



# Forest Green

## Leaf Pressing Machine Details



Forest Green



**industree**  
with women, for planet

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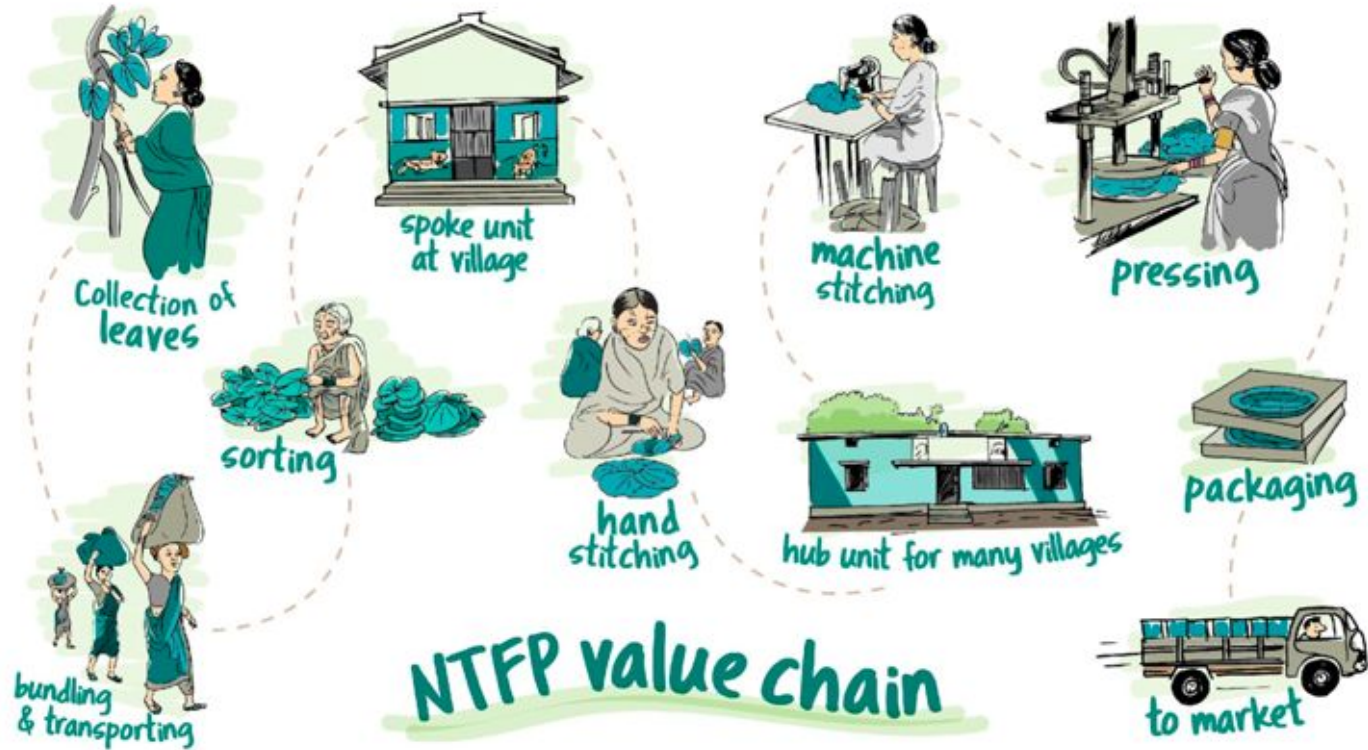
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# Overview of Forest Green

Incubated by Industree in 2021, Forest Green is enabling an inclusive ecosystem to facilitate socio-economic opportunities and building sustainable livelihoods for women and youth in forest fringe areas of Odisha. The initiative has created the mechanism to empower the women of Khonds, Kui, Dharua, Paraja tribe to prosper and increase their general wellbeing.

