



## **A New Value Stream Approach for Trading of Siali Leaf Plate (Important NTFP): An Opportunity for Strengthening the Livelihood Status of Tribal Kandho Community of Kandhamal District of Odisha**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author PPS designed the study, wrote the methodology and wrote the first draft of the manuscript. Authors KKS, MS and VT managed the analyses of the study. Authors MS, KSSC and VT managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Siali leaf-plate production is an indispensable means of livelihood in Kandhamal district of Odisha. The leaf has so many uses like plates, bowls and packing material. In the market, it is more precious and advantageous than the Sal leaf due to its low cost, large in size, hygienic, non-odorous, non-toxic, lightweight, heat resistant and biodegradable. The present study was carried out in Kandhamal district putting particular emphasis on two blocks Daringbadi and Raikia. A total of five villages were selected, from which 78 households were randomly chosen. From each block, 7 traders were chosen purposefully and were interviewed. The analytical techniques viz. Descriptive analysis, SWOT analysis, Price spread analysis and value chain analyses were used for the study. The marginalised poor tribal of the district are unaware of the new value stream

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approach and the road ahead in front of them to commercialise their product. The paper aims at contributing improved livelihoods through a conceptualised value chain incorporating various improved technology, cooperatives and producer organisation. The tribal women perform a variety of functions at different stages in the value chains, but their roles tend to be improper and inadequately acknowledged because they are operating in the informal sector, so this problem should be solved through the intervening solution proposed.

*Keywords: NTFP; leaf plate; value chain; livelihood; sustainable.*

## 1. INTRODUCTION

Siali (*Bauhinia vahlii*), commonly called Siali Patta is a massive creeper that grows mostly in Sal forests. The moisture content of the Sal forests is conducive and acts as a stimulus for Siali's growth. Siali leaf-plate production is an indispensable means of livelihood in various parts of India [1]. Siali leaf (*Bauhinia Vahlia*) is an important NTFP (Non-timber forest product) in different parts of Orissa. The leaf is mostly used locally by the grocery shops, hotel as plates, bowls and packing material. In the market, it is more precious and advantageous than the sal leaf. In the rural areas of Ganjam, Gajapati and Phulbani the siali plates are mainly being used during different community feasts and various occasions. The leaf has a reasonably good market in some districts of Andhra Pradesh. The Siali value chain starts from the jungles of Kandhamal district in Orissa, where the Siali produce is collected and sent to the markets in all over India [2]. From leaf to plate it has gone through various stages of processing like collecting, stitching, drying, packaging, sealing and branding. A strong rope is prepared from its

stem bark. Seeds are edible after roasting, nutritious and considered as a substitute to almond, traditionally used by local healers as aphrodisiac, tonic and vermifuse (killing abdominal worms). Seeds are also given in case of infertility of women. Leaves are used in case of dysentery and stomach ache by tribal healers. Siali plate has much more advantage over other leaf plates, like low cost, large size, hygienic, non-odorous, non-toxic, lightweight, heat resistant, natural and biodegradable. The weight of each plate is only 60 grams, and weighing capacity is 1500 grams [3].

### 1.1 Uses of Siali Leaves

Six different products are made from Siali leaves:

- Loose leaves (used for dry snacks)
- Rough-stitched plates (from poor quality leaves)
- Medium- stitched
- Close-stitched (called bhoji Khali, as used in feasts)
- Machine- stitched (using sewing machine)
- Moulded plates.

Rough Stitched	Medium Stitched	Fine or Close Stitched	Machine Stitched
Roughly stitched plates have two to three stitches between each leaf and in no particular orientation. Poor quality leaves are used in roughly stitched plates.	Medium stitched plates have five to six stitches between two leaves, where the stitches also follow an orientation to make it look neat. They are leak proof if the leaves have holes they are patched.	Excellent stitched plates have twelve to fourteen stitches between two leaves, where the stitches follow a closed orientation. These plates are also leak proof.	Machine stitched plates are made with a sewing machine. The quality of this is really good as the stitches are finely oriented and is completely leak proof

In this paper, an innovative framework is presented for the sustainable development of the tribal people of the district by receiving more income through a new Value Stream approach [4]. Value Stream Mapping is one of the best tools to map a process and to identify its main criticalities. The primary objective of this paper consists in the solution of a problem faced by the tribal woman and in earning of more income with the utilisation of same raw materials. The proposed approach is based on some advanced steps and integrates Value Stream Mapping with other tools. With this backdrop, the current study was carried out in Kandhamal district with the following objective.

