SANITARY PADS & DIAPERS USING BANANA AND ARECANUT FIBER ALONG WITH COCONT PEAT

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Introduction:

- The present scenario is widespread use of non-biodegradable sanitary pads & diapers poses serious environmental, health issues due to plastic content, chemical exposure, and improper disposal. These products take centuries to decompose, contributing to landfill overflow and microplastic pollution. Their burning release harmful greenhouse gases. Additionally, limited access to affordable sustainable alternatives and lack of awareness will worsen the issue. A shift toward eco-friendly options is crucial for a healthier environment and society.
- This project focuses on developing eco-friendly, biodegradable sanitary pads & diapers with the use of combined natural materials like Banana fiber, Arecanut fiber, and Coconut peat, finding the right combination & proportion of these agricultural by-products for excellent absorbency, breathability and sustainability. Unlike conventional chemical-based products, this alternative aims to reduce environmental pollution and promote safer, skin-friendly hygiene solutions. The initiative supports both environmental conservation and rural waste utilization.
- It aims to create biodegradable sanitary pads & diapers by using natural materials that are safe for both users and the environment. By replacing harmful chemical-based products, it promotes better personal health and hygiene. Additionally, it reduces environmental pollution and supports rural

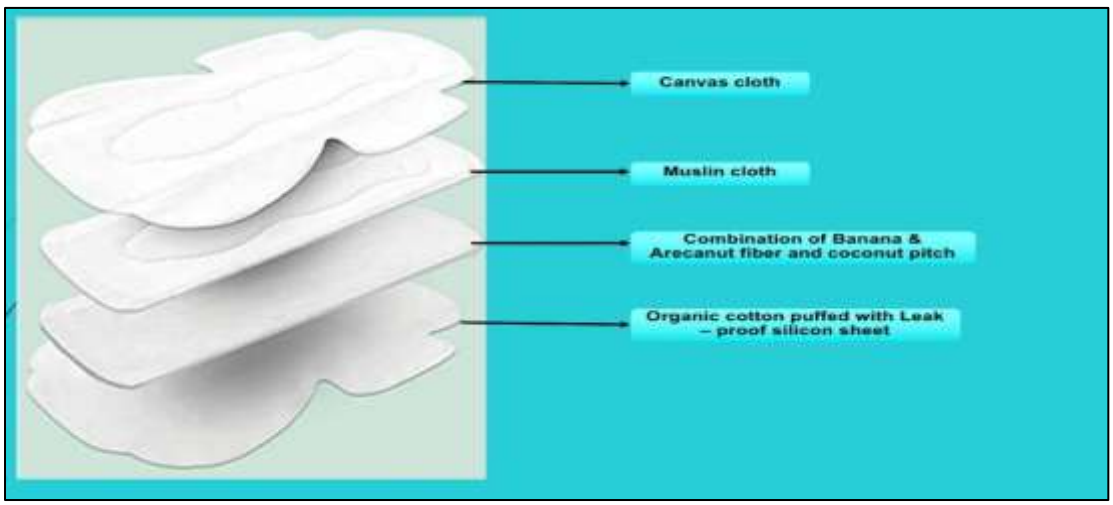
livelihoods through the use of agricultural waste, Eco-friendly, Biodegradable in soil, making it a sustainable and socially impactful solution for the society.

- Creating rural women employment in manufacturing these products.

Objectives:

- Developing Sanitary pads & diapers using a combination of Banana Fiber, Arecanut Fiber and Coconut Peat to create an Eco-friendly, biodegradable alternative to exiting chemical-based product.
- The aim is to reduce the impact on contamination of environment impact associated with disposable pads and diapers, which are often made from plastic and non-biodegradable materials.
- Many commercial pads & diapers contain plastics, contributing significantly to landfill waste. By replacing plastics (Decomposition in earth takes a very long period) with natural fibers (Decomposition in earth takes very short duration), these products could help reduce plastic pollution and also Waste-to-Product Model.
- It helps to reduce environmental pollution, contamination, supports and uplifts rural economy which also promotes a healthier and non-toxic alternative for users.

Methodology:



The project Methodology are as follows:

1. Extraction of Banana fiber: Banana stem is cut to the length varying from 23cm to max 35cm based on the standard size required, squeezed to remove water content, dried naturally/drying using elevated temperature and air circulation.
2. Arecanut Fiber: The fiber has to be extracted from the arecanut outer shell, squeezed to remove water content, dried naturally/force drying using elevated temperature and air circulation. That should be placed in between with the longer banana fibers.
3. Coconut peat: The coconut peat is the extracted from the coconut rind and dried naturally, which has maximum moisture retention property
4. All these three ingredients are placed in layered manner to have maximum moisture retention property in 4 layered pads and diapers.
5. All these above ingredients are sandwiched between 1stlayer of canvas cloth, 2nd layer of muslin cloth and 4th layer of organic cotton puffed with leak proof silicon sheet.
6. These are stitched and secured properly for non-leaking.

