P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating (2025): 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 9; September 2025; Page No. 471-474

Received: 10-06-2025
Accepted: 14-07-2025

Indexed Journal
Peer Reviewed Journal

Prospects of agripreneurship in northeast India through value addition of lotus (*Nelumbo nucifera*): A case study

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DOI: https://www.doi.org/10.33545/26180723.2025.v8.i9g.2444

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Abstract

The entrepreneurial spirit is crucial for the growth and success of the country and also plays a vital role in achieving economic independence. The Northeast region (NER) of India is a reservoir of rich natural resources and a diverse blend of people and cultures with a potential to evolve into a thriving commercial hub. The present study highlights the case study on entrepreneurship development in the NER through value addition of lotus and its fiber. It also determines the viability and feasibility of the venture in the region through cost and return analysis. The study concluded that the selected enterprise has generated a gross income of Rs. 18,87,000 and the benefit cost ratio based on variable cost and total cost resulted by 1.30 and 1.29 respectively.

Keywords: Agripreneurship, northeast India, lotus fiber, value addition, cost benefit ratio

Introduction

Entrepreneurship plays a pivotal role in the industrial growth and overall development of the nation, serving as the foundation for maximizing performance across various sectors. India's economy has a significant reliance on agriculture, with around 67% of the population residing in rural areas deriving their income from agricultural and related activities (Khan, 2021) [4]. In recent times, the agricultural landscape has expanded into a comprehensive ecosystem, encompassing various business activities related to farming, from production to consumption. The dynamics of economic activity are evolving in response to changes in social perspectives and consumer demands. The agriculture and agribusiness sector, operating at the grassroots level, holds the potential to bring about substantial socio-economic transformation across the nation, impacting the lives of numerous individuals (Ram *et al*. 2012) [6]. However, a significant amount of surplus produced goes to waste due to limited initiatives in processing, value addition and marketing of processed products. Therefore, the current situation necessitates organized entrepreneurs who can address both economic and social issues (Ram *et al*. 2012) [6].

The entrepreneurial spirit is crucial for the growth and success of the country and also plays a vital role in achieving economic independence. It also encompasses enthusiasm, persistence and the ability to identify opportunities for an enterprise. A nation's capacity to generate a continuous stream of business opportunities relies on the engagement of its people in entrepreneurial activities, making entrepreneurs the driving force behind national growth. Successful entrepreneurship is not necessarily contingent on a strong business and financial background; instead, well-structured training can cultivate outstanding entrepreneurs. In today's world of growing population, employment opportunities are limited. According to Dollinger (2003) [2], entrepreneurship within the agricultural context involves establishing innovative economic entities with the aim of achieving growth or profit amidst the challenges of risk and uncertainty in agriculture. The process of employing entrepreneurial approaches in agriculture and related sectors is known as Agripreneurship, involving the implementation of innovative methods to enhance productivity and financial gains. Agripreneurship transforms agricultural endeavors into entrepreneurial initiatives, contributing to rural economic development by introducing novel ideas in agriculture. An agripreneur, often an innovator, plays a pivotal role in driving improvements in the rural economy by taking risks, employing innovation, developing new processes and exploring new market opportunities. Agricultural businesses, once perceived as low-tech and dominated by small scale enterprises focused on traditional practices, have witnessed significant changes in the past decade. Economic, liberalization, reduced agricultural market protection and societal evolution have compelled agricultural businesses to adapt to market

dynamics, changing consumer lifestyles, environmental regulations and evolving standards for product quality, supply chain management, food security and sustainability.

The Northeast region of India, consisting of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, is a reservoir of rich natural resources and a diverse blend of people and cultures. Endowed with abundant biodiversity, significant hydro energy potential, oil and gas reserves, coal deposits, limestone, forest resources, fruits, vegetables, flowers, herbs, aromatic plants, as well as rare and diverse flora and fauna, Northeast India has the potential to evolve into a thriving commercial hub. Therefore, the present study highlights the case study of potential untapped agricultural resources for entrepreneurship development in the NER of India through value addition of lotus.

