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Design And Development Of A Portable Innovative Operation Stripping Device (PIOSD)

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Abstract:
A "PIOSD" (Portable Innovative Operation Stripping Device) was designed and developed to answer the pressing needs of the abaca farmers in the province of Catanduanes. The issues considered was the ability to process abaca fibres right in their abaca plantation and maximize their time and fibres production, address the low quality of traditionally extracted fibre production, and generate employment for the people interested in the community. The device is portable and compressed in size, it is made from locally available materials, and its weight is five (5) times lighter than the modern stripping machines available in the site of study. The device has three (3) major parts, and it has a capacity to operate simultaneously. The device has three (3) replaceable blades, can strip three different tuxes with a stripping pressure of two (2) small tensional spring with different sizes. 17 A 12 VDC high speed motor and has a large amount of torque needed to produce fibres. The abaca fibre produced is classified as a good cleaning with grades of I, and G. The device has recorded daily capacity of 25 kg dried abaca fibre output by the age (60 years 20 and above) senior citizen farmers operator and 50 kg by age of (below 60 years old) junior farmers operator.
Keywords: *keyword 1; keyword 2; keyword 3 (List three to ten pertinent key words specific to the article yet reasonably common within the subject discipline.)*

1. INTRODUCTION

Abaca (Musa textilis), recognized globally as Manila hemp, is a vital crop for fiber production in the Philippines. Despite its economic significance, traditional stripping methods remain labor-intensive, exposing farmers to health risks and low yields. This study introduces the Portable Innovative Operation Stripping Device (PIOSD), aiming to 30 mechanize the process while maintaining portability, affordability, and usability

1.1 Objectives

The research study is focused on the Design and Development of a PIOSD

1.1.1 What are the materials needed in designing a PIOSD?

1.1.2 What are the considerations and requisites for the Development terms of:

- Materials to be used
- Mechanical consideration
- Power capacity to produce fiber?
- Portability of the device in terms of:
- Size
- Weight

1.1.3 What are the results of test trials of the device in terms of workability:

Abaca Fiber Production;

1. Power Used;

- Replaceable Blades Used

1. G
2. Maximum Power Time Used?

1.1.4 Test the validity of the device.

1.1.5 Evaluate the device in terms of:

- Acceptability of the User
- Reliability of the device

1.1.6 Development of user's guide operational manual.

2. MATERIALS AND METHODS

2.1 The materials of the prototype were constructed using the following:
2.1.1 A compact DC motor to power the stripping mechanism
2.1.2 Adjustable blades made of stainless steel for durability
2.1.3 A rechargeable lithium-ion battery
2.1.4 A modular frame for easy maintenance and upgrades
• Design of PIOSD
The overview of methodology of research study is shown in Figure 1. This flow chart can serve as a guide on how to design and developed the PIOSD

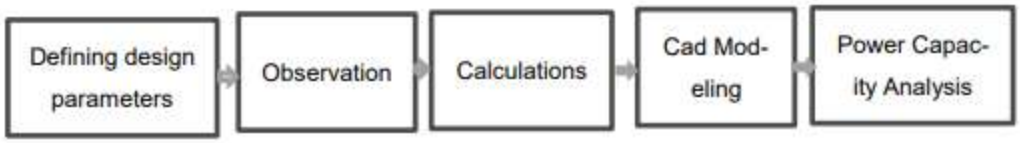

Figure 2. Methodology Flow Chart

2.2 Design Considerations

The Design Considerations in the Development of the PIOSD has to come up with the design as desired by the small scale farmers, the technical characteristics considered in the design and development of the PIOSD are the following:
2.1.1 Portable and light in weight for on-site use in the abaca plantations to address the discoloration of abaca fiber during transport.
2.1.2 Can be transport easily to uphill's abaca plantation and set-up the PIOSD.
2.1.3 Easy to operate with wooden spindle through DC motor switch that transmits the force from the stripping knife's by pausing the clutch to open the stripper's blade and released.
2.1.4 Set-up the PIOSD horizontally to allow mobility of the device.
2.1.5 Rechargeable batteries operated with long operational life, dual power charge supply by solar and wind energy.
2.1.6 Replaceable stripper's blade with different sizes and load minimal to avoid energy stop functionality of the device.
2.1.7 Economical in cost than conventional stripping machines to make it affordable for small-scale farmers.
The researcher designed and developed a prototype that is portable and can stand alone and operate the device in any area of the abaca plantation where the prototype of a PIOSD is set up and ready to use. The design of the device was operated by a rechargeable 12 VDC battery to operate the **PIOSD**. We need an alternate rechargeable battery for replacement of power. The design should consider the requirements of the target users, including portability, ease of use, and safety.
The Design and Development of a PIOSD was conceptualized to use a battery-powered source to develop the device. The purpose is to address the problems encountered by the farmers residing in the province of Catanduanes. The majority of the farmers find difficulties in hauling the stripper machine and producing abaca fiber through pulling force manually and they spend more time making the "Hag-otan" stripper area. The PIOSD will produce abaca fiber by a person who can stand alone through using of user's guide referral. The device can operate through a two (2) batteries connected in parallel to increase the power capacity of the power supply.
During the daytime, the alternate rechargeable battery is charged through the solar panel harnesses energy from the sun's radiation. The design of the device is movable it is placed anywhere no area of "Hag-otan" is occupied. The only thing to do is to set the device in the swelling area of the abaca.
2.3 Developmental Process
The development process of the prototype will involve the following steps:
2.3.1 Identify the materials needed.

