE MEDIATED MICROBIAL FUEL CELL	BIOCHEMISTRY	M.Sc	Dr. R.PRASHANTHI Dr. AMARNATH SATHEESH	Ms. MAREPALLI DIVYA Ms. PUNYASHREE RAJ Ms. PADMASHREE H P	7000.00	YES
02.	44S_MSC_053	IMPLEMENTATION OF TASAR SILKWORM PUPAE (ANTHRAEA MYLITTA DRURY) AS AN ALTERNATIVE NEW SOURCE OF DIETARY PROTEIN FOR ANIMAL FEED	BIOCHEMISTRY	M.Sc	Mrs. RAMYA KUMARI B S Dr. GEETIKA PANT	Ms. VIDYA.V.R. Ms. SANGITA DAS	6000.00	YES
03.	44S_MSC_056	A COMPARATIVE STUDY OF NATURAL COAGULANT MUSA ACUMINTA (BANANA STEM), BRASILIOPUNTIA BRASILIENSIS (CACTUS) AND MORINGA OLEIFERA (DRUMSTICK) EXTRACT ON WASTE WATERS WITH THAT OF A CHEMICAL COAGULANT POTASH ALUM.	MICROBIOLOGY	M.Sc	Dr. PRASANNA SRINIVAS.R Dr. MANJUNATH.A.S	Mr. AKHIL R NADHAN Mr. MD ILIYAS Mr. NAGESH K H	6000.00	NO

te:

- Transaction details of sanctioned amount of Rs. 33000/- credited on 28th May 2021 by NEFT DR- P148210110028880-MS RAMAIAH COLLEGE BLORE-BARB0VJMSRI- BLR IISc.

To

The Co-ordinator,
KSCST SPP project,
RCASC
Bangalore.

Dear Sir,

Please find below the statement of expenses that was incurred by the students for the completion of their research project in KSCST SPP 2021. The project undertaken was “ ICT a substitute for offline education in Rural Education Development” by students Sreerekha, Abhishek and Harika S (2019-21 MBA).

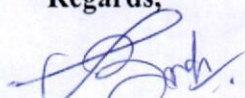
KSCST SPP 2021.

STATEMENT OF EXPENSES FOR THE RESEARCH PROJECT STUDY

PARTICULARS	AMOUNT
FIELD STUDY	3,000.00
RESEARCH	1,800.00
FEASIBILITY STUDY EXPENSES	1,200.00
PRINTING CHARGES	600.00
TRAVEL	900.00
INTERNET CHARGES	400.00
TOTAL	7,900.00

Please do the needful.

Regards,



Dr. Bindu Nambiar

Dean- Management studies

M S RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE
KSCST Project fund list

SL No	Amount	Name	A/c No	IFSC CODE	Name of the Bank
0001	7000	Abhishek B R	29150110029664	UCBA0002915	UCO BANK , Bellary
0002	7000	Tanisha Rathore	0499010657679	PUNB0049920	Punjab Nantion Bank , Bangalore Urban
0003	7000	Marepalli Divya	21021010005475	UBIN0821021	Union Bank of India, Balasamudram Kakkanti , AP
0004	6000	Vidya V R	17400100080269	FDRL0001740	The Federal Bank Ltd, Puthoor
0005	6000	Akhil R Nadhan	1909101027422	CNRB0001909	Canara Bank ,Chelannur

33,000.00
CH NO 000025
19.10.2021

[Handwritten Signature]
29/10/21



22/10/21

“ICT – A Substitute For Offline Education In Rural Education Development”

44S_MBA_015

**Name of the Students : 1. Mr. Abhishek BR
2. Ms. Harika S
4. Ms. Sree rekha T R**

**Project guide : 1. Dr. Chakrapani Gopal
2. Mr. Mahesh Pai G**

Department : Management Studies

Name of the College : MS Ramaiah College of Arts, science & commerce

Introduction / Problem definition

Even though we are one nation, we still continue to have a rural-urban divide in every aspect and education also falls in that sphere. The wide gap coming in between rural and urban education can be witnessed in many ways. The gaps can be witnessed in various ways. While the teaching methodology in rural schools is still primitive, the urban schools are keen on adopting modern ways of teaching like concept learning and focus on development of each student.