Forest Green has given them opportunities to leverage forest based enterprises, providing continuity in work and decent incomes, build their socio-economic cohesion while enabling them to preserve their prevailing culture. Theory of Change focuses on the key strategy that transforms the green resources and skills of the women to a higher value product, such as a globally compliant buffet plate. The higher-value plates have the potential to fetch a 10X price of 10 cents with customers across India and can be supplied globally at these prices. The climate-driven impact under Forest Green has significantly supported natural and eco-friendly based products, with women driving the climate actions and conserving the environment at the grassroots level. There lies a huge scope for these products to be taken to the international markets as well, especially since communities across the globe are looking for sustainable solutions that can substitute single-use plastic.

# Overview of Leaf Plate Value Chain



# Forest Green, Odisha

## No of Women Engaged :

- Leaf Collectors : 1500+
- Leaf Stitchers : 180
- Value Addition (pressing and packaging) : 60

## Production per Day :

- 8000 to 10000pcs from the 8 pressing machines

## Trainings Provided :

- Soft Skill- 6Y, Gender, Gender Based Violence, Micro Enterprise Leadership, Board member Training, Financial Inclusive Training.

## Hard Skill :

- Leaf Hand Stitching, Sewing machine, Pressing & Packaging, etc.

## Location :

- Village 150, across 4 Districts
- District-Kandhamal, Nayagarh, Koraput, & Khordha
- State : Odisha
- Distance of Center to Forest : Minimum of 2 km radius and maximum of 50 km radius

# Steps in Leaf Plate Value Chain

## Organisation of Clusters

**Cluster 1 :** Leaf Collection with Sorting + Hand Stitching (if required) at work from home level

**Cluster 2 :** Sorting + Machine Stitching - work from home and work from unit level

**Cluster 3 :** Hydraulic Pressing Unit, Quality Checking + Packaging at Hub level

**Cluster 4 :** Warehouse at cluster and Hub level



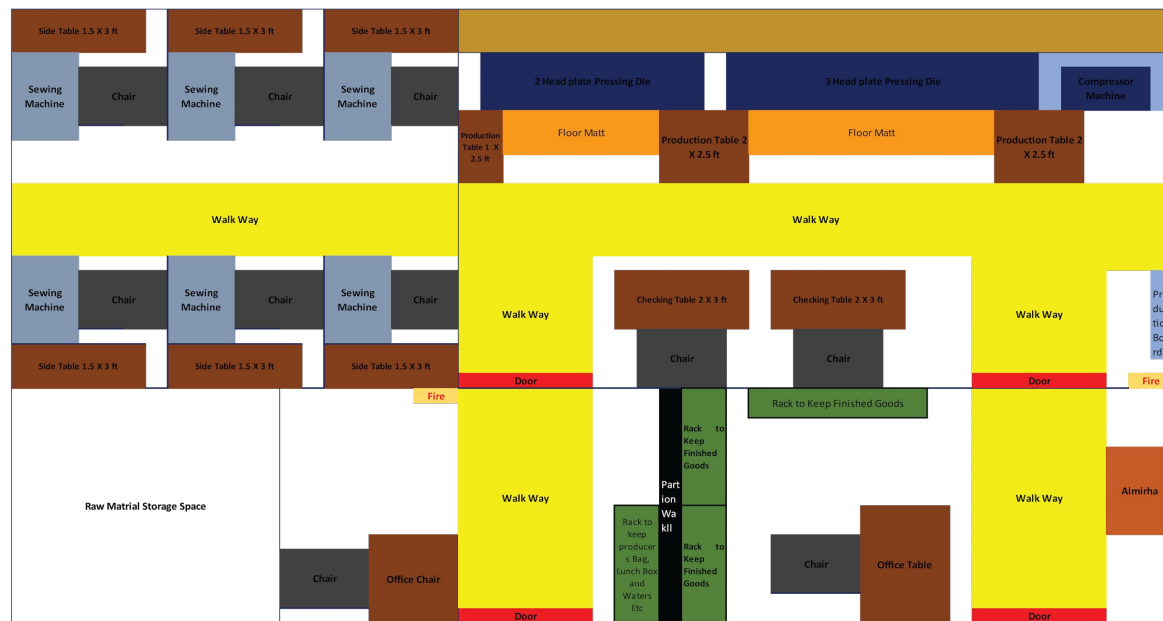
# Steps in Leaf Plate Value Chain

## Layout of Units - Spoke Unit Landruguda (use link for better view of the layout)

[https://drive.google.com/file/d/1MYa-ytjcvCs\\_FvhPGbIYPAHHjjj0bv5S/view?usp=drive\\_link](https://drive.google.com/file/d/1MYa-ytjcvCs_FvhPGbIYPAHHjjj0bv5S/view?usp=drive_link)