- To analyse the strength, weakness, opportunity and threat of the Siali Leaf-Plate production.
- To describe the prevailing marketing channels and price spread analysis.
- To analyse the value chain of siali leaf plate production.
- To propose a conceptual model of leaf plate making.

socioeconomic characteristics of the community, the processes carried out for the making of plates and the ongoing trading process and income generated. 78 households were randomly selected from five villages for the purpose of household survey and self-administered interview was conducted with the members of the households. In order to generate information about the marketing channel, key informants' interview was conducted with three local businessmen in Daringbadi bazaar and the staffs of pradan involved in the trade of siali leaf. A purposive field visit was arranged to take photos of different plant parts for identification and plate making. The information collected was compared with published literature. The study is both qualitative and quantitative in nature, since it involves more of observing and understanding the conditions prevailing in the study region.

## 2. METHODOLOGY

The present study was carried out in Kandhamal district placing special emphasis on two blocks Daringbadi and Raikia. Kandho are the most significant ethnic group in Kandhamal, and they form nearly 60 percent of the total population [5]. A household survey was conducted to obtain information about the demographic and

**Table 1. Structure of sampling design**

District	Block	Village	Tribal household	Local traders
Kandhamal	Daringbadi	Sonepur	12	7
		Daringbadi	22	
		Sikaramaha	14	
	Raikia	Mandakia	12	7
		Lengumaha	18	
<b>Total</b>		<b>5</b>	<b>78</b>	<b>14</b>

### 2.1 S.W.O.T. Analysis of the Siali Leaf-Plate Production

SWOT analysis technique was used to indicate the current constraints and future possibilities of the leaf plate making in Kandhamal district. It is a strategic planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in any venture.

Strengths	Weaknesses
1. Abundance of raw material	1. A time consuming process
2. Eco-friendly nature	2. Non - standardised quality
3. Durability of the product	3. Easily damaged
4. Based on traditional knowledge	4. Depleting quantity
5. Empowerment of the women	5. Storage capacity
6. Low investment - a no liability business	6. Working capital
	7. Product portfolio not yet optimised
	8. Absence of marketing and trading expertise
Opportunities	Threats
1. Creation of value additions	1. Plastic and paper plates are cheaper [7]
2. Supply of value - added products directly to end markets [6]	2. Price driven market
3. Brand creation	3. Unscientific cropping of Siali
4. Increasing the outreach of the cooperative by bringing in more families	4. Multiple stakeholders

Siali leaf plate production in the district today is constrained by many factors. It created history by becoming the large contributor of siali leaf plate. One of the objective of this paper is an effort to analyses the strengths, weaknesses, opportunities and threats of siali leaf plate production. While the strengths lie in having the abundance raw material, durability and women empowerment, the weaknesses lie in non-standardized quality, absence of product portfolio and lack of market information. Efforts need to be made to face the threats and exploit the available opportunities.

## 2.2 Marketing Channel

Marketing channels are the routes through which produce reaches the final consumer. The following two marketing channels were identified in the marketing of leaf plate in the study area.

### Channel I:

Producer → local trade → wholesaler  
 → Retailer → Consumer

### Channel II:

Producer → local trader → manufacturer  
 → Retailer → Consumer

### 2.2.1 Price spread

It is the difference between the price paid by the consumer and the price received by the producer. It mainly consists of marketing cost and marketing margin. The price spread analysis was carried out as follows

#### 2.2.1.1 Producer's share in consumer's rupee

$$P_s = \frac{P_f}{P_c} \times 100$$

$P_c$  = Consumer's price  
 $P_f$  = Producer's price then the  
 $P_s$  = Producer's share in consumer's rupee

$$P_s = \frac{360}{550} \times 100 = 65.45$$

$$P_s = \frac{360}{1200} \times 100 = 30.00$$

It is observed that there were two marketing channels prevail in the study area. The producer's prices are same in both the cases, but the consumer price differ due to more value addition done by the manufacturerer, though the producer share in consumer rupee is more in channel I, but the channel II is preferred over I due to value addition.