- Dearth of adequate number of schools.
- Lack of pocket-friendly educational institutions
- Inadequate infrastructure

Objectives

Implementation of upgraded system of imparting education in rural areas.

Utilizing the integrated marketing techniques(video conferencing, online surveys for testing, etc) to improve the process of education.

Optimization of growth parameters for imparting education with latest technology.

- Utilizing the 3D images or videos of topic to help students inculcate better techniques of learning

Methodology

Identifying the gap between the traditional way and latest way of imparting education and further implementing the digitalization techniques.

Identification of the platforms which are helpful in imparting education to the students in an easy manner.

Inculcating the 3D models of the objects related to topics to help the students grasp better.

Optimization of the projectors for presenting the 3D models for easier learning -process.

Captivating the improved technologies like virtual reality to provide the students a better understanding.

Implementation

- ❑ Infrastructure procurement issues due to Pandemic
- ❑ Equipment Supply chain road block
- ❑ Movement issues for implementation

Results

- Faster and easier way of learning and imparting education to the students in the rural areas.
- The students grasp the topic by the practical exposure gained through the digitalization of the educational practices and implementation of newer technology.
- Implementation of the latest technology to impart education will result in increased performance when compared to the traditional method of imparting the education and knowledge.

Applications, Advantages, Disadvantages in the project

- ☐ Utilising the modern technologies to impart education was a major challenge as the implementation and installation required a huge amount of knowledge.
- ☐ Finding students for imparting education through modern technology has been a greater challenge to the project.
- ☐ Utilising the modern and upgraded technology would be at a greater advantage to the students in learning and implementing it practically.

Potential for Future Work / Scope of Commercialization

A total of 15% of increase in performance can be seen through a survey conducted from different students in and around Ballari.

The Virtual Reality will help the students to understand the topics to the best of their knowledge through practical exposure.

Implementation of Augmented reality will further help the students to gain knowledge about the topics in easier way.

Implementing both AR and VR together can also be the future of imparting education to the students in a very convenient way.

Conclusion

- The Virtual Reality will help the students to understand the topics to the best of their knowledge through practical exposure.
- Implementation of Augmented reality will further help the students to gain knowledge about the topics in easier way.
- Implementing both AR and VR together can also be the future of imparting education to the students in a very convenient way.

The 45th Series of Student Project Programme

Final Report on

**TREATMENT OF AGRICULTURE WASTE WATER USING BIO
ADSORBENTS**

Project Reference No: 45S_MBA_072

Sanctioned Budget: 8000Rs.

Ramaiah College of Arts, Science and Commerce, Bangalore.

Department of Management Studies

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Introduction

Water pollution is a global Challenge that has become more prevalent in both developed and developing nations, threatening both economic progress and the physical and environmental health of billions of people.

The three primary causes for the water pollution are human settlements, industries and agriculture. Each year industries dump tons of waste into the water bodies while 80% of municipal waste goes untreated.

Environmental pollution is mainly due to rapid industrialization. It is a demanding problem for maintaining the quality and cleanness of water. The discharges of industrial wastes into aquatic bodies are a great threat to the aquatic life, human health and other living organisms. It is a matter of great importance due to their toxicity and after effects. Agricultural waste water is primarily the excess water that runs off the field at the low end of furrows, border strips, basins, and flooded areas during surface irrigation. This waste water is also referred to as irrigation tailwater. A certain amount of tailwater runoff is necessary to ensure adequate penetration of water along the length of the furrow or border strip being irrigated and to achieve an irrigation efficiency.