This unit is a spoke unit. The accounts for production and warehousing to a limited extent. This unit feeds the Hub.

Additionally at Village level that are Spokes functioning on 1 or maximum 2 production activities based on skill and access to material.



# Guidelines

## Points to Remember for Selection of Leaves

**Color of Leaf:** Green, Golden Green, Medium Green

**Types of Leaf:** Sal Rough Stitch, Siali Rough Stitch and Siali Fine Stitch

**Size of Leaf:** 14' to 17' in diameter

## Points to Remember for Hand Stitching :

**Ensure Leaves are:** Green, Medium Green with no holes and no Spots

**While stitching:** The sticks should be in a line no overlapping/too. Maintain uniform distance from stick to stick.

The sticks should be in the border of leaves.

# Guidelines

## Points to Remember for Storage :

**Radius of Collection:** 8 to 10 Km

Sewing Machine Details - 180 numbers, work from home and work from spoke and work from hub.

**Pressing Unit:** Electricity vs Solar - both are possible

Production Efficiency : Sewing efficiency 50-70 leafs per hour

# Compliance Practices

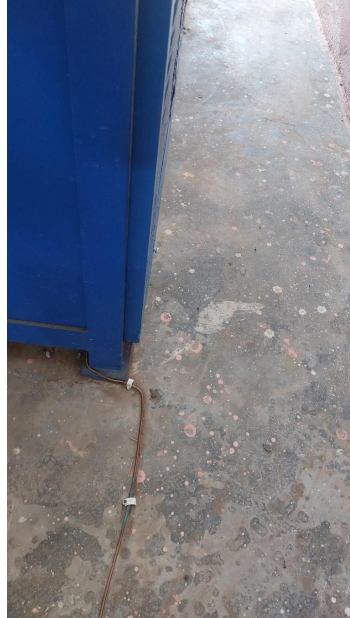
## List of Phone Numbers to be displayed at Unit Level

- On Call Ambulance 108
- Police Speed Dial Number 100
- Fire Speed Dial Number 101
- Municipality Hospital Ambulance
- Nearest Hospital (atleast two with distance from Unit)
- Panchayat Office Number
- Water Supply Number
- Electricity Department Helpline & Electricity Department Person
- Women Helpline
- Snake Helpline (for units closer to forest)

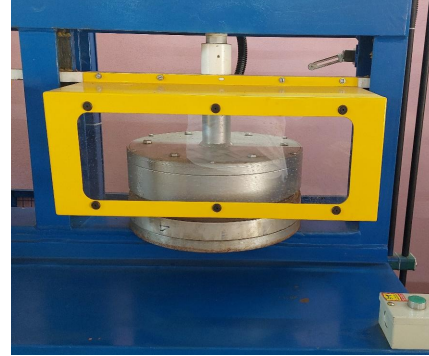
# Compliance Practices : Personal Protective Equipment & Machine Features



Safety hand Gloves



Proper Earthing to the Machines



Safety Glass



Rubber Mat to stand on while using the machine

# Leaf Plate Pressing Machine Vendor Details

**Name: Fluid Power Machines Private Limited**

## Office Address

No. 14-A, 5th South Street, Avarapalayam,  
Ganapathi, Coimbatore – 641 006,  
Tamil Nadu, India.

## Factory Address

46-47, Lakshmi Nager, Near by SIDCO,  
Malumichampatti – 641 050,  
Tamil Nadu, India.