History of Lotus yarn: Lotus is regarded as a very spiritual plant and the lotus flower motif is a very popular textile design. Among numerous religions, Hinduism and Buddhism have a profound religious tie to the lotus plant (Aishwariya and Thamima, 2019) [1]. Lotus textiles are particularly popular in Thailand and Myanmar as a sumptuous fabric with a long manufacturing period and the appearance and feel of silk-linen blend. According to sources, the extraction of fibre from lotus stem have begun around 1910, when Daw Sa Oo (Madame Sparrows Egg) set out to make robes for the highly revered abbot of a nearby monastery out of the fibres of the local padonma-kya lotus plant, which grew wild in the lake's shallows. They experimented as a group with various filament extraction and preparation techniques, finally weaving a pair of robes to her taste. The gratified abbot had the weavers' name changed to Daw kya Oo (Madame Lotus Egg) in recognition of her religious accomplishment. Throughout their lifetimes, Daw Kya Oo and her companions continued to weave using lotus yarn for charitable rather than commercial motives, making one or two sets of robes each year for famous local abbots (Aishwariya and Thamima, 2019; Tomar and Yadav, 2019) [1, 7].

Materials and Methods

The study was carried out in M/s. Sanajing Sana Thambal located at Thanga Moirang, Bishnupur district at Manipur. Primary data regarding the cost incurred in the establishment of enterprise and the return generated from the production was collected from the proprietor of the enterprise. To determine the outcomes, the data collected were examined with the help of analytical tools i.e. cost and return analysis to derive the results.

Cost and return analysis

Cost Analysis

a. **Cost A_1:** It encompasses expenses such as cost of hired human labour, raw materials, packaging materials, transportation, cost of machinery, electricity charges, interest on working capital and fixed capital, land revenue and depreciation cost of machinery and equipment.
b. **Cost C:** Cost C=Cost A_1 + Imputed value of family labour
c. **Variable cost:** Variable cost includes the cost of labour, raw materials, packaging materials, electricity cost, transportation cost and working capital @ 7% per annum.
d. **Fixed cost:** It includes depreciation cost on the work shed, land revenue, machinery and equipment and interest on fixed capital @ 7% per annum.

Return Analysis

a. **Gross income:** Gross income was imputed by multiplying the output of products by their respective prices.
b. **Farm business income:** It is the subtraction of Cost A_1 from gross income
   Farm business income = Gross Income – Cost A_1
c. **Net income:** Net income was determined by subtracting Cost C from gross income
   Net income = Gross Income – Cost C
d. **Benefit-cost ratio:** Benefit-cost ratio based on variable cost = Gross Income/Variable cost
   Benefit-cost ratio based on total cost = Gross Income/ Total cost

Results and Discussion

Case study of M/s. Sanajing Sana Thambal Pvt. Ltd.

Lotus silk, a unique textile crafted from the delicate fibers of lotus stems, is renowned as one of the world's most expensive fabrics due to its intricate and labor-intensive production process. Primarily manufactured in countries such as Vietnam, Myanmar and Cambodia, lotus silk gained traction in India when a woman from Manipur discovered the technique for fiber extraction. Pioneering this endeavor, she became the first woman entrepreneur in India to introduce lotus silk, establishing her enterprise, "M/s. Sanajing Sana Thambal Pvt. Ltd.". She not only embarks on producing lotus silk yarn, but also aimed to share the fiber extraction method with other women in her village.

The proprietor, Tongbram Bijiyashanti Devi, hailing from the Bishnupur District of Manipur, where farming and fishing are predominant occupations, innovatively utilized lotus stems from Loktak Lake to create scarves, neckties, masks, lengyanphee (stoles) and various apparels which are sold locally at prices of Rs 400 per face mask, Rs 1200 per necktie, and Rs 7,000 to Rs 20,000 for scarves, depending on their size. Her initiative not only generated income for her family but also offered an inventive livelihood option for the other people, particularly women, contributing significantly to the economic well-being of rural women. The labor-intensive nature of the production process contributes to the higher costs of these products, but Bijiyashanti ensures that her employees receive a respectable honorarium from the generated income.