**Table 2. Price spread analysis of channel –I**

Particulars	Rs/Bundle	Percentage
Price received by the tribal woman ( $P_f$ )	360	72.00
Local trader purchase price	360	72.00
Marketing cost of local trader	30	5.45
Marketing margin of local trader	20	3.63
Selling price of local trader	410	74.54
Wholesaler purchase price	410	74.54
Marketing cost	40	7.27
Marketing margin	30	5.45
Selling price of wholesaler	480	87.27
Retailer purchase price	480	87.27
Marketing cost of retailer	20	3.63
Marketing margin of retailer	50	9.09
Selling price of retailer	550	100
Purchasing price of consumer ( $P_c$ )	550	100
<b>Price spread</b>	<b>CP-PP=190</b>	<b>34.54</b>

## 3. ANALYSIS OF THE SIALI LEAF PLATE VALUE CHAIN

### 3.1 Collection

The tribal women of the study district are dependent upon forest produces, mostly Siali leaves for their livelihood. The tribal women wake up early in the morning to leave for forests. They spend the whole day collecting leaves, seed, tamarind, Mahua flowers and return during day. These are sold at Rs. 10 to Rs. 15 per chakki which has 80 to 100 leaves. Local traders come to these areas to buy the leaves. Also the big traders who make the most profits directly buy the loose leaves and take it to the cities like

Berhampur, Kothkuttam where they themselves do the value addition.

### 3.2 Rough Stitched / Medium Stitched / Close Stitched / Machine Stitched

The loose leaves are made into rough, medium stitched, close stitched and machine stitched leaf-plates by various producer groups. Rough stitch has the largest market, because there is more money to be made by traders who buy them at the cheapest rates and add value to them and thereafter sell at very profitable margins.

**Table 3. Price spread analysis of channel –II**

Particulars	Rs/Bundle	Percentage
Price received by the tribal woman	360	30.00
Local trader purchase price	360	30.00
Marketing cost of local trader	30	2.50
Marketing margin of local trader	20	1.66
Selling price of local trader	410	34.16
Manufacturer purchase price	410	34.16
Marketing cost Manufacturer	290	24.16
Marketing margin Manufacturer	340	28.33
Selling price of Manufacturer	1040	86.66
Retailer purchase price	1040	86.66
Marketing cost of retailer	50	4.16
Marketing margin of retailer	110	9.16
Selling price of retailer	1200	100
Purchasing price of consumer	1200	100
<b>Price spread</b>	<b>CP-PP=840</b>	<b>70.00</b>

### 3.3 Drying

After stitching the plates are sundried to increase the storing capacity. Due to this operation the leaves are free from any fungal infection. Sometimes due to more heat the plates were broken and loose the market price.

### 3.4 Cutting

From here onwards, the traders add the value. The leaves are stacked and manually cut to make the plates look perfectly round in shape and thus more appealing. A majority of the cut leaves are directly packed and sold to the markets. Only a small portion moves to the next level of value addition, which is moulding.

### 3.5 Moulding

Moulding into buffet plates is a product that serves only an elite market. Family weddings, important functions and big hotels, use moulded plates. Here, the cut leaves are made to have a base of cardboard and a thin plastic sheet is inserted in between to make it leak proof. This arrangement is put into a moulding machine which will then produce the buffet plates. These plates look fancy and are the most expensive of all Siali plates.

### 3.6 Packaging

This marketing function carried out at two stages, one at the farmer level and another at manufacturer or retailer level. Packaging is where most of the value is added. The finer the packaging, the higher the price fetched per chakki. At farmers level rough packaging was carried out by binding the chakies with the rope made up of siali bark and at traders level, the cut leaves or moulded leaves are put into plastic bags in bunches of 20 or 40. These are transparent plastic covers. To make it look fancy, a round gold sheet – as per the exact size of the plate is inserted at the top and the bottom of the bunch to make it look good from both sides. Then the bags are sealed and are stacked in bunches of 80 or 100, 5 bags of 20, or two bags of 40. The bunch is then wrapped in a cane mesh and tied with jute rope.

### 3.7 Branding

This is probably the most crucial part of the value addition. The packages are branded before the sealing. "Madhuri Special", for example, is a popular brand of plates [3]. The sealing takes place once the worker makes sure that the brand is inserted in both sides and remains at the centre. The only drawback in branding is that there are many limitations. A unique brand with a hologram or some other sort would be a good idea, else they all look the same, each copying the others brand name.

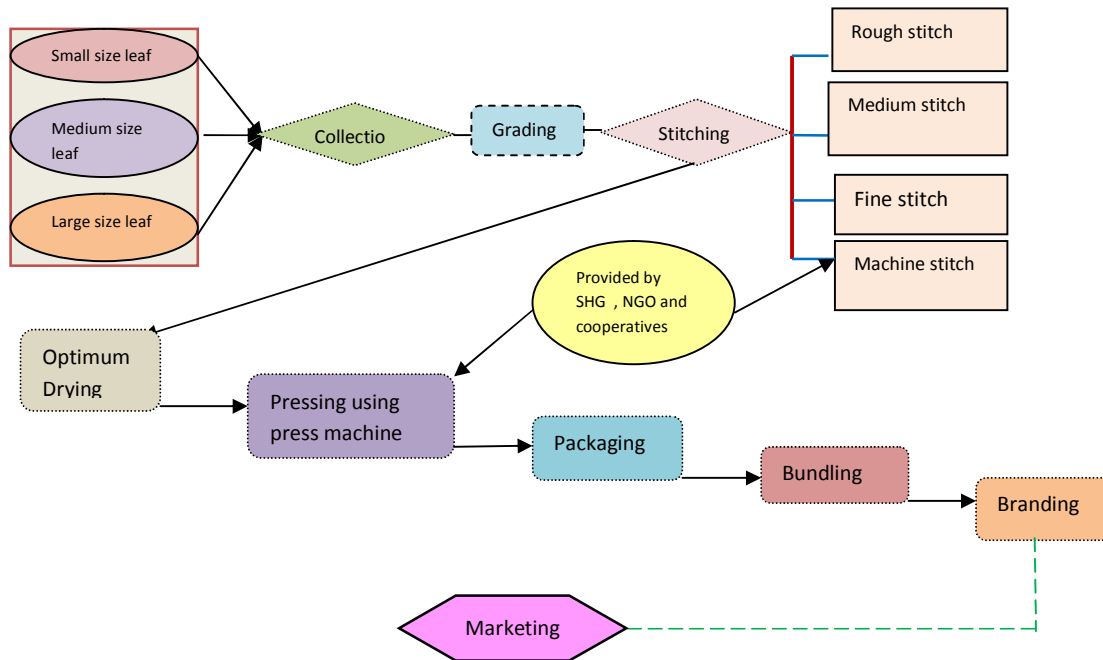


Fig. 1. Best leaf plate making (practice) model for the tribal people

#### 4. PREVAILING SITUATION IN THE STUDY AREA

The tribal woman have earned their livelihood by plucking Siali leaves in spring and winter when the siali leaves are good for plucking. Their activities have remained basically the same throughout the year. The women of the households wake up early to leave for the forests. They spend the whole day collecting leaves and return late in the evening. Then they stitch the leaves (rough or medium) some of them doing close or fine stich using machine provided by the cooperatives in respective gram panchayat after that the stitched plates are dried for 2 to 3 days, then the leaves are bundled by the men, using a tall and hollow metal structure to press the leaves inside and bundle them tightly. The unstitched leaves and the roughly stitched plates are then bought by the local trader by giving very cheaper rate like Rs 10 to Rs 15 per chaki depending on the quality of the leaves. The factors that determine quality are the levels of dryness and the colour of the leaves. Normally the faded green coloured leaf fetches the maximum price. This particular type is found only during months of April and May every year. Often the trader will simply dictate a price and the villagers are unable to argue due to their financial obligation. The tribal have a very vulnerable source of income. "Siali gives us

enough money to buy salt and sugar and a few basic necessities in the house." "You have to understand that when a family says that, sugar and salt is a big deal for them they often have to make do without such basic necessities, this is because of their deep rooted poverty." [3]. The Siali producers of the district are unaware about value additions. They have dealt only with loose dried leaves for generations. They are incapable of bargaining for a better price and quoting a price for the leaves based on basic inflation over the years. Importantly, their skills have not been harnessed to bring more income to the family by selling value added products to the market. What puts them at even greater disadvantage is their complete lack of awareness on how to capitalise on a product that originates in the district and gets sold for ten times this price in main city markets.

#### 5. PROPOSED INTERVENING SITUATION OF THE STUDY AREA

Kandhamal district in Orissa is known as one of the country's most impoverished pockets. Encouraging such a no investment or low investment, self-earning activity which offers the people a stable source of livelihood and equips them to come together and capitalise on the large quantities of value added Siali-leaf plates to ensure them of higher incomes. More than half

(60 per cent) of the families in Kandhamal were already engaged in Siali leaf-plate production. This sector itself has a lot of demand. Its typical use in urban centres during marriages and other social occasions ensures that there is a very steady increase in the demand for leaf plates. There is also a huge demand from other states like - Andhra Pradesh and Maharashtra also. In this situation the question is how the income of the group can be increased using innovative methods. The people are very laborious, so how their efforts can be converted into money. From the discussion and the research knowledge it was found that, if the tribal woman collected leaves and graded them according to size, then stitch them as per the demand like for snacks purpose only small leaves can be used no need of using large size and cut them to appropriate size, like that for bowl medium size leaf can be used and for plate large size. Another drawback in the area was that the tribal women sometimes to meet their financial scarcity sell the plates with rough stitch which then again are restitched by the traders, so if the producer groups stitch perfectly giving some time they can get more price. Another important idea is the Involvement of SHG in leaf plate trading in order to provide the tribal producers with the opportunity to add value and sell their produce directly to bigger leaf-plate markets. Needless to say, this effort broke the monopoly of the local traders.

### 5.1 Advantages of the Proposed Situation

- Additional income.
- Gain the idea of different value addition.
- Market link can be established.

## 6. CONCLUSION AND RECOMMENDATIONS

Understanding the siali leaf plate commercialisation through a profit lens requires mapping of the full value chain, as well as the interactions and relationships between the actors involved in the different stages. Up-scaling of trade in siali leaf plates needs careful consideration as it could displace women through labour-saving technologies and through enhanced profits and more specialised value chains that attract modern technology [8]. Promotion of women's involvement in and benefits from leaf plate value chains will require tailored support to meet women's needs concerning independent legal status, technology, organisation, and managerial capacity. The above study suggest that with increased

awareness amongst government agencies/ departments and NGOs of the less visible roles that women play and targeted interventions, [9] particularly in policy and legislation, training and collective action, women could benefit more from their current activities and, in some cases, from expansion into new areas of the value chains. Our purpose in this article has not been to condemn all attempts at promoting siali leaf commercialisation, but rather to optimise the prevailing situation and achieve simultaneous conservation of forest product and its development. Conservation and sustainable use of these resources will lead to a path of sustainable agriculture and assured food security of the tribal communities. This calls for a need of training to the collectors about the importance and methods of sustainable and scientific harvesting of siali leaves. However, the venture remains a useful means of contributing to improved livelihoods, particularly of the marginalised forest-dependent poor [10]. In order to improve the profit margin of the tribal women of the district, capacity building of the community in terms of technical trainings, involvement of cooperatives, financial support, storage facilities, and knowledge of legal requirements can help to improve the livelihood status of the community.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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