Another source of agricultural waste water is effluent from plants processing crops harvested from the field and those preparing processed food, operated by and for farmers, usually in centralized facilities. These facilities generate considerable amounts of agricultural/industrial waste water, typically containing high concentrations of pesticides which contain chemicals like phosphorus, arsenic, chromium, cobalt and many other chemicals.

Objectives:

1. To study the efficiency of the rice husk in removal of the pesticides from waste water.
2. To compare the efficiency of the activated charcoal and rice husk in removal of the pesticides from waste water.
3. To study whether the water is potable after refining.

Necessity for the treatment

- The farmers use pesticides, fungicides, fertilizers directly on the farms and the runoff from the fields contaminate the water bodies and the wastewater contains pesticides, nutrients, sediments, pathogens, organic manure, heavy metals, etc.
- The use of pesticides in farming causes the highest amount of water pollution.
- 50 percent of the OECD countries concluded that the concentration of pesticides and nutrients in the groundwater and water surface near agricultural lands are tremendously high.
- The accumulation of sediments and eutrophication leads to distortion of fisheries and biodiversity in lakes and also coastal waters.
- It leads to lower number of aquatic life, lower, dangerous to livestock, the property value etc.

Statement of the Problem

Agricultural runoff is one of the major contributors for the water pollution; it affects all the living organisms by causing serious health issues, reducing life expectancy, killing the aquatic life so treating the waste water is important to save lives and to save water for the future purpose.

Literature Review

1. K. Kadirvelu, M. Kavipriya, C. Karthika, M. Radhika, N. Vennilamani, S. Pattabhi (2003)

Heavy metals and colours were removed from an aqueous solution using activated carbons made from agricultural solid wastes such as banana pith, maize cob, coconut tree sawdust, and silk cotton shell. All colours and metal ions were quantitatively removed after very little time was needed for adsorption. According to experimental findings, all carbons are efficient at removing pollutants from water. Since all of the agricultural solid wastes employed in this study were freely, abundantly, and locally accessible, it is anticipated that the generated carbons will be financially feasible for the treatment of wastewater.

2. M. Achaka, A. Hafidi, N. Ouazzani, S. Sayadi, L. Mandi (2008)

This study describes the use of a particular type of banana peel carbon (BPC) with -OH and -NH₂ functional groups on the selective adsorption of gold from used printed circuit boards (PCBs). BPC for Au(III) adsorption reached equilibrium in 30 min, and Au(III) adsorption was successful at pH 2.5. The adsorption isotherm revealed that Au has a maximum adsorption capacity of 801.7 mg/g (III). According to the findings, BPC has a strong affinity for Au(III) ions and a weak affinity for base metal ions like Cu(II), Ni(II), Fe(III), and Pb (II). The HCl-thiourea solution can entirely recover the BPC adsorbent that captured the gold.

3. Rafaela González-Montelongo, M. Gloria Lobo, Mónica González (2009)

The level of nitrate in a few agriculturally based rural habitations in northern Rajasthan, India, was assessed. The nitrate (as NO₃(-)), sulphate (as SO₄(2-)), and a few other parameters were measured in a total of 64 groundwater samples from 21 distinct villages and sub-villages in the district of Sri Ganganagar, India. Individual samples ranged from 7.10 to 82.0 mg l⁻¹ of NO₃(-) in groundwater. However, the average NO₃(-) for all samples was 60.6±33.6 (SD) mg l⁻¹, which suggests that groundwater is unfit for drinking if the BIS permitted limit (22.6 mg l⁻¹) is used as a benchmark. In this region, SO₄(2-) levels ranged from 28.6 to 660.3 mg l⁻¹. The regression analysis reveals distinct sources rather than a single source of NO₃(-) and SO₄(2-) pollution in several regions. The point and non-point sources of NO₃(-) and SO₄(2-) in groundwater of this region may be N-fertilizer, sewerage, animal waste, organic manure, geology of sub-surface soil layers, pit latrines, etc. Results thus indicated that groundwater of this part of the State is severely polluted due to anthropogenic activities. The continuous consumption of such water may pose serious health hazardous in local residents.