Bijiyashanti emphasizes the significant health benefits associated with lotus fabric wears. According to her, these products can aid in alleviating issues such as neck pain, heart problems, restlessness of mind and headaches. Additionally, clothes made from lotus yarn are entirely biodegradable and environmentally friendly. She claims that her clothing items serve various purposes, ranging from ceremonial and fashion wear to casual use. Lotus cloth is also sought after for rituals and worship purposes and there is currently an insufficient supply to meet the demand from outside sources. Despite the potential for modern

technology to enhance production volume, Bijiyashanti expresses a preference for handmade products. She values the craftsmanship involved and highlights the absence of specific machines designed for this particular production process. As of now, she remains focused on maintaining the authenticity and uniqueness of her handmade lotus fabric wears. Having trained over 50 local women in fiber extraction and yarn spinning, her enterprise has diversified into producing lotus tea from water lily flowers. Recognizing her efforts, she was selected for Start-up Manipur under the agricultural tourism category, showcasing products derived from aquatic plants.

Table 1: Details of raw material procured and cost of procurement by "M/sSanajing Sana Thambal Pvt. Ltd."

Sl. No.	Name of Raw Material	Price (Rs/bundle)	Quantity Purchased Per Year (bundle or Kg)	Cost of Procurement (Rs.)	Percentage Share in total cost (%)
1	Lotus stem	100	680	68,000	38.64
2	Water lily flower	150	720	1,08,000	61.36
Total cost incurred in raw material				1,76,000	100.00

Table 2: Details of cost incurred in procurement of packaging material per year by "M/s. Sanajing Sana Thambal Pvt. Ltd."

Sl. No.	Packaging items	Cost (Rs. /piece)	Quantity used per year (unit)	Total cost per year (Rs.)
1	Stand up pouch	4	12000	48,000
2	Labelling & printing cost	2	13000	26,000
Total				74,000

Table 1 displays the raw materials procured by "M/s. Sanajing Sana Thambal Pvt. Ltd". The company produces lotus yarn and value-added water lily tea. The procurement of water lily flower resulted with highest cost (61.36 percent), followed by lotus stem (38.64 percent), and the overall cost incurred in raw material procurement was Rs. 1,76,000. Table 2 displays the specifics of the cost incurred in the purchase of packaging materials per year and it was observed that the highest cost was incurred in the procurement of stand-up pouches (Rs 48,000) followed by Labelling & printing cost with Rs 26,000. The total cost incurred in procurement of packaging material per year was Rs. 74,000. An overall cost of Rs. 95,500 was invested in setting up the enterprise (depicted in table 3). The highest cost was incurred in establishment of work shed (Rs. 85,500) followed by spinning machine and wooden table with Rs. 6,000 and Rs. 4,500 respectively.

Table 3: Details of fixed capital installed by "M/s. Sanajing Sana Thambal Pvt. Ltd."

Sl. No.	Machinery	Quantity	Rate (Rs)	Total (Rs)
1	Work shed	1	85,000	85,000
2	Spinning machine	4	1,500	6,000
3	Wooden table	9	500	4,500
	Total			95,500

Analysis of production cost and returns

Table 4 outlines the production output and returns of "M/S Sanajing Sana Thambal Pvt. Ltd.". The extraction of yarn and crafting various artistic products such as lengyan (scarf), ties, and masks is done by the enterprise itself. The enterprise relies on its skilled craftspeople for the extraction of this natural fiber. It takes one to two months to extract enough lotus silk for a single scarf and the resulting product can be priced tenfold higher than regular silk. The delicate lotus silk threads need to be processed within 24 hours while still wet to prevent breakage, but once woven, they exhibit durability comparable to traditional silk.

Table 4: Production of value-added products from lotus and income generated by "M/s. Sanajing Sana Thambal Pvt. Ltd."

Sl. No.	Product	Production (piece/packet)	Price/piece or packet (Rs.)	Gross return (Rs.)
1	Lengyan (Scarf)	10	7500	75,000
2	Tie	7	1200	8,400
3	Mask	9	400	3,600
4	Water lily tea	18000	100	18,00,000
Total Income				18,87,000

The enterprise's overall revenue amounted to Rs. 18,87,000, with the highest production and revenue stemming from water lily tea, driven by its strong demand for medicinal properties and natural antioxidants. The scarcity of lotus silk production each year contributes to its high cost, as the demand consistently outstrips the limited supply. Scarves crafted from lotus silk provide a luxurious feel similar to real silk, but due to the intricate and labor-intensive weaving process involved with lotus fibers, lotus silk stands as one of the most expensive fabrics globally.

