ARYAVART SHODH VIKAS PATRIKA
RNI TITLED NO. UPBIL04292RNI
REG. NO. UPBIL/2014/66218 **PP. No.- 193-1**

I S S N NO. - 2347 – 2944 (Print)
e-I S S N NO.- 2582 – 2454 (Online)
Vol.-18, No.-IV, Issues-34, YEAR-Oct-Dec. 2024

Pineapple Fibers (PALF): Status in Northeast India and Potential for Entrepreneurship

1. DR. Anupama Mishra
2. Dr. Jyoti V. Vastrad

1. Professor, Textile and Apparel Designing Department 2. Dean, College of Community Science, CAU (I), Tura (Meghalaya) India

Received-15.12.2024, Revised-22.12.2024, Accepted-29.12.2024 **E-mail : anupamamishra8@gmail.com**

Abstract: ***The Northeast region of India is known for its rich biodiversity and favorable agro-climatic conditions, making it a major hub for agricultural production. Among its diverse crops, pineapple stands out as a key contributor, accounting for nearly 40% of India's total pineapple production. States such as Assam, Meghalaya, Manipur, and Tripura are at the forefront of pineapple cultivation, with over 100,000 hectares under pineapple farming, yielding approximately 1.2 million metric tons annually. However, despite this impressive production, the potential of pineapple leaves—a significant by-product—remains largely untapped. Pineapple leaves, which can be processed to extract valuable pineapple leaf fiber (PALF), are often discarded as waste. The development of PALF industries presents vast opportunities for entrepreneurship, economic growth, and sustainable development in the region (Dey & Saha, 2021).***

Key words : Pineapple Fibers, Biodiversity, Agro-climatic, farming, development, biodegradability

Properties and Applications of Pineapple Leaf Fiber- Pineapple leaf fiber has gained significant attention due to its superior properties, including high tensile strength, biodegradability, and versatility. These characteristics make it an excellent sustainable alternative to synthetic fibers, with applications in textiles, composite materials, paper production, and handicrafts. Research indicates that one hectare of pineapple cultivation can yield approximately 2.5 tons of fiber, with a recovery rate of 4% to 5% from the leaves (Prasad & Pande, 2019). PALF's unique properties position it as a critical material for eco-friendly industries, further strengthening the case for its commercialization.

In the textile sector, PALF is used to create high-quality fabrics known for their durability, lightweight nature, and breathable qualities. Pineapple fiber textiles are gaining popularity in the sustainable fashion industry due to their eco-friendly characteristics and aesthetic appeal. Additionally, PALF is utilized in the production of biodegradable composites, which serve as an alternative to plastic-based materials in automotive, packaging, and construction industries.

The paper and pulp industry also recognizes the potential of PALF due to its high cellulose content, making it suitable for producing specialty and handmade papers. These products are in high demand globally due to their unique textures and sustainable attributes. PALF-based paper and fabric products contribute to the development of a circular economy by minimizing waste and promoting the use of renewable resources.

Market Potential and Economic Opportunities

As global demand for natural fibers continues to rise, the sustainable materials market is projected to grow at a compound annual growth rate (CAGR) of 5.5%, reaching $15 billion by 2030 (Natural Fibers Industry Report, 2023). This expanding market presents a significant opportunity for Northeast India to position itself as a leading supplier of natural fibers. With an annual export potential of $50 million for pineapple-based products, the region's abundant raw materials could play a crucial role in meeting global demand while enhancing local economies (Sarkar, 2021).

Challenges in the Pineapple Fiber Industry -Despite its vast potential, the pineapple fiber industry in Northeast India faces several challenges. A major hurdle is the limited awareness among farmers regarding the economic benefits of pineapple leaf utilization. Most farmers currently focus on fruit

I S S N NO. - 2347 – 2944 (Print)
e-I S S N NO.- 2582 – 2454 (Online)
Vol.-18, No.-IV, Issues-34, YEAR-Oct-Dec. 2024

production, discarding the leaves as agricultural waste. Additionally, the absence of proper infrastructure for fiber extraction and processing further impedes the industry's growth (Das & Yadav, 2020).

Another significant challenge is the lack of market access for pineapple-based products. Without established supply chains, entrepreneurs struggle to scale production and enter global markets. Additionally, insufficient investment in research and development (R&D) hampers advancements in fiber extraction technologies and product innovation.

Strategies for Industry Development- To overcome these barriers and unlock the full potential of PALF, a strategic and multi-faceted approach is required:

1. Capacity-Building Programs: Educating farmers and entrepreneurs on fiber extraction techniques, processing, and product development will enhance awareness and participation in the industry.
2. Infrastructure Development: Establishing fiber processing units, equipped with modern extraction and refining technologies, will improve efficiency and product quality.
3. Government Support and Policies: Introducing subsidies, incentives, and financial support mechanisms can encourage entrepreneurship and investment in PALF-based industries.
4. Collaboration and Partnerships: Engaging stakeholders such as farmers, artisans, NGOs, and private enterprises will foster an integrated value chain, enhancing production and marketing efforts.
5. Investment in Research and Innovation: Encouraging R&D to improve fiber extraction methods, develop innovative products, and enhance the durability and usability of PALF will be critical for market expansion.

Sustainable Development and Future Prospects-The commercialization of PALF in Northeast India aligns with the country's broader sustainability goals, reducing dependency on synthetic materials and promoting environmentally friendly alternatives. By integrating traditional knowledge with modern technology, the region can transform agricultural by-products into valuable economic assets. The development of PALF industries can create employment opportunities for thousands of farmers, artisans, and entrepreneurs, contributing to economic growth and environmental sustainability.

As the global market for eco-friendly products continues to expand, Northeast India has a unique opportunity to establish itself as a leader in sustainable fiber production. By fostering a conducive ecosystem for PALF-based entrepreneurship, the region can drive innovation, support rural livelihoods, and set an example for sustainable development worldwide.

Conclusion- Pineapple leaf fiber represents an untapped resource with immense potential for economic and environmental benefits. Through strategic interventions, policy support, and collaborative efforts, the Northeast region of India can harness this opportunity to create a thriving PALF industry. By doing so, it can contribute to global sustainability efforts while promoting regional economic development. Leveraging its rich biodiversity and traditional expertise, Northeast India can emerge as a frontrunner in sustainable fiber innovation, setting a precedent for other regions to follow.

*****