Methodology:

In this study we have considered Nitrate solution as the most of the fertilizer contain nitrate as main ingredient and it has also found that agricultural wastewater contains 0-18mg/lit of nitrate.

To find the optimum adsorbent dosage for various adsorbent materials and to find the optimum contact time for the adsorbent mixture based on removal efficiency, Column studies were adopted. The Synthetically prepared nitrate solution was used for all the studies.

Adsorbent preparation:

- Rice husk is washed twice with double distilled water to remove dust and soluble impurities and then it is allowed to dry at 343K for 24 hours.
- After adsorbent is dried, it is sieved by using meshes to get desired size of 30 micrometer and stored in the air tight container.



For finding the efficiency of adsorbents standard solution where prepared for the test

- Stock nitrate solution – Dissolved 0.7218 g of dry potassium nitrate in deionized water and diluted to 1000 ml.
- Standard nitrate solution – Diluted 50 ml of stock nitrate solution to 500 ml with distilled water to get standard solution having a strength 100 ml equal to 100 microgram nitrate nitrogen.
- From stock nitrate solution and standard nitrate solution, nitrate solutions of required concentration were prepared by dilution with distilled water.
- The experimental work was carried out in the column study, adsorption test was done.
- 200 ml of samples in column containing different quantities of adsorbent materials was poured and the test carried out in regular room temperature and the samples were collected and UV Spectrometer test was conducted.
- Same procedure followed for finding optimum contact time by changing flow rate of the solution i.e. 20ml/min, 10ml/min, 5ml/min and 2.5ml/min.

Analysis of nitrate level in the sample can be determined accurately by the use of UV spectrometer. After all the adsorption tests 10 ml sample whose nitrate concentration to be estimated should be taken into nozzles tubes and it should be made up to 100 ml using distilled water. 2 ml should be taken from each diluted sample and add 1 ml of chromotropic acid reagent. The solution was, kept for 3 minutes and then added 7ml of concentrated sulphuric acid. Finally, this sample must be tested under UV spectrometer in order to find out the nitrate

concentration in each sample accurately Removal efficiency is the percentage that represents the number of molecules of a compound removed or destroyed in a medium relative to the number of molecules that entered the system.

Removal efficiency was calculated using equation. Removal efficiency = $((C_i - C_f) / C_i) \times 100$ where C_i – Initial nitrate concentration C_f –Final nitrate concentration.

Results:

The effect of adsorbent amount (Rice husk) on removal efficiency was studied by varying the adsorbent amount as 2,4,6 and 8g. The table.1 shows that higher removal efficiency was obtained for the adsorbent amount of 2 g. Initial concentration of nitrate is 100 mg/l.

TABLE I.EFFECT OF ADSORBENT AMOUNT (RICE HUSK)

SI NO	Adsorbent Amount (g)	Initial concentration (mg/l)	Final concentration (mg/L)	Removal efficiency (%)
1	2	100	14.5	85.5
2	4	100	18.8	81.2
3	6	100	24.8	75.8
4	8	100	25.2	74.8

It was clear that percentage of nitrate removal decreased with increasing of adsorbent amount. This could be due to the clot formation of Rice Husk powder particles at high adsorbent doses, which reduce the adsorption capacity because the clot formation results reduction in the effective active site for adsorption.

The effect of adsorbent amount (activated charcoal) on removal efficiency was studied by varying the amount of adsorbent as 2,4,6 and 8g. The table II shows that higher removal efficiency was obtained for the adsorbent dosage of 6 g. Initial concentration of nitrate is 100 mg/l.