Table 5 presents the total variable and fixed cost incurred per year by the enterprise. It includes cost incurred in labour, raw materials, packaging materials, transportation cost, electricity charges and interest on working capital (computed as 7 percent of the total working capital). The cost incurred in labour, raw material, packaging material, transportation cost, electricity charges and the interest on working capital was resulted as Rs. 10,57,800, Rs. 1,76,000,

Rs. 74,000, Rs. 43,200, Rs. 3,600 and Rs. 94,822 respectively. The total fixed cost resulted by Rs 7169. From the table, it can be concluded that the total cost incurred in labour cost and cost of raw material are higher than the other cost. It is so, because the enterprise is home-based small-scale industry, where majority of the machineries are manually operated and is labour intensive due to which it requires high labour. The procurement cost of raw material and packaging material is high because the raw materials are procured from the local markets due to which they purchase the raw material at market price.

Table 5: Total variable and fixed cost incurred per year by M/S Sanajing Sana Thambal Total variable cost incurred (Value in Rupees)

Cost of Labour	
Family labour	109800
Skilled labour	756000
Unskilled labour	192000
Total Labour Cost	1057800
Cost of raw materials	176000
Cost of packaging material	74000
Transportation cost	43200
Electricity charge	3600
Interest on working capital@ 7%	94822
Total variable cost	1449422
Total fixed cost incurred	
Depreciation on machineries and equipment	6650
Land revenue	50
Interest on fixed capital @ 7%	469
Total fixed cost	7169

Table 6: Cost of production per year by"M/S Sanajing Sana Thambal"

Cost items	**Value in Rs.**
Hired labour	948000
Raw material	176000
Packaging material	74000
Transportation	43200
Electricity	3600
Depreciation of machinery & equipment	6650
Interest on working capital @ 7%	94822
Interest on fixed capital @ 7%	469
Land revenue	50
Cost A1	1346791
Imputed value of family labour	109800
Cost C	1456591

Table 6 provides information on the annual total production costs incurred by the startups. The production cost in the business was determined through the computation of both Cost A1 and Cost C. Cost A1 encompasses all expenditures related to hired human labor, raw materials, packaging materials, transportation, electricity charges, interest on working and fixed capital, land revenue and machinery and equipment depreciation. Cost C was derived by incorporating the monetary value of human labor into Cost A1. However, Cost A2 and Cost B could not be determined since none of the startups had leased land**.** The Cost A_1 and Cost C for "M/s. Sanajing Sana Thambal" was highest at Rs 13,46,791 and Rs. 14,56,591 respectively.

Table 7: Returns per year from the products produced by "M/S Sanajing Sana Thambal"

Returns	**Value in Rs.**
Gross Income	1887000
Net income	540209
Farm business income	430409
Income over variable cost	437578
Benefit cost ratio based on variable cost	1.30
Benefit cost ratio based on total cost	1.29

The analysis of returns generated by the enterprise focused on examining different categories of farm income, including gross income, farm business income and net income. Additionally, the benefit-cost ratio was calculated based on both variable costs and total costs. To determine the gross income of the enterprise, the total production of products was multiplied by the market selling price of those products. The details of returns from the products produced by the enterprise are presented in table 7. The enterprise generated a gross income of Rs. 18,87,000 and the benefit cost ratio based on variable cost and total cost resulted by 1.30 and 1.29 respectively.

Conclusion

Agripreneurship with the value addition of lotus results to be a viable and feasible business with the benefit-cost ratio on variable cost and total cost equaling to 1.30 and 1.29 respectively. Although the items derived from lotus fibers are opulent and costly, due to time-consuming processes and the requirement of high skills from extractors and weavers, nevertheless due to its distinctive and durable nature of lotus fabric, it has garnered attention from both national and international clothing brands. However, certain challenges persist, such as the necessity for enhanced processing facilities and increased technical support for value-added products. Through strategic and technological interventions, the potential for lotus silk and other value-added lotus products will not only enhance economic prospects but also establish a prominent presence on the global stage as a premium and unique transformative quality product.

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