Result and Conclusion**:**

- ✓ Raw materials used are waste bye product of agriculture produce. Effective utilization of Banana steam, Arecanut fiber & Coconut peat are used in combination to develop a biodegradable, Non-toxic and Non contaminated product.
- ✓ Sustainable Use of Agricultural By-products like Banana and Arecanut Fibers, which are typically agricultural waste products (presently they have used for landfills), by using these raw materials and producing the product promotes a circular economy in rural areas. This contributes to a more sustainable agricultural industry.
- ✓ By using this product it improves Skin Health because these products are naturally soft and breathable, they could help in reducing skin irritations, rashes, or infections, which are commonly caused by the plastic and chemicals in regular sanitary pads and diapers. The breathable nature of the natural fibers helps to keep the skin dry, preventing the growth of bacteria or fungi.

- ✓ Sustainable Menstrual and Infant Care Options: The availability of eco-friendly sanitary products can promote more sustainable practices in menstrual health and infant care. This could drive a cultural shift towards more sustainable consumption patterns, especially in communities where disposable products are heavily used but are environmentally harmful.
- ✓ These materials are not only eco-friendly but also functional, ensuring the product performs well in terms of absorbency, comfort, and odour control, making them competitive in the market.

In conclusion, These are the results which is helpful to replacing the use of Commercial pads in the present day market.

1. Use of waste raw materials available in rural areas and converting into a useable product.
2. These products are biodegradable and environmental friendly.
3. Use of these products will avoid contamination of environment.
4. Will generate rural women employment, Improving the economic conditions.

Project Outcome & Industry Relevance:

- This project results in the development of Eco-friendly, Biodegradable sanitary pads & diapers using naturally available materials with high absorbency and moisture retention. The multi-layered design ensures comfort, durability, and leak protection while being free from harmful chemicals. The outcome is a hygienic, non-toxic product that promotes user health and reduces skin irritation and infections.
- Industrially, this innovation offers a sustainable alternative to commercial sanitary products, aligning with the growing demand for green and ethical consumer goods. It encourages the use of agricultural by-products, reducing waste and supporting a circular economy. The project also opens new avenues for rural employment and low-cost production units, with increased environmental regulations as well as consumer awareness, this solution has strong market potential and relevance in both local and global hygiene industries.

Working Model vs. Simulation/Study:

Experiments are under process in finding a right combination, pattern in placing Banana fiber, Arecanut fiber & Coconut peat for its strength, absorbability, spreadability, retention of moisture for long duration.

Project Outcomes and Learnings:

This project provided hands-on experience in extracting and processing natural Banana and Arecanut fibers. It taught effective techniques for drying and managing moisture content using both natural and forced methods. We understood the high absorbency and moisture retention capacity of coconut peat. The layering of eco-friendly materials enhanced our knowledge of functional product design. We gained skills in assembling and stitching biodegradable, leak-proof hygiene products. The project highlighted the importance of sustainable alternatives to chemical-based items. It improved our problem-solving abilities in developing practical, user-friendly solutions. We learned about the environmental benefits of using biodegradable materials over synthetic ones. The project also emphasized the role of agricultural waste in promoting rural economic growth. Overall, it strengthened our teamwork, creativity, and industry-relevant innovation skills.

Future Scope:

The future scope of this project includes:

- This eco-friendly product can be scaled up for commercial mass production, offering a sustainable alternative to commercial sanitary pads & diapers.
- Rising awareness about environmental conservation, the demand for biodegradable hygiene products is expected to grow significantly.
- The process can be standardized and automated using simple machinery for fiber extraction, drying, and product assembly to improve efficiency.
- There is potential for rural employment generation by setting up small-scale production units in Banana, Coconut and Arecanut growing regions.
- Further research can enhance absorbency and comfort by optimizing the fiber blend and layering technique.

- The product design can be expanded to different sizes and types, catering to babies, women and adults with incontinence.
- Export opportunities can be explored in global markets that prioritize eco-conscious products.
- Collaboration with healthcare sectors and NGOs can help in the wide distribution of these products in rural and underprivileged areas.
- The concept supports zero-waste and circular economy models by utilizing agricultural waste effectively.
- Educational institutions and startups can work together to create cost-effective models and raise awareness about menstrual and personal hygiene.
- Further development may include biodegradable packaging to create a fully eco-friendly product cycle.
- Testing and certification from health and safety bodies can improve credibility and consumer trust.
- The model could inspire similar innovations using other regional agricultural residues.
- Ultimately, this project can contribute to reducing plastic pollution, promoting public health and achieving sustainability goals.