2.3.2 Select high-quality rechargeable battery "Li-Po" batteries and solar panels used for chargers that meet the device's portable. Consider factors such as efficiency, durability, and workability of the device.
2.3.3 The DC/AC power source are made to operate the **PIOSD.**
2.3.4 Use a readymade modified inverter to invert the 12 VDC source to 220 VAC, to manage the power source.

2.3.5 Testing the workability of the device

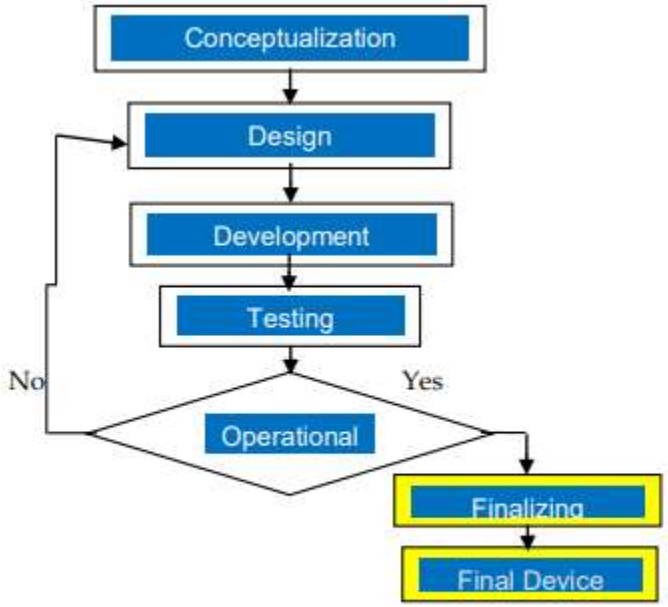

Figure 3. Developmental Flowchart

2.4 Assembly Process
All parts were fabricated and assembled in a controlled lab environment. The motor and blade alignment was calibrated for optimal stripping performance. The handle and support system was ergonomically tested by volunteers.
2.5 Initial Testing and Iteration
The prototype underwent initial testing on various materials (e.g., wires, stems, etc.).
2.5.1 Observations included:
2.5.2 Smooth operation with minimal vibration
2.5.3 High stripping accuracy
2.5.4 Battery life lasting up to 6 hours per charge

2.6 Description of the PIOSD
The Portable Innovative-Operation Stripping Device (PIOSD) is a lightweight, userfriendly tool designed to efficiently remove coatings, layers, or insulation materials from surfaces. Developed to address the need for a mobile and effective stripping solution, the PIOSD combines innovative stripping technology with a compact design for easy transport and operation.
Equipped with a high-performance motor and adaptable stripping attachments, the PIOSD allows users to quickly and safely strip a variety of materials with minimal effort. Its ergonomic design reduces operator fatigue, while built-in safety features ensure secure handling.
Compared to traditional stripping methods, the PIOSD offers faster operation times, improved precision, and enhanced portability, making it an ideal tool for industrial maintenance, construction projects, and field operations where mobility and efficiency are crucial.

The materials was sourced out from the researcher project site in the Catanduanes State University (CatSU), Virac, Catanduanes. The researcher developed the PIOSD through there capability skills as designer, developer, fabricator and assembler of the device of. Innovation on Technology. Here is the complete design of the PIOSD was shown in the figure 4.

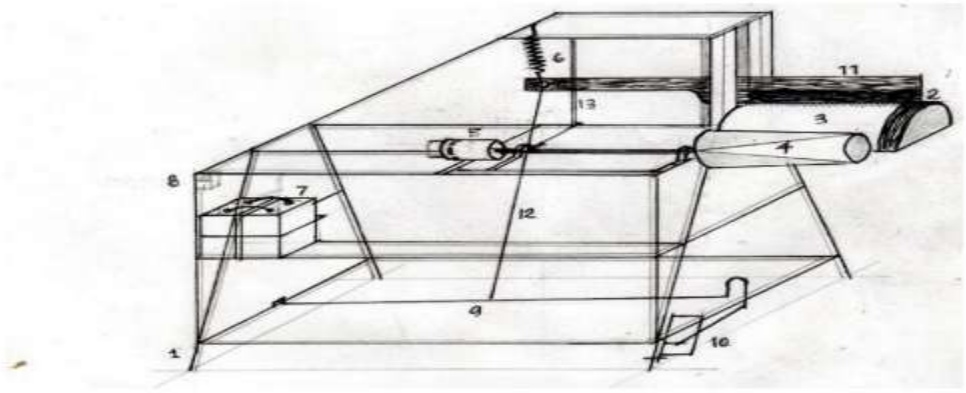

Figure 4. Complete Design of the "PIOSD"

The researcher provide the technical drawing that was shown in figure 5. The 3-D structure frame of the PIOSD was drawn to guide the researcher in the process of development of the PIOSD. The structure was fixed by welding the joints of the metal square tube x 1.20 mm thickness to be assembled. The dimension of the PIOSD was measures 80 cm height x 60 cm wide x 80 cm length.