## Contact Number

Kannan - +91 98420 31303  
Ram Kumar - +91 98422 31391

Web Site : <https://www.fluidpowerindia.com>

## Location :

<https://www.google.com/maps/dir//46-47,+lakshmi+nagar,+near+sidco,+malumichampatti,+Coimbatore,+Tamil+Nadu+641050/@10.907512,76.9285741,12z/data=!4m8!4m7!1m0!1m5!1m1!1s0x3ba850757a3a3f87:0x1a2329343dc58ffa!2m2!1d77.010976!2d10.907523?entry=ttu>

## Per Machine and per Dye (Mold) Cost Listed

| Sl. No | Description                 | Qty in Set | Unit Rate in Rs. |
|--------|-----------------------------|------------|------------------|
| 1      | 14" Round Die               | 1          | ₹ 33,000.00      |
| 2      | 12" Round Die               | 1          | ₹ 28,500.00      |
| 3      | 10" Round Die               | 1          | ₹ 24,000.00      |
| 4      | 12" Compartment die         | 1          | ₹ 35,500.00      |
| 5      | 10" Compartment die         | 1          | ₹ 30,000.00      |
| 6      | 5" Bowl                     | 1          | ₹ 12,500.00      |
| 7      | 4" Bowl x 2 Nos(Single Die) | 1          | ₹ 22,500.00      |

**Hydraulic Leaf plate making machine without dies (2 Head machine) - Rs. 220000 + 18% GST additional**

## Technical Specification

- Box Type Structure, Frame is fabricated, Steel Plates duly welded with suitable reinforcements to give strength to withstand the load during operation
- Hydraulic Cylinder Bore : 63mm, Ram : 36mm - 3.5 Tons load output
- 2HP hydraulic powerpack with 50 ltrs tanks capacity and Rexroth gear pump
- Working Pressure : 120 Bar
- Electrical operated directional control valve for up/down of the cylinder
- Select make Digital type Temperature controller for top & bottom Heater
- Select make Digital timer is provided for die opening
- Pipe lines: Pipelines will be of seamless steel & fittings will be of forged M.S. material
- Power Requirement 3 to 4.5 kw based on the die size will vary

