Manufacturing of Eco-Friendly Stationery from Pine Wood (Chir Pine) – Uttarakhand

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1. Introduction

The Manufacturing of Eco-Friendly Stationery from Pine Wood project is conceptualised as a forest-based, sustainable manufacturing enterprise that converts locally available Chir Pine (Pinus roxburghii) wood into high-value stationery and desk utility products. Uttarakhand possesses abundant pine forests, and a significant quantity of pine wood, forest thinnings, and low-grade timber remains under-utilised or used only as fuelwood. This project aims to channel this resource into organised manufacturing, thereby creating livelihood opportunities, promoting eco-friendly alternatives to plastic stationery, and strengthening the rural MSME ecosystem.

The growing awareness around sustainability, plastic reduction, and green consumerism has created a strong demand for wooden stationery products in schools, colleges, offices, corporate gifting, and export markets. Pine wood, being lightweight, workable, and aesthetically pleasing, is particularly suitable for stationery manufacturing. The project aligns with Uttarakhand's policy focus on forest-based livelihoods, MSME development, and value addition at the local level rather than raw material out-migration.

2. Basic Project Information

Particular	Details
Project Title	Pine Wood Stationery Manufacturing Unit
Product Category	Eco-friendly Wooden Stationery
Raw Material	Chir Pine (Pinus roxburghii) Wood
Sector	Forest-based MSME
Enterprise Type	Manufacturing
Target Market	Schools, Colleges, Offices, Corporate Gifting, Export
Location Suitability	Uttarakhand (Pauri, Tehri, Almora, Nainital)
Legal Status	Proprietorship / LLP / Private Limited

Particular	Details
MSME Classification	Micro / Small Enterprise

3. Industry Overview and Market Context

The stationery industry in India is undergoing a gradual shift from plastic-based and synthetic products toward sustainable, biodegradable, and natural alternatives. Wooden stationery has emerged as a niche yet fast-growing segment driven by eco-conscious institutions, corporate houses adopting ESG norms, and premium gifting markets. Globally, wooden stationery products are also gaining acceptance in export markets due to their handcrafted appeal and low environmental footprint.

Uttarakhand holds a comparative advantage in this sector due to the availability of pine wood, traditional carpentry skills, and proximity to large consumption centres such as Delhi-NCR. With appropriate branding, quality control, and design inputs, pine wood stationery units in the state can compete effectively with products manufactured in other parts of India and abroad.

4. Product Range and Applications

The unit will manufacture a diversified range of pine wood stationery and desk accessories catering to educational institutions, offices, and gifting markets. Product diversification helps reduce market risk and ensures year-round demand.

Product Category	Specific Items
Writing Tools	Wooden pencils, pen bodies
Desk Accessories	Pen stands, card holders, paperweights
School Stationery	Rulers, geometry boxes
Office Supplies	Clipboards, file holders
Gift Items	Engraved stationery sets
Custom Products	Logo-engraved corporate stationery

5. Raw Material Requirement

The primary raw material for the project is Chir Pine wood sourced from authorised forest depots, Van Panchayats, and licensed timber suppliers. Supporting materials include eco-friendly adhesives, natural polishes, and paper-based packaging.

Raw Material	Source	Annual Requirement
Pine Wood Blocks	Van Panchayats / Forest Depots	25–30 MT
Wood Adhesive	Local chemical suppliers	500 kg
Natural Polish	Herbal / Water-based	300 litres
Sandpaper	Hardware suppliers	As required
Packaging Material	Local paper units	Bulk

6. Manufacturing Process

The manufacturing process is designed to be simple, labour-intensive, and suitable for small-scale operations while maintaining consistency and quality. Pine wood logs are first seasoned to reduce moisture content, followed by cutting, shaping, finishing, and branding.

Step No.	Process Description
1	Procurement of pine logs
2	Seasoning and drying
3	Cutting into planks and blocks
4	Precision shaping and turning
5	Sanding and surface finishing

Step No.	Process Description
6	Engraving and branding
7	Polishing using eco-friendly polish
8	Quality inspection
9	Packaging

Manufacturing Flow Chart:

Pine Wood Procurement

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Seasoning & Drying

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Cutting into Blocks

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Shaping & Turning

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Fine Sanding

↓

Engraving / Branding

↓

Eco-Polishing

↓

Quality Inspection

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Packaging & Dispatch

7. Machinery and Equipment Requirement

The machinery selected for the unit balances affordability, productivity, and ease of operation. Most machines are standard woodworking equipment readily available in Uttarakhand and nearby industrial centres.

Machinery	Quantity	Approx. Cost (₹)
Wood Cutting Saw	1	1,20,000
Wood Turning Lathe	2	2,50,000
Drilling Machine	1	60,000
Belt Sander	1	80,000
Laser Engraving Machine	1	3,50,000
Dust Collector	1	1,00,000
Hand Tools & Jigs	Set	90,000

8. Installed Capacity

Parameter	Value
Working Days	300 days
Shifts	1
Daily Output	400–500 items
Annual Output	Approximately 1.2 lakh units

9. Manpower Requirement

The unit will generate direct employment for skilled and semi-skilled workers, particularly carpenters and rural youth. The manpower structure is designed to keep overheads low while ensuring smooth operations.

Position	Number	Monthly Salary (₹)
Unit Manager	1	25,000
Skilled Wood Craftsmen	4	18,000
Machine Operator	2	15,000
Finishing & Polishing Worker	2	12,000
Packaging Assistant	1	10,000
Accountant (Part-time)	1	8,000
Total	**11**	—

10. Land and Infrastructure Requirement

Component	Requirement
Covered Area	2,000–2,500 sq. ft.
Production Hall	1,500 sq. ft.
Storage Area	500 sq. ft.
Power Load	15–20 HP
Water Requirement	Minimal
Waste Disposal	Sawdust reuse

11. Estimated Project Cost

Cost Head	Amount (₹)
Machinery & Equipment	10,50,000
Furniture & Fixtures	1,00,000
Raw Material (Initial)	2,50,000
Building & Electrification	3,00,000
Working Capital	3,00,000
Contingency	1,00,000
Total Project Cost	**21,00,000**

12. Means of Finance

Source	Amount (₹)
Promoter Contribution	6,30,000
Bank Loan	14,70,000
Margin Money	30%

13. Revenue and Profitability Projection

With an average selling price of ₹180 per unit and an annual production of approximately 1.2 lakh units, the unit has strong revenue potential. The projections assume gradual capacity stabilisation, conservative price growth, and controlled operating costs. The unit is expected to achieve operational stability by the end of Year 2.

Particular	Amount (₹)
Annual Sales Turnover (Year 1)	2,16,00,000
Total Production Cost	1,45,00,000
Gross Profit	71,00,000
Net Profit (Approx.)	38–42 lakh

14. Five-Year Financial Projections

The five-year financial projection is based on moderate growth in production volume, improved operational efficiency, and gradual expansion into institutional and corporate markets. A conservative annual growth rate of 10–12% has been assumed.

5-Year Projected Income Statement

Year	Estimated Turnover (₹)	Total Cost (₹)	Net Profit (₹)
Year 1	2,16,00,000	1,78,00,000	38,00,000
Year 2	2,40,00,000	1,95,00,000	45,00,000
Year 3	2,68,00,000	2,14,00,000	54,00,000
Year 4	3,00,00,000	2,36,00,000	64,00,000
Year 5	3,35,00,000	2,60,00,000	75,00,000

Key Financial Indicators

Indicator	Value
Average Net Profit Margin	17–22%
Payback Period	2–2.5 years
Internal Rate of Return (Indicative)	28–32%
Debt Service Coverage Ratio (Avg.)	>1.8

| Annual Sales Turnover | 2,16,00,000 | | Total Production Cost | 1,45,00,000 | | Gross Profit | 71,00,000 | | Net Profit (Approx.) | 38–42 lakh |

15. Break-Even Analysis

Parameter	Value
Fixed Cost	₹35 lakh
Contribution Margin	35%
Break-even Period	20–22 months

16. Marketing Strategy

Channel	Strategy
Institutional Sales	Schools and colleges
Corporate Gifting	Custom engraving and bulk orders
Online Platforms	GeM, Amazon, Etsy
Exhibitions	MSME and handicraft expos
Branding	Eco-friendly and ‘Made in Uttarakhand’ positioning

17. Uttarakhand-Based Vendors

Raw Material Suppliers

Vendor	Location
Van Panchayat Timber Depots	Pauri, Tehri
Forest Development Corporation	Dehradun
Local Timber Yards	Rishikesh, Haldwani

Machinery Suppliers

Vendor	Location
WoodTech Machines	Dehradun
Himalayan Engineering Works	Haridwar
TechnoCraft Industries	Rudrapur

18. Environmental, Social and Sustainability Impact

The Pine Wood Stationery Manufacturing Unit is inherently aligned with sustainability principles and circular economy practices. By utilising locally available pine wood sourced through authorised channels such as Van Panchayats and Forest Development Corporation depots, the project promotes responsible forest resource management and discourages illegal logging.

The substitution of plastic-based stationery with wooden alternatives significantly reduces non-biodegradable waste generation in educational institutions and offices. Pine wood products are biodegradable, renewable, and have a much lower lifecycle environmental footprint compared to plastic or metal stationery.

From an operational perspective, the unit adopts low-energy manufacturing processes, relies primarily on mechanical woodworking rather than chemical-intensive processes, and uses

water-based or herbal polishes. Wood waste such as sawdust and offcuts is reused for briquettes, incense sticks, composting, or local fuel needs, ensuring near-zero waste discharge.

Sustainability Impact Table

Sustainability Dimension	Impact
Resource Efficiency	Utilisation of low-grade pine wood
Waste Management	100% reuse of sawdust and scrap
Plastic Reduction	Replacement of plastic stationery
Energy Use	Low power-intensive machinery
Carbon Footprint	Reduced through local sourcing

Social Sustainability

The project generates stable rural employment for carpenters, machine operators, and packaging workers, with particular scope for engaging youth and traditional artisans. Skill upgradation in precision woodworking, laser engraving, and quality finishing enhances long-term employability. The enterprise also strengthens Van Panchayat income streams, creating a direct economic incentive for sustainable forest management.

19. Risk Analysis and Mitigation Matrix

Like any manufacturing enterprise, the Pine Wood Stationery Manufacturing Unit faces certain operational, financial, and market-related risks. However, these risks are manageable and can be effectively mitigated through planning, diversification, and institutional linkages. A structured risk assessment strengthens the project's bankability and long-term sustainability.

Risk Category	Identified Risk	Likely Impact	Mitigation Strategy
Raw Material Risk	Irregular supply of pine wood	Production disruption	Long-term sourcing agreements with Van Panchayats and Forest Dept. depots
Regulatory Risk	Delay in forest transit permits	Logistics delay	Advance permits and compliance with Forest Department norms
Market Risk	Demand fluctuation	Revenue instability	Product diversification and institutional tie-ups
Price Risk	Rise in raw material or power cost	Margin reduction	Energy-efficient machinery and bulk procurement
Operational Risk	Skill shortage	Quality issues	Regular skill training and SOP-based production
Financial Risk	Cash flow mismatch	Working capital stress	Adequate working capital and phased expansion
Technology Risk	Machine downtime	Production loss	Preventive maintenance and AMC contracts
Environmental Risk	Waste disposal issues	Compliance penalties	100% reuse of sawdust and scrap wood
Competition Risk	Entry of low-cost producers	Price pressure	Branding, quality focus, eco-certification
Climate Risk	Monsoon-related transport disruption	Supply delays	Buffer stock and flexible production planning

20. Conclusion

The Pine Wood Stationery Manufacturing Unit represents a financially viable, environmentally sustainable, and socially inclusive enterprise for Uttarakhand. By combining locally available forest resources, skilled human capital, and a rapidly growing market for eco-friendly products, the project offers strong potential for long-term growth. The integrated approach of value addition, sustainability, and risk mitigation makes the enterprise well-suited for support under DUY, MSME financing, and green entrepreneurship programs. With appropriate institutional support, branding, and quality assurance, the unit can evolve into a scalable and replicable model for forest-based manufacturing in the Himalayan region.

Disclaimer

Only a few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not imply any recommendation.