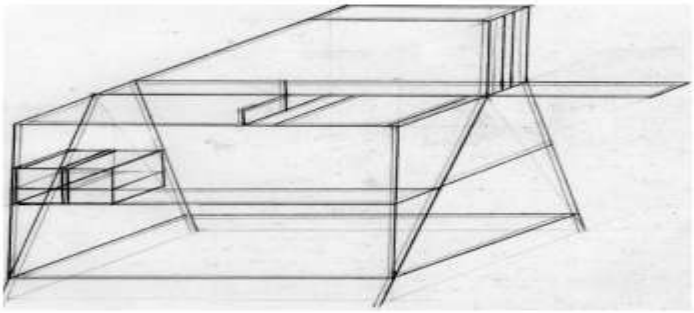

Figure 5. The 3-D Three Dimensional Structure Frame of the PIOSD

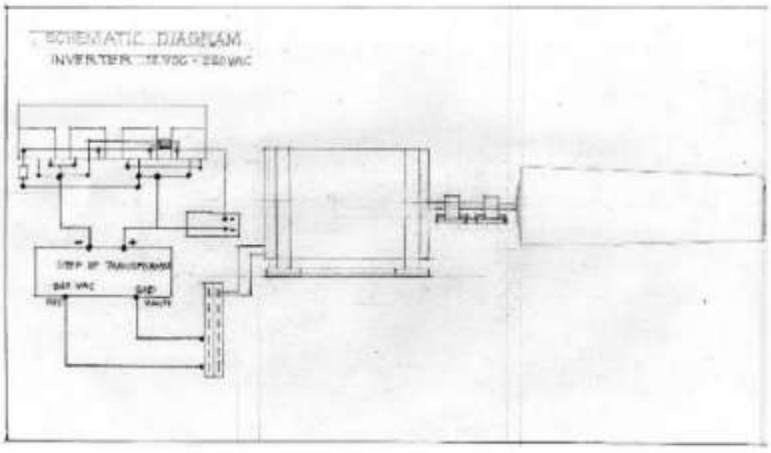

Figure 6. The Schematic Diagram Connection of the Power Supply

A 12 Volts DC High Powasd Motor was connected to the positive (Red) wire to the positive terminal- of the Inverter and the negative (Black) wire to the negative terminal of the Spring; 3) Torsional cable; 4) Clutch Pad. They are synchronous connected through the following parts: The stripper knife with replaceable blade pivoted at the middle part and connected to a tensional spring at other end and same point where connected a tensional cable with a height of 80 cm down to the middle part of the lever arm pivoted at the end point. On the other side of the lever arm is bend upward to has a clearance distance to step down the clutch pad. The clutch pad was design to has a clearance angle to open the Stripper's Knife.

At first, the blade was assembled with a serration. However, the electric motor stopped during the operation. This problem was eventually solved by modifying the stripper's knife by making three (3) holes on the knife and attached the replaceable blade to the stripper so the final prototype used part of a cross cut saw teeth blade with a size of "G". For the spring- loaded in the stripper's blade additional spring added to hold the stripper's knife firmly.

The spring compress when the foot pad press stepped on and causes the spring block to open to insert the tuxy. The PIOSD is operated by 12 VDC battery connected to the 12 VDC electric motor. An oriented operator can operate the PIOSD.

The stripper pedal use to open the stripper knife by pausing down the step of the pedal. However, if the motor switch on and the operation stopped. This problem was eventually solved by replacement of a motor with high powasd capacity which means high speed and high torque to sustained the overturning power from the loop of the wooden spindle to driven continuously and to produce fibre of abaca.

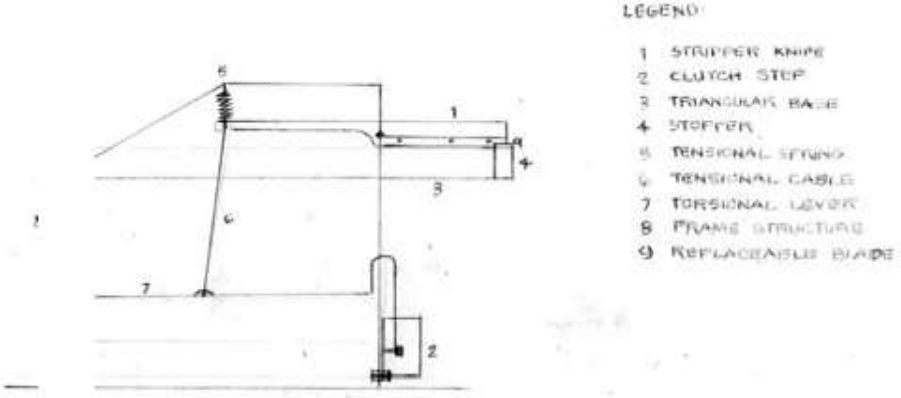

Figure 7. The Feeder Structure Parts Assembly

The feeder structure part are made of part of the crosscut saw blade serve as replaceable blade attached to the stripper's knife, by screwing three bolts with knots. The two (2) tensional springs are used to press the stripper's knife and mount to the the end of the metal handle of the knife to counter force and control the load of the stripper's knife firmly. The dimension of the two tensional springs has a diameter of 2.5 cm and the length of 10 cm. The wooden spindle has a diameter of 10 cm made of hard wood tapered into a frustum with a 10° inclination. To takeout the strip of abaca easily.

2.7 Different Views of PIOSD

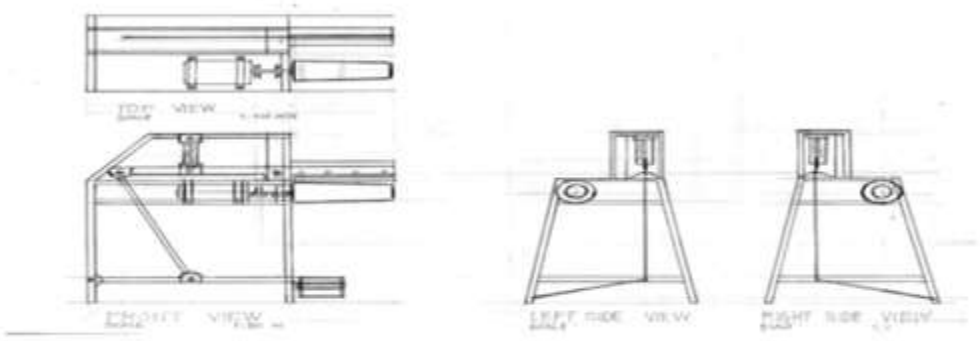

Figure 8. Top and Front Views and Left and Right Side Views of the PIOSD

The producer structure is composed of the following parts: 1) Wooden Spindle; 2) 12 236 VDC High Powasd Motor; 3) Lithium-Ion Battery; They are synchronous connected237 through the following parts: The wooden spindle has a centroid axial stainless rod con238 nected to a two housing bearing with a ¾ inch diameter and mounted directly to the axial 239 rod of the DC electric motor. The source of power of the electric motor will be connected 240 to the 12 VDC Lithium-Ion Battery. The power switch will have connected in series in the 241 battery and has a detachable connection of alligator clip.

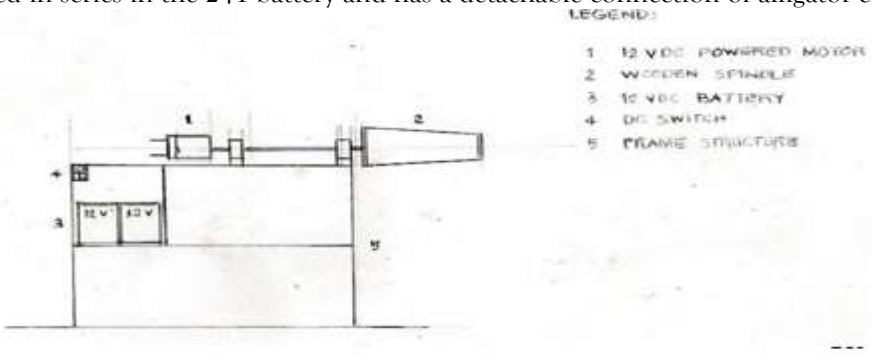

Figure 9. The Producer Structure Parts Connection

The tensional spring tensioned which the foot press is stepped on and causes the stripping block to open to insert the tuxy. The device was operated manually with the aid of the motor connected to the driven spindle and the 12 Volts DC high powered motor. The high powered motor has a weight of 3 kgs motor can increase the torque and in the same way, increase the angular momentum of the axis to strip the fiber out from the tuxes'.

2.8 Technical Characteristics of the PIOSD

The design consideration of the technical characteristics are the following: 1) The fi259 nal model developed requires a small design and Portable and light in weight for on-site use in the abaca plantations to address the discoloration of abaca fibre during transport; 2) It can be transport easily to uphill abaca plantation and need small area to set-up the PIOSD; 3) Easy to operate with the wooden spindle through DC motor switch that transmits the force from the stripping knife's by pausing the clutch to open the strip264 per's blade and released; 4) Set-up the PIOSD horizontally to allow mobility of the de265 vice; 5) Economical in cost than conventional stripping machines to make it affordable for small-scale farmers; 6) It uses natural energy for sustained energy as an alternate con267 tinuous charging of the battery and is environmental friendly; 7) Its design has a wind 268 flow that is concentrated to catch the wind blowing from any direction; 8) It is easy to 269 maintain and requires less maintenance cost, it mounted in any open area; 9) Easy to 270 remove and put in a safe place to continue operation anytime in a day and even if it's a 271 cloudy day; 10) It's design is economical and replicated.

2.9 Technical Features

2.7.1 Weight: 20 kg
2.7.2 Replaceable blade: remodel from the part of a cross cut saw blade.
2.7.3 A hard wooden board (dapilan) mounted on a metal frame and can be easily adjusted by any hard object.
2.7.4 Two tensional spring to maintain the blade tightly pressed into the wooden board
2.7.5 Can be installed for right-hand or left-hand use
2.7.6 Ready to use
2.7.7 Produces "G" fiber grade; "JK" fiber grade.

3. RESULTS

3.1 Fabrication and Technical Design of the PIOSD

The PIOSD is a device for abaca fiber extraction, where leaf sheaths are scraped using a stripper blade with the aid of a wooden spindle attached to a 12 Volts DC high powered motor. It includes a structure frame, feeder frame structure, a wooden spindle assembly, and stripping assembly. The wooden spindle setup

horizontally is keyed to the shaft and is retained thereon by a two set of ball bearing housing for properly setup. During operation, a foot pedal assembly was press to step on to insert the tuxes in the stripper knife with attached a replaceable blade.

A 12 Volts DC motor is then operated if the batteries are fully charge and the two (2) batteries are connected in parallel to maximize the potential difference capacity of the two batteries to has sustainability power out on the batteries as the power supplies of the PIOSD. The motor will be connected to the positive terminal of the first battery and the negative terminal will be connected to the negative terminal of the second battery which connected in parallel to simplify the running of operation of charges of the PIOSD operation.

The PIOSD is portable and detachable into two parts for easy handling. 1) Main frame structure of the PIOSD, 2) Two (2) Batteries. The Prototype of PIOSD has a total weight of 15 Kgs including the batteries and the frame structures of the PIOSD. The stripper's knife with attached of replaceable blade and has a thickness of 0.50 cm and a length of 40 cm including the metal handle. The replaceable blade of stripper made of a part of a crosscut saw blade attached to the stripper's knife with three (3) bolts with knots fixing to the knife. It has 10 teeth per inch (2.54 cm), capable of 16 serrations in abaca fibre produced. The stripping block measure o.ooo8 sq. m. It can strip three tuxes with a stripping block pressure of 20 KPa at a high speed of 40 rpm. The wooden spindle is 10 degrees inclined, made from hard wood, which does not corrode easily. It is made from locally available materials with a portable device and maximizing the time consumed to produce abaca fibre in the area of abaca plantation. The factors of usages of PIOSD are as follows: 1) The PIOSD is portable and easy to transfer from one place to another; 2) Battery Operated with alternative one (1) unit of battery; 3) No required of stripping area, it can strip beside the area where you tuxied; 4) Easy to operate the PIOSD.

Using the PIOSD, the fibre recovery rate is higher than that of the traditional tool used by the farmers. The extract fibre has a lesser amount of non-fibrous materials content do not dry quickly and are considered marketable at a low price. This result is indicative of PIOSD capability to reduce good quality fibre. The farmers adopt the PIOSD (Portable Innovative Operation Stripping device and the portability in one device to strip abaca fibres.

3.2 Farmer's Perception of the PIOSD.

The data from the accomplished interview forms was analysed using descriptive analysis. Below are the results The user's acceptability level on the PIOSD is very high having a rating of 90%.

3.2.1 Battery Life and Efficiency:

Use two (2) 12 VDC Rechargeable battery with high powered capacity (100 Amperes- Hour per 10 Hours) the battery.to optimize the power consumption to extend battery life, possibly through more efficient motors or power management systems. Include a portable fast charger to reduce downtime.

3.2.2 Maintenance and Durability:

Apply used oil to the frame structure to prevent rust. Use small brush to clean the replaceable blade of the PIOSD to extend the device's lifespan. Design the device for easier disassembly and cleaning to simplify maintenance.

3.2.3 Solar Energy System:

Table 5. Data Reading of the Solar Charge Controller

Trial No	Supply Energy Reading	Solar Charge Controller	Energy Losses	Solar Panel to Load (Volt)	Percentage of Energy Loses (%)
1	PV Energy	13.8 Volts	12.8 Volts	12 Volts	7.2%
2	Light Intensity	13.8 Volts	12.8 Volts	12 Volts	7.2%

The conclusions drawn from the design and development of a Portable InnovativeOperation Stripping Device (PIOSD) typically depend on the materials needed, design consideration and requisites of material to be used, mechanical consideration, portability in terms of workability producing abaca fiber, power used, blade used, maximum power time used, replaceability, acceptability and reliability

The use of metal square tubes as the primary structural component in the design of the portable innovative operation stripping device proves to be a highly effective choice due to their superior strength-to-weight ratio, ease of fabrication, and resistance to deformation under load. This material not only ensures structural integrity and durability during operation but also supports portability and ease of maintenance, making it ideal for field applications and long-term use.

In the development of the portable innovative operation stripping device, careful consideration of material selection and mechanical requirements is crucial to achieving functionality, durability, and portability. The use of lightweight yet high-strength materials, such as metal square tubing, ensures structural stability without compromising ease of transport. Additionally, mechanical factors such as load-bearing capacity, resistance to wear and corrosion, and ease of assembly was prioritized to enhance operational efficiency and longevity. These deliberate design choices collectively contribute to a device that is reliable, user-friendly, and suitable for use in various operational environments.

The successful development of the portable innovative operation stripping device is rooted in the careful integration of key considerations involving material selection, mechanical design, power capacity, and portability. The use of durable yet lightweight materials such as metal square tubing provides the necessary structural integrity while ensuring ease of transport. Mechanically, the device is designed to withstand operational stress, maintain consistent stripping performance, and support efficient fiber production. Furthermore, its power system is optimized to deliver sufficient energy for continuous operation without compromising portability. With its compact size and manageable weight, the device meets the essential criteria for field deployment, making it a practical and efficient tool for fiber extraction in various environments.

Based on the results of the test trials, the portable innovative operation stripping device for abaca fiber production demonstrates effective workability in field conditions. The use of replaceable blades contributed to consistent fiber quality and operational efficiency. The device successfully produced abaca fiber with a Class G-sized strip, meeting standard classification requirements. Moreover, the device operated efficiently within its maximum power time, indicating its energy sustainability and suitability for remote or off-grid applications. Overall, the device proves to be a viable and efficient tool for abaca fiber processing, combining portability, ease of maintenance, and reliable performance.

The results of the test trials confirm the validity of the portable innovative operation stripping device as an effective tool for abaca fiber production. The device consistently demonstrated reliable performance, efficient stripping capability, and ease of operation. Its portability, use of replaceable blades, and ability to produce Class G-sized fibre strips within optimal power usage parameters support its practical application and technological soundness. Therefore, the device is considered valid for use in improving the efficiency and quality of abaca fiber extraction in both small-scale and field-based operations.

The test trials demonstrate that the portable innovative operation stripping device is highly reliable in performing its intended function of abaca fiber extraction. The device consistently operated without malfunction across multiple trials, maintained stable performance using replaceable blades, and delivered uniform Class G-sized fiber strips. Its consistent output and dependable power usage indicate that it can withstand repeated use under typical working conditions. Therefore, the device proves to be a reliable tool for sustainable and efficient abaca fiber processing.

4. DISCUSSION

Performance trials showed fiber outputs between 25 kg/day (older operators) to 50 kg/day (younger operators). Farmers reported ease of transport, simple operation, and improved productivity compared to manual stripping. The solar-powered system proved effective for off-grid use, and maintenance was minimal due to modular blade design.

The light energy harnessed by the two (2) solar panels connected in parallel, will connect to terminal A of the solar charge controller and the charge reading appearing on the monitor is 13.8 Volts. In another situation of energy, during high radiation, the solar energy is harnessed by the solar panels connected in parallel, with the same connection, which will connect to terminal A of the solar charge controller and the charge reading appearing on the monitor is 13.8 Volts. The battery is connected to terminal B of the solar charge controller then the voltage reading appears is 12.8 Volts, which is the voltage used for charging the battery storage and

terminal C is used to connect the load to the terminal of the battery storage 12 VDC, (50 A-H per 10 Hours) power capacity. There are 7.2% of Solar Energy loss of energy used in the actual load. The solar energy harnessed by solar panels is the same as the light energy acquired by the solar panels because the reading on the solar charge controller is same reading as 13.8 Volts charge passing through the line. Therefore, the Energy harnessed from the solar and light energy is the same energy that we can use as an alternative source for charging the battery to sustain the power capacity of the battery that undergo operation of the device.

5. CONCLUSIONS

The conclusions drawn from the design and development of a Portable Innovative-Operation Stripping Device (PIOSD) typically depend on the materials needed, design consideration and requisites of material to be used, mechanical consideration, portability in terms of workability producing abaca fiber, power used, blade used, maximum power time used, replaceability, acceptability and reliability

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The PIOSD successfully met its design objectives: improving productivity, portability, and user adaptability. It holds potential for broader implementation in rural areas. Further improvements include weatherproofing, adjustable blade settings, and training modules for local farmers. Wider distribution and LGU-based support are recommended to enhance community adoption.

6. Patents

This section is not mandatory but may be added if there are patents resulting from the work reported in this manuscript.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/doi/s1, Figure S1: title; Table S1: title; Video S1: title.

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"During the preparation of this manuscript/study, the author(s) 530 used [tool name, version information] for the purposes of [description of use]. The authors have reviewed and edited the output and take full responsibility for the content of this publication."

Conflicts of Interest:

Declare conflicts of interest or state "The authors declare no conflicts of interest. Authors must identify and declare any personal circumstances or interest that may be perceived as inappropriately influencing the representation or interpretation of reported research results. Any role of the funders in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results must be declared in this section. If there is no role, please state "The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results".

Abbreviations:

The following abbreviations are used in this manuscript:

PIOSD Portable Innovative Operation Stripping Device
MDPI Multidisciplinary Digital Publishing Institute
DOAJ Directory of open access journals
TLA Three letter acronym
LD Linear dichroism

Appendix A

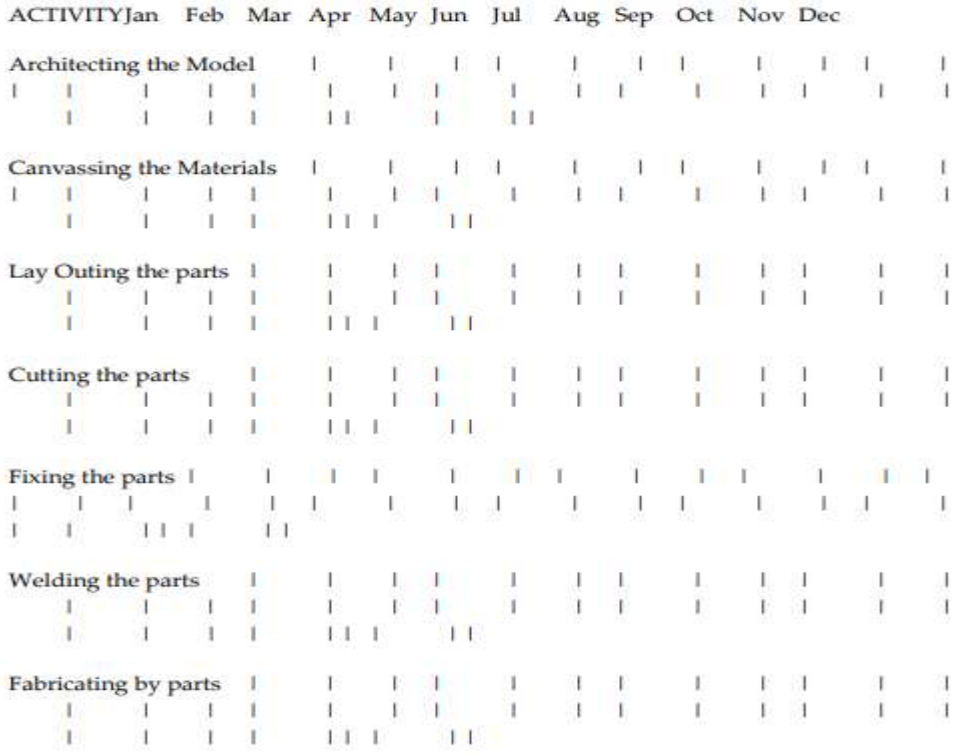
Appendix A.1

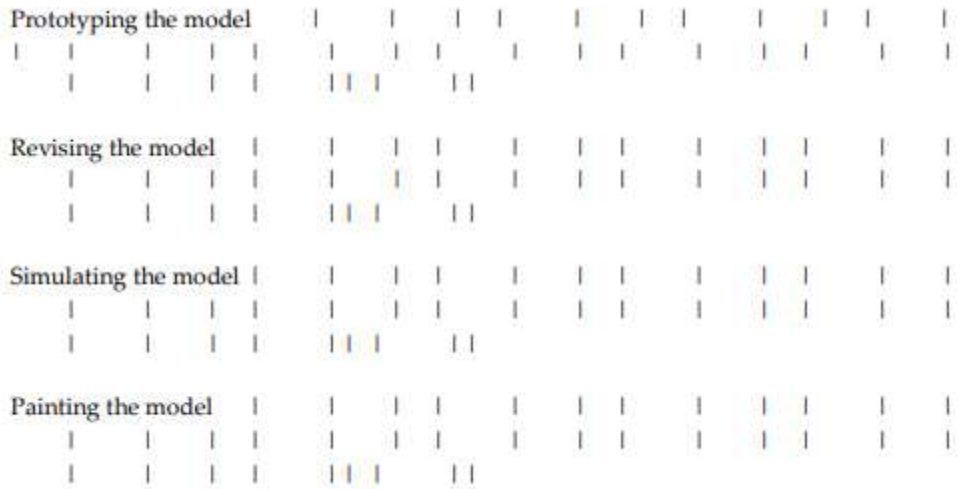
A. Materials Needed for the Portable Mechanized Battery-Power Energy

1. Motor and Wooden Spindle	1	Pc	Conical Wooden Spindle	P	1, 000.00
	1	Pc	Stainless rod ½" diameter x 2 ft length	P	500.00
	1	Pc	High-Speed DC Motor (12 VDC)	P	6, 000.00
			Sub–Total :	P	7, 500.00
2. Power Source	2	Pcs	Solar Panel (100 Watts)	P	10, 500.00
	1	Pc	Inverter, 12 VDC – 220 VAC, P = 5000 Watts	P	7, 000.00
2 Sets Battery Housing	4	Pcs	Li-Po Battery Heavy, Alternate Power Supply Duty (12 Volts) @ P 5000 per Set of Battery Housing	P	5, 000.00
	1	Pc	Solar Charge Controller with Connecting wires, (Length = 5 meters)	P	3, 100.00
			Sub-Total :	P	25, 600.00
3. Stripper Knife and Blade Sizes	1	Set	Stripper knife ½" thick x 2 ½" x width x 12" length	P	3, 000.00
	1	Pc	Replaceable Stripper Guide Stainless ,Gauge 16	P	2, 000.00
	1	Pc	Replaceable Stripper Guide Stainless Gauge 16	P	2, 000.00
			Sub-Total :	P	7, 000.00
4. Accessories	1	Set	Spring with housing	P	100.00
	1	Pc	Tension Cable L = 1.5 m	P	300.00
	1	Pc	Horizontal Torsional Rod L= 1.0 m Lever Arm with Pivot Bolt	P	500.00
	1	Pc	Foot Pad	P	100.00
	2	Sets	½" diameter Housing Bearing	P	1, 000.00
2	Pcs	Pivot Bolts Stripper		P	200.00
1	Pc	Stripper Triangular Platform Base (Flexi Glass) ¾ " Thick		P	500.00

	1	Liter	Primer Paint	P 500.00
	1	Liter	Navy Blue (Acrylic Paint)	P 500.00
	1	Liter	White (Acrylic Paint)	P 500.00
			Sub-Total :	P 4, 200.00
5. Frame Structure	5	Pcs	SquareTube , size : 1 ½ x 1 ½ " x 20'	P 5, 000.00
	4	Kls	Welding Rod (Portable Inverter Welding Machine)	P 2, 000.00
	5	Kls	WeldingRod	P 500.00
			Sub-Total:	P 7, 500.00
			TOTAL COST OF MATERIALS:	P 51, 300.00

Appendix A.2
GHAANT CHART
PROJECT TITLE: Design and Development of a "PIOSD" (Portable Innovative–Operation Stripping Device)





Appendix B
APPENDIX C
User's Guide for the
PIOSD (**Portable Innovative-Operation Stripping Device)**
Table of Contents

1. Introduction
2. Safety Precautions
3. Features and Components
4. Operating Instructions
5. Maintenance and Care

1. Introduction

The Portable Innovative-Operation Stripping Device was designed to be a user-friendly tool to simplify stripping abaca fibre by the ABACANEROS. This device ensures precision and efficiency.

2 Safety Precautions

To ensure safe operation, please adhere to the following guidelines:

- **Read Before Use:** Familiarize yourself with this guide before operating the device.
- **Setup PIOSD horizontally :** Always setup in a horizontal area..
- **Keep Away from Children:** This device is not a toy. Kept in a safety placed..
- **Inspect Before Use:** Check for visible wire connections and checked the battery if fully charge before use.

3. Features and Components

- **Compact Design:**Lightweight and portable for ease of use.
- **Adjustable Stripping Mechanism:** Supports a wide range of wire and material sizes.
- **Precision Blades:** Durable, replaceable, and engineered for clean cuts.
- **Rechargeable Battery (if applicable):** Provides cordless convenience.

4. Operation Instructions

Step 1: Preparation

1. Ensure the device is clean and free from debris.
2. Adjust the stripping mechanism to the required size using the knob or slider.

Step 2: Operation

1. Insert the material into the designated stripping channel.
2. Gently press the activation trigger or switch.
3. Maintain steady pressure and guide the material through the device.

4. Release the trigger/switch once stripping is complete.

Step 3: Final Steps

- Inspect the stripped material to ensure it meets specifications.

- Repeat the process as needed.

5. Maintenance and Care

- **Cleaning:**Wipe the device with a soft, damp cloth after each use. Do not immerse in water.
- **Blade Replacement:** Replace blades when dull or damaged. Follow the replacement instructions provided.
- **Storage:** Store in a cool, dry place. Use the provided carrying case if included.
- **Battery Care:** For rechargeable models, charge fully before first use and avoid overcharging.

6.Troubleshooting

Issue Possible Cause Solution	Possible Cause	Solution
Device won't start	Battery is low or dead	Recharge or replace the battery
Poor stripping quality	Blades are dul	Replace the blades
Material jams in device	Incorrect adjustment size	Reconfigure the stripping mechanism

Appendix D
Request Letter
Hon. BAYRAN T. SORRERA
Bgy Captain, Danicop,
Virac, Catanduanes

Sir
Greeting!
This is to respectfully request to conduct data gathering in the site area of Barangay Danicop from ***June 20 to December 30, 2024***. Data gathering will include collection of data in Solar and Wind Energy during in any weather condition in a dat. This is in relation to the research study entitled**: "Design and Development of a (*PIOSD*) Portable Innovative-Operation Stripping Device"** conducted by the faculty of the Catanduanes state University, College of Science, and Mathematics Department. The study will provide baseline information on how the **(*PIOSD*) Portable Innovative-Operation Stripping Device** relates to operate battery by charging Solar-Wind Hybrid Power energy. This information may be used to guide the constituent in the community to utilized the natural energy as a source maintenance of their alternative technology. Other related data which may be collected during the collection process may also be used for further studies.

The study will also provide on their utilization of Solar-Wind Energy including their uses in different technologies. The collection of data are considered the open are and near the coastal area to maximize the energy harnessed by the technology.

Hoping for your favorable response on this matter.
Thank you very much.

Very truly yours,
PIO G. PANTI JR., Ph.D
COS, Faculty Researcher NOTED:
LANI A. ILAGAN, Ed.D
Researcher Coordinator, COS
VICENTE G. PADILLA, MAME
Dean, College of Science

JOSE Z. TRIA, Ph.D
Research Director, RDS

ROSANNA S. ABUNDO, Ed.D

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