# Machine Pictures



Machine Front Side



Machine Back Side



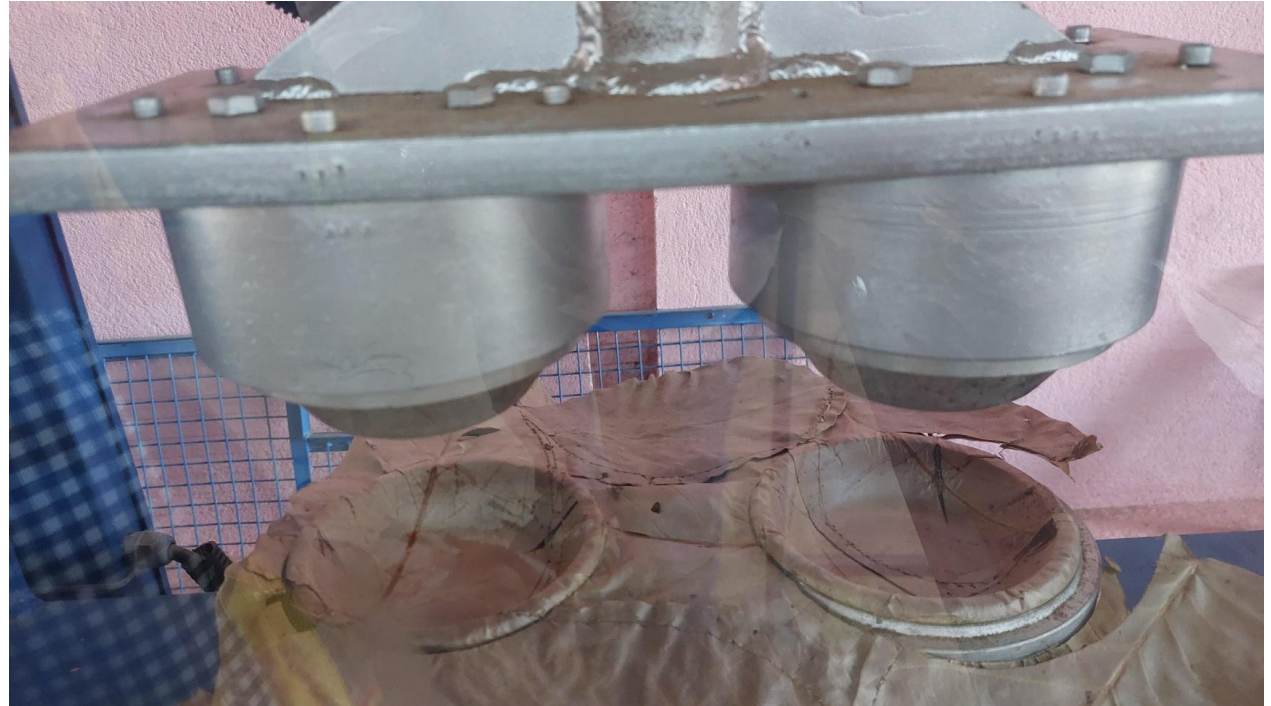
Oil Tank Back Side



Electric Panel Box



Single Plate Die



Double Plate Die

## Operational Sequence

- The system is designed with single cycle auto operation with auto/manual control.
- Initially set the temp. required for dies thru temperature controller for both die.
- Keep the control in auto mode
- Load the leaf in between the die, then press the down button
- The die will move downward and once the load reached the timer will start.
- Meanwhile the operator will load the leaf in second machine and press the down button
- Once the time is over, the die of the first machine will open and the operator will take the plate.
- Again the operation will load the leaf in first machine and press down button.
- At the same the second machine will open after the time over and ready for next cycle.

# Production Efficiency

| Product Details     | Die Size in Inches | Per Hour Capacity with 100% efficiency No. PCS |
|---------------------|--------------------|------------------------------------------------|
| Leaf with Cardboard | 14                 | 55                                             |
|                     | 12                 | 55                                             |
|                     | 10                 | 55                                             |
|                     | 8                  | 70                                             |
|                     | 6                  | 70                                             |
|                     | 5                  | 70                                             |
|                     | 4                  | 80                                             |

| Product Details | Die Size in Inches | Per Hour Capacity with 100% efficiency No. PCS |
|-----------------|--------------------|------------------------------------------------|
| Only Leaf       | 14                 | 60                                             |
|                 | 12                 | 60                                             |
|                 | 10                 | 65                                             |
|                 | 8                  | 80                                             |
|                 | 6                  | 80                                             |
|                 | 5                  | 80                                             |
|                 | 4                  | 80                                             |

## Leaf Plates : Potential Materials

### Materials for leaf plates & containers include

- Siali ( *Bauhinia vahlii*),
- Sal (*Shorea robusta*),
- Teak (*Tectona grandis*)
- Yam (*Dioscoreaceae*)
- Jackfruit (*Artocarpus heterophyllus*)

# Market Overview

Domestic markets for biodegradable single use plates & food storage containers has boomed after regulation & enforcement of rules restricting the use of plastics.

This has removed the unrealistic pricing of single use disposable & brought substitutes such as areca sheath, Sugarcane pulm / Bagaas, moulded paper & leaf plates on an even playing field.