TABLE II. EFFECT OF ADSORBENT AMOUNT (ACTIVATED CHARCOAL)

SI NO	Adsorbent Amount (g)	Initial concentration (mg/l)	Final concentrati on (mg/L)	Removal efficiency (%)
1	2	100	18.5	81.5
2	4	100	13.5	86.5
3	6	100	11.6	88.4
4	8	100	12.8	87.2

The results showed that the adsorption efficiency is highly dependent on quantity of adsorbent added. Maximum removal was 88.4 % for 6 g activated charcoal. As the amount of adsorbent increasing so does the efficiency. Which means that, more active areas become available for nitrate intake when concentration of adsorbent increased. But at higher adsorbent concentration there was a decrease in efficiency it might be due to the formation aggregates among adsorbent particles, which results in a decrease in effective surface area for adsorption.

The efficiency of Rice Husk and activated charcoal as the adsorbent for removal of nitrate from aqueous solution using batch experiment has been observed. The amount of nitrate adsorbed was found to vary with adsorbent dosage. It is observed that maximum removal efficiency of Rice Husk was 85.5 % at an amount 2g of adsorbent And by activated charcoal it was found that maximum removal was 88.4 % at an amount of 6g of adsorbent.

Influence of contact time on removal efficiency for Rice Husk powder was studied by using 2g adsorbent material with varying the contact time at flow rate of 20ml/min, 10ml/min, 5ml/min, 2.5ml/min. The table IV shows that higher removal efficiency was obtained for the flow rate of 2.5ml/min.

TABLE III. EFFECT OF CONTACT TIME (RICE HUSK)

SI NO	Flow rate(ml/min)	Initial concentration (mg/l)	Final concentration (mg/L)	Removal efficiency (%)
1	20	100	24.6	75.4
2	10	100	20.4	79.6
3	5	100	17.6	82.4
4	2.5	100	16.4	83.6

Influence of contact time on removal efficiency for Rice husk is presented in table III for different time periods. After reaching the value 82.4%, at flow rate of 5ml/min after this the removal efficiency gradually become a constant value which indicates the formation of an equilibrium as the active areas are reduced or absence of active areas.

The effect of contact time on removal efficiency for Activated charcoal powder was studied by using 6g adsorbent material with varying the contact time as 20ml/min, 10ml/min, 5ml/min and 2.5ml/min. The table IV shows that higher removal efficiency was obtained for the flow rate of 2.5ml/min.

TABLE IV. EFFECT OF CONTACT TIME (ACTIVATED CHARCOAL)

SI NO	Flow rate (ml/min)	Initial concentration (mg/l)	Final concentration (mg/L)	Removal efficiency (%)
1	20	100	18.6	81.4
2	10	100	15.4	84.6
3	5	100	12.6	87.4
4	2.5	100	12.2	87.8

Table IV shows nitrate removal at various contact times using activated charcoal; as bio adsorbent. The nitrate removal increased with increase in contact time. However, after reaching the value 87.4% at flow rate 5ml/min, there was no significant change or improvement in the efficiency which indicates the formation of equilibrium.

The best conditions for nitrate elimination, according to study findings, occur at a flow rate of 5 ml/min. This is owing to the lack of new active regions, which allowed the adsorption process to reach equilibrium at a flow rate of 5 ml/min.

In comparison to rice husk, activated charcoal has a greater propensity to absorb nitrate. Rice Husk and Activated charcoal both exhibit equal levels of adsorption at lesser dosages 80-90%, effectiveness for each adsorbent. Therefore, rice husk might be a preferable option for general use.

Thus, it is evident from this investigation that bio adsorbents have excellent adsorption capacity. Rice husk is affordable, readily available, and cheap. This can offer a quick, efficient, and affordable way to remove nitrate from tainted water.

Conclusion and Scope of Future work:

- Rice husk is the cheaper and effective adsorbent in removal of pesticides from the water.
- Experimental results show that the adsorbent used gives efficiency up to 85%, whereas activated charcoal gives up to 87 %, but treatment by using activated carbon is costlier compared to bio-adsorbent(Rice husk). Hence Rice husk can be used as a replacement of conventional activated charcoal.
- This experimental study on adsorbent would be quite useful in developing an appropriate technology for removal of pesticides from the water and with further treatment it can be used for drinking purpose.

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