3.1.1 Grants received from Government and non-governmental agencies for research projects / endowments in the institution during the last five years

Academic Year	:	**2022-2023**
Name of the Project Application	:	**Tamarind Shell Removal Machine**
Name of the Principal Investigator	:	**Dr. Sivakandhan. C** Assistant Professor, Department of Mechanical Engineering, Nadar Saraswathi College of Engineering and Technology, Vadapudupatti, Theni.
Name of the Co-Principal Investigator	:	**Mr. Surulimani. P** Assistant Professor, Department of Mechanical Engineering, Nadar Saraswathi College of Engineering and Technology, Vadapudupatti, Theni.
Name of the Funding Agency	:	ABIMALAR TRADERS, THENI
Amount Sanctioned	:	**Rs. 2,00,000** /-
Duration of the project	:	Six Months

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Date: 01/08/2022

To

ABI MALAR Traders
(Tamarind Merchant)
168, Mirandah lane, Near Kmarajar Primary School,
G.H. Road, Theni.

Dear Sir,

Sub: ***Research project work – Joint Venture*** – reg.

The Nadar Saraswathi College of Engineering and Technology (NSCET) was founded in 2010 and is renowned for its modern facilities and infrastructure. It is located in Theni's Vadaputhupatti, Annanji. High-quality instruction and learning environments layered with layers of structure and discipline are the main goals of Nadar Saraswathi College of Engineering and Technology (NSCET). Our courses cover Civil Engineering, Computer Science and Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, and Postgraduate Courses in Manufacturing and Structural Engineering. Additionally, our college supports research and provides engineering competency consulting. The members of our faculty that specialise in mechanical engineering are likewise experts in their field. As a result, I'm contacting you now to convey our desire to collaborate on joint ventures and research projects with ABI MALAR Traders. We are excited about the chance to collaborate on a new research project from ABI MALAR Traders.

Thanking you,

Yours sincerely,

01/08/22

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY ★ THENI 625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

TIN No. :33125182881
CST. No. 159312/13-2-2012

Cell : 9894537122

ABI MALAR TRADERS

Tamarind Merchant

168,Mirandah lane, Near Kamarajar Primary School,
G.H.Road, Theni—625531

Date: 10/08/2022

To

The Principal,

Nadar Saraswathi College of Engineering and Technology,

Annanji (P.O), Vadapudupatti,Theni-625 531.

Dear Sir,

Subject: ***Research Project Fund*** – reg.

Ref: Request letter dated on 01/08/2022

I trust this letter finds you well. I am writing to formally express our approval and support for the collaborative project proposal titled "Tamarind Shell Removal Machine" with Nadar Saraswathi College of Engineering and Technology. After careful consideration of the project details presented in your proposal, we are excited about the potential advancements in electric transportation that can result from this collaboration. We believe that the innovative approach outlined in the proposal aligns well with our company's commitment to sustainability and technological advancements. As part of our approval, we commit to providing the necessary resources, including access to relevant facilities, technical expertise, and collaboration with our team members to ensure the success of the Tamarind Shell Removal Machine development project. Furthermore, we look forward to establishing regular communication channels and project milestones to monitor the progress and address any challenges that may arise during the course of the collaboration. Please feel free to reach out if you require any additional information or clarification. We are enthusiastic about the collaborative efforts ahead and confident that this project will bring forth valuable outcomes for both our organizations.

Thank you

Yours faithfully,

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Date: 12/08/2022

To

ABI MALAR Traders
(Tamarind Merchant)
168, Mirandah lane, Near Kmarajar Primary School,
G.H. Road, Theni.

Dear Sir,

Subject: ***Research project work-Acknowledging your letter dated*** **10/18/2022** - Submission of the Project Proposal titled Tamarind Shell Removal Machine" - Reg.

Ref: Your Reference letter Dated 10/08/2022

I am writing to express our sincere appreciation on behalf of the staff and students of Nadar Saraswathi College of Engineering and Technology for the privilege of submitting our project proposal to ABI MALAR Traders. We deeply appreciate and feel privileged to be given the opportunity to be selected for participation on this project. We acknowledge the significance of your firms in the sector and appreciate the benefits of collaborating with a reputable organisation such as ABI MALAR Traders. We much appreciate your support in granting us the opportunity to showcase our ideas and solutions, as it serves as a source of encouragement and motivation for our academic community. Therefore, I am presenting a project entitled "Tamarind Shell Removal Machine" for your careful examination and subsequent consideration. Please get the required budget and team member allocation for the proposed project and take appropriate action.

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

Yours Sincerely,

12/08/22

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Date: 12/08/2022

To

ABI MALAR Traders
(Tamarind Merchant)
168, Mirandah lane, Near Kmarajar Primary School,
G.H. Road, Theni.

Dear Sir,

Sub: ***Submission of Project proposal with Budget & Allocation of Team****-reg.*

With reference to the above, herewith, I submit a project proposal attached with budget and also assigning the team for the forthcoming research project, kindly receive it and do the needful.

Yours Sincerely,

12/08/22

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY THENI 625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

Nadar Saraswathi College of Engineering and Technology

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Submission of Research Proposal

On

TAMARIND SHELL REMOVAL MACHINE

Submitted

To

Abi Malar traders,

Tamarind Merchant,

168, Mirandah Lane,

Near Kamarajar Primary School,

G. H. Road,

Theni - 31

Nadar Saraswathi College of
Engineering & Technology

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

Project Title:TAMARIND SHELL REMOVAL MACHINE

We present a project aimed at developing an innovative Tamarind Shell Removal Machine, addressing a critical need in the agriculture sector. This technology will streamline tamarind processing, fostering economic growth and sustainability. We seek funding to bring this solution to fruition.

Detailed Project Description:

1. Introduction: Tamarind is a popular tropical fruit widely used in culinary applications and traditional medicine. However, the process of manually removing the tough outer shell from the tamarind pulp can be labour-intensive and time-consuming. To address this challenge, the Automated Tamarind Shell Removal Machine is designed to streamline and automate the shell removal process, enhancing efficiency in tamarind processing industries.

2. Objectives: The primary objectives of the project are:
Develop a machine capable of efficiently and accurately removing tamarind shells.
Increase productivity by automating a previously manual and time-consuming task.
Improve overall efficiency and reduce labour costs in tamarind processing.

3. Machine Components: The Tamarind Shell Removal Machine comprises several key components:
Hopper: This is where the raw tamarind is loaded into the machine for processing.
Conveyor System: Transports tamarind from the hopper to subsequent processing stages.
Shell Removal Mechanism: Employs cutting-edge technology, such as robotic arms or mechanical grippers, to efficiently remove the tamarind shells.
Pulp Collection Tray: Gathers the shell-free tamarind pulp for further processing or packaging.
Control Panel: Enables operators to set parameters, monitor the machine's performance, and troubleshoot issues.

*4. Working Principle:*The machine operates on a sequence of automated steps:
Raw tamarind is loaded into the hopper.The conveyor system transports the tamarind to the shell removal mechanism.The shell removal mechanism employs a combination of mechanical and/or robotic arms to delicately remove the outer shells from the tamarind.
Shell-free tamarind pulp is collected in the pulp collection tray.The machine can be programmed for different tamarind sizes and varieties, ensuring adaptability to various processing needs.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY THENI 625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

5. Benefits:
Increased Efficiency: The machine significantly reduces the time and labour required for tamarind shell removal, leading to increased overall efficiency.
Consistency: The automated process ensures a consistent level of shell removal accuracy, minimizing product waste.
Adaptability: The machine can be adjusted to accommodate different tamarind sizes and varieties, making it versatile for various processing requirements.
Cost Savings: By automating the labour-intensive shell removal process, the machine contributes to cost savings in the long run.

6. Safety Measures:The machine is equipped with safety features such as emergency stop buttons, sensors to detect irregularities, and protective covers to prevent operator injuries during operation.

Budget:
The estimated budget for this project is Rs 2,00,000 covering research and design, prototype development, training and outreach, and distribution.

Project Duration:5 Months

Expected Impact:

*1.Increased Productivity:*Enhanced efficiency in tamarind processing, leading to increased production and income for farmers.
*2. Sustainable Agriculture:*Reduction in waste and environmental impact, aligning with sustainable farming practices.
*3.Empowering Farmers:*Providing farmers with a modern, labour-saving tool to boost their economic viability.

Conclusion:
The Automated Tamarind Shell Removal Machine is a technological solution designed to enhance the efficiency of tamarind processing industries. By automating the labour-intensive task of shell removal, the machine contributes to increased productivity, consistency, and cost savings, ultimately benefiting the tamarind processing sector. Your support for this project will not only revolutionize tamarind processing but also contribute to the advancement of sustainable agriculture practices. We welcome the opportunity to discuss this proposal further and explore potential collaboration.
Thank you for considering our project for funding.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Date: 12/08/2022

The Following faculty members are assigned for conducting the research work for the proposed project titled "Tamarind Shell Removal Machine".

List of Faculty members

S. No	Name of the PI & Co-PI	Designation and Specialization	Contact Information
1.	**Dr. Sivakandan. C**	Professor/ Mechanical Engineering	9976412468 Avr.krj@gmail.com
2.	**Mr. Surulimani. P**	Assistant Professor/ Mechanical Engineering	9894933543 Mech.nagaraj543@gmail.com

12/08/22

PRINCIPAL

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

TIN No. :33125182881
CST. No. 159312/13-2-2012

Cell : 9894537122

ABI MALAR TRADERS

Tamarind Merchant

168,Mirandah lane, Near Kamarajar Primary School,
G.H.Road, Theni—625531

To

The Principal
Nadar Saraswathi College of Engineering and Technology
Annanji (P.O), Vadapudupatti, Theni-625 531.

Dear Sir,

Subject: **Approval of Research Fund**

Your project idea, "Tamarind Shell Removal Machine," was meticulously reviewed by ABI MALAR traders and approved. Your project's potential effect and significance inspire us to assist its success. Tamarind Shell Removal Machine research, development, prototyping, and testing are included in the budget. Machine user documentation and a user interface are also included. Please find attached a cheque for Rs. 2,00,000 **(Cheque No: 931472)** to start your project. Using finances efficiently and effectively according to the authorised project plan is crucial. We think this effort will develop technology and give industry and society vital insights.

Project Title: Tamarind Shell Removal Machine
Project Duration: 12-08-2022 – 30-05-2023
Approved Budget: Rs. 2,00,000/-

Investigators

1. **Dr. Sivakandan- Principal Investigator**
2. **Mr. Surulimani - Co-Principal Investigator**

Thank you for your effort to this amazing project. We await its success.

Sincerely,

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

TMB Tamilnad Mercantile Bank Ltd

THENI Branch
630, FIRST FLOOR, NEHRUJI ROAD,
THENI - 625531
IFS Code : TMBL0000007

Valid for three months from the date of issue.

1	7	0	8	2	0	2	2
D	D	M	M	Y	Y	Y	Y

Pay Nadar Saraswathi College of Engineering and Technology OR BEARER
या धारक को

Rupees Two Lakhs Only
रुपये

अदा करें ₹ 2,00,000/-

A/c. No.	007700050900583

Cheque No.	01931472

For ABIMALAR TRADERS

Authorised Signatory

Payable at all our branches

Please sign above

Manipal Technologies Limited : Chennai / CTS-2010

⑈931472⑈ 625060102⑆ 010007⑈ 29

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI 625 531

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
ISO 9001 : 2015 Certified Institution
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Date 27/02/2023

PROJECT REPORT

Objectives:

1. Design and build an affordable tamarind cover removal machine capable of processing a specified quantity of tamarind per hour.
2. Ensure precision in cover removal to minimize waste.
3. Prioritize safety features to mitigate the risk of accidents.
4. Develop a user-friendly interface for easy operation and maintenance.

Project Scope:

The project will encompass research, development, prototyping, and testing of the Tamarind Cover Removal Machine within the specified budget. Additionally, it includes the creation of a user interface and comprehensive documentation for machine users.

Budget Allocation:

1. Research and Analysis: Rs. 50,000/-
2. Design and Prototyping: Rs. 80,000/-
3. User Interface Development: Rs. 30,000/-
4. Documentation: Rs. 40,000/-

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

THENI MELAPETTAI HINDU NADARGAL URAVINMURAI

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
ISO 9001 : 2015 Certified Institution
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

Timeline:

1. Research and Analysis: Aug 18, 2022- Aug 30, 2022
2. Design and Prototyping: Sep 1, 2022 - Feb 1, 2022
3. User Interface Development: Feb 3, 2022 - Jan 27, 2023
4. Documentation: Feb 5, 2023 - Feb 19, 2023

We believe that the successful execution of this project will not only contribute to the advancement of technology but will also provide valuable insights for the benefit of the industry and society.

We kindly request your approval and support for the timely commencement and execution of the Tamarind Cover Removal Machine project. Our dedicated team at Nadar Saraswathi College of Engineering and Technology is enthusiastic about contributing to this innovative solution.

Thank you for considering our proposal. We are eager to collaborate closely with your esteemed organization to ensure the success of this project.

Sincerely,
Mr. Sivakandan
Principal of Investigator
Professor
Nadar Saraswathi College of Engineering and Technology
Mail Id: surulimani@nscet.org
Mobile: 7667746191

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY ★ THENI 625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
ISO 9001 : 2015 Certified Institution
Vadapudupatti, Annanji (po), Theni - 625 531,
Tamilnadu, India.

UTILIZATION CERTIFICATE

1. Title of the Project : Tamarind Shell Removal Machine
2. Name of the Institution : Nadar Saraswathi College of Engineering and Technology, Theni
3. Name of the Principal Investigator : Dr. C.Sivakandhan, Prof/Mech
   Mr.P. Surulimani, AP/Mech

It is confirmed that a total of ₹ 2,00,000 in grants-in-aid was approved in the year 2022-2023 for Nadar Saraswathi College of Engineering and Technology for consultancy projects on 17/08/2022. An amount of ₹2,00,000 has been allocated for the development of an Tamarind Shell Removal Machine, specifically for the aim of validating the results. I confirm that the full grant amount has been used prudently and solely for the purpose outlined in the study proposal.

27/2/2023

PRINCIPAL INVESTIGATOR

21/2/23

PRINCIPAL
Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY THENI 625 531

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY THENI 625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of Engineering and Technology
Vadapudupatti, Theni-625 531.

TIN No. :33125182881
CST. No. 159312/13-2-2012

Cell : 9894537122

ABI MALAR TRADERS

Tamarind Merchant

168,Mirandah lane, Near Kamarajar Primary School,
G.H.Road, Theni—625531

Date: 27/02/2023

To

The Principal,

Nadar Saraswathi College of Engineering and Technology,

Annanji (P.O), Vadapudupatti,Theni-625 531.

Dear Sir,

Subject: ***Tamarind Shell Removal Machine*** – reg.

We confirm the reception of the project report, which was compiled by the research team led by Associate Professor Dr. Sivakandhan, from the Department of Mechanical Engineering. The report was evaluated by our panel of specialists, and we are delighted to notify you that the results contained in the project report satisfy our production criteria. We commend the collective endeavour and comprehension exhibited throughout this endeavour. We anticipate the opportunity to collaborate on future scientific endeavours. We would like to once again extend our appreciation to Nadar Saraswathi College of Engineering and Technology for their invaluable contribution to the successful culmination of this research endeavour.

Thanking you.

Yours Faithfully,

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY
THENI
625 531

Dr. C. MATHALAI SUNDARAM, M.E.,M.B.A.,Ph.D.,
Principal
Nadar Saraswathi College of
Engineering and Technology
Vadapudupatti, Theni-625 531.