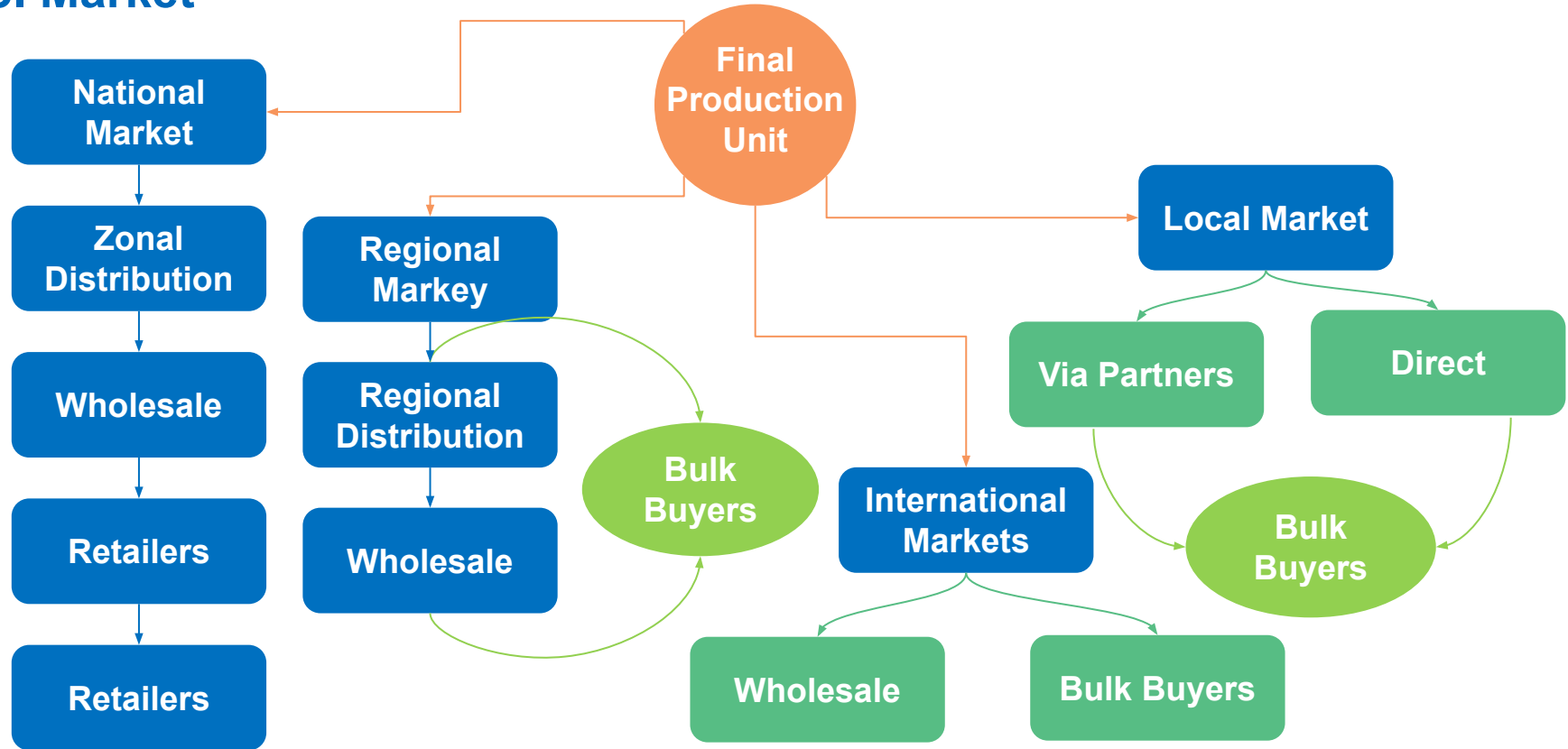
Tribal communities have traditionally used leaf plates for their own use and then found markets for it through middlemen in cities. Used in temples, festivals & marriages primarily, leaf plates from Odisha through a chain of middlemen & traders are used as faraway as in Gujarat.

# Market Requirements

Modern Markets however require plates to be stiff enough to hold in one hand whilst standing & eating and this has resulted in the production of heated hydraulically pressed plated with inserts for stiffness. For a viable supply chain the following should be considered

- Availability of sustainable collection of leaves
- Distance from collection to primary processing units
- Availability of power, transport and infrastructure for secondary & final production including processing of fallouts, cutoffs and waste.
- Access to Markets

### 3. Market



\* International needs to meet phytosanitary Compliances

## Different Product Sizes





Forest Green



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### Connect

Ayan Dutta : 7763804860

Email : [ayan@industree.org.in](mailto:ayan@industree.org.in)

Suresh : 9891252284

Email : [suresh@industree.org.in](mailto:suresh@